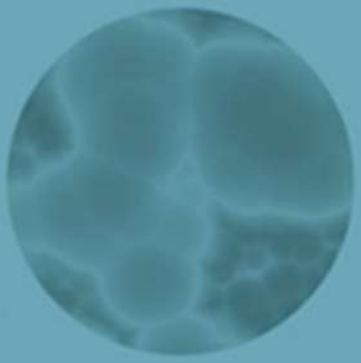

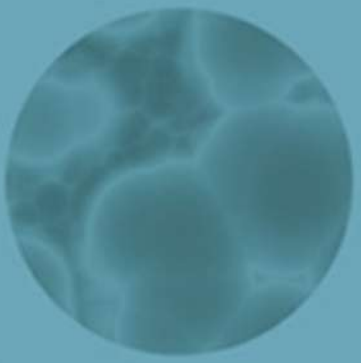

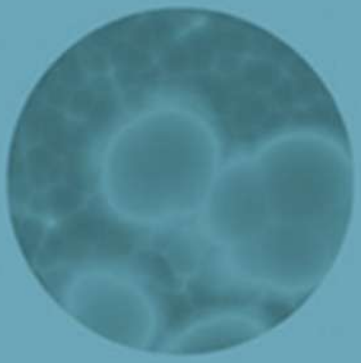

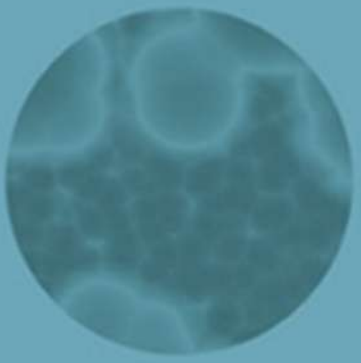

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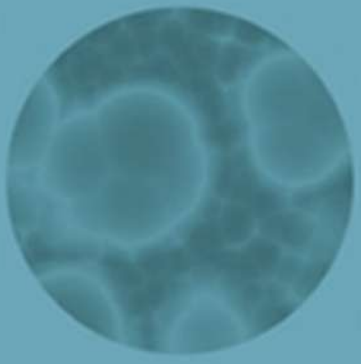

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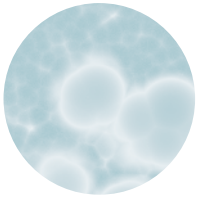

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## THEORY AND PRACTICE

7E

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## THEORY AND PRACTICE
## 7E

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# Foreword

Congratulations on choosing a rewarding and fulfilling career path.

The authors Gabrielle Koutoukidis, Kate Stainton and Jodie Hughson along with a team of worthy contributors have developed an essential learning resource for the Diploma of Nursing student in this the seventh edition of *Tabbner's Nursing Care: Theory and Practice*.

As you work from the fundamentals of nursing onto psychosocial and physiological nursing care you will be rewarded with the wealth of knowledge that fills the pages of this book. This book will not only contribute significantly to you as a learning tool but will remain a valuable resource to refer to as your career progresses.

*Tabbner's Nursing Care* is a user-friendly resource and the content throughout highlights developmental considerations, cultural aspects of care, current research and health education. All of the features will assist students in reflecting on their new-found knowledge and gaining a critical-thinking outlook. The comprehensive examples of Nursing Care Plans and Progress Notes throughout assist you in producing concise and accurate documentation while on placement and into your nursing career. There are examples of how to use the decision-making framework to best manage and develop your scope of practice and there is nothing more valuable in nursing than Lived Experiences—these experiences will become your most valuable developmental tools.

Enrolled Nurses have always been valuable members of the nursing team, giving hands-on care to individuals and their families/carers and being advocates for that care. As Enrolled Nurses become more involved in the multidisciplinary team they need increased IT skills, auditing (collecting and collating data) skills and quality and safety processing skills. Chapters on nursing informatics and technology in healthcare along with quality and safety in healthcare have been an important inclusion in the seventh edition of *Tabbner's Nursing Care*.

As an Enrolled Nurse you will never stop learning and developing new skills. Even when your formal education is complete I would encourage you to embrace all opportunities to learn, within your scope of practice.

Always remember: evidence-based practice underpins best practice.

**Louise Dearman**
*President*
*National Enrolled Nurse Association (NENA)*

# Publisher's dedication

**Alice Ray Tabbner**
*25 December 1919–13 December 1994*

Ray (as she preferred to be known) Tabbner was born in Birmingham, England. After working in the St John Ambulance in World War II where she said she 'became engrossed in nursing', she completed her training as a nurse in the 1940s. She moved to Australia in 1948 and worked in a number of Sydney hospitals before settling in Melbourne.

Ray established a career in nursing education in 1953 taking on the role of Tutor at the recently established Melbourne School of Nursing. In 1954 she successfully completed her Sister Tutors Diploma through the College of Nursing Australia and remained a Tutor at the school until 1961 when she was awarded the Inaugural Nurse Scholarship in Geriatrics from Mount Royal Hospital. As a consequence of receiving this award, Ray was appointed to the position of Deputy Matron of Geriatric Nursing at Mount Royal. She later established the Nursing Aides course at the Fairfield Hospital in Melbourne under the leadership of Vivian Bulwinkel, and in 1973 was appointed Deputy Director Nursing (Education), one of three executive positions at the Royal Melbourne Hospital.

An innovative educator and mentor, Ray Tabbner was one of the first nurses to call for the establishment of 'Nurse Banks' in Australia to ensure flexibility in the nursing workforce for those nurses wishing to pursue family or other interests while pursuing their chosen profession. She was also a great advocate of ongoing training to ensure nurses could maintain flexibility in their lives and return to nursing with confidence.

In 1975 she was appointed Principal Teacher at the Melbourne Nursing Aides School (later renamed Melbourne School for Enrolled Nurses), a position she occupied until 1978 when she retired to write. Originally titled *The Handbook for Nursing Aides*, this book was later renamed *Nursing Care: Theory & Practice*, and since the publication of the first edition in 1981, it has become known and loved by generations of nursing students as simply *Tabbner's*.

An article published in 1973 in the Melbourne *Sun* described her as being 'as flighty as your average banker. Her dark hair has streaks of steel grey and the creases in her dazzlingly white nurse's uniform would slice bread'. However, students from the 1950s to the 1970s remember her with great fondness and warmth. Ray Tabbner was said to be very approachable and a welcome relief from many 'military style' nurse educators. She taught everything from anatomy and physiology to bandaging and nursing care and made a great impression on her students. As one student from 1955 put it, 'Everything Miss Tabbner said, I learned'.

The Tabbner name has become synonymous with Enrolled Nurse/Registered Nurse Division 2 education not only throughout Australia—the influence of her name extends via this publication to New Zealand, the United Kingdom, the Middle East, Africa and the West Indies.

This seventh edition of *Tabbner's Nursing Care* is dedicated to her memory and her contribution to nurse education.

# Preface

The seventh edition of *Tabbner's Nursing Care* is a significant revision which reflects the scope of practice in contemporary enrolled nursing practice while still retaining the strengths of previous editions that have made it an essential resource for enrolled nursing students and their facilitators.

## The role of the Enrolled Nurse

The Enrolled Nurse is an essential member of the healthcare team, providing person-centred nursing care which includes recognising what is normal and abnormal in assessing, intervening and evaluating individual health and functional status. Enrolled Nurses' responsibilities also include providing support and comfort, assisting with activities of daily living to enable individuals to achieve their optimal level of independence and providing for the emotional needs of people. Where state and territory law and organisational policies allow, Enrolled Nurses may administer prescribed medicines or maintain intravenous fluids, in accordance with their educational preparation.

Enrolled Nurses are required to be information-technology literate, with specific skills in the application of healthcare technology. Enrolled Nurses demonstrate critical- and reflective-thinking skills in contributing to decision making, including reporting changes in health and functional status and individual responses to healthcare interventions. Enrolled Nurses work as part of the healthcare team to advocate for and facilitate the involvement of individuals, their families and significant others in planning and evaluating care and progress towards health outcomes. The role also requires them to act as preceptors for students and other healthcare workers.

Career opportunities for Enrolled Nurses are expanding and include acute care; perioperative, emergency, intensive and coronary care; aged care; rehabilitation; community and mental health nursing; and general practice settings. In addition, Enrolled Nurses work in specialty areas such as nursing education, diabetes education, continence management, dementia management, lactation consultancy, workplace safety and wound care. There are also increasing opportunities for Enrolled Nurses to move into management positions.

## Seventh edition of *Tabbner's Nursing Care*

Holistic, person-centred care is the approach used throughout the textbook, allowing students to appreciate the skill and scope required to be a safe and competent Enrolled Nurse. All chapters have been completely revised with a focus on critical thinking and problem solving, quality and safety and evidence-based practice, with national registration requirements addressed where appropriate.

Two new chapters have been included to highlight contemporary nursing issues:

- Nursing informatics and technology in healthcare
- Quality and safety in healthcare

The full-colour internal design enhances photos and illustrations to provide clear and meaningful visual aids to learning.

The seventh edition has been carefully developed to align with the Diploma of Nursing in the HLT Health Training Package for the enrolled nursing student. It provides a contemporary approach to nursing practice and is an invaluable teaching resource. The text provides the theoretical knowledge on the care that individuals may require in a range of healthcare settings and offers special features to enhance student learning of the material.

This edition is a culmination of the efforts of many nursing academics and professionals who are passionate about the education of Enrolled Nurses and the important role they play in healthcare settings. We are grateful for their enthusiasm and support throughout the writing process. In addition, we would like to thank the team at Elsevier for their hard work and perseverance in ensuring the publication of this edition.

**Gabby Koutoukidis**
**Kate Stainton**
**Jodie Hughson**

# Acknowledgments

I was delighted to be invited as an editor again for *Tabbner's 7E* and to have the opportunity to do this alongside two very good friends of mine—Kate and Jodie. This seventh edition is the culmination of work by many writers and nursing educators and I would like to thank all contributors for their enthusiasm and support for Enrolled Nurse education.

I would also like to acknowledge all the nursing students and teams I have worked with over the years who have inspired in me a passion for teaching and ensuring best nursing practice.

**Gabby Koutoukidis**

To my husband, Anthony, and children Ben, Alex and Maddy, thank you so much for your understanding and support throughout the work on this edition of *Tabbner's*.

As both a nurse educator and nurse myself, I realise the importance of a textbook that prepares students for the contemporary healthcare environment.

To my co-editors, the contributors, the reviewers and the team at Elsevier thank you for all your knowledge and hard work.

**Kate Stainton**

Once again my experience as an editor for the seventh edition of *Tabbner's Nursing Care* has been exciting and challenging. When a project like this is embarked upon it is not only oneself that makes sacrifices but all those around us, family and friends, and I appreciate the understanding my husband Stuart and the rest of our family have given to me throughout the last 2 years. This last year for me personally was a year of reflection and soul searching but it has strengthened my passion and commitment to my lifelong profession of nursing.

I also thank the Elsevier team for all the hard work in getting this edition to publication. I feel privileged to be working alongside my co-editors Gabby and Kate who are truly dedicated and inspirational women.

And for all the students reading this as they embark on the journey to becoming a nurse I would like you to reflect on these simple but moving words from a patient, given to nursing staff at a facility last year:

'Thank you. You saved my life.'

**Jodie Hughson**

The Editors and Publisher would like to specifically acknowledge the work of Dr Lesley Seaton, who co-authored Chapter 10, Cultural competence and safety, and pay tribute to her dedication, passion and invaluable contribution to nurse education in Australia and New Zealand.

# Standard steps for all clinical skills/interventions

These are the essential steps that must be done consistently with each individual contact in order to deliver responsible and safe nursing care.

| Before the procedure | |
|---|---|
| **Step 1** | • Mentally review the steps of the procedure beforehand<br>• Discuss the procedure with your instructor/supervisor/team leader, if required<br>• Confirm correct facility/organisation policy/safe operating procedures |
| **Step 2** | • Check the order in the chart, individual's healthcare record<br>• Review handover report to assess specific instruction or need of person (allergies)<br>• Gather equipment/supplies. If using a procedure trolley, ensure it is cleaned and place all equipment to be used on the bottom shelf<br>• Perform hand hygiene |
| **Step 3** | • Introduce yourself, explain and communicate the activity clearly to the individual and/or family.<br>• Identify the individual as per facility/organisational policy using three individual identifiers<br>• This may include but is not limited to identifying the individual's<br>> identification allocated healthcare number on hospital bracelet/band<br>> seeking verbal confirmation from the individual of given and family name<br>> date of birth<br>> gender<br>> address<br>> Medical record number<br>• Ensure therapeutic interaction. This may include but is not limited to:<br>> Introducing oneself<br>> Ensuring privacy before undertaking the procedure<br>> Why the procedure has been ordered<br>> Why the procedure will be undertaken and frequency<br>> What is involved in undertaking the procedure<br>> Listen to the individual's concerns or questions about the procedure before it is undertaken<br>> Ensure the individual is aware of their responsibilities required of them before undertaking the procedure<br>> Maintain professional boundaries<br>• Gain consent to perform the procedure<br>• Identify teaching needed<br>• Assess for pain relief as applicable to clinical skill/intervention |
| **Step 4** | • Assist the individual to assume an appropriate position of comfort<br>• Keep yourself safe e.g. raise the bed to appropriate working height<br>• Provide adequate lighting for the procedure<br>• Arrange supplies and equipment |

| | |
|---|---|
| **During the procedure** | |
| **Step 5** | • Perform hand hygiene<br>• Put on gloves following standard precautions as appropriate<br>• Place on eyewear, mask and gown as appropriate<br>• Ensure the individual's safety and comfort throughout procedure |
| **Step 6** | • Promote independence and involvement if possible<br>• Assess the individual's tolerance to the procedure |
| **After the procedure** | |
| **Step 7** | • Dispose of used supplies and sharps appropriately<br>• Remove eyewear and other protective equipment and discard or store appropriately<br>• Remove gloves (if worn) and perform hand hygiene. Remove eyewear and other protective equipment and discard or store appropriately<br>• Clean used equipment and store appropriately |
| **Step 8** | • Make the individual comfortable and inform them of how the procedure went, or of any results/values<br>• Restore the bed height, tidy the bed and surrounding area. Place call bell and personal items within reach<br>• Perform hand hygiene |
| **Step 9** | • Record and document assessment findings, details of the procedure performed and the individual's response<br>• Report abnormalities as required<br>• Reassess the individual to ensure there are no adverse effects/events from the procedure |

*(from deWit & Williams [2014]* Fundamental Concepts and Skills for Nursing*, 4th edn. WB Saunders, Philadelphia, reproduced with permission; and Griffin, Potter & Ostendorf [2015]* Nursing Interventions & Clinical Skills*, 6th edn. Mosby Elsevier)*

# Text features

Learning Outcomes assist students to focus on key information in each chapter

Key Terms are listed at the beginning of each chapter and defined within the text

Chapter Focus introduces the key concepts in each chapter

Lived Experiences are taken from actual clinical situations to help students understand a particular health experience from the point of view of individuals, their families or nurses and other health professionals

Nursing Care Plans provide comprehensive examples of an individual's care within a specific scenario

Case Studies provide context for practice and include questions for student reflection

Clinical Interest Boxes offer information on developmental considerations, cultural aspects of care, current research and teaching individuals

## Understanding and promoting health

*Glenda Verrinder and Lyn Talbot*

CHAPTER 6

### LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Discuss the difference between concepts of health, wellbeing, illness and disease
- Identify and discuss determinants of health
- Compare and contrast medical, behavioural and socioenvironmental models of health promotion
- Describe the principles underpinning health promotion practice
- Outline the action areas of the Ottawa Charter for Health Promotion
- Outline the major strategies within the Continuum of Health Promotion Practice
- Identify and source the literature on health promotion programs in Australia as it relates to nursing
- Discuss the role of the nurse in health promotion
- Facilitate person-centred education
- Utilise the nursing process in health promotion

### KEY TERMS

Australian Institute of Health and Welfare (AIHW)
Continuum of Health Promotion Practice
Declaration of Alma-Ata
determinants of health and illness
health inequalities
health inequities
health literacy
health promotion
homeostasis
illness
nursing process
Ottawa Charter for Health Promotion

### CHAPTER FOCUS

This chapter provides a focus for nurses from which to recognise the interrelationship of factors that determine health, wellbeing and illness. This perspective enables nurses to effectively facilitate health promotion with individuals and families and within the wider community. The chapter is presented in three parts. First, we discuss concepts of health, wellbeing and illness and what determines health. Second, we outline the emergence of health promotion, discuss what health promotion is and provide guidance for practice. Finally, we discuss the role of nurses in promoting health.

Overall the world's population is generally living longer and experiencing healthier lives. However, major disparities in health exist within and between countries. International leadership in reducing health inequalities comes from the World Health Organization (WHO) who defined health as 'a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity' (WHO 1946). This perspective of health and wellbeing leads us to health promotion practice where we employ medical, behavioural and socioenvironmental approaches depending on key priorities identified by evidence.

The role of the nurse in promoting health can be multilayered. Essentially, though, it is to gather evidence and work in collaboration with others to enable individuals, families and communities to reach their full health potential. In this chapter we introduce you to health promotion theories to guide practice; principally, the Ottawa Charter for Health Promotion (WHO 1986) and the **Continuum of Health Promotion Practice** (Talbot & Verrinder 2014), which highlight the collective role of health and other sectors, organisations and communities in achieving optimal health and wellbeing. Understanding theories that underpin health promotion practice is a key strategy for nurses in contributing to the enter- promoting health and reducing inequalities to improve health outcomes.

### LIVED EXPERIENCE

The refugee health program at the community health centre in which I work provides a range of services to facilitate settlement in Australia. On arrival to Australia, the lifestyle of refugees changes dramatically, including changes to diet and exercise; there is an increase in energy-dense diet and people become sedentary which increases the risk of chronic disease. In refugee camps the food is rationed and people are often hungry and high levels of incidental exercise are required to survive.

As the refugee nurse, I worked with Karen the community health nurse to develop a healthy lifestyle program. We found that the refugees in this community were not familiar with the notion of preventative healthcare. Furthermore, most health literature is in English and based on Western lifestyle. As part of the program we screened 30/32 refugees using the diabetes.

Togeth transition f pre- and po activity, em

Overall slight incre a result of

### NURSING CARE PLAN 8.1

Mary was not able to explain to me the medical procedure she was having today. She told me she was very frightened and thought she might die. I explained the procedure to her again and answered her questions. She was able to explain it back to me and told me that she doesn't feel as anxious any more. She stated that she will go ahead with the procedure. She informed me that she suffers from anxiety and is very worried about how she will cope when she is discharged.

**Assessment:** Anxiety due to concerns about ability to cope upon discharge
**Issue/s to be addressed:** Medication review—at present not on anti-anxiolytics or anti-depressants
**Goal/s:** Mary verbalises reduced level of anxiety and is able to state processes which are in place to improve her ability to cope when discharged

| Care/Actions | Rationale |
|---|---|
| 1. Spend time with Mary encouraging her to discuss her worries and concerns | If interest and concern are demonstrated Mary will be more likely to talk about her worries. Verbalising concerns |
| 2. Explain t that they | |
| 3. Provide relations | |
| 4. Collabor | |
| 5. Provide effects if commen | |
| 6. Monitor antidepr | |
| Evaluation | |
| Mary reporte Mary was ab | |

### CASE STUDY 41.1

Grace is 42 years old. She was born with a brain injury as a result of birth trauma. Her parents have been her primary carers since birth. Grace requires a high level of physical assistance. For example, every day of her life her father has lifted her from her bed in the morning and carried her to a recliner chair in the lounge and later returned her to bed the same way. Each day her mother has prepared the food and assisted Grace with her meals. Because of the difficulties Grace has with chewing and swallowing her food, mealtimes have always been a lengthy process. Personal care routines such as showering and dressing are provided by her parents. Sometimes Grace resists and yells out. Grace is incontinent of urine and her parents fit her with disposable pads every morning and change them frequently during the day. They take care of the pressure areas that sometimes develop.

After leaving her special developmental school at 17 years Grace began attending a day centre 3 days each week. She was taken there in a community bus specially designed to accommodate her wheelchair. Activity at the centre revolved mostly around the staff meeting the hygiene, toileting, medication, mobility and nutritional needs of the two dozen or more people with severe or profound disabilities who also attended. The staff reported that Grace spent a lot of her time there simply dozing.

On the days she is at home Grace has many things surrounding her that give her pleasure. She has a box containing many different pieces of material. She enjoys the feel of the different textures, especially the velvet and silk. Other times she holds on to colourful toys and, although she has a profoundly limited vocabulary, she is able to express her pleasure in her favourite television programs and music. Grace also enjoys being with her mother in the kitchen and sitting on the outside veranda watching people walk past the house. Many of the neighbours greet her cheerfully.

Grace's parents have been anxious for some time about their future ability to care for her, but now Grace's mother has fallen a admitted t available a

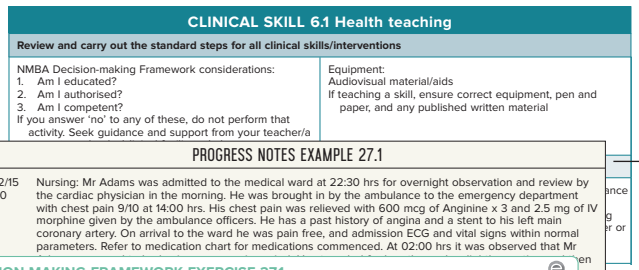
1. What n
2. What n transiti
3. What o
4. What a
5. What c
6. How ca
7. What d

### CLINICAL INTEREST BOX 30.4 Refeeding syndrome

First discussed in prisoners of war post WWII, refeeding syndrome is the derangement of serum electrolytes, vitamins and fluid resulting from over-aggressive treatment of malnourished individuals. In response to carbohydrate load, insulin is released, leading to increased glycogen, fat and protein synthesis. This triggers sudden uptake of potassium, phosphate and magnesium. This intracellular movement results in hypokalaemia, hypophosphataemia and hypomagnesaemia (Khan et al 2011). Symptoms of lethargy, shortness of breath, muscle weakness, GI upset, ataxia and delirium are indicative of these electrolyte disturbances. Individuals at an increased risk of developing Refeeding syndrome are children, individuals with greater than 10% weight loss in 4 weeks, anorexia for more than 7 days and chronic alcoholism. It is recommended electrolyte abnormalities are corrected prior to commencement of refeeding at a rate of 10–20 kCal/kg/day before gradually increasing over week.

*(Sydney Children's Hospital 2013; Khan et al 2011)*

**Clinical Skills** are in a referenced, step-by-step format emphasising the nursing process and include rationales for each step



**CLINICAL SKILL 6.1 Health teaching**

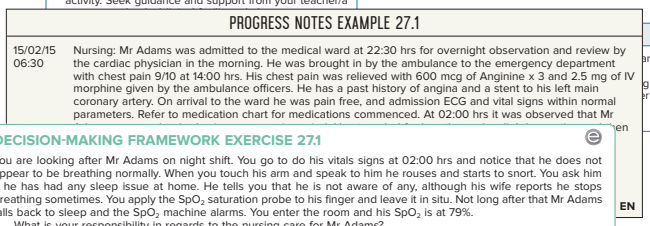
**Review and carry out the standard steps for all clinical skills/interventions**

NMBA Decision-making Framework considerations:
1. Am I educated?
2. Am I authorised?
3. Am I competent?

If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a

Equipment:
Audiovisual material/aids
If teaching a skill, ensure correct equipment, pen and paper, and any published written material

**Progress Note Examples** show how a student might document care of an individual while on placement



**PROGRESS NOTES EXAMPLE 27.1**

15/02/15 06:30 Nursing: Mr Adams was admitted to the medical ward at 22:30 hrs for overnight observation and review by the cardiac physician in the morning. He was brought in by the ambulance to the emergency department with chest pain 9/10 at 14:00 hrs. His chest pain was relieved with 600 mcg of Anginine x 3 and 2.5 mg of IV morphine given by the ambulance officers. He has a past history of angina and a stent to his left main coronary artery. On arrival to the ward he was pain free, and admission ECG and vital signs within normal parameters. Refer to medication chart for medications commenced. At 02:00 hrs it was observed that Mr

**Decision-making Framework Exercises** are specific to the chapter content and the EN scope of practice



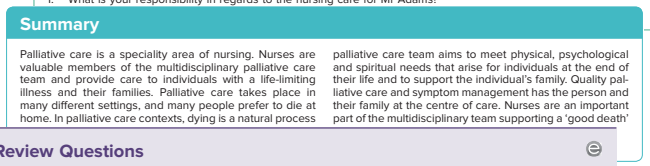
**DECISION-MAKING FRAMEWORK EXERCISE 27.1**

You are looking after Mr Adams on night shift. You go to do his vitals signs at 02:00 hrs and notice that he does not appear to be breathing normally. When you touch his arm and speak to him he rouses and starts to snort. You ask him if he has had any sleep issue at home. He tells you that he is not aware of any, although his wife reports he stops breathing sometimes. You apply the $SpO_2$ saturation probe to his finger and leave it in situ. Not long after that Mr Adams falls back to sleep and the $SpO_2$ machine alarms. You enter the room and his $SpO_2$ is at 79%.

1. What is your responsibility in regards to the nursing care for Mr Adams?

EN

**Summary** highlights the key points in the chapter content

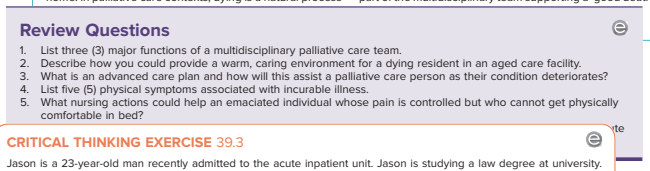


**Summary**

Palliative care is a speciality area of nursing. Nurses are valuable members of the multidisciplinary palliative care team and provide care to individuals with a life-limiting illness and their families. Palliative care takes place in many different settings, and many people prefer to die at home. In palliative care contexts, dying is a natural process

palliative care team aims to meet physical, psychological and spiritual needs that arise for individuals at the end of their life and to support the individual's family. Quality palliative care and symptom management has the person and their family at the centre of care. Nurses are an important part of the multidisciplinary team supporting a 'good death'

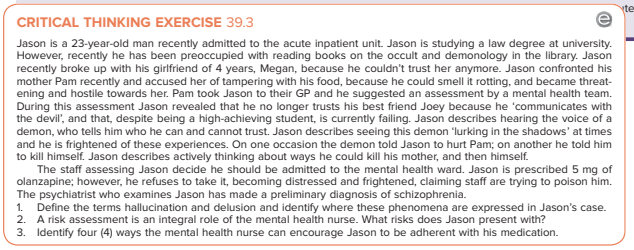
**Review Questions** assist students with comprehension and review of the chapter content



**Review Questions**

1. List three (3) major functions of a multidisciplinary palliative care team.
2. Describe how you could provide a warm, caring environment for a dying resident in an aged care facility.
3. What is an advanced care plan and how will this assist a palliative care person as their condition deteriorates?
4. List five (5) physical symptoms associated with incurable illness.
5. What nursing actions could help an emaciated individual whose pain is controlled but who cannot get physically comfortable in bed?

**Critical Thinking Exercises** stimulate the student to think critically and problem solve



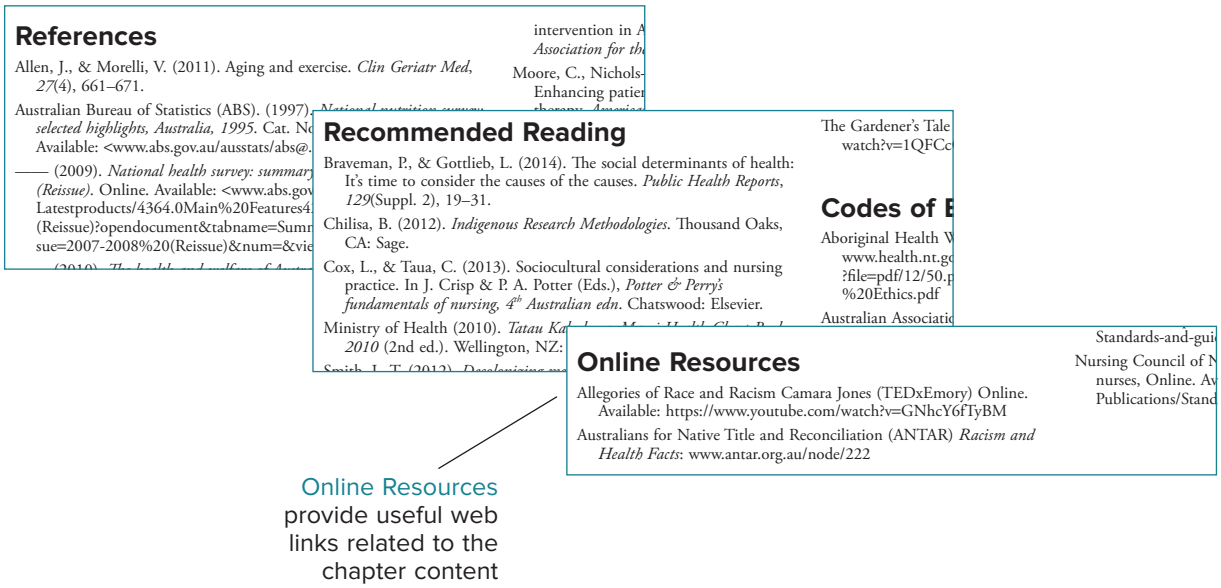
**CRITICAL THINKING EXERCISE 39.3**

Jason is a 23-year-old man recently admitted to the acute inpatient unit. Jason is studying a law degree at university. However, recently he has been preoccupied with reading books on the occult and demonology in the library. Jason recently broke up with his girlfriend of 4 years, Megan, because he couldn't trust her anymore. Jason confronted his mother Pam recently and accused her of tampering with his food, because he could smell it rotting, and became threatening and hostile towards her. Pam took Jason to their GP and he suggested an assessment by a mental health team. During this assessment Jason revealed that he no longer trusts his best friend Joey because he 'communicates with the devil', and that, despite being a high-achieving student, is currently failing. Jason describes hearing the voice of a demon, who tells him who he can and cannot trust. Jason describes seeing this demon 'lurking in the shadows' at times and he is frightened of these experiences. On one occasion the demon told Jason to hurt Pam; on another he told him to kill himself. Jason describes actively thinking about ways he could kill his mother, and then himself.

The staff assessing Jason decide he should be admitted to the mental health ward. Jason is prescribed 5 mg of olanzapine; however, he refuses to take it, becoming distressed and frightened, claiming staff are trying to poison him. The psychiatrist who examines Jason has made a preliminary diagnosis of schizophrenia.

1. Define the terms hallucination and delusion and identify where these phenomena are expressed in Jason's case.
2. A risk assessment is an integral role of the mental health nurse. What risks does Jason present with?
3. Identify four (4) ways the mental health nurse can encourage Jason to be adherent with his medication.

**References and Recommended Reading** encourage further reading within each chapter topic



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**Recommended Reading**

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The Gardener's Tale watch?v=1QFCc

**Codes of E**

Aboriginal Health W www.health.nt.g ?file=pdf/12/50.p %20Ethics.pdf

Australian Associati

Standards-and-gui

Nursing Council of N nurses, Online. Av Publications/Stand

**Online Resources**

Allegories of Race and Racism Camara Jones (TEDxEmory) Online. Available: https://www.youtube.com/watch?v=GNhcY6fTyBM

Australians for Native Title and Reconciliation (ANTAR) *Racism and Health Facts*: www.antar.org.au/node/222

**Online Resources** provide useful web links related to the chapter content

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UNIT
1

# The evolution of the nursing profession

CHAPTER 1
Nursing: the evolution of a profession

CHAPTER 2
Professional nursing practice: legal and ethical frameworks

CHAPTER 3
Nursing research and evidence-based practice

CHAPTER 1

# Nursing: the evolution of a profession

*Katie Frankiewicz*

## KEY TERMS

Australian Commission on Safety and Quality in Health Care (ACSQHC)
Australian Health Practitioner Regulation Agency (AHPRA)
Australian Nursing and Midwifery Accreditation Council (ANMAC)
Australian Nursing and Midwifery Federation (ANMF)
Enrolled Nurse (EN)
International Council of Nurses (ICN)
National Safety and Quality in Health Service (NSQHS) standards
Nursing and Midwifery Board of Australia (NMBA)
Registered Nurse (RN)
Royal College of Nursing Australia (RCNA)
Standards for Practice
unregulated healthcare workers

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Discuss the historical development of nursing
- Define nursing theory
- Explain the purpose of nursing models
- Explain the differences in the educational preparation of Registered Nurses (RNs) and Enrolled Nurses (ENs)
- Discuss scope of practice
- List the five characteristics of a profession and discuss how nursing demonstrates these characteristics
- Discuss the reasons nursing is in a constant state of change
- List at least one nursing theory and discuss its impact on nursing today
- Discuss current influences on nursing

## CHAPTER FOCUS

To understand contemporary issues in nursing the student nurse needs to understand how nursing has evolved in Australia. This chapter includes a discussion of the history of nursing, factors influencing nursing practice, scope of practice and the role of the nurse in contemporary healthcare and professional nursing organisations. This chapter will help the student understand and appreciate the influences of the past, present and future on modern nursing. A study of nursing theory can help the student develop an understanding of the purpose of nursing practice. This chapter introduces the student to a variety of nursing theories that inform nursing practice.

## LIVED EXPERIENCE

I was 17 when I started training to be a nurse. I grew up on a farm in regional Victoria, and had to move to Melbourne and live in the nurses' quarters. I was so excited, but missed home terribly. Living in meant that you became close with your colleagues, and we all became family in a way. It was so hard in the early days, being the new nurse on the ward. I was so disoriented and didn't know what to do or where anything was. We all worked so hard, and the expectations were high. You did split shifts, night duty, whatever was asked of you, and you did it without complaining. I still remember the first time I was called 'Sister'. It made it all worthwhile.

**Ollie, Retired Nurse**

## WHAT IS NURSING?

Nursing is a profession with a specialised body of knowledge that draws from the social, the behavioural and the physical sciences. Nursing is a unique profession because it addresses responses of individuals and families to health promotion, health maintenance and health problems. Nursing is seen as being important both for the provision of safe, quality care and for the humane, compassionate treatment of the individual (Scott et al 2014). There are many philosophies and definitions of nursing. Over 100 years ago Florence Nightingale defined nursing as 'the act of utilising the environment of the patient to assist him in his recovery' (Nightingale 1969 (1860)). Nightingale considered a clean, well-ventilated and quiet environment essential for recovery. Often considered the first nurse theorist, Nightingale raised the status of nursing through education. Nurses were no longer untrained housekeepers but people educated in the care of the sick (Berman et al 2015).

Virginia Henderson was one of the first modern nurses to define nursing. The definition she posed in 1966 was adopted by the **International Council of Nurses (ICN)** in 1973 and still holds wide appeal in the nursing profession. Henderson defined nursing as:

*assisting the individual, sick or well, in the performance of those activities contributing to health, its recovery, promoting quality of life or to a peaceful death that the client would perform unaided if he or she had the necessary strength, will or knowledge.*

**(Henderson, in Crisp et al 2013)**

In 2014 the ICN reviewed the definition of nursing:

*Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well, and in all settings. Nursing includes the promotion of health, prevention of illness, and the care of the ill, disabled and dying people. Advocacy, promotion of a safe environment, research, participation in shaping health policy and in patient and health systems management, and education are also key nursing roles.*

**(ICN 2014)**

Nursing also helps individuals carry out prescribed therapy, to be independent of assistance and function to maximum potential as soon as possible (Crisp et al 2013).

There are themes that are common to the many definitions of nursing (Berman et al 2015):

- Nursing is caring
- Nursing is an art
- Nursing is a science
- Nursing is individual centred
- Nursing is holistic
- Nursing is adaptive
- Nursing is concerned with health promotion, health maintenance and health restoration
- Nursing is a helping profession.

In nursing, a combination of technical skill, clinical experience and theoretical knowledge is required. Historically there has been a tendency for nursing education to focus on the mastery of nursing skills. However, nursing practice is far more complex than technical skills alone. Nursing expertise is required for interpreting clinical situations and for complex decision making and case management. It is the basis for the advancement of nursing practice and the development of nursing science (Institute of Medicine 2011). When providing nursing care, the nurse makes clinical judgments about the care needed for individuals based on fact, experience and standards of care. Knowledge, expertise and lifelong learning are gained through the continual process of critical thinking (Crisp et al 2013).

## Patients, consumers or clients? What's in a name?

The nomenclature for persons receiving healthcare has changed in line with cultural changes in nursing and healthcare. Where the person was once referred to as the patient, they have also been referred to as the client or the consumer (Daly et al 2014). So why the change in terminology and what do these words mean? The word 'patient' originates from a Latin word meaning 'to suffer' or 'suffering' (Oxford Dictionaries 2015). In times past the term 'patient' was used for those who were waiting for or undergoing medical treatment and care in a hospital. Usually, people became patients when they sought assistance because of illness or for surgery. This term was understood to have implied connotations about the medical model of health: some believed that the term 'patient' implied passive acceptance of the decisions and care of health professionals (Berman et al 2015; McLaughlin 2009). Other terms are now frequently used by health professionals in place of 'patient'. Nurses and others are now increasingly using the term 'clients', 'consumers', 'customers' or 'service users' (McLaughlin 2009).

Many of the alternative terms proposed to replace the word 'patient' can also be found wanting (McLaughlin 2009). For example, a 'consumer' is defined as an individual, a group of people or a community that uses a service or commodity. Individuals who use healthcare products or services are consumers of healthcare. This implies the 'consumer' is a purposeful seeker of healthcare who expects to get what they came seeking. This has not previously been the case in most instances in healthcare, where the provider is more accountable to the manager and key performance indicators than to the needs and wants of the consumer (McLaughlin 2009). Today the National Safety and Quality Health Service (NSQHS) Standards focus on the importance of engaging consumers in partnership and using consumer experiences and expertise to drive the delivery of safe and high-quality healthcare (ACSQHC 2012; ACSQHC 2015). A 'customer' signifies that health is a commodity in which the customer possesses an understanding of their health needs and the services available equal to that of the health professional. It is well known in healthcare that a knowledge imbalance exists between 'consumer' and service provider.

A 'client' is a person who engages the advice or services of another who is qualified to provide this service. The health status of a client is the responsibility of the individual in collaboration with health professionals (Berman et al 2015).

None of these terms is without fault at defining those who seek healthcare, and all are used interchangeably in healthcare settings. The roles and relationships between those seeking and providing care have changed dramatically. Health literacy is considered to be vital to ensure partnerships between individuals and healthcare providers. These partnerships only work if everyone can give, receive, interpret and act on health and healthcare information (ACSQHC 2012; ACSQHC 2015).

Despite the connotations associated with the word 'patient' the **Australian Commission on Safety and Quality in Health Care (ACSQHC)** (2012; 2015) and the Australian Nursing and Midwifery Federation (ANMF) (2010) continue to embrace the term 'patient-centred care'. The National Safety and Quality Health Service Standards intend to 'create a health service that is responsive to patient, carer and consumer inputs and needs' (2012). The ICN (2012) tells us that 'the nurse's primary professional responsibility is to people requiring nursing care' and that nurses ensure that individuals receive accurate information to consent to care and treatment. The 2016 *Enrolled Nurse Standards for Practice* (NMBA) also refer to individuals/group throughout. As it is the person or individual who seeks healthcare this is the preferred nomenclature throughout this book with the exception of Chapter 7 where the term 'patient' is used and Chapter 39 where the term 'consumer' is used.

## Historical perspectives

### A brief history of nursing

Nursing is a profession steeped in tradition and history and historical accounts of nursing reflect the dynamic and evolving nature of the profession. The word 'nurse' is derived from a Latin word meaning to nourish or cherish and, as birth, illness, injury and death are common to all human beings, there has always been a need for someone to take on the task of caring for others. In earlier times, and still today in some cultures, superstition and witchcraft surround illness and form the basis of the treatment of illness. For some cultures it was, and still is, believed that sickness was a punishment for wrongdoing and that the signs of illness were evidence of the presence of evil spirits. Treatment was prescribed by witch doctors and priests and, although much of it was barbaric and caused more suffering than the illness, many old herbal remedies are still used in a modified form today. Until well into the eighteenth century those who suffered a mental illness were considered to be possessed by the devil and were treated with extreme cruelty.

Some of the earliest organised nursing was performed by men who staffed the hospitals founded by military religious orders during the crusades; for example, the Knights of St John of Jerusalem, the Teutonic Knights and the Knights of St Lazarus. During the twelfth and thirteenth centuries several secular orders were active in caring for the sick, whose members included men and women (Burchill 1993). Some of the orders were the Ursulines, the Poor Clares, the Beguines and the Benedictines. Also at this time a religious order called the Augustinian Sisters of the Hôtel Dieu was founded in Paris; this is the world's oldest order of nuns devoted purely to nursing.

During the sixteenth century, Henry VIII of England ordered the dissolution of the English monasteries and the confiscation of their property and enormous wealth. This meant that large numbers of sick and destitute people previously cared for by the religious orders were left to die. Workhouses were built to house the poor, many of whom were

sick. These people lived in appalling conditions and were required to work in return for the accommodation provided. Finally, conditions in the city of London became so dreadful that, after many petitions from the people of London, Henry VIII was forced to allow hospitals such as St Bartholomew's, St Thomas's and St Mary's to be re-founded, and others to be established. The hospitals were insufficiently staffed by untrained workers, many of whom were of very poor character. Patients were housed in dreary, grossly overcrowded wards (Russell 1990).

The period from the beginning of the eighteenth century to the middle of the nineteenth century has been termed the 'Dark Ages' of nursing, during which the care of the sick and the status of the nurse reached the lowest level imaginable. The squalid conditions in hospitals and the undesirable character of those attending the sick were publicised by people such as the prison reformers John Howard and Elizabeth Fry, and the writer Charles Dickens, who in *Martin Chuzzlewit* created the unsavoury characters Sairy Gamp and Betsy Prig to typify the nurses of the time—criminals and women of low moral standards who were uneducated and who themselves lived and worked in appalling conditions (Burchill 1993).

In 1836, with the help of his wife, a Lutheran clergyman named Theodor Fliedner established an institution called Kaiserwerth, situated near Dusseldorf in Germany. There they trained carefully selected women as deaconesses, and Kaiserwerth became famous for the high standard of training and the quality of care given to the sick. It became a centre of nurse training and received many trainees from overseas countries, some of whom set up similar institutions in their own countries (Burchill 1993).

Modern nursing has evolved as a result of the influence that Kaiserwerth had on people like Elizabeth Fry, who founded the Protestant Sisters of Charity in an attempt to ensure that the sick were cared for by women of good reputation, such as Agnes Jones. Jones revolutionised conditions in the workhouses and established a school of nursing to train nurses in the care of sick people in the workhouses, and Florence Nightingale, the founder of modern nursing, was inspired by Elizabeth Fry's training program (Burchill 1993).

Florence Nightingale was born in 1820 during a trip made by her English parents to the Italian city of Florence, after which she was named. Her parents were wealthy and cultured and Florence received an extensive education far beyond the standard usually received by the young women of her time. She travelled widely and led the full social life common to one in her place in society but, despite this, felt unhappy and dissatisfied. She was interested in nursing but this met with strong opposition from her family and it was not until she was over 30 years of age that she was able to realise her ambition. In 1850 she spent two weeks at Kaiserwerth and visited again in 1851, after which she was appointed Superintendent of the 'Establishment for Gentlewomen during Illness' in 1853 in London (MacDonnell 1970).

Florence Nightingale first achieved fame when, in 1854 during the Crimean War, she was asked to take a party of 38 nurses to Scutari in the Crimea. On arrival the nurses met with fierce opposition from the medical officers, who would not allow them to care for the sick and injured soldiers. Nightingale devoted her energies to improving the filthy conditions by introducing the principles of personal and communal hygiene, obtaining medical supplies, organising a good food supply and generally establishing sanitary conditions, such as handwashing, and the importance of fresh air. Within 2 or 3 weeks opposition had been overcome and the nurses were invited to take over the care of the sick. To the soldiers, Nightingale became an idol and, as she brought ease and comfort to the very sick by the light of the lamp she carried at night, she became known as the 'Lady of the Lamp' (Russell 1990).

After the Crimean War the English public raised £44 000 as a mark of appreciation of Nightingale's work. She used the money to establish a School of Nursing at St Thomas's Hospital in London. The first probationer nurses were admitted to the Nightingale School in June 1860 and given one year of training followed by two years of experience in the hospital. Many of these nurses became matrons of the large hospitals in London and elsewhere. By the time Florence Nightingale died in 1910 at the age of 90, not only had she facilitated remarkable progress in nursing services and education of nurses, she had made many significant achievements in public health matters of the time (MacDonnell 1970).

## Nursing in Australia—the beginning

The first people arrived in Australia from South-east Asia over 40 000 years before Europeans first landed in the seventeenth century. These were the first nations of Aboriginal people and they are acknowledged as the traditional caretakers of the land.

Australia's white colonisation began as a penal colony, which is where the beginnings of modern nursing in Australia commenced. The first hospital in Australia, Sydney Hospital, was opened in 1811. Most nurses were convict women, with some convict men also performing nursing duties. They were provided with their keep but no wages in exchange for their labour. The nurses were frequently described as being of poor character, with drunkenness while on duty common (Burchill 1993).

The first trained nurses, five Irish Sisters of Charity, arrived in Sydney in 1838 to provide care to the sick and infirm who, up to this stage, had been housed in squalid buildings and cared for by untrained staff (Schultz 1991).

In the 1840s the transportation of convicts to Australia ceased and the country was opened to free settlers. Gold was discovered in 1851 and once people in other countries heard about the gold mining boom many people rushed to Australia to make their fortune. However, the country lacked even the most basic infrastructure (fresh water supply, sewerage systems, healthcare) so these services had to be very rapidly developed as the country was colonised.

Prior to 1868 the state of nursing was, to say the least, substandard. Unskilled persons were often promoted to nursing roles despite no education or training—some could

not even read or write. Stories abound of 'nurses' attending patients in hospitals dishevelled and intoxicated, and leaving patients unattended most of the time. Conditions were so bad patients who went to hospital once vowed never to return (MacDonnell 1970).

### The Florence Nightingale nurses

The state of healthcare in Australia in the mid-nineteenth century had become so deplorable that a group of doctors sent a letter to Henry Parkes, then Colonial Secretary of New South Wales, urging him to do something. Henry Parkes responded by writing a letter to Florence Nightingale requesting her to provide a contingent of nurses to Australia to clean up the hospitals. A similar action was undertaken by leaders of the time in New Zealand. Florence Nightingale sent six of her best trainees to Australia to set up a training school. These six nurses were Lucy Osburn, Mary Barker, Bessie Chant, Eliza Blundell, Annie Millar and Haldon Turriff (MacDonnell 1970). (See Clinical Interest Box 1.1.)

Over time the Nightingale principles for the care of the ill were adopted. Nurses were trained in practical skills such as the application of dressings, leeching and administering enemas. Of equal importance were the character traits of punctuality, cleanliness, sexual purity and, above all, obedience. (See Clinical Interest Box 1.2.) A large proportion of nursing work was housekeeping, mostly domestic tasks. However, personal traits such as diligence and compassion were desirable characteristics in those who cared for the sick and were looked upon favourably (MacDonnell 1970).

## Australian nurses in wartime

Australian nurses have redeemed themselves and the reputation of nursing in the years since Australia's beginnings with their efforts and achievements. There are many amazing stories of nurses throughout Australia's history and nurses are particularly well represented in the heroic and inspiring stories from wartime (Australian War Memorial 2011).

### CLINICAL INTEREST BOX 1.1
### The Nightingale Pledge

I solemnly pledge myself before God and this assembly to pass my life to purity and in the practice of my profession faithfully.

I will abstain from what is deleterious and mischievous and will not take or knowingly administer any harmful drug.

I will do all in my power to elevate the standards of my profession

And will hold in confidence all private matters that come to my knowledge in the practice of my calling

With loyalty I will endeavour to aid the physician in his work

And devote myself to those committed to my care.

### Boer War

More than 60 Australian nurses went to the Boer War. Some were funded by governments or by privately raised funds, while others went at their own expense. The nurses served the sick and wounded under very harsh conditions. Three were awarded Royal Red Cross medals. The Boer War marked the death of nurse Frances Hines—the first Australian woman to die in a declared war (Australian War Memorial 2011).

### World War I

Prior to Australia's Federation in 1901, each colony controlled its own defence force, of which the nursing services formed a part. In July 1903 the nursing services of each colony combined to form the Australian Army Nursing Service. The

### CLINICAL INTEREST BOX 1.2
### Job description of a floor nurse (1887)

(Developed in 1887 and published in a magazine of Cleveland Lutheran Hospital)

In addition to caring for your 50 patients, each nurse will follow these regulations:

1. Daily sweep and mop the floors of your ward, dust the patients' furniture and window sills.
2. Maintain an even temperature in your ward by bringing in a scuttle of coal for the day's business.
3. Light is important to observe the patient's condition. Therefore, each day fill kerosene lamps, clean chimneys, and trim wicks. Wash windows once a week.
4. The nurse's notes are important to aiding the physician's work. Make your pens carefully. You may whittle nibs to your individual taste.
5. Each nurse on day duty will report every day at 7 A.M. and leave at 8 P.M., except on the Sabbath, on which you will be off from 12 noon to 2 P.M.
6. Graduate nurses in good standing with the Director of Nurses will be given an evening off each week for courting purposes, or two evenings a week if you go regularly to church.
7. Each nurse should lay aside from each pay a goodly sum of her earnings for her benefits during her declining years, so that she will not become a burden. For example, if you earn $30 a month you should set aside $15.
8. Any nurse who smokes, uses liquor in any form, gets her hair done at a beauty shop, or frequents dance halls will give the Director of Nurses good reason to suspect her worth, intentions, and integrity.
9. The nurse who performs her labour, serves her patients and doctors faithfully and without fault for a period of five years will be given an increase by the hospital administration of five cents a day providing there are no hospital debts that are outstanding.

*(Scrubs nd) (http://scrubsmag.com/a-list-of-rules-for-nurses-from-1887/)*

Service, which was part of the Australian Army Medical Corps, was made up of volunteer trained nurses who were willing to serve in times of a national emergency (see Figure 1.1).

At the outbreak of World War I staff were recruited from both the nursing service and the civilian workforce. They served at field and base hospitals in Australia as well as in Egypt, England, France, Belgium, Greece, Salonika, Palestine, Mesopotamia and India. (See Clinical Interest Box 1.3.) Two thousand one hundred and thirty-nine Australian nurses served in World War I (Australian War Memorial 2011).

### World War II

The Australian Army Nursing Service was one of only two women's services (the other being Voluntary Aid Detachments) that were active at the outbreak of war in 1939. Initially the enlisted nurses were the only females to serve outside Australia. Members served in England, Egypt, Palestine, Libya, Greece, Syria, Ceylon, Malaya, Singapore, Papua New Guinea and the Solomon Islands as well as throughout Australia. They served on hospital ships, troop transports, base and camp hospitals and some spent time in prisoner of war camps (Australian War Memorial 2011).

The first six Australian nurses were captured at Rabaul in January 1942. Shortly before Singapore fell, 65 nurses were evacuated on the *Vyner Brooke*. Twelve died when the ship was sunk off Sumatra and 21 in the Banka Island massacre on 16 February 1942. Thirty-two of these nurses became prisoners of war, held with civilian internees in camps on and around Palembang, in Sumatra. Conditions were horrendous and over three and a half years of captivity the nurses suffered with tropical disease and the effects of malnutrition. Eight of these nurses died in captivity (Australian War Memorial 2011).

**Figure 1.1** Portrait of Number 11 Australian General Hospital, matron and staff nurses, c. 1919

*(Australian War Memorial)*

## CLINICAL INTEREST BOX 1.3 Australian army nursing service pledge of service

I pledge myself loyally to serve my King and Country and to maintain the honour and efficiency of the Australian Army Nursing Service. I will do all in my power to alleviate the suffering of the sick and wounded, sparing no effort to bring them comfort of body and peace of mind. I will work in unity and comradeship with my fellow nurses. I will be ready to give assistance to those in need of my help, and will abstain from any action which may bring sorrow and suffering to others. At all times I will endeavour to uphold the highest traditions of Womanhood and of the Profession of which I am Part.

*(Australian Army Nursing Service (AANS) Pledge of Service. © Commonwealth of Australia)*

## Progress of nursing in Australia

### The history of nursing education in Australia

The late 1800s and early 1900s saw the spread of the Nightingale system across Australia, which was an import from the United Kingdom. This was a vocational training with theory and clinical components. Nurses were trainees, and were provided with board, lodging and uniforms and received a minimal wage in exchange for their services to the hospital. The Nightingale system was seen as the most advanced scheme in the world, and Florence Nightingale was seen as an ultimate authority in nursing matters. The quality of nursing services was so greatly improved with the introduction of the Nightingale system that any attempts to change the system were strongly resisted. For some 100 years this system provided hospitals with a cheap, heavily disciplined hospital workforce. The downside of this model of education was that the service needs of hospital took priority over the educational needs of the nurse. Provisions that today we take for granted, such as well-stocked, up-to-date libraries, classrooms and qualified nursing teachers, were often lacking. The theory component was always seen as being less important than the clinical component, with the limited theory component being delivered by medical staff, other healthcare workers or the Matron (Russell 2011). Unfortunately, because of the long hours of work, student nurses were frequently too tired to concentrate during such classes. During the twentieth century a move towards professionalism emerged and with it came considerable conflict between the view that nursing is a vocation, which should be inherently subordinate to medicine, and the view that nursing is a profession, different from, but of equal status with, medicine (Russell 1990).

The first state in Australia to pass relevant registration legislation was South Australia, in 1920. Western Australia followed in 1922, New South Wales and Victoria in 1924. The emerging sense of professionalism among nurses led to a greater focus on industrial issues. The Australian Nursing Federation (ANF) (now known as ANMF) held its first meeting in 1924 and through this forum the quest for greater professional recognition, increased wages and improved working conditions began—a quest that continues today (Crisp et al 2013).

From the early 1960s concerns were being voiced about problems with recruitment into nurse training, including poor retention and high attrition rates. Of the nurses who did complete training many who were eligible to practise as Registered Nurses did not enter the workforce. One of the strategies introduced to address recruitment and retention problems was the introduction of a second tier of nurses, the **Enrolled Nurse (EN)**.

The 1960s and 1970s saw Australia bombarded with expert committees and workshops to try to address the issues within nursing. While there was considerable disagreement over many of the recommendations from the resulting reports, the committees were generally in agreement over the problems with nurse education. All agreed that change was essential, and that it was necessary to:

- Find a more appropriate venue for nurse education
- Move away from the apprenticeship system, as the needs of the hospital were given greater priority than the needs of the training nurse
- Continue with the 2 levels of nursing education
- Change the required entry standard
- Urgently change the existing curricula.

Disagreement still existed over whether registration programs should remain within the healthcare sector or be moved to the higher education sector, and whether the program should be the responsibility of the Minster for Education or the Minister for Health. This was also a period of considerable unrest within the nursing profession. Nurses were increasingly dissatisfied with wages and conditions, and the role of the nurse was becoming increasingly complex due to social and technological changes.

'Pilot' programs began to emerge as alternatives for the education of Registered Nurses, and in 1983 a surprise announcement was made by the then Minister for Health in NSW that all basic nurse education would be transferred into the higher education sector by January 1985. In 1984 the Australian federal government announced full support for the transfer of nursing education into the tertiary sector. The College of Nursing Australia, NSW College of Nursing, Royal Australian Nursing Federation and NSW Nurses' Association, who had fought long and hard for a national decision, celebrated with jubilation.

In 1985 alone one university and 12 Colleges of Advanced Education offered the Diploma of Applied Science (Nursing) for the first time. The last intakes into hospital-based courses were to occur in 1990, with the full transfer of all pre-registration nursing programs into the higher education sector being achieved in 1993. In 1992 the nomenclature 'Bachelor of Nursing' was adopted (Russell 2011).

Enrolled Nurse education has seen marked changes over the years. Prior to 1987 the *Nurses Registration Act* of 1953 dictated that education was to consist of 75 hours of lectures during one year of practice. Emphasis was placed on undertaking set tasks under the guidance of the Registered Nurse, with very little underpinning theory. This included:

- Thirty hours of basic nursing techniques and procedures which included lifting and positioning patients; preventing bedsores; mouth, hair and nail care; and using bed pans and urinals
- Twelve hours on medical and surgical conditions and related nursing care
- Five hours of simple anatomy and physiology.

Change in the role and the education of the EN is attributed to employers seeking to expand the role of the EN. The Board insisted that with an expansion of the role a substantial strengthening of the theoretical education was required. In 1987 the 'nursing aide' title was changed to 'Enrolled Nurse', and a syllabus, approved by the Board, was instituted. Hospitals ceased to provide the theoretical component, and students attended Colleges of Technical and Further Education (TAFE) for 12 weeks, in which they received 360 hours of theoretical instruction. For the remaining 40 weeks of the year students rotated through various clinical areas as required by the Nurses Registration Board. TAFE NSW and the Sydney Adventist Hospital were the only providers of EN education in NSW.

Over time the qualification has increased, to an Advanced Certificate, Certificate IV and currently a Diploma of Nursing, with the Advanced Diploma of Nursing also being available as an additional study option to ENs.

The theoretical education for ENs has increased over 600% since 1987, with students now being required to undertake additional hours of theory with specified clinical placement requirements (Nurses and Midwives Board nd).

Table 1.1 outlines the major milestones in Australia's nursing history.

## NURSING PRACTICE IN AUSTRALIA

### Competency standards/standards for practice

To ensure that nurses continue to practise at a high standard that ensures safety of the public, the Australian Nursing and Midwifery Council (ANMC) developed the *National Competency Standards for the Registered Nurse* (NMBA 2010) and the *National Competency Standards for the Enrolled Nurse* (NMBA 2002). The **Nursing and Midwifery Board of Australia (NMBA)** is now responsible for the standards relating to the professional practice of nurses and midwives, and has recently replaced these with the *Enrolled Nurse Standards for Practice* (NMBA 2016a) and the *Registered Nurse Standards for Practice* (NMBA 2016b). Standards of nursing practice are developed and established from a basis of strong scientific research and the advice of clinical experts. Standards of nursing practice serve as objective guidelines for the provision of nursing care and as a means to evaluate that care. They provide a method to ensure that individuals receive high-quality individualised care, to ensure that nurses know what is necessary to provide expert nursing care and to ensure that measures are in place to determine that the care meets specific standards.

Educational institutions can recommend students for registration only if they have demonstrated the required standards. After registration or enrolment it becomes the

**TABLE 1.1 | Milestones in Australian nursing**

| | |
|---|---|
| 1811 | Sydney Hospital opens; nursing undertaken by convict men and women |
| 1836 | Deaconess Institute of Kaiserwerth, Germany, is founded |
| 1838 | Five Irish Sisters of Charity, Australia's first trained nurses, arrive in New South Wales |
| 1848 | Opening of Yarra Bend Asylum at what was to become known as Melbourne to enable the mentally ill to be transferred from gaol |
| 1860 | Florence Nightingale publishes *Notes on Nursing: What It Is and What It Is Not* |
| 1868 | Sir Henry Parkes requests Nightingale provide trained nurses for New South Wales<br>Arrival of Lucy Osburn and five Nightingale nurses at Sydney Infirmary (to become Sydney Hospital) |
| 1871 | Nightingale-trained matron appointed to the Alfred Hospital, Melbourne |
| 1899 | Australasian Trained Nurses Association is founded in New South Wales |
| 1933 | Australian Capital Territory nursing registration commences |
| 1949 | Formation of College of Nursing Australia (now RCNA) |
| 1952 | *Nursing Research*, a journal reporting on the scientific investigations of nursing, established in the United States |
| 1975 | First nursing diploma program in Australia in a College of Advanced Education (CAE) in Melbourne, followed quickly by programs in New South Wales, South Australia and Western Australia |
| 1983 | New South Wales announces that all nursing education in the state will be transferred to CAEs by 1985<br>International Council of Nurses embeds in new constitution the categories 'first-level nurse' (the Registered Nurse, RN) and 'second-level nurse' (the Enrolled Nurse, EN). Magnet Hospital research begins in the United States |
| 1990 | All nursing education transferred to tertiary sector and at degree level in Australia |
| 2000 | International nursing shortage is recognised and becomes a government priority in Australia<br>Increase in 'medical error' becomes an international concern |
| 2002 | Two national reviews in Australia, the Senate Review of Nursing and a National Review of Nursing Education |
| 2004–2006 | National Nursing and Nursing Education Taskforce in Australia |
| 2005 | Australian Nursing Council becomes Australian Nursing and Midwifery Council (ANMC) |
| 2007 | Australian federal government announcement of national system of regulation and accreditation for health professionals—including nurses and midwives |
| 2010 | The Australian *Health Practitioner Regulation National Law Act 2009* comes into effect<br>The Australian Health Practitioner Regulation Agency (AHPRA), the organisation responsible for the registration and accreditation of 10 health professions across Australia, is established<br>ANMC is established as the accreditation authority responsible for accrediting education providers and programs of study for the nursing and midwifery profession |
| 2011 | Accreditation process for Nursing Courses in Australia is taken over by ANMC; ANMC becomes Australian Nursing and Midwifery Accreditation Council (ANMAC)<br>Unification of Royal College of Nursing, Australia (RCNA) and The College of Nursing (TCoN) to become Australian College of Nursing |

(ANMAC, Crisp et al 2013, NMBA, RCNA)

responsibility of the individual nurse to ensure that this minimum standard is maintained. The standards are broad and principle-based to allow practising nurses to use as a benchmark to assess competence in a range of settings. The responsibilities included in the standards are illustrative of the types of core activities that an EN would be expected to undertake on entry to practice. All ENs have a responsibility for ongoing professional development to maintain an up-to-date knowledge base and skill level.

The *Enrolled Nurse Standards for Practice* (NMBA 2016a) were developed to reflect three domains of EN practice: professional and collaborative practice, provision of care and reflective and analytical practice. There are 10 standards and each contains several indicators. The indicators are key generic examples of competent performance. Clinical Interest Box 1.4 outlines the *Enrolled Nurse Standards for Practice* (NMBA 2016a).

Patricia Benner's seminal research, *From Novice to Expert* (1984), explores how nurses progress in the development of expertise to explain the domains of nursing practice. Clinical Interest Box 1.5 outlines the development of nursing expertise.

## Scope of practice

The scope of nursing and midwifery practice is that which nurses and midwives are educated, competent and permitted by law to perform. The actual scope of an individual nurse's or midwife's practice is influenced by the:

- Settings in which they practise
- Health needs of people
- Level of competence and confidence of the nurse
- Service provider's policy requirements.

Supervision of Enrolled Nurses by Registered Nurses can be direct or indirect. Supervision is defined as access, in all contexts of care, at all times to a named and accessible RN for support and guidance.

- Direct supervision: the supervisor (RN) is actually present, observes, works with, guides and directs the person who is being supervised.
- Indirect supervision: the supervisor (RN) works in the same facility or organisation as the supervised person, but does not constantly observe their activities. The supervisor must be available for reasonable access. Reasonable access will depend on the context, the needs of the person receiving care and the needs of the person being supervised.

It is important to remember, however, that the EN retains responsibility for their own actions and remains accountable for providing delegated nursing care at all times (NMBA 2016; Brown et al 2015; Starr 2012). See Clinical Interest Boxes 1.6 and 1.7.

The global shortage of nurses and the expanding roles for nurses has seen health services and aged care services utilising unlicensed/**unregulated healthcare workers**.

These workers are employed as health services assistants (HSA) or assistants in nursing (AIN) in the acute sector, and personal care workers (PCW) or personal care attendants (PCA) in the aged care sector. While the role of the unregulated healthcare worker has been controversial in the past they are now accepted as an essential member of the care team, who works closely with the EN and RN, particularly in aged care. The debate is now largely centred on arrangements for adequate supervision by RNs, the ratio of carers to nurses and the regulation of carers.

## Decision-making frameworks

Since the introduction of the competency standards for the Enrolled Nurse in the early 1990s the role and scope of practice of the EN has developed substantially in Australia. To help nurses to act within their scope of practice, the decision-making framework nursing flowchart and summary guide were released in April 2007 and were rebranded by the NMBA in 2013 (NMBA 2013) (see Figures 1.2 and 1.3). Scope of practice tools, such as the decision-making framework nursing flowchart and summary guide, provide a tool for nurses and employers to use:

- When considering or determining practice and to clarify expectations of nursing practice
- When employers are creating, interpreting and planning policies that apply to nursing practice
- As a performance criterion for nurses
- To stimulate professional discussion related to decision making and scope of practice.
  (Willis 2012)

Nurses are both responsible and accountable for their individual practice, and scope of practice is dynamic and based on individual needs and benefit and legislative requirements. It is not limited to specific tasks or functions but is a combination of knowledge, judgment and skill that guides the nurse's practice. Scope of practice should be broad and flexible to allow for innovation, growth and change and to ensure that there is consistency with current health needs and that actions support improved health outcomes (International Council of Nurses (ICN) 2013).

To practise within the full scope of practice of the profession may require individuals to update or increase their knowledge, skills or competence. When participating in continuing professional education the EN must not assume that they have the right to engage in this practice in the workplace. Employers must support practice at a more advanced level. It is also important to remember that consumer needs and benefits do not override legal and organisational parameters for practice (Starr 2012). Case study 1.1 looks at the repercussions of acting outside your scope of practice, even in an emergency situation. Employers also have a responsibility to support nursing practice by not placing nurses in situations and environments where they need to act beyond their level of competence/legal scope of practice and providing safe, supportive environments that promote competent practice (ICN 2013).

## Code of ethics

The need for a code of ethics was acknowledged during the Australasian Nurse Registering Authorities Conference

## CLINICAL INTEREST BOX 1.4 NMBA *Enrolled Nurse Standards for Practice* (2016)

### Professional and collaborative practice

**Standard 1: Functions in accordance with the law, policies and procedures affecting EN practice**

**Indicators:**

1.1 Demonstrates knowledge and understanding of commonwealth, state and/or territory legislation and common law pertinent to nursing practice.
1.2 Fulfils the duty of care in the undertaking of EN practice.
1.3 Demonstrates knowledge of and implications for the NMBA standards, codes and guidelines, workplace policies and procedural guidelines applicable to enrolled nursing practice.
1.4 Provides nursing care according to the agreed plan of care, professional standards, workplace policies and procedural guidelines.
1.5 Identifies and clarifies EN responsibilities for aspects of delegated care working in collaboration with the RN and multidisciplinary health care team.
1.6 Recognises own limitations in practice and competence and seeks guidance from the RN and help as necessary.
1.7 Refrains from undertaking activities where competence has not been demonstrated and appropriate education, training and experience has not been undertaken.
1.8 Acts to ensure safe outcomes for others by recognising the need to protect people and reporting the risk of potential for harm.
1.9 When incidents of unsafe practice occur, reports immediately to the RN and other persons in authority and, where appropriate, explores ways to prevent recurrence.
1.10 Liaises and negotiates with the RN and other appropriate personnel to ensure that needs and rights of people in receipt of care are addressed and upheld.

**Standard 2: Practises nursing in a way that ensures the rights, confidentiality, dignity and respect of people are upheld.**

**Indicators:**

2.1 Places the people receiving care at the centre of care and supports them to make informed choices.
2.2 Practises in accordance with the NMBA standards codes and guidelines.
2.3 Demonstrates respect for others to whom care is provided regardless of ethnicity, culture, religion, age, gender, sexual preference, physical or mental state, differing values and beliefs.
2.4 Practises culturally safe care for (i) Aboriginal and Torres Strait Islander peoples; and (ii) people from all other cultures.
2.5 Forms therapeutic relationships with people receiving care and others recognising professional boundaries.
2.6 Maintains equitable care when addressing people's differing values and beliefs.
2.7 Ensures privacy, dignity and confidentiality when providing care.
2.8 Clarifies with the RN and relevant members of the multi-disciplinary healthcare team when interventions or treatments appear unclear or inappropriate.
2.9 Reports incidents of unethical behaviour immediately to the person in authority and, where appropriate, explores ways to prevent recurrence.
2.10 Acknowledges and accommodates, wherever possible, preferences of people receiving nursing care.

**Standard 3: Accepts accountability and responsibility for own actions.**

**Indicators:**

3.1 Practises within the EN scope of practice relevant to the context of practice, legislation, own educational preparation and experience.
3.2 Demonstrates responsibility and accountability for nursing care provided,
3.3 Recognises the RN[1] as the person responsible to assist EN decision-making and provision of nursing care.
3.4 Collaborates with the RN to ensure delegated responsibilities are commensurate with own scope of practice.
3.5 Clarifies own role and responsibilities with supervising RN in the context of the healthcare setting within which they practice.
3.6 Consults with the RN and other members of the multidisciplinary healthcare team to facilitate the provision of accurate information, and enable informed decisions by others.
3.7 Provides care within scope of practice as part of multidisciplinary healthcare team, and with supervision of a RN.
3.8 Provides support and supervision to assistants in nursing (however titled) and to others providing care, such as EN students, to ensure care is provided as outlined within the plan of care and according to institutional policies, protocols and guidelines.
3.9 Promotes the safety of self and others in all aspects of nursing practice.

[1]*Where an enrolled nurse is working in maternity services setting it is expected that they will be supervised by a midwife.*

*Continued*

## CLINICAL INTEREST BOX 1.4 NMBA *Enrolled Nurse Standards for Practice* (2016)—cont'd

### Provision of care

**Standard 4: Interprets information from a range of sources in order to contribute to planning appropriate care**

**Indicators:**

4.1 Uses a range of skills and data gathering techniques including observation, interview, physical examination and measurement.
4.2 Accurately collects, interprets, utilises, monitors and reports information regarding the health and functional status of people receiving care to achieve identified health and care outcomes.
4.3 Develops, monitors and maintains a plan of care in collaboration with the RN, multidisciplinary team and others.
4.4 Uses health care technology appropriately according to workplace guidelines.

**Standard 5: Collaborates with the RN, the person receiving care and the healthcare team when developing plans of care**

**Indicators:**

5.1 Develops and promotes positive professional working relationships with members of the multi-disciplinary team.
5.2 Collaborates with members of the multi-disciplinary healthcare team in the provision of nursing care.
5.3 Contributes to the development of care plans in conjunction with the multidisciplinary healthcare team, the person receiving care and appropriate others[2].
5.4 Manages and prioritises workload in accordance with people's care plans.
5.5 Clarifies orders for nursing care with the RN when unclear.
5.6 Contributes to and collaborates in decision-making through participation in multidisciplinary healthcare team meetings and case conferences.

**Standard 6: Provides skilled and timely care to people whilst promoting their independence and involvement in care decision making**

**Indicators:**

6.1 Provides care to people who are unable to meet their own physical and/or mental health needs.
6.2 Participates with the RN in evaluation of the person's progress toward expected outcomes and the reformulation of plans of care.
6.3 Promotes active engagement and the independence of people receiving care within the health care setting by involving them as active participants in care, where appropriate.
6.4 Demonstrates currency and competency in the safe use of healthcare technology.
6.5 Exercises time management and workload prioritisation.
6.6 Recognises when the physical or mental health of a person receiving care is deteriorating, reports, documents and seeks appropriate assistance.

**Standard 7: Communicates and uses documentation to inform and report care**

**Indicators:**

7.1 Collects data, reviews and documents the health and functional status of the person receiving care accurately and clearly.
7.2 Interprets and reports the health and functional status of people receiving care to the RN and appropriate members of the multidisciplinary healthcare team as soon as practicable.
7.3 Uses a variety of communication methods to engage appropriately with others and documents accordingly.
7.4 Prepares and delivers written and verbal care reports such as clinical handover, as a part of the multidisciplinary healthcare team.
7.5 Provides accurate and appropriate information to enable informed decision making by others.

### Reflective and analytical practice

**Standard 8: Provides nursing care that is informed by research evidence**

**Indicators:**

8.1 Refers to the RN to guide decision-making.
8.2 Seeks additional knowledge/information when presented with unfamiliar situations.
8.3 Incorporates evidence for best practice as guided by the RN or other appropriate health professionals.
8.4 Uses problem-solving incorporating logic, analysis and a sound argument when planning and providing care.
8.5 Demonstrates analytical skills through accessing and evaluating healthcare information and quality improvement activities.
8.6 Consults with the RN and other relevant health professionals and resources to improve current practice.

[2]*Appropriate others include those in direct association with the person receiving care (with his/her consent) such as family, unpaid and paid carers, volunteers and clergy.*

## CLINICAL INTEREST BOX 1.4 NMBA *Enrolled Nurse Standards for Practice* (2016)—cont'd

**Standard 9: Practises within safety and quality improvement guidelines and standards**

**Indicators:**

9.1 Participates in quality improvement programs and accreditation standards activities as relevant to the context of practice.

9.2 Within the multi-disciplinary team, contributes and consults in analysing risk and implementing strategies to minimise risk.

9.3 Reports and documents safety breaches and hazards according to legislative requirements and institutional policies and procedures.

9.4 Practises safely within legislative requirements, safety policies, protocols and guidelines.

**Standard 10: Engages in ongoing development of self as a professional**

**Indicators:**

10.1 Uses EN standards for practice to assess own performance,

10.2 Recognises the need for, and participates in, continuing professional and skills development in accordance with the NMBA's Continuing professional development registration standard.

10.3 Identifies learning needs through critical reflection and consideration of evidence-based practice in consultation with the RNs and the multidisciplinary healthcare team.

10.4 Contributes to and supports the professional development of others.

10.5 Uses professional supports and resources such as clinical supervision that facilitate professional development and personal wellbeing.

10.6 Promotes a positive professional image.

*(NMBA 2016a)*

## CLINICAL INTEREST BOX 1.5 Benner's stages of nursing expertise

**Stage I. Novice**

No experience (nursing student). Performance is limited, inflexible and governed by context-free rules and regulations rather than experience.

**Stage II. Advanced beginner**

Demonstrates marginally acceptable performance. Recognises the meaningful 'aspects' of a real situation. Has experienced enough real situations to make judgments about them.

**Stage III. Competent practitioner**

Has 2–3 years experience. Demonstrates organisational and planning abilities. Differentiates important factors from less important aspects of care. Coordinates multiple complex care demands.

**Stage IV. Proficient practitioner**

Has 3–5 years experience. Perceives situations as wholes rather than in terms of parts, as in Stage II. Uses maxims as guides for what to consider in a situation. Has holistic understanding of the individual, which improves decision making. Focuses on long-term goals.

**Stage V. Expert practitioner**

Performance is fluid, flexible and highly proficient. No longer requires rules, guidelines or maxims to connect an understanding of the situation to appropriate action. Demonstrates highly skilled intuitive and analytic ability in new situations. Is inclined to take certain action because 'it felt right'.

*(Benner 1984)*

## CLINICAL INTEREST BOX 1.6 Decision-making framework considerations

NMBA decision-making framework considerations:

1. Am I educated?
2. Am I authorised?
3. Am I competent?

If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator.

(ANRAC) in 1990. It was deemed that there was need for focus on ethical behaviour for Australian nurses and that a documented code of ethics would assist in achieving this focus. The *Code of Ethics for Nurses in Australia* (ANMC 2008) comprises eight value statements, each of which is further defined by several explanatory statements. The eight value statements are:

1. Nurses value quality nursing care for all people
2. Nurses value respect and kindness for self and others
3. Nurses value the diversity of people
4. Nurses value access to quality nursing and healthcare for all people
5. Nurses value informed decision making
6. Nurses value a culture of safety in nursing and healthcare
7. Nurses value ethical management of information
8. Nurses value a socially, economically and ecologically sustainable environment promoting health and wellbeing.

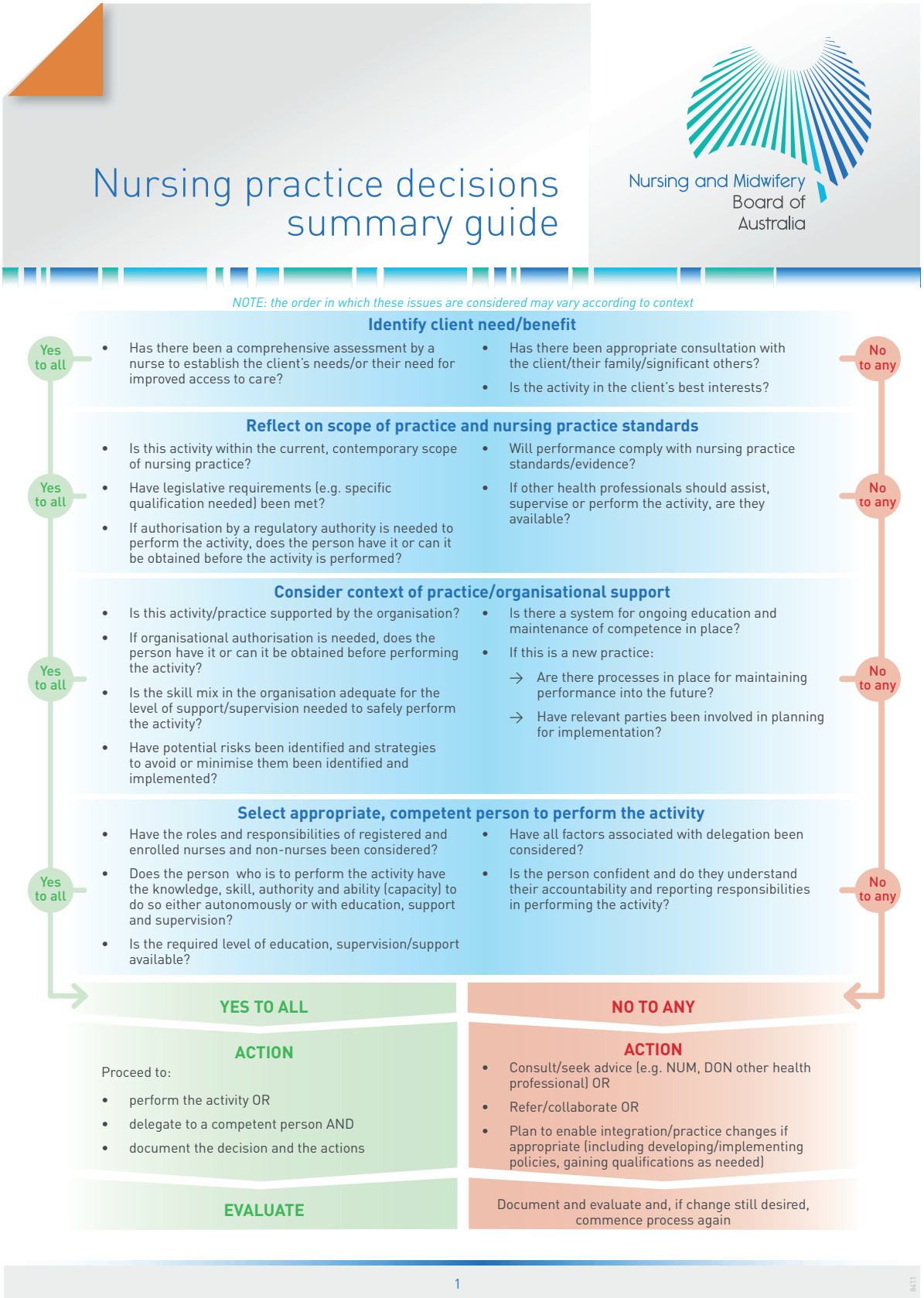


**Figure 1.2** NMBA nursing practice decisions summary guide
*(NMBA 2013)*

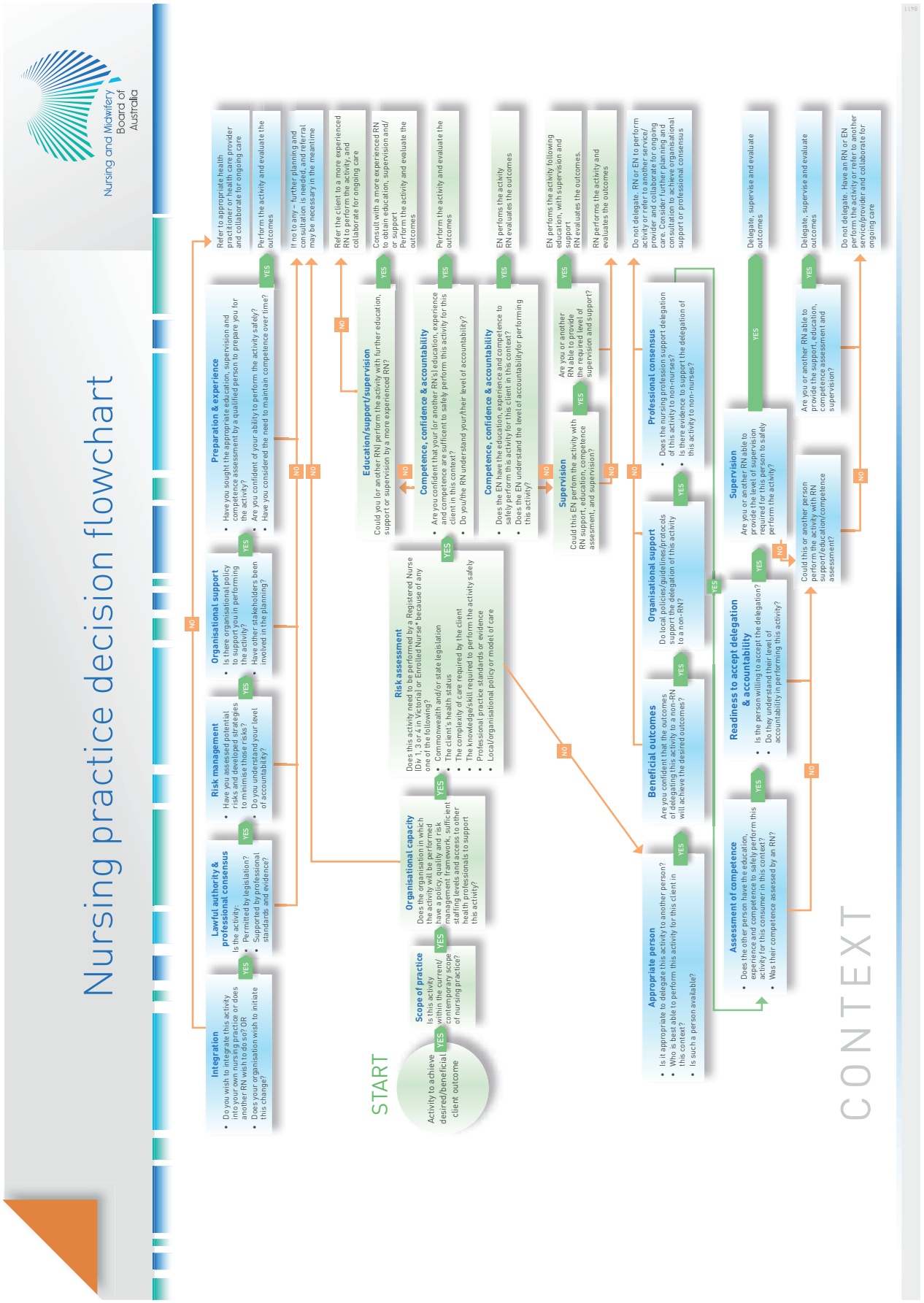


**Figure 1.3** NMBA nursing practice decision flowchart
*(NMBA 2013)*

## CLINICAL INTEREST BOX 1.7 Factors that influence scope of practice

The scope of practice of nursing practice is recognised as varied and diverse, responsive to meeting the broad range of individual/populations' healthcare needs. It is dependent on the context of practice, influenced by:

- Type of setting (e.g. healthcare agency, educational organisation, community health service)
- Location of the setting (e.g. urban, rural or remote, community, acute care)
- Characteristics of individuals (e.g. health status, age, learning needs)
- Focus of healthcare activities (e.g. health promotion, research, education)
- Complexity of practice (e.g. health acuity of the individual/population)
- Level of responsibility/accountability of the healthcare provider
- Resources that are available/accessible as part of the health service.

*(Willis 2012)*

## CASE STUDY 1.1

In 2011 a registered midwife (RM) was found guilty of unprofessional conduct, was reprimanded and had conditions placed on her registration after acting outside her scope of practice and hospital policies. During an emergency situation the RM performed a vacuum delivery, which she believed she had been accredited to perform after completing an Advanced Life Support in Obstetrics course. The Nursing and Midwifery Professional Standards Committee found that:

- She operated outside her scope of practice and contrary to hospital policy
- She was not accredited or authorised to perform the vacuum delivery
- Her years of experience should have prepared and guided her to a more appropriate path during an emergency.

As a result the midwife was cautioned and had conditions placed upon her registration (Nursing and Midwifery Professional Standards Committee of New South Wales 2011; Starr 2012).

1. Discuss the main factors that determine your scope of practice as a nurse.
2. Does your scope of practice change in an emergency situation?

These value statements are deliberately broad to reflect the variety of nursing practice areas, and variation in populations and their healthcare needs. The website for the NMBA contains information for nurses and for the public including codes, guidelines and position statements. Further discussion of the code of ethics can be found in Chapter 2.

## Registration

From 1 July 2010, with the introduction of the Health Practitioner Regulation National Law, 14 health professions, including nursing, are regulated by legislation that is consistent nationwide. Each health profession has its own national board that is responsible for regulating the health professionals. Primarily these boards protect the public and set standards and policies that registered practitioners need to meet. In order for nurses to register they need to prove that they meet the following registration standards, set by the national board for nursing, the NMBA:

- Continuing professional development
- Criminal history
- English language skills
- Professional indemnity insurance
- Recency of practice.

(Australian Health Practitioner Regulation Agency (AHPRA) 2014a; NMBA 2015)

Clinical Interest Boxes 1.8 and 1.9 provide more information on continuing professional development.

### Nursing and Midwifery Board of Australia

The NMBA has established state and territory boards to support the work of the national board in the national scheme. The national board will set policy and professional standards, and the state and territory boards will continue to make individual notification and registration decisions affecting individual nurses and midwives (see Case Study 1.2).

The functions of the NMBA include:

- Registering nursing and midwifery practitioners and students
- Developing standards, codes and guidelines for the nursing and midwifery profession
- Handling notifications, complaints, investigations and disciplinary hearings
- Assessing overseas-trained practitioners who wish to practise in Australia
- Approving accreditation standards and accredited courses of study (NMBA).

See Clinical Interest Box 1.10 for further information on the Nurses and Midwives Board of Australia.

### Australian Health Practitioner Regulation Agency

The **Australian Health Practitioner Regulation Agency (AHPRA)** supports the NMBA. The primary role of the board is to protect the public and set standards and policies that all registered health practitioners must meet. AHPRA:

- Supports the NMBA in its primary role of protecting the public
- Manages the registration processes for health practitioners and students around Australia

## CLINICAL INTEREST BOX 1.8 Continuing professional development

From 1 July 2010 Enrolled and Registered Nurses and midwives and nurse and midwife practitioners have been required to meet the Continuing Professional Development (CPD) Standard set by the NMBA (this standard does not apply to students or nurses and midwives with non-practising registration).

- Under this standard nurses are required to participate in at least 20 hours of CPD per year (nurses who are also registered as midwives must complete 20 hours as a nurse and 20 hours as a midwife)
- One active hour of learning equals one hour of CPD
- CPD must be relevant to the context of practice
- Written documentation must be kept to demonstrate evidence of a minimum of 20 hours of CPD per year
- Compulsory annual in-services can count towards CPD (e.g. annual infection control, CPR, fire training)
- Audits are conducted annually by the board on a number of nurses and midwives in Australia
- CPD activities can include attending conferences, seminars, courses and in-services, meetings, reading a journal article and reflecting on it, watching and reflecting on webinars.

### Documenting CPD

(See also Clinical Interest Box 1.9)

Documentation of CPD needs to include the date, activity undertaken, description of the outcomes and number of hours spent on each activity. Evidence needs to be verified (e.g. a certificate attached or signature from the person running the course).

Documentation needs to demonstrate that you have:

- Developed a learning plan based on learning needs (that is relevant to your context of practice)
- Identified and prioritised learning needs based on an evaluation of practice against competency or professional practice standards
- Participated in effective learning activities that are relevant to learning needs
- Reflected on the value of learning activities and their effect on your practice.

*(NMBA 2016c)*

## CLINICAL INTEREST BOX 1.9 Documenting CPD

| Identified learning need | Relevant planned activities | Achieved? |
|---|---|---|
| To be able to recognise a deteriorating patient and know when to refer them to other healthcare professionals | Complete 'Between the Flags' | Yes |

| | |
|---|---|
| Title: DETECT Between the Flags | Date: 22/5/2015 |
| Venue/Organisation: NSW Health e-learning | Presenter: E-learning |
| Evidence: Certificate | CPD hours: 4 |

*Briefly describe the content:*
This e-learning taught me how to detect deteriorating patients, undertake and evaluate, provide initial treatment, when it is necessary to escalate care and how to communicate in teams. It also taught me how to correctly use and interpret the associated observation chart.

*How did the information relate to your work/why did you undertake this learning?*
I undertook this learning as I did not feel that I had the appropriate knowledge and skills to know how to identify a deteriorating patient and provide appropriate treatment until help arrives. I picked this as a learning goal as it will help me to meet competency unit 7, manages nursing care of individuals and groups within the scope of enrolled nursing practice.

*The implications for my practice are:*
I know the warning signs to look out for when I am concerned about a patient.
I know how and when to escalate a situation.
I have learnt how to better communicate in teams.

*(Ausmed Education nd; Nurses for Nurses 2015; NSW Health 2009)*

- Has offices in each state and territory where the public can make notifications about a registered health practitioner or student
- On behalf of the boards, manages investigations into the professional conduct, performance or health of registered health practitioners, except in NSW where this is done jointly by the Health Professional Councils Authority and the Health Care Complaints Commission
- On behalf of the national board, publishes national registers of practitioners so important information about the registration of individual health practitioners is available to the public
- Works with the Health Complaints Commission in each state and territory to make sure the appropriate

## CASE STUDY 1.2

Margaret, 72, came into the Nursing and Midwifery Board of Australia's (NBMA) registration enquiry desk to ask for assistance. She stated that she had been a nurse for over 50 years and she did not understand why she had been refused her registration renewal. The nursing officer who attended to her enquiry asked her if she was currently working, she replied that she had not worked for 30 years but she did not see what that had to do with her nursing registration. She stated she had been a nurse for over 50 years and no one should have the right to take that away from her. She had sent her renewal with her payment every year and never been refused before.

When the nursing officer explained that registration was a licence to practise and as the NMBA had a duty to ensure nurses who had registration to practise were skilled and competent practitioners and that it was no longer acceptable to just renew your registration every year, Margaret became teary. She said, 'Well, if I cannot keep my registration I am not a nurse anymore!' The nursing officer advised her that she would always be a nurse, just not a practising one and she could apply for a non-practising nurse registration.

1. What standards do nurses need to meet in order to be registered to practise as a nurse?
2. How do these standards help to ensure that nurses are skilled and competent practitioners?
3. Think about what is involved in meeting registration standards. Which standards would Margaret no longer meet when attempting to renew her registration? Why?

organisation investigates community concerns about individual, registered health practitioners
- Supports the boards in the development of registration standards, and codes and guidelines
- Provides advice to the Ministerial Council about the administration of the national registration and accreditation scheme.

(AHPRA 2014b)

### Australian Nursing and Midwifery Accreditation Council

The role of the **Australian Nursing and Midwifery Accreditation Council (ANMAC)** is now, as Australia's independent accreditation authority for nursing and midwifery, to undertake:

- Development of accreditation standards
- Accreditation of Australian nursing and midwifery courses
- Accreditation of Australian providers of nursing and midwifery courses
- Assessment of, for the purposes of permanent migration, internationally qualified nurses and midwives
- Provision of policy advice on matters relating to accreditation and skilled migration of nurses and midwives.

(ANMAC 2014)

## CLINICAL INTEREST BOX 1.10 The Nursing and Midwifery Board of Australia

The Nursing and Midwifery Board of Australia has developed a professional framework for nursing practice using a set of national standards and codes. The core standards are:

Codes of ethics for:
- Midwives
- Nurses

Codes of professional conduct for:
- Midwives
- Nurses

Professional practice guidelines for:
- Nursing and midwifery—Advertising of regulated health services
- Nursing and midwifery—Guidelines for mandatory notifications

Guidelines covering:
- Competency standards/standards for practice
- Decision-making framework
- Registration standards
- Principles for the assessment of national competency standards/standards for practice
- Professional boundaries
- Re-entry to practice policy

These standards and codes can be used by:
- Individual nurses to assess his or her own performance or the performance of their peers.
- Regulatory authorities to assess nurses involved in professional misconduct matters.
- Higher and vocational education authorities who use competency standards as a framework for course development.
- Employers who use competency standards for employment assessment and development of job description forms.
- The profession, for communication to consumers of the standards which can be expected from a Registered or Enrolled Nurse.

#### Standards and codes

The *Code of Professional Conduct for Nurses* in Australia is a set of expected national standards of nursing conduct for Australian nurses.

The *Code of Ethics for Nurses* in Australia outlines the ethical standards expected and required of nurses practising in Australia.

*(NMBA 2015)*

**CRITICAL THINKING EXERCISE 1.1**

Discuss how the NMBA, AHPRA and ANMAC work together to regulate the nursing profession.

## PROFESSIONAL NURSING ORGANISATIONS

### Australian College of Nursing

In 2011 the **Royal College of Nursing, Australia (RCNA)** and The College of Nursing (TCoN) united to become the Australian College of Nursing (ACN). The ACN provides a strengthened base for the nursing profession that communicates with government, other sectors and the public. It fosters research, policy and strategic development and provides a foundation for professional development and education activities (RCNA 2011).

### Australian Nursing and Midwifery Federation

The Australian Nursing Federation (ANF) (now the **Australian Nursing and Midwifery Federation (ANMF)**) was established in 1924. It is the national union for nurses and the largest professional organisation in Australia. The ANMF's core business is the industrial and professional representation of nurses and nursing through the activities of a national office and branches in every state and territory. ANMF has an Enrolled Nurse special interest group, the National Enrolled Nurse Association (NENA), whose mission is to promote the value of ENs and raise awareness of the EN role within the community. The National Enrolled Nurse Association also provides a forum for all ENs to participate at a national level. In 2013, the ANF changed its name to the Australian Nursing and Midwifery Federation to recognise its midwife members (www.anmfvic.asn.au/about-us/history)

## NURSING—THE PROFESSION

Nursing is not simply a collection of specific skills, and the nurse is not simply a person trained to perform specific tasks. Nursing is a profession. No one factor absolutely differentiates a job from a profession, but the difference is important in terms of how nurses practise. When a person is said to act professionally, for example, it is implied that the person is conscientious in actions, knowledgeable in the subject and responsible to self and others. Although there is not universal agreement on a definition, a profession is generally expected to include the following characteristics:

- An extended and broad-based education of its members
- A theoretical body of knowledge leading to defined skills, abilities and norms
- The provision of a specific service
- Autonomy in decision making and practice
- The regulation of practice, both legally through legislation, and ethically through a code of ethics for practice.

Historically the dependent relationship between nursing and medicine made claiming nursing as a profession was problematic. Given this relationship, the areas of autonomy and decision making in practice were particularly controversial. Nowadays, nursing's claim to professional status is supported by consideration of the characteristics of a profession, education, theory, service, autonomy and a code of ethics (Crisp et al 2013) and the interdependent relationship enjoyed between nursing and medicine.

### Nurse education

Nursing education in Australia is regulated by ANMAC, NMBA and AHPRA. Education providers are required to deliver courses that meet the accreditation standards of ANMAC and are approved by the NMBA. Students must also be registered with AHPRA by their education provider. Both these organisations play a key role in protecting the public. ANMAC ensures high standards of nursing education that produces nurses who practise in a safe and competent manner. Registration with AHPRA allows the NMBA to act on matters that may impact the safety of the public, including student impairment or serious convictions (AHPRA 2014c; ANMAC 2014).

There are two types of nurse and thus nurse education in Australia. These nurses practise across a wide range of settings within health and community settings (Daly et al 2014). The **Registered Nurse (RN)**, or division one nurse, requires the completion of an undergraduate degree in the higher education or university sector. A stand alone nursing degree is of 3 years duration; however, some education providers offer the opportunity to gain a combined degree with, for example, midwifery in 4–5 years (AHPRA 2013). The RN practises nursing independently and interdependently and is regarded as responsible and accountable for all decisions and actions taken in relation to individual care. The RN is also responsible for delegating care to Enrolled Nurses and healthcare workers, taking into account education, training and context of care. Various career progression paths are available to RNs including clinical nurse specialist (CNS), clinical nurse consultant (CNC), nurse unit manager (NUM) and nurse educator (Daly et al 2014; NMBA 2010).

The Enrolled Nurse (EN) requires the completion of a Diploma of Nursing, generally through the vocational education and training (VET) sector. This program is of 18 months duration. Enrolled Nurses are able to complete an Advanced Diploma of Nursing to develop higher-level skills and work in specialty areas of healthcare. ENs are able to undertake further studies to become RNs. Many universities offer recognition of prior learning and thus a shorter degree program to ENs who wish to undertake the Bachelor of Nursing (AHPRA 2013; Daly et al 2014; Australian Government 2012a). The role of the EN was also discussed under Scope of Practice.

**Unregulated healthcare workers** are employed in healthcare facilities within Australia to undertake personal care tasks and activities of daily living. This is carried out under the supervision of the RN. Various titles are given to

people fulfilling this role, including Assistant in Nursing (AIN), nursing assistant, nursing support worker, individual service/support attendant. Many undergraduate nursing students undertake employment in this area while they are completing their degree. Other unregulated healthcare workers may have completed a Certificate III in Health Service Assistance through the VET sector (Australian Government 2012b; Daly et al 2014). See Case Study 1.3 and Decision-making Framework Exercise 1.1.

## Theories and models of nursing

The practice of professional nursing and development of nursing knowledge has to some extent evolved from nursing theories. Theoretical models serve as frameworks for nursing curricula, clinical practice and research. Nursing theories can help make sense of processes and practices. Nursing theories are an attempt to elucidate the nature of nursing practice, the principles on which practice is based and the proper goals and functions of nursing in society. In this way nursing theories help create an understanding of the practice of nursing, how nurses interact with individuals and how nursing actions and provision of nursing care is structured (Daly et al 2014).

The development of nursing theory was an essential part of establishing professional status and independence. Nursing theory has clearly demonstrated that nursing, as a profession, shares a common body of knowledge with medicine (Crisp et al 2013). However, nursing has a different perspective, namely to care rather than to cure. This perspective provides nursing with its own set of knowledge and theoretical assumptions.

### CASE STUDY 1.3

Gemma is a newly graduated EN working on the medical admission unit (MAU) of a large teaching hospital. On a busy morning shift she is team nursing 10 individuals with one RN and two unregulated healthcare workers (UHW), one of whom is a second-year Bachelor of Nursing student. One individual was particularly unwell, and the RN was caught up looking after her and asked Gemma to look after the remaining nine individuals on the ward as well as supervising the UHWs.

In the next hour Gemma knows that one individual needs IV antibiotics, two have schedule 8 medications due and another needs to have a catheter inserted prior to being transferred to another ward.

1. Discuss the roles of the RN, EN and unregulated healthcare workers.

## Defining theory and model

A *theory* is an abstract statement formulated to explain or describe the relationships between concepts or events. A nursing theory conceptualises an aspect of nursing for the purpose of describing, explaining, predicting and/or prescribing nursing care (Crisp et al 2013). A *model* is a conceptual framework developed from a set of concepts and assumptions; it is a conceptual representation of reality. A model provides the outline for which theory provides the functions. Thus, a model represents *structure* while a theory suggests *function*. Numerous conceptual models of nursing practice have been devised, most of which:

- Are based on sound theory
- Contain implied or explicit assumptions, values and goals
- Are implemented by the nursing process.

Nursing theories serve several essential purposes, as is illustrated in Clinical Interest Box 1.11.

### CLINICAL INTEREST BOX 1.11 Purposes of nursing theories and conceptual frameworks

In clinical practice:

- Assist nurses to describe, explain and predict everyday experiences
- Serve to guide assessment, intervention and evaluation of nursing care
- Provide a rationale for collecting reliable and valid data about the health status of individuals, which are essential for effective decision making and implementation
- Help to establish criteria to measure the quality of nursing care
- Help build a common nursing terminology to use in communicating with other health professionals. Ideas are developed and words defined
- Enhance autonomy of nursing by defining its own independent functions

In education:

- Provide a general focus for curriculum design
- Guide curricular decision making

In research:

- Offer a framework for generating knowledge and new ideas
- Assist in discovering knowledge gaps in the specific field of study
- Offer a systematic approach to identify questions for study, select variables, interpret findings and validate nursing interventions.

*(Berman et al 2015)*

### DECISION-MAKING FRAMEWORK EXERCISE 1.1

- Using the NMBA decision-making framework determine what the EN should do in Case Study 1.3.
- Do you accept this delegation from the Registered Nurse?
- What strategies could Gemma use in this situation? What alternative could you suggest to the Registered Nurse?

## Components of nursing theoretical models

A *domain* is a field or scope of knowledge of a discipline and contains the subject, central concepts, values and beliefs, phenomena of interest and the central problems of the discipline. The components of a discipline's domain are described in a paradigm. A *paradigm* is a model that explains the links to science, philosophy and theory accepted by the discipline. Nursing's paradigm directs the activity of the nursing profession and includes four major concepts—person, health, environment and nursing (Berman et al 2015; Crisp et al 2013).

## Overview of selected nursing theories

Many nursing theories have been developed in the past and many are still being developed today. The following selection of nursing theories is a historical overview that discusses nursing's four fields of interest: person, health, environment and nursing.

### Peplau's theory

In 1952 Hildegard Peplau made an attempt to analyse nursing action using an interpersonal theoretical framework. Her theory focuses on the relationships formed by people as they progress through each developmental stage. She viewed the goal of nursing as developing a relationship between the nurse and individual whereby the nurse acts as resource person, counsellor, teacher and surrogate (Crisp et al 2013).

### Abdellah's theory

In 1960 Fay Abdellah, with her colleagues, devised a theory that emphasised the delivery of nursing care to the whole person. Using a problem-solving approach the nurse formulates a plan to help individuals meet their physical, emotional, intellectual, social and spiritual needs. This model was progressive for its time as it referred to nursing diagnosis, which was not seen as part of the nursing role at the time (Crisp et al 2013; Nursing Theory 2013). Abdellah and colleagues identified 21 specific individual needs that fall into four key areas:

1. Comfort, hygiene and safety
2. Physiological balance
3. Psychological and social factors
4. Sociological and community factors.

(Crisp et al 2013)

### Henderson's theory

In 1966 Virginia Henderson described the goal of nursing as helping the individual to gain independence as rapidly as possible.

Henderson identified 14 basic needs that provide a framework for nursing care. These are to:

1. Breathe normally
2. Eat and drink adequately
3. Eliminate by all avenues of elimination
4. Move and maintain a desirable position
5. Sleep and rest
6. Select suitable clothing; dress and undress
7. Maintain body temperature within normal range
8. Keep the body clean and well groomed
9. Avoid dangers in the environment
10. Communicate with others
11. Worship according to faith
12. Work at something that provides a sense of accomplishment
13. Play or participate in various forms of recreation
14. Learn, discover or satisfy the curiosity that leads to normal development and health.

(Berman et al 2015; Crisp et al 2013)

### Johnson's theory

In 1968 Dorothy Johnson portrayed the goal of nursing as reducing stress so that the individual can recover as quickly as possible. Johnson viewed people as a collection of behavioural subsystems that interrelate to form a whole person, and her theory focuses on a person's needs in terms of the following behaviours:

- Security-seeking behaviour
- Nurturing-seeking behaviour
- Mastery of oneself and one's environment according to internalised standards of excellence
- Taking in nourishment in socially and culturally acceptable ways
- Ridding the body of waste in socially and culturally acceptable ways
- Sexual and role identity behaviour
- Self-protective behaviour.

Johnson saw the nurse's role as identifying the individual's inability to adapt to stress, and as providing the nursing care necessary to assist them in resolving problems to meet their needs (Crisp et al 2013).

### King's theory

Imogene King (1971, cited in Crisp et al 2013) viewed the goal of nursing as helping individuals and groups to attain, maintain and restore health, or to die with dignity. King saw nursing as a process of interaction between nurse and individual whereby, through communication, goals are set and agreement reached on ways to achieve goals.

### Orem's theory

In 1973 Dorothea Orem depicted the goal of nursing as helping the individual to achieve health through self-care (Crisp et al 2013). Orem saw nursing as a service required when individuals are unable to care for themselves, or unable to be cared for by others of significance to them; that is, when demands exceed their self-care abilities. The nurse identifies why an individual is unable to care for themself and implements measures that assist them to meet their needs. The overall goal of nursing care is to assist the individual to achieve self-care whenever possible.

### Roy's theory

Callister Roy viewed the goal of nursing as assisting people towards health by promoting and supporting their ability to adapt to various demands (Crisp et al 2013):

- Meeting basic physiological needs
- Developing a positive self-concept
- Performing social roles

- Achieving a balance between dependence and independence.

Roy saw nursing as being concerned with people as total beings, and intervening when necessary to assist them to adapt to one or more of these demands.

### Roper, Logan and Tierney's theory

Roper, Logan and Tierney in 1985 viewed the goal of nursing as helping people to prevent, alleviate, solve or cope with problems related to activities of living. Their model of nursing is based on their model for living and includes five main concepts:

1. Activities of living
2. Factors affecting activities of living
3. Life span
4. Dependence–independence
5. The nursing process.

The activities of living, which are the focus of the model, are:

- Maintaining a safe environment
- Communicating
- Breathing
- Eating and drinking
- Eliminating
- Personal cleansing and dressing
- Controlling body temperature
- Mobilising
- Working and playing
- Expressing sexuality
- Sleeping
- Dying.

(Crisp et al 2013)

Many of these theories influence the way Australian authorities promote the profession of nursing, by providing a framework for regulation, ethics and conduct.

## Relationship of theories to nursing process

The nursing process is a tool and framework for contemporary nursing practice. It is a series of planned steps that produces a particular end result. In simple terms, the nursing process is a method used to assess, plan, deliver and evaluate nursing care. Clinical Interest Box 1.12 illustrates the relationship of two theories to the nursing process. Providing the framework for nursing care, the nursing process consists of five components, each of which follows logically one after the other:

1. Assessment
2. Nursing diagnosis
3. Planning
4. Implementation
5. Evaluation.

The process is adaptable to different individuals and different care settings. In addition, the process offers a systematic approach to nursing practice, enhances research opportunities and is compatible with many other systems in the healthcare delivery system, such as computer-generated care plans, patient information systems and patient acuity systems. Although the nursing process is central to the domain of nursing it is not a

### CLINICAL INTEREST BOX 1.12 Selected nursing theories and the nursing process

#### Orem's general theory of nursing

**Assessing**

Involves collecting data about the individual's capacities (knowledge, skills and motivation) to perform universal, developmental and health–deviation self-care requisites. Determines self-care deficits.

**Diagnosing**

Stated in terms of the individual's limitations for maintaining self-care (a deficit in self-care agency).

**Planning**

Involves considering and designing, with the individual's participation, an appropriate nursing system (wholly compensatory, partially compensatory, supportive-educative or a mix) that will help the individual achieve an optimal level of self-care (i.e. enhance the individual's self-care agency).

**Implementing**

Assisting the individual by acting for or doing for, guiding, supporting, providing a developmental environment and teaching.

**Evaluating**

Determining the individual's level of achievement in resolving self-care deficits and in performing self-care.

#### Roy's adaptation model

**Assessing**

Involves two levels. First-level assessment includes collecting data about output behaviours related to the four adaptive modes (physiological, self-concept, role function and interdependence modes).

Second-level assessment includes collecting data about internal and external stimuli (focal, contextual or residual) that are influencing the identified behaviours.

**Diagnosing**

Focuses on adaptation problems and uses one of three alternative methods:

1. Stating behaviours within one mode with their most relevant influencing stimuli
2. Clustering behavioural information and labelling it according to indicators of positive adaptation and a typology of common adaptation problems related to each mode. Roy provides a typology of indicators of positive adaptation and a typology of commonly recurring adaptation problems according to each of the four modes
3. Labelling a behavioural pattern when more than one mode is being affected by the same stimuli.

**Planning**

Setting goals in terms of behaviours the individual is to achieve and planning nursing interventions to promote the effectiveness of the individual's coping mechanisms and adaptive behaviours.

## CLINICAL INTEREST BOX 1.12 Selected nursing theories and the nursing process—cont'd

**Implementing**

Altering and manipulating the focal, contextual and residual stimuli by increasing, decreasing or maintaining them.

**Evaluating**

Determining the individual's output behaviours with those identified in the goals.

*(Berman et al 2015:51)*

theory. It provides a process for the delivery of nursing care, not the knowledge component of the discipline. However, there have been attempts to build a comprehensive theory from the process and to use the nursing process in conjunction with other theories that lack a process element. (For more information on the nursing process refer to Chapter 17.)

### CRITICAL THINKING EXERCISE 1.2

Part of your education includes experiences in different types of healthcare settings. Choose a nursing theory and explain how the nursing theory is applied to the nursing process in your chosen setting using the headings assessing, diagnosing, planning, implementing and evaluating.

### Service

Nursing has always been a service profession, although in the past the service was usually viewed as a charitable one largely directed towards the care of the physically ill. Nurses today need to acknowledge and value the importance of nursing care across a broad range of practice settings and with different groups of clientele. Moreover, they need to work with the individual and family, individualising care, considering cultural and religious differences and providing support for the entire extended family.

### Autonomy

Autonomy is an essential element of professional nursing. Autonomy means that a person is reasonably independent and self-governing in decision making and practice (Crisp et al 2013). RNs attain increased autonomy through higher levels of education, through clinical competence and in diverse practice settings. RNs are increasingly taking on independent roles in nurse-run clinics, as nurse practitioners, and in collaborative practice and advanced-nurse practice settings. ENs also have increased autonomy in certain settings; for example, in the aged-care sector and in the community.

All nurses are accountable for the type and quality of nursing care provided. The degree to which nurses are held accountable for their actions reflects the level of education they have received, which in turn informs the degree of responsibility the nurse has in the workplace. The nursing profession regulates accountability through nursing audits and standards of practice.

## INFLUENCES ON NURSING

### Societal influences on nursing

The societal influences on nursing include developments in medical science and technology, which have impacted on the changing role and function of the nurse, and other factors such as demographic changes, cultural diversity and the consumer movement, which have also had an impact on the structure and practice of nursing.

### Demographic changes

Changes that have influenced healthcare in recent decades include the population shift from rural areas to urban centres, increasing lifespan, the higher incidence of long-term illness and increased incidence of substance abuse, mental illness and diseases such as cancers. Nursing as a profession responds to such changes by exploring new methods for providing care, by changing educational emphasis and by establishing practice standards in new areas (Crisp et al 2013).

### Cultural diversity

Australia is a multicultural society, which means that nurses frequently encounter individuals from cultures different from their own. Nurses need to be open to the challenges presented by cultural diversity and seek the information they require to provide culturally sensitive care. In Australia for many years there has been recognition of the multicultural nature of the country but little emphasis on the care of Indigenous people (Crisp et al 2013).

### Consumer movement

The availability of information through sources such as the internet means that healthcare consumers are potentially better informed than ever before. The public's concepts of health and nursing have changed, and consumers are an effective force in changing nursing practice to meet consumer needs. As people are searching for ways to be free of disease the media helps to emphasise messages of health promotion and disease prevention, further driving consumers to become active participants in making decisions about health and nursing care, with most consumers now believing that good health is a right of all people and that they must assume responsibility for their own health (Berman et al 2015).

The **National Safety and Quality in Health Service (NSQHS) Standards** include 'partnering with consumers'. It requires healthcare facilities to work in partnership with individuals and consumers to improve the safety and quality of care. Healthcare should be an active partnership between consumers and healthcare providers, with a healthcare service that is responsive to the needs and input of individuals, carers

and consumers. Evidence shows that healthcare provided in partnership with consumers is associated with:

- Improved clinical outcomes
- Decreased rates of healthcare-acquired infections
- Improved delivery of preventative care services
- Improved adherence to treatment regimens
- Improved functional status.

(Australian Commission on Safety and Quality in Health Care 2012)

As consumers are becoming more health literate through the increased availability of information, the consumer movement and partnerships in healthcare are becoming a greater factor in the delivery of healthcare. Health literacy is discussed further in Chapters 5 and 6.

## Human rights movement

Respect for the right of all people to the optimal standard of nursing and healthcare is central to the philosophy of the nursing profession. This view is reflected in the codes of ethics and standards of all nursing professional organisations. Nurses need to be consciously aware of personal values and where they are likely to impact on the quality of care given to a person. Where problems arise, advice or support should be requested (Crisp et al 2013).

## Summary

An overview of the theories and models of nursing helps to demonstrate how theory can inform the way in which we view the person, health, the environment and nursing itself. This allows nurses to establish connections and meaning in nursing and facilitates continuity of care. The utilisation and application of nursing theory (in the form of philosophies, models and theories) help nurses think critically for professional practice. Theory and research together lead to a systematic inquiry, which informs practice (Daly et al 2014).

The profession of nursing is in a constant state of change. The evolution of nursing has brought us to the point where there are endless opportunities to improve the health and welfare of our individuals and the communities in which we live. The role of the EN and the RN has changed from that of a vocation to a role that emphasises education and professional standards, exemplified by the development of competencies for the EN and the RN and codes of ethics, as well as the national framework for decision making for nursing practice. The role of the EN is expanding and embracing new areas such as technology in healthcare. Some states and territories have developed an Enrolled Nurse Advanced Practice role. The challenge for the future will be to incorporate these changes into the role of the EN while still maintaining the standards of the profession and to ensure that each nurse understands each other's role.

## Review Questions

1. What are the themes that are common to the many different definitions of nursing?
2. The scope of practice of the EN is influenced by what factors?
3. The *Enrolled Nurse Standards for Practice* (NMBA 2016a) reflect three (3) domains of EN practice. List these domains.
4. What are the purposes of nursing theories and conceptual frameworks?
5. What does autonomy mean? How is it relevant in nursing?
6. What factors have impacted on the changing role and function of the nurse?
7. What is the difference between a theory and a model?
8. What role do ANMAC, AHPRA and NMBA play in nurse education?
9. What characteristics are said to make nursing a profession rather than a job?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Ausmed Education: www.ausmed.com.au

Australian Commission on Safety and Quality in Health Care: www.safetyandquality.gov.au

Australian Health Practitioner Regulation Agency: www.ahpra.gov.au

Australian Nursing and Midwifery Accreditation Council: www.anmac.org.au

Australian Nursing and Midwifery Federation (ANMF): www.anmf.org.au

Australian War Memorial: www.awm.gov.au

International Council of Nursing: www.icn.ch

Nurses for Nurses: www.nursesfornurses.com.au

Nursing and Midwifery Board of Australia (NMBA): www.nursingmidwiferyboard.gov.au

Royal College of Nursing, Australia: www.rcna.org.au

CHAPTER 2

# Professional nursing practice: legal and ethical frameworks

*Kalpana Raghunathan*

## KEY TERMS

accountability
advance directives
advocacy
assault and battery
bioethics
common law
consent
civil law
criminal law
documentation
do not resuscitate order
ethical decision making
ethical dilemma
ethical principlism
ethics
false imprisonment
jurisdiction
legal issues
legal liability
legal responsibilities of nurses
legislation
malpractice
mandatory reporting
moral problems
negligence
nursing ethics
obligation
open disclosure
regulation
responsibility
restraint
rights
standards of care
torts
vicarious liability

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, you should be able to:

- Define key terms
- Explain the legal concepts that apply to nursing practice
- Describe the legal responsibilities and obligations of nurses and notion of accountability
- Identify the steps to, and apply the decision-making framework for, nurses in professional practice
- Identify standards for care and professional conduct for nurses
- Identify and discuss legal issues that arise in nursing and impact on nursing practice
- Examine ethical principles and the importance of ethics to nursing practice
- Critically examine nursing ethics, ethical responsibilities and obligations of nurses and advocacy
- Identify and discuss ethical and moral issues that arise in nursing and impact on nursing practice
- Critically examine ethical dilemmas or moral problems that may arise in nursing
- Identify the steps and apply ethical decision making to deal with moral problems in nursing
- Outline a plan of nursing care for individuals across a lifespan in a range of healthcare contexts within legal and ethical parameters of nursing practice

## CHAPTER FOCUS

In recent years the role and scope of practice of Enrolled Nurses (EN) has rapidly expanded and evolved. Safe professional practice requires a sound understanding of the legal and ethical responsibilities and obligations that apply to nursing practice. This chapter introduces the EN student to the fundamental legal and ethical concepts relevant to the practice of nursing. The chapter identifies the legal and ethical frameworks for professional nursing practice in caring for individuals across a lifespan in a range of healthcare contexts. A deeper understanding of these requirements requires further reading.

The ethical standards that guide professional nursing practice are universal. However, the legal and regulatory aspects of nursing are different between countries, and within Australia may even differ between states and territories. Also, the legal and regulatory guidelines for professional practice are constantly subject to changes in laws. It is therefore essential that nurses familiarise themselves and update their knowledge about changing legal requirements that govern clinical practice in the legal and regulatory system in which they practise.

## LIVED EXPERIENCES

I have previously worked as an Assistant in Nursing and therefore am aware of certain aspects of nursing. Now that I am studying the course it has made me more aware of the legal and ethical aspects of nursing. The *Code of Conduct for Enrolled Nurses* must be adhered to at all times. I have learnt that if it has not been documented then it didn't happen and the potential ramifications of this could lead to legal investigation and the potential to be sued. Nurses have a responsibility and duty of care for their clients and patients. I have learnt that there are laws, policies, protocols and procedures that are in place to enable safe working practices and so therefore I need to work within my scope of practice.

**Ben, Enrolled Nursing Student**

# INTRODUCTION

In healthcare, legal and ethical frameworks provide guidelines for standards of care and professional practice. Legal and ethical standards govern the clinical practice of healthcare professionals. Nurses at all levels and areas of practice as healthcare professionals have certain legal and ethical responsibilities and obligations.

The healthcare environment today is complex and inherent, with different kinds of legal and ethical concerns with implications for professional practice. Cost and resource restraints tend to push organisations to focus on business values. The emphasis on individual or person-centred care in today's healthcare environment requires the nurse to respond appropriately to situations, value the person's needs and act in the interest of the individuals in their care. It is therefore essential that nurses, as members of the healthcare team, understand the legal and ethical frameworks within which they function to ensure the provision of safe and competent care.

# LEGAL ASPECTS OF NURSING PRACTICE

In Australia, the legal framework around nursing practice is based on the common laws and Acts of the Parliament relevant to nursing practice. Nurses should be aware of their legally defined rights and responsibilities, and should have an understanding of the laws that govern their personal and professional lives. Ignorance of a law is not accepted as an excuse for violation of that law.

As healthcare professionals, nurses have the **legal responsibilities** common to all members of society, and also the responsibilities imposed by the nature of their work, which may be defined as responsibilities in respect of:

- The provision of safe, effective nursing care
- The health of the community
- The employing authority
- The nursing profession.

(Berman et al 2015)

The functions of law in nursing are summarised in Clinical Interest Box 2.1.

## Common law system

Australia is referred to as a common law country. The **common law** system has its origins in the legal system and principles developed in England around the fourteenth century, which became the basis for the legal systems of its colonies. The English common law system forms the basis for the complex and sophisticated legal system that exists in Australia today (Atkins et al 2014; Staunton & Chiarella 2013).

In common law countries the source of law and the legal system is based on a combination of:

- Common law
- Acts of Parliament.

### Common law

Common law is the body of law made by judges as a result of decisions in cases that come before the courts (Staunton & Chiarella 2013). These decisions form precedents (legal principles) and can then be applied in similar cases. This body

## CLINICAL INTEREST BOX 2.1
## Functions of law in nursing

The law serves a number of functions in nursing:

- It provides a framework for establishing which nursing actions in the care of individuals are legal
- It differentiates the nurse's responsibilities from those of other health professionals
- It helps establish the boundaries of independent nursing action
- It assists in maintaining a standard of nursing practice by making nurses accountable under the law.

*(Berman et al 2015)*

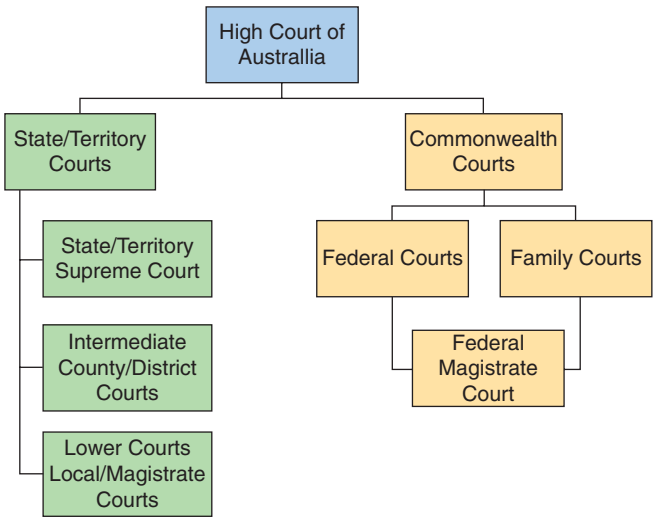


**Figure 2.1** Hierarchy of Courts in Australia

*(Adapted from Staunton & Chiarella 2013:12)*

of law is often referred to as case law and is equally as important as legislation (Forrester & Griffiths 2014). Some examples of common law that apply to nursing practice are the law of consent, the law of assault and battery and the law of contract (Kerridge et al 2013). In Australia there are different levels of courts consisting of judges and magistrates. The court systems for the Commonwealth and each state and territory are separate. The type of cases heard by each court will depend upon the relevant area of the constitution and the jurisdiction. Figure 2.1 shows the structure and hierarchy of the court system in Australia.

### Types of law

In understanding how laws function it is important to be aware of the distinctions between types of laws. Laws are classified as either:

- Criminal law or
- Civil law.

**Criminal laws** are concerned with offences against people and their property. The government makes rules as to what constitutes minimum levels of acceptable behaviour in society and seeks to enforce these rules through the police. A violation of a criminal law is called a crime, and it is sanctioned by some form of punishment, such as payment of a fine or imprisonment (Staunton & Chiarella 2013). Some examples of major criminal offences that can apply to nursing practice are murder, manslaughter, criminal assault and criminal negligence (Kerridge et al 2013).

**Civil laws** are concerned with the legal disputes between people and/or organisations and are concerned with differences over personal or property issues which people are unable or unwilling to resolve themselves (Staunton & Chiarella 2013). Such laws provide the means by which rights can be enforced and wrongs can be remedied. A person found to have broken a civil law will usually be required to pay monetary compensation to the person alleging personal or property loss or damage. Some examples of areas of civil law that can apply to nursing practice include legal and binding contracts, individual's safety, negligence, consent, freedom of movement and property. Under civil law, negligence and trespass to person is considered as a category of tort law.

**Torts** are civil wrongs committed by someone against a person or their property and interests, resulting in claims for compensation from the person responsible for causing injury or damage (Atkins et al 2014).

### Acts of parliament

The parliament has the power to make or unmake laws. Laws made by the Parliament are referred to as parliamentary or statutory laws and known as Acts of Parliament (Staunton & Chiarella 2013). Acts of parliament are the other major source of law and are commonly referred to as **legislation**.

Acts are accompanied by Regulations that give directions for the administration of the Act (Forrester & Griffiths 2014).

The Australian *Health Practitioner Regulation National Law Act 2009*, arising from the National Registration and Accreditation Scheme for health professions, is an example of an Act of Parliament. The Regulations accompanying this Act are administered by the Australian Health Practitioner Regulation Agency (AHPRA) which is responsible for ensuring that the intentions of this Act are followed in terms of regulating health professionals under the national accreditation scheme (see AHPRA website).

Nurses practising in Australia need to be aware that Acts may differ from state to state or territory and many health laws in relation to regulation of hospitals and healthcare services are within the **jurisdiction** of state and territory law. Some examples of Acts relevant to nursing practice are outlined in Clinical Interest Box 2.2. Nurses are bound by the laws of the place they reside and work in under state and territory jurisdiction. For example, if a health professional commits a legal offence in the line of work they are subject to the legal system in that state or territory.

### The employer

Healthcare institutions as employers are legally responsible for the acts committed by all employees during the course of

## CLINICAL INTEREST BOX 2.2 Specific Acts relevant to the nursing profession

- *Child Protection Act (or Children and Young Persons Act)*
- *Coroner's Act*
- *Drugs, Poisons and Controlled Substances Act*
- *Freedom of Information Act*
- *Health Practitioner Regulation National Law Act (Australia)*
- *Human Tissue Act, or Human Tissue and Transplant Act*
- *Mental Health Act*
- *Nurses Act*
- *Work Health and Safety Act*

their employment. This is referred to as the doctrine of **vicarious liability** and is relevant to all nurses. It renders an employer vicariously liable for an employee's actions committed during the course of employment (Brack 2014). For example, a hospital may be held liable due to negligence in duty of care for the person by the act or omission of care by a nurse causing harm or damage. However, the legal liability of the employer does not absolve a nurse from individual responsibility, and legal action can be taken against a hospital and a nurse or against a nurse as an individual if harm is caused by the actions of the nurse. Nurses have personal liability for activities carried out in the line of work and must ensure that they work within the scope of employment (Anselmi 2012). In the situation of nurses who are self-employed, they are solely responsible and liable for the harm caused by their actions.

It is the **responsibility** of healthcare employers to ensure that:

- Employees possess the required qualifications, registration and level of competence
- All legal requirements are met, including valid contracts of employment
- Safety standards are observed in relation to standards of care, buildings and equipment. (Staunton & Chiarella 2013)

## CRITICAL THINKING EXERCISE 2.1 Vicarious liability

A home care nurse is driving a health service car and runs over a pedestrian at a busy intersection. Consider the following scenarios:

- It is customary for home care nurses to drive service provider vehicles to make scheduled visits.
- The nurse was going home after completing all scheduled visits for the day.
- The nurse was eating her lunch in the car and was distracted at the intersection before the turn.

Was there negligence and, if so, is the home healthcare service provider liable?

## Nursing regulation

Broadly defined, **regulation** is any government measure enforced to seek control or change the behaviour of individuals or a group of people in society (Cusack et al 2013). The primary function of the nursing regulatory authority is to protect the health and safety of members of the public by ensuring that nurses are competent and fit to practise. The nursing profession in Australia is regulated by AHPRA under the National Registration and Accreditation Scheme for health professions. The *Health Practitioner Regulation National Law Act* came into effect on 1 July 2010, and the registration and accreditation of nurses is implemented through the national Nursing and Midwifery Board of Australia (NMBA). (See Online Resources at the end of this chapter for NMBA link.)

Note that the midwifery classification is separate to that of nursing. Under nursing there are three classifications:

1. Nurse practitioner
2. Registered Nurse
3. Enrolled Nurse.

By defining the terms under which a nurse may practise in each of the classifications of registration, the law protects the community by deeming the qualified nurse to be safe and competent to practise nursing. Nurses who do not fulfil the requirements of the standards, codes and guidelines for the nursing and midwifery profession may not practise as nurses or midwives. It is unlawful for a person to represent themselves as a nurse if they do not meet the requirements for practice. (See online resources for codes, guidelines and scope of practice for nurses.) (See Clinical Interest Box 2.3 for summary of *Code of Professional Conduct* and Chapter 1 for *Code of Ethics for Nurses*.)

As health professionals, an annual practising certificate or renewal of registration must be obtained from the nursing regulatory authority. The responsibility for ensuring that registration or enrolment fees are paid each year and demonstrating competence fit for practice rests with the individual nurse. Nurses have to meet the standards and requirements for registration or enrolment that govern professional practice. (See NMBA Online Resources and Chapter 1.)

The nursing regulatory authority is empowered to deregister nurses in certain circumstances; for example, a nurse's registration or enrolment may be cancelled if they unlawfully use a registration number or if they are found to be unfit for practice, guilty of misconduct or negligence in a professional respect.

In Australia it is a requirement that nursing students enrolled in an accredited program of study are also noted on the Australian Nursing and Midwifery Board student register. It is the responsibility of the education provider to ensure relevant details of students are provided to the regulatory

## CLINICAL INTEREST BOX 2.3
## Professional standards for nurses

**Professional codes for practice**

**Code of Professional Conduct for Nurses in Australia (Conduct Statements)**

1. Nurses practise in a safe and competent manner.
2. Nurses practise in accordance with the standards of the profession and broader health system.
3. Nurses practise and conduct themselves in accordance with laws relevant to the profession and practice of nursing.
4. Nurses respect the dignity, culture, ethnicity, values and beliefs of people receiving care and treatment, and of their colleagues.
5. Nurses treat personal information obtained in a professional capacity as private and confidential.
6. Nurses provide impartial, honest and accurate information in relation to nursing care and health care products.
7. Nurses support the health, wellbeing and informed decision making of people requiring or receiving care.
8. Nurses promote and preserve the trust and privilege inherent in the relationship between nurses and people receiving care.
9. Nurses maintain and build on the community's trust and confidence in the nursing profession.
10. Nurses practise nursing reflectively and ethically.

*(NMBA 2013b)*

## CLINICAL INTEREST BOX 2.4
## Recognising professional boundaries

*Questions to consider:*

- Is the nurse doing something the person needs to learn to do themself?
- Whose needs are being met—the person requiring care or the nurse's?
- Will performing this activity cause confusion regarding the nurse's role?
- Is the behaviour such that the nurse will feel comfortable in their colleagues knowing they had engaged in this activity, behaved in this way with a person in their care?

*(Australian Nursing and Midwifery Council and New Zealand Nursing Council 2010)*

authority on commencement of study. The primary purpose of the student register is to protect the health and safety of members of the public. There are greater numbers of nursing students in the clinical practice environment today and it is important to consider legal and ethical implications for clinical practice and safety of the students and the healthcare clients. (See NMBA Online Resources.)

### Professional boundaries

Professional nursing practice requires nurses to be aware of and understand the legal and professional boundaries within which they must function (Griffith & Tengnah 2013). Professional boundaries in nursing are the parameters within which nurses practise, to ensure that the limits of professional and therapeutic relationships with individuals in their care are not crossed. When a nurse crosses professional boundaries then that action is deemed as unprofessional conduct or behaviour. It is considered a misuse of the power vested in the professional over a vulnerable person in their care (Kerridge et al 2013).

Regardless of the healthcare setting, nurses in daily professional practice are faced with difficult decisions linked to professional boundaries. It is critical that nurses as healthcare professionals recognise the lines of separation from the person in their care and apply sound judgment in managing issues around professional boundaries. Common examples of professional boundary concerns in nursing practice are accepting gifts and services, entering into sexual relationships, entering into financial arrangements, access to health information and disclosing health information (Griffith 2013; Griffith & Tengnah 2013).

The professional boundaries for nursing practice in Australia are defined by guidelines and principles of safe practice prescribed by the Nursing and Midwifery Board of Australia. These are set out in the framework for professional practice guidelines, *Professional Boundaries for Nurses* (2010). The guidelines provide a framework of what constitutes the limits of professional behaviour in nurse–individual relationships and the decision-making tool is designed to assist with concerns relating to these situations. (See Clinical Interest Box 2.4.)

## CRITICAL THINKING EXERCISE 2.2
## Professional boundaries

The family of an elderly female resident at an aged care facility tell the nurse they would like to thank her for looking after their mother. They offer the nurse flowers and a box of chocolates. They also invite the nurse to visit them for a meal in their home.

What should the nurse do in this situation within the framework of professional boundaries?

# AREAS OF LEGAL LIABILITY IN NURSING

**Legal liability** means that a person is subject to certain legal **obligations**.

Nurses have legal responsibilities which arise from the fiduciary nature of the professional relationship with individuals in the health setting determined by laws and Acts (Atkins et al 2014). It is important for nurses to realise that

they are legally responsible for their own actions and that, although the EN works under the supervision of a Registered Nurse (RN), this does not relieve them of personal liability. Nurses have a responsibility, to themselves and the person in their care, to refuse to perform an activity if:

- They are asked to do something that is beyond the legal and professional scope of their role
- They have not been prepared to perform a function safely
- Directions are unclear, unethical, illegal or against the policies of the healthcare agency.

The nurse as a healthcare professional must work within their *scope of practice* and have a responsibility to be aware of the legal principles and concepts that impact on professional practice. The scope of practice for a nurse is determined by four factors:

1. The nurse's level of training and demonstrated competence
2. The nurse's context of practice and level of employment
3. State and Commonwealth legislation
4. The employer's policy framework.
   (Atkins et al 2014)

The framework for decision making with all professional encounters and work situations is outlined in the *Nursing Practice Decision Flowchart* (NMBA 2013a). The flowchart clearly identifies steps to guide nurses in making appropriate decisions in terms of evaluating the situation and the course of action to take (see Chapter 1). (See Decision-making Framework Exercise 2.1.)

## Contracts

A contract is an agreement between parties that is legally enforceable because of mutuality of agreement and obligation. A contract gives rise to **rights** and obligations that are protected and enforced by the law (Staunton & Chiarella 2013). The terms and conditions of the contract are binding on parties to the contract (Kerridge et al 2013).

A contract may be in writing or it may arise by implication, such as an agreement that is reached between an individual and a healthcare agency to which they are admitted. Although in this case the person is not required to sign a document, they will have entered into a contract as to the nature and extent of their proposed treatment with the healthcare agency or the medical officer. The expectation is that safe and appropriate care is provided.

An important form of contract for nurses is the contract of employment that nurses as employees enter into with their employer. Arising out of this contractual relationship are certain rights and obligations relevant to both the employee and the employer that are defined in a written contract of employment. Employment contracts are covered under the area of industrial law, and industrial awards impose specific provisions on employers relating to the health and safety of employees, the payment of wages and the provision of certain conditions. An industrial award is a document that sets out the wages and conditions of a particular group of employees and represents the contract of employment between the employer and the employee. A copy of each award can be obtained from the Fair Work Commission. Employers are required to have copies of the relevant awards available so that they are accessible to employees. Nurses have a responsibility to themselves to understand their contract of employment and their industrial award.

When starting each work shift, nurses engaged through nursing agencies are under contract to the health agency to which they have agreed to be allocated. A nursing agency is only an employment agency even though the nurse's pay may be processed through it.

## Standards of care

**Standards of care** are the guidelines or criteria for the standard of care that a nurse is expected to deliver (Kerridge et al 2013). Nurses have a responsibility to be familiar with the standard of care which includes the degree of care, skill and judgment they are expected to exercise and to understand the importance of not undertaking tasks outside their defined role and function. In the provision of healthcare delivery nurses must exercise a reasonable standard of care in order to meet the legal obligation for *duty of care* (Atkins et al 2014). There are a number of documents that help nurses to know the standard of care that is expected of them. Some are more binding and important than others, some documents set the minimum standards for practice and others clearly identify the standards to which nurses ought to aspire in daily practice. (See Online Resources for the range of documents including competency standards/standards for practice, codes and guidelines that identify standards of care.)

In Australia the *Enrolled Nurse Standards for Practice* (NMBA 2016) provide a regulatory and assessment framework to guide the scope of practice of Enrolled Nurses. These

### DECISION-MAKING FRAMEWORK EXERCISE 2.1

Mary, a 23-year-old female, is admitted for investigation and treatment. This is her second admission in six months. She presents with irritable bowel syndrome, chronic diarrhoea, severe weight loss and abdominal pain. Mary is fully investigated with no cause found. This time she confides in the nurse looking after her that she has been taking high doses of OTC aperient daily to keep her weight down. Mary has kept this a secret from her family and not told anyone.

How should you respond to this situation in accordance with legal and ethical aspects of nursing, and the decision-making framework for nurses?

documents are binding. For enrolled nursing students these documents set the minimum criteria for standards to be demonstrated to be eligible for entry into practice. Other sources of information to help nurses know the standard of care expected are healthcare agency policy and procedure manuals, government policy documents, professional organisations, evidence-based practice guidelines, nursing literature and specific **regulations** relevant to area of practice.

## Negligence

**Negligence** is a tort and means a civil wrong that relates to incidents where a person who suffers injury through a negligent act or omission can seek compensation from the person responsible for the negligence (Staunton & Chiarella 2013). If a nurse gives care that does not meet accepted standards, the nurse may be held liable for negligence; for example, if the nurse's actions result in harm to a person. Like other health professionals, nurses have a duty of care and, generally, negligence means failure by a nurse to take appropriate actions to protect the safety of the person in their care (Atkins et al 2014). This may involve failing to do something that should have been done, or doing something that should not have been done. Examples of negligence in nursing include incorrect administration of medications, failure to communicate important information about a person's condition, failing to take appropriate measures to prevent an injury and even failure to exercise reasonable care in giving advice to someone in their care.

### CRITICAL THINKING EXERCISE 2.3 Negligence

Mr Smith, 80, was admitted for cardiac surgery and is recuperating. On the day that the medical officer allows him to walk down the corridor with assistance, he asks you to help him do so. Mr Smith has thromboembolic disease (TED) stockings on and he has slippers in his locker. You get him out of bed and assist him to walk down the corridor, which has a newly polished linoleum floor. You forget to put on his slippers, although you knew about them. While walking down the hall, you turn to look out of the window at a commotion in the car park. As you are looking, Mr Smith's feet slip from under him and he falls to the floor and hurts his hip.

What are the elements of negligence and how do they apply to this case?

In the event of alleged negligence against a nurse the responsibility or the onus for proving negligence is with the plaintiff or the person alleging negligence. A plaintiff must prove four elements to succeed in an action for negligence:

1. That the nurse owed the plaintiff a duty of care
2. That the nurse breached this duty of care
3. That the plaintiff suffered injury or harm as a result of the breach
4. The harm was foreseeable.
(Atkins et al 2014)

### CLINICAL INTEREST BOX 2.5 Types of negligence that result in breach of duty of care and malpractice

- Failure to follow standards of care
- Failure to use equipment safely
- Failure to communicate adequately
- Failure to document adequately
- Failure to assess and monitor adequately.

*(Atkins et al 2014)*

The likelihood of injury to an individual and the risk of liability are reduced when the nurse adheres to the principles of sound nursing practice and follows the established policies relating to standards of care. The concepts of negligence and **malpractice** are often used together in legal terminology as negligent behaviour or actions can result in malpractice (Weld & Bibb 2009). The case of malpractice is more expansive and covers all conduct or actions that are improper during the course of performing duties that result in liabilities. Clinical Interest Box 2.5 lists categories of negligence that may result in malpractice.

## Defamation

The term 'defamation of character' refers to any communication, spoken or written, about an individual that injures their reputation. The term 'libel' is used when the communication is written, whereas the term 'slander' is used when the communication is spoken. With regard to nursing practice, everyone has a right to expect their privacy and confidentiality to be respected, and colleagues have a right to expect that their personal and professional reputations will not be harmed.

Nurses should therefore exercise extreme caution when discussing or documenting information relating to individuals in their care and when discussing members of staff. For example, a nurse may not be openly critical of the standard of care provided by another nurse. A nurse who is genuinely concerned about standards of nursing care should direct their concern through the proper channels and do so confidentially when making a complaint or report to senior administration (Mair 2014). Nurses should refrain from gossiping about colleagues, as this practice may lead to irreparable damage to an individual's personal or professional reputation. Nurses should avoid making statements in writing in healthcare records that may be interpreted as being of a defamatory nature. Nurses must ensure that all statements relating to a person are written in an objective rather than a subjective manner.

## False imprisonment

**False imprisonment** refers to the wrongful deprivation of a person's freedom of movement, such as restraining or detaining a person against their will (Atkins et al 2014). With

regard to nursing practice, there are certain situations in which a person may need to be restrained; for example, to protect them from injury, protect others from being injured or prevent damage of property. Nurses must be aware that the application of any **restraint** is only performed in consultation with the person's medical officer, and then only after very careful consideration. Written authorisation by a medical officer is generally required for the application of a restraint. Nurses need to know state laws and their organisation's policies regarding restraint of individuals. Apart from very specific instances, there are no powers to detain a person in a healthcare agency against their wishes, except when it is an involuntary admission under mental health legislation. The Department of Health and Ageing has guidelines for the use of restraints in health and aged care organisations. There must be a medical officer's order for the restraint which states the reason and time period. The order must be reviewed daily. Restraints can only be used after every other possible way of ensuring the safety of the person has been tried unsuccessfully. (See Chapter 15 for further discussion on the use of restraints.) All healthcare agencies have a document that a person is asked to sign if they decide to leave the agency against medical advice.

## Assault and battery

**Assault and battery** are considered criminal offences as well as breaches of civil law (Staunton & Chiarella 2013). Although the term 'assault' is used to describe both actions, there is a distinction between the two. Assault occurs when a threat to carry out unwanted and unlawful contact on another person is made, thereby causing that person to fear for their safety. Battery involves the direct, intentional and uninvited application of physical contact to another person's body that may or may not cause harm (Berman et al 2015).

### CRITICAL THINKING EXERCISE 2.4 Assault

A nurse became the subject of disciplinary action by the unit manager of an aged care facility after she was reported for assault by the family of a resident at the facility. The nurse was reported for sitting on the resident's bed and placing her hand on the resident's shoulder when she was visibly upset and distressed. The nurse had not asked the resident before doing so.

Has assault been committed in this situation? Give reasons for your answer.

In nursing practice, a nurse could intentionally or unintentionally commit an act of assault if they did anything in terms of touching someone in their care without consent. As many nursing activities involve direct physical contact with a person there is the possibility of committing assault and battery, which could result in an offence of trespass to the person if unwanted and unlawful contact is made (Mair 2014). The important factor in situations in which physical contact is involved is to make sure you have the person's consent.

## Consent

**Consent** is an agreement between two parties and can be provided in a number of ways (Staunton & Chiarella 2013). Consent is usually implied or expressed (Cole 2012; Rock & Hoebeke 2014). Implied consent is frequently given in the performance of nursing activities. For example, if a nurse requests a person in their care to hold out their arm so that they can measure their blood pressure, and the person does so, then they have implied their consent to that procedure. Expressed consent is given in verbal or written form. In the healthcare setting people frequently give consent verbally; for example, by agreeing to have a procedure performed. Written consent provides documentary evidence that consent was given. Before any invasive procedure or surgical intervention is performed a person is requested to sign a consent form. Although the primary responsibility for advising and informing the person about a particular treatment rests with the medical practitioner, frequently the task of witnessing the person's signature on consent forms is undertaken by nurses (see Clinical Interest Box 2.6).

Regardless of the form in which consent is given it must be valid. For consent to be valid it must be voluntarily and freely given. It should also cover the treatment to be carried out, and be given by a legally competent person who has sufficient information about the treatment or intervention to be performed. Nurses have a professional responsibility to ensure that the person receiving treatment or care is well informed, once the course of treatment is agreed upon (see Clinical Interest Box 2.7).

### CLINICAL INTEREST BOX 2.6 Steps to observe when witnessing a signature on written consent forms

- Ensure that all sections of the consent form are completed. Never ask the person to sign a blank consent form
- If the person wants to alter the consent form the treating medical practitioner must be informed immediately
- If the person asks questions about the nature of the procedure or treatment the treating medical practitioner must be informed immediately
- On contacting the treating medical practitioner, a relevant entry must be made in the health records including the medical practitioner's response
- If the person refuses to sign the consent form, the treating medical practitioner and appropriate administrative staff must be notified and the refusal documented in the health records.

*(Staunton & Chiarella 2013)*

## CLINICAL INTEREST BOX 2.7
### Elements of valid consent

1. That consent is given freely and voluntarily without coercion
2. That the person giving consent is fully informed
3. That the person giving consent is competent to make decisions.

*(Staunton & Chiarella 2013)*

## CRITICAL THINKING EXERCISE 2.5
### Consent

A graduate nurse wanted to observe and learn how to perform a complex wound dressing. This was an orientation week on a busy orthopaedic ward. The graduate nurse went into the patient's room and explained what she wanted. The patient agreed but her daughter who was in the room did not agree. The graduate nurse stayed and watched the procedure.

What are the issues or considerations in relation to consent in this situation?

Legal capacity to give consent is determined by age and the person's mental and intellectual function. Legal consent can only be given by a competent adult. If the person is unable to give consent specific legislation enables others to give consent on the behalf of that person (Staunton & Chiarella 2013). Parents and guardians can provide consent for children and minors. Under guardianship legislation a guardian or appointed authority may give consent for treating a mentally incompetent person. Mental health legislation allows non-consensual treatment of mentally ill persons. In circumstances when it is difficult to obtain consent, for example if the person is unconscious, consent can be obtained from someone legally authorised to give consent on behalf of them. If the situation arises that the person requires emergency treatment and it is impossible to obtain consent from that person, an authorised person may give consent. In the event of life-threatening situations, the overriding duty of care negates the need for consent and legislation enables medical intervention without consent. An example would be an unconscious person who has serious life-threatening injuries from a motor vehicle accident.

Informed consent is given when the person is provided with adequate information about, and understands, the procedure to which they are consenting. The person giving consent understands the risks and benefits involved as well as the actual procedure (Atkins et al 2014). When a nurse provides information to a person about the nursing procedure to be performed it is the responsibility of the nurse to ensure that the person consenting is competent to determine what treatment or care they will be subjected to. In the case of medical and surgical procedures it is the responsibility of the medical officer to provide the person with an adequate explanation of any proposed treatment. Informed consent for medical and surgical treatment is documented on a consent form, which is a legal record. This form is signed by the person giving consent to the treatment and the medical officer providing the information. In some healthcare facilities, a general medical treatment consent form is signed by the individual on admission for the treatment and care provided during the course of that admission. However, this does not include specific medical interventions that may be required to diagnose or treat the individual. Additional informed consent is required for diagnostics tests or procedures.

An important consideration with regard to consent is that a person has the right to withhold or revoke their consent at any time provided they are competent to do so. In this event they must be informed about any detrimental consequences of refusal (Atkins et al 2014). If either situation arises, the event must be reported immediately to the nurse in charge and the medical officer, and be documented.

### Right to receive information

Nurses as healthcare professionals are required to provide appropriate and sufficient information to the person in their care in accordance with the principles of informed consent. For example, nurses must inform the person before performing any procedures; this includes clearly explaining the purpose of the intervention or care, describing any potential issues or risks that may arise and obtaining permission from the person. The NHMRC (2004) *Guidelines for Medical Practitioners on Providing Information to Patients* set out the minimal information that needs to be communicated to patients by the medical practitioner. Nurses also have a professional responsibility to ensure that adequate information has been provided to the person about a particular treatment or procedure and to answer the person's questions in an honest and helpful way in relation to their care (Staunton & Chiarella 2013).

## Confidentiality and privacy

'Confidentiality' refers specifically to restrictions upon private information revealed in confidence, with an understanding that the information will not be disclosed to others; 'privacy' refers to ownership of one's own body or information about one's self (Kerridge et al 2013). Nurses have a legal and ethical obligation not to disclose confidential information acquired about individuals in their care, except when such disclosure occurs during the course of their professional duties (Griffith 2014). Information that may be classified as confidential and private may be anything related to the individual's condition, treatment being given, prognosis or anything relevant to a person's private life. Disclosure of such information may lead to legal action against the healthcare agency. Information concerning a person's health is protected by law. The requirement for nurses to observe a duty of confidentiality is stated in the Code of Conduct and *Code of*

*Ethics for Nurses*. (See Clinical Interest Box 2.3, Chapter 1 and Online Resources.)

Information communicated in nursing and medical records must be kept confidential and, therefore, nurses are responsible for protecting records from unauthorised readers. Information provided to other treating healthcare professionals should be kept to a need-to-know basis, and consent from the person must be obtained if a third party requires access to their healthcare records (Atkins et al 2014). A person's right to privacy must be respected and their affairs must not be discussed with other healthcare patients, non-professional staff or members of the general public. In the case of family members, information should only be divulged to the people involved in the care of the person. If someone has an appointed guardian, that person can have access to health information in order to make treatment decisions. For a child, the parent or appointed guardian is allowed access to the health information.

### CRITICAL THINKING EXERCISE 2.6 Confidentiality

Mrs Brown is a woman you are giving nursing care to. You know from her medical records and your handover report that she has been diagnosed with terminal cancer. You are told she does not want her family to know about her condition.

What do you say when Mrs Brown's daughter asks you if she is dying and why do you give this reply?

Discretion should be used by nurses during their off-duty hours and they should avoid careless chatter about the healthcare agency, any of the individuals in their care or staff members. Nurses must know the rules and policies that govern social media use and what information can or cannot be posted. In Australia the national board's social media policies and specific employer policies apply to all health practitioners—failure to comply can result in disciplinary action (Douglas 2014). See the *National Board Policy for Registered Health Practitioners: Social Media Policy* (AHPRA 2014). If approached at any time by a representative of an organisation, press, radio or television, a nurse should refrain from giving information but should refer the enquiry to the administrative section or other appropriate department of the healthcare agency. It is important that nurses are also alert to situations when a person asks them to keep a secret, because this information may relate to matters of harm to themselves or others, and will need to be acted upon appropriately as a healthcare professional.

### CRITICAL THINKING EXERCISE 2.7 Confidentiality and privacy

You are arriving at work and are in a crowded elevator. The conversation in the elevator revolves around a well-known celebrity who was admitted during the night following a motor vehicle accident.

How has this person's right to confidentiality been breached? What would you do in this situation?

## Mandatory reporting

In certain circumstances nurses as health professionals are compelled by law to disclose confidential information so that appropriate interventions or decisions can be made for the protection and safety of the persons in their care. This is referred to as **mandatory reporting** (Atkins et al 2014). The requirements for compulsory reporting and who is mandated to report vary slightly between states and territories. (See Clinical Interest Box 2.8.) In Australia nurses are legally bound to report suspected cases of child abuse or neglect by law as a health professional group, along with others who work with families, children and youth (Mathews & Walsh 2014). There are two types of duties under which nurses are required to report suspected child abuse and neglect: *duty of care* and *duties of professional or industrial policy.* Situations that require reporting, and who is mandated to report to child protection services, are clearly set out in the legislation, and these requirements vary between states and territories. The types of abuse or neglect that must be reported include physical or emotional abuse, physical or emotional neglect, sexual abuse and exposure. See the *Australian Institute of Family Studies Fact Sheet Mandatory Reporting of Child Abuse* (AIFS 2014). (See Clinical Interest Box 2.9.)

There are no mandatory reporting laws for reporting of elder abuse in Australia, but there are compulsory reporting requirements through the *Aged Care Amendment (Security and Protection) Act 2007*, whereby employers, staff, residents or anyone should report these cases to the Office of Aged Care Quality and Compliance. Elder abuse may include neglect or abuse that is physical, sexual, psychological, financial or social in nature (Atkins et al 2014:166).

Mandatory reporting is also an AHPRA requirement for all registered health professionals, their employers and

### CLINICAL INTERNET BOX 2.8 Situations that require mandatory reporting

- Certain deaths
- Injuries involving firearms
- Diseases that threaten public health
- Medical conditions that may result in harm to public
- Professional misconduct
- All crimes
- Abuse and sexual abuse of children
- Abuse of elderly
- Domestic violence (in Northern Territory)

*(Atkins et al 2014)*

education providers in order to protect the safety of the public and prevent individuals being placed at risk of harm. The Nursing and Midwifery Board of Australia *Guidelines for Mandatory Notification* (2014) provide nurses with a clear framework for understanding and interpreting legal obligations for reporting. Nurses have an obligation to report if there are reasonable grounds that a health practitioner has engaged in 'notifiable conduct' (see Clinical Interest Box 2.10).

## Documentation

Health records are important legal documents and it is therefore important that nurses keep accurate and complete records of all treatment and care administered to the person. Electronic health records are also becoming more common and it is essential that all health data is updated and stored appropriately. In the course of work a nurse is required to document information about the person on nursing care plans, progress notes, flow charts and any other care-specific documents used in the healthcare facility (see Progress Note 2.1). These health records are legal evidence of the interventions and care provided. A person's records may be required in legal proceedings; for example, as evidence in a case when treatment and care is disputed or where negligence has been alleged. Therefore, in addition to ensuring that any information is recorded accurately and concisely for the purpose of communication between members of the health team, accurate detailing of all relevant information is necessary to provide adequate explanation to a court of law. If a person's records are required in legal proceedings they will be subject to very close scrutiny by lawyers. Good quality **documentation** in such situations will provide a clear account and help nurses defend their case. Staunton and Chiarella (2013) list a number of important considerations for quality documentation (see Clinical Interest Box 2.11).

In the healthcare setting, guidelines and policies issued by the healthcare agency, professional organisations and state or territory governments must be adhered to in relation to healthcare records documentation and management. An example is the New South Wales Health Department *Policy Directive for Health Care Records: Documentation and Management* (NSW Health 2012). This policy document clearly sets guidelines for all aspects of healthcare records documentation and management (see Table 2.1 for a summary of the policy principles).

### CLINICAL INTEREST BOX 2.9 Grounds for reporting suspected abuse

- A person tells you that a child has been abused or neglected
- A child tells you that they have been abused or neglected
- Your own observations give you reason to believe that the child has been abused or neglected.

*(Atkins et al 2014)*

### CLINICAL INTEREST BOX 2.10 Notifiable conduct

Under section 140 of the *National Law*, 'notifiable conduct' is where a practitioner has:

- Practised the practitioner's profession while intoxicated by alcohol or drugs
- Engaged in sexual misconduct in connection with the practice of the practitioner's profession
- Placed the public at risk of substantial harm in the practitioner's practice of the profession because the practitioner has an impairment
- Placed the public at risk of harm because the practitioner has practised the profession in a way that constitutes a significant departure from accepted professional standards.

*(NMBA 2014)*

## Reporting of adverse events and clinical incidents

Nurses have an ethical and legal responsibility to report any accidents or incidents that occur within a healthcare agency. A written report must be made immediately after an accident or incident occurs in which the individual, a visitor or a member of staff was involved, even when no injuries appear to have been sustained or the incident seems trivial. Healthcare agencies have special forms, often an electronic incident reporting system, for this purpose. Reporting of adverse events and clinical incidents provides a source of information to improve the quality of care and to evaluate the effectiveness of policies (Staunton & Chiarella 2013). Requirements for reporting adverse incidents may vary between healthcare

### PROGRESS NOTE 2.1

| | |
|---|---|
| 21/02/2015<br>1645 hrs | Nursing: Mr Smith complained of mild pain to lower back at 1600 hours. Requested some analgesics. Administered as per PRN orders: Paracetamol 1000 mg, 6-hrly order. Assessed 1630 hours, patient states the pain is settling. To be reviewed by RMO on PM round. Nil other issues at time of report. (EN, Bloom, K.) |

## CLINICAL INTEREST BOX 2.11 Quality documentation

**Important considerations for quality documentation**

- Reports should be accurate, brief and complete
- Reports should be legibly written
- Reports should be objectively written
- Entries in reports should be made at the time a relevant incident occurs, or as soon as possible after the incident
- Abbreviations should not be used in reports unless they are accepted within the healthcare organisation and there is a policy acknowledging this or they are widely acknowledged medical abbreviations
- If medical terminology is used in reports, the nurse should be sure of the exact meaning, otherwise it could prove misleading
- Any errors made in recording should be dealt with by drawing a line through the incorrect entry and initialling it before continuing
- No entry concerning the person's treatment should be made on behalf of another nurse
- All reports need to be dated and signed.

To reduce the risk of an incorrect entry being made:

- Don't make an entry in a person's health record before checking the name on the record
- Don't make an entry in a person's health record by identifying room or bed number only
- Make sure the person's name and identifying number is on every sheet/page of the document before making an entry
- Avoid wherever possible making notes concerning a person on loose paper for rewriting later into the person's notes

*(Adapted from Staunton & Chiarella 2013)*

providers and within state and territory jurisdictions. The incident reporting systems within each state and territory are guided by policy developed in conjunction with the Australian Commission on Safety and Quality in Health Care (ACSQHC) *National Safety and Quality Health Service Standards*. An example of a reporting system is the Victorian Health Incident Management System (VHIMS) which is guided by the *Victorian Health Incident Management Policy* and provides a structured framework for reporting (State of Victoria Department of Health 2011). It is important that nurses familiarise themselves with the correct reporting requirements for their area of work and jurisdiction.

There is always a possibility that the 'aggrieved person' may take legal action, in which case the written report becomes a very important document. The information included in the report must be factual, clear, concise and objective. Personal opinions must not be included, and care must be taken to avoid using terms that could be misinterpreted. For further details on documentation and reporting skills, refer to Chapter 18. Examples of adverse events that may be reported are listed in Clinical Interest Box 2.12.

## Witnessing wills

In the healthcare setting a person wishing to make a will should be given all the assistance required but it is policy in most healthcare agencies that nurses cannot act as witnesses.

## Coroner's court

A coroner's court is presided over by a magistrate called a **coroner**. The coroner is a government official. The role of the coroner is to detect unlawful homicide and reportable deaths (Atkins et al 2014). The legislation and title of the Act dealing with the role and functions of coroners is the same in all states and territories, and is the *Coroners Act.* (See Clinical Interest Box 2.13.) A coroner is required to investigate any death that was unexpected, or if the person died in unusual or violent circumstances. An inquest into a death may be conducted as long as several years after the event occurred and, in the case of an inquest arising out of a person's death in a healthcare

**TABLE 2.1 | Example of policy principles for healthcare records**

| THE NSW HEALTH POLICY DIRECTIVES PRINCIPLES FOR CREATION, MANAGEMENT AND DISPOSAL OF HEALTHCARE RECORDS (NSW HEALTH 2012) | | |
|---|---|---|
| • Individual records | • Completeness and comprehensiveness | • Quality improvement, review, evaluation and research |
| • Continuity of care | • Responsibility for documentation | • Durability |
| • Confidentiality | • Timeliness of documentation | • Storage and security |
| • Authenticity | • Ownership | • Retention |
| • Relevance | • Access | • Disposal |

## CLINICAL INTEREST BOX 2.12 Examples of clinical incidents that must be reported

- Procedures involving the wrong patient or body part resulting in death or major permanent loss of function
- Suicide of an inpatient or serious self-harm, suicidal behaviour
- Retained instruments/material after surgery requiring re-operation/further surgical procedures
- Intravascular gas embolism resulting in death or neurological damage
- Haemolytic blood transfusion reaction resulting from ABO incompatibility
- Medication error resulting in death of a patient
- Maternal death or serious morbidity associated with labour or delivery
- Infant discharged to wrong family or infant abduction
- Adverse events resulting in serious patient harm or death
- Fetal complications associated with healthcare delivery
- Delay in recognising or responding to clinical deterioration
- Complications of resuscitation or anaesthetic management
- Complications of surgery
- Complications of an inpatient fall
- Infection control breaches
- Unexpected death of a mental health patient/consumer
- Absconding of any mental health patient/consumer
- Therapeutic equipment failure/medical device incident
- Hospital-acquired pressure injuries
- Clinical deterioration of a mental health patient resulting in harm (physical, verbal or sexual) to staff, other patients or other persons.
- Inappropriate treatment/s.

*(Department of Health, Western Australia 2015:6)*

agency, a nurse may be called upon to give evidence. If this situation arises, nurses are advised to seek legal advice before giving a statement to the police or appearing in court. The healthcare agency through which the nurse is employed will generally ensure that they are represented by the agency's legal representatives. Alternatively, a nurse can be represented by the professional nursing organisation of which they are a member.

All deaths that occur in the healthcare environment are not subject to a coronial inquest. It is only reportable deaths defined by the *Coroners Act* of the state or territory that are investigated by the coroner, and this varies between jurisdictions. See Clinical Interest Box 2.14 for examples of reportable deaths.

## CLINICAL INTEREST BOX 2.13 The role of the coroner

The primary task of the coroner is to establish the following facts in the event of a coronial investigation:

- That death occurred
- The identity of the deceased
- The date, place, manner and cause of death
- The cause of fires or explosives if relevant.

*(Staunton & Chiarella 2013)*

## CLINICAL INTEREST BOX 2.14 Examples of reportable deaths (this may vary between jurisdictions)

- The identity of the person who has died is unknown
- The death of the person was violent or unnatural
- The death of the person happened in suspicious circumstances
- A 'cause of death' certificate has not been issued and is not likely to be issued for the person
- The death of the person was a healthcare-related death
- The death of the person occurred in care
- The death of the person occurred in custody
- The death of the person occurred as a result of police operations.

*(Coroners Act 2003, Office of the Queensland Parliamentary Council. © The State of Queensland)*

## Right to refuse treatment

It is the legal right of a person to refuse medical treatment under the common law jurisdiction (Johnstone & Kanitsaki 2009). To give or force treatment without consent will result in the nurse being liable for charges of assault and battery. Examples of situations when a person's right to refuse treatment may arise in daily practice include decisions by the person to refuse their medication, refuse to have a procedure performed or refuse blood transfusions or organ donations due to their religious or personal values. In some situations, terminally ill individuals may decide not to have certain treatments. A person can also withdraw consent at any time during their treatment or care. (See Case Study 2.1.)

## End-of-life care

The most important considerations for nurses when caring for a person who is dying are to respect the wishes of the person and provide care that is appropriate to their needs. This requires the nurse to be familiar with important factors, including legal implications associated with providing end-of-life care (McGowan 2011). It is the responsibility of the nurse to ensure that the person's needs and concerns are

### CASE STUDY 2.1 RIGHT TO REFUSE TREATMENT

Mr Mill is a 73-year-old man diagnosed with pancreatic cancer. The treatment is to undergo a total pancreatectomy which will offer a 50% chance of curing the cancer. The operation carries a 5% risk of mortality and a 100% side effect of insulin-dependent diabetes and probable ongoing problems related to malabsorption syndrome. Without the surgery Mr Mill is likely to live reasonably well for the next 6 to 12 months. Beyond this period he will require palliative care and die from the cancer. Mr Mill discusses this with his family. He decides against the operation.

Will the legal right of the individual to refuse medical treatment apply in this case?

### CLINICAL INTEREST BOX 2.15 Advance care directives

Usually advance care directives are made by:

- The very elderly, who wish to avoid futile, painful and undignified care in the event of cardiac arrest or stroke
- Those with a terminal illness who do not wish to prolong their lives
- Those undergoing dangerous medical procedures.

*(Atkins et al 2014)*

communicated and discussed with everyone involved in their care. Nurses are required to ensure that every aspect of care and the discussions and planning of care are documented. Promoting quality end-of-life care and person-centred care is a primary focus in palliative care nursing. Nurses should ensure that special religious and cultural practices associated with providing end-of-life care are considered. Australia is a multicultural society and it is therefore important for nurses to become familiar with the special needs of people from different cultures. Nurses working with Indigenous people must respect the special rituals and practices related to death and care of the body. In Australia, approach to end-of-life care is guided by policy, legislation and set standards for care. Legislation pertaining to end-of-life care is placed at state and territory levels and there are variations in the application of these laws. There are two main areas of the legislation and these are concerned with nomination of a substitute decision maker and the laws concerning advance care directives (ACSQHC 2013a). The *Standards for Providing Quality Palliative Care for all Australians* (Palliative Care Australia 2005) provide guidelines for quality management of care. (See also Chapter 38.)

## Advance directives

**Advance care directives** are documented statements that enable a competent adult to specify their wishes with regard to parameters for future medical treatment that can assist healthcare providers in decision making in the event that the person is not able to participate in decisions regarding treatment (Atkins et al 2014). Examples of specific wishes may include decisions relating to artificial ventilation, organ donation, blood transfusion, nutrition and do not resuscitate orders. Advance directives may also incorporate instructions with regard to nominating another person with enduring power of attorney for medical treatment decisions on their behalf. Often a family member or relative may be identified to make health treatment decisions (Jeong et al 2010). In Australia, terms governing substitute decision making vary from state to state. There are some differences in the legislation related to advance directives between states and territories for healthcare procedures and in the event of future terminal or life-limiting illness (Atkins et al 2014). The *National Framework for Advance Care Directives* (AHMAC 2011) document identifies policy and best practice guidelines for advance care directives within the context of jurisdictional differences in law and processes. When following advance care directives nurses should take steps to ensure that care directives comply with legislation and policy, the wishes of the person are current and the document is up to date. For more information on advance care directives and care planning refer to the *Advance Care Planning Australia* website. (See Clinical Interest Box 2.15.)

## Do not resuscitate orders

The '**do not resuscitate order**' (DNR) is also referred to as 'not for resuscitation order' (NFR). This order is written by the medical practitioners in the person's medical record following a decision to not attempt to resuscitate the person if further intervention or treatment is considered futile or unwanted. Such decisions are made to prevent the use of cardiopulmonary resuscitation if the person stops breathing or their heart stops beating. The requirements for NFR orders vary between states and territories and nurses should consult the Department of Health policy guidelines. The order for NFR must conform to the law of consent, and is based on an expressed decision by the person, their family and medical practitioners. If the person is not capable, their family or agent with the medical power of attorney must be involved in the discussions. The reason behind the decision and the DNR or NFR order must be documented clearly in the person's medical records and reviewed regularly, including for each admission into the healthcare facility (Forrester & Griffiths 2014). Within the healthcare setting forms for documenting the NFR orders vary between facilities. An example of a NFR document is the *Medical Order for Life Sustaining Treatment* form which contains a DNR or NFR section for detailing decisions about and the extent of medical interventions.

## Open disclosure

**Open disclosure** is the open discussion of adverse incidents that have resulted in harm or potential harm while receiving

**TABLE 2.2 | Open disclosure framework**

**THE ELEMENTS OF OPEN DISCLOSURE**

- An apology or expression of regret, which should include the words 'I am sorry' or 'we are sorry'
- A factual explanation of what happened
- An opportunity for the individual, their family and carers to relate their experience
- A discussion of the potential consequences of the adverse event
- An explanation of the steps being taken to manage the adverse event and prevent recurrence.

| *The guiding principles of open disclosure framework* | *Open disclosure process (key considerations and actions)* |
|---|---|
| 1. Open and timely communication<br>2. Acknowledgement<br>3. Apology or expression of regret<br>4. Support, and meeting the needs and expectations of individuals, their families and carers<br>5. Support, and meeting the needs and expectations of those providing healthcare<br>6. Integrated clinical risk management and systems improvement<br>7. Good governance<br>8. Confidentiality | 1. Detecting and assessing incident<br>2. Signalling the need for open disclosure<br>3. Preparing for open disclosure<br>4. Engaging in open disclosure discussion<br>5. Providing for follow up<br>6. Completing the process<br>7. Maintaining documentation |

*(ACSQHC 2013b)*

healthcare with the person, their family and carers (ACSQHC 2013b:11). The open disclosure process involves communicating openly when healthcare does not go to plan and harm has been caused. Adverse incidents such as medical errors, near miss and no harm, procedural errors or injury during treatment or procedure should be disclosed to the person. The level of response required in these situations will be determined by the seriousness of the adverse event and its consequences. Open disclosure is embedded in professional ethics for health professionals and it is a legal requirement in line with acting in the best interests of the person, duty of care and the individual's right to information. The person affected should be informed of the errors or harm that may have been caused so that they can seek appropriate and timely interventions. Experienced or senior staff should facilitate the process of open disclosure. Care must be exercised with all documentation and communications as these records may be required as evidence in legal proceedings. There may be legal liability and disciplinary proceedings for staff involved depending on the nature of incident. The Australian Commission for Safety and Quality in Health Care *Australian Open Disclosure Framework* (2013b) provides clear guidelines for open disclosure. The framework for open disclosure is intended to contribute to improving the safety and quality of healthcare. Table 2.2 provides a summary of the framework. See Case Study 2.2.

### CASE STUDY 2.2 OPEN DISCLOSURE

Mr Cohen is an 85-year-old man admitted for a day procedure. He has a routine endoscopy for investigating abdominal pain. The nurse assisting the medical officer on this procedure is an Enrolled Nurse (EN). The EN has been working in the endoscopy theatre for 3 months. For the procedure a paediatric mouth bit was used to assist during the scope to protect Mr Cohen's mouth and teeth. The EN was responsible for managing the device during the procedure. When Mr Cohen was returned to the recovery unit after the procedure a broken tooth was found on his pillow.

Apply the principles and process for open disclosure in this case.

## LEGAL RESPONSIBILITIES OF NURSING STUDENTS

Nursing is a practice-based profession and this requires students to touch individuals when providing care and to be exposed to the professional environment in order to learn nursing skills properly. Therefore, those involved in the education and supervision of students, and the students themselves, all carry the responsibility for ensuring that students are properly supervised and are never put into a situation where the person's safety and wellbeing might be at risk in any way (Kerridge et al 2013). Supervisors and students should ensure that they are adequately prepared to undertake new skills in the clinical environment and also that they have had previous practice in nursing skills laboratories. Students must be supervised by an experienced and competent nurse either from their tertiary education institution or from the clinical environment in which the student is placed. If students are uncertain about procedures in the clinical

environment it is their responsibility to inform their supervisor and seek clarification.

During the course of their nursing studies many students often find work as Assistants in Nursing. In these situations it is important to recognise that, while such employment will undoubtedly provide valuable experience, the student is employed as an unqualified member of staff and should not take on responsibilities outside the scope of that role (Berman et al 2015).

In Australia, under national legislation nursing students enrolled in an approved program of study at a tertiary institution are registered with the Nursing and Midwifery Board of Australia for the duration of their education and clinical training as a student. The core role of this Board is to protect the public: everyone is entitled to expect to receive a safe standard of care, regardless of whether the care is delivered by a registered or student nurse. Education providers now require students to provide evidence of criminal checks prior to undertaking professional practice placements. The Nursing and Midwifery Board of Australia requires reporting of prior criminal history when applying for registration, and a person may be denied registration even though they have completed their qualifications if there is a criminal record. (See Online Resources at the end of this chapter for NMBA link for information about student registration.)

## LEGAL ISSUES IN THE NURSING SPECIALTIES

Professional nurses work in various areas of nursing specialties and it is important to be aware of specific **legal issues** that impact on these areas of practice. The situational context of professional practice requires nurses to be familiar with different expectations of the roles, organisational policies and procedures, and specific legislative elements that are related to the particular healthcare environment.

Some examples of issues in different nursing specialties or disciplines are highlighted in Table 2.3. Nurses must be aware of the specific issues that may impact on their daily practice when working in these areas. These issues also raise many important considerations in terms of adequacy of skills and staffing, supervision and scope of practice relevant to the area of work.

## ETHICAL ASPECTS OF NURSING

As healthcare professionals it is essential that nurses have an understanding of ethics and what it means to practise ethically in an increasingly complex and changing healthcare environment. Healthcare professionals are bound by a strict code of professional practice and ethical standards for conduct.

Whilst the legal aspects of nursing require nurses to act in accordance with the laws and regulations for professional practice, ethical practice is concerned with professional conduct guided by knowledge of what is right or wrong and what is expected and responsible behaviour when dealing with difficult and complex situations in professional practice (Johnstone 2011). Broadly stated, 'the law describes the minimum standards of acceptable behaviour and ethics delineates the highest standards of moral behaviour' (Dahnke & Dreher 2006).

The importance of attention to ethics in healthcare is necessary because of factors such as the rapid advances in medical care and technology, issues in allocation of limited healthcare resources, questions related to quality of life and issues in prolonging life, and the protection of individual rights. The primary concern of the healthcare team must be the provision of the very best standard of healthcare and, to achieve this, it is necessary for all team members to respect the abilities and functions of their co-workers and observe *ethical standards*. Professional groups each have a code of ethics that consists of standards of conduct that members of the group are expected to follow. Refer to Chapter 1 for the *Code of Ethics for Nurses*.

### Ethics

**Ethics** may be defined as a set of moral principles that imply a commitment unrelated to monetary reward or prestige and which are derived from a system of values and beliefs concerned with rights and obligations. Ethics is concerned with ascribing moral values to, or passing moral judgment on, such things as people, situations or actions. Ethics is also concerned with the justification of such moral ascriptions (Fry et al 2011; Johnstone 2011; Kerridge et al 2013).

Ethics involves different moral and philosophical positions regarding what is good and what may not be right. A number of different theoretical perspectives may be applied to guide ethical behaviour. The well-known ethical theories are deontological ethics, teleological ethics, moral rights theory, virtue ethics and ethical principlism. In nursing practice and healthcare 'ethical principlism' is a commonly applied framework for analysing ethical issues and moral decision making (Johnstone 2011). (See Clinical Interest Box 2.16.) Over time different important principles emerge and impose order in a situation, highlighting central considerations in solving complex issues and in assisting decision making (Grace 2014).

#### Ethics and morality

It is important to understand that the terms ethics and morality are used together and interchangeably in ethical discussions. The term 'ethics' comes from the ancient Greek *ethikos* and 'morality' comes from the Latin *moralitas*, and they both relate to 'custom and habit'. Essentially the terms ethics and morality are used to describe various ways of thinking about and understanding beliefs and values about morally right and wrong behaviour (Butts & Rich 2013; Grace 2014; Johnstone 2011).

In the course of daily practice nurses are frequently confronted by difficult ethical issues and moral dilemmas. Consequently, conflict may arise over philosophies, personal values and professional responsibility. It is most important that nurses have an understanding of their own values and how ethical problems may be resolved without compromising personal values (Johnstone 2014).

## TABLE 2.3 | Examples of legal and ethical issues in nursing specialities

### ISSUES IN DIFFERENT NURSING SPECIALTIES

| Medical/surgical nursing: | Critical care nursing: | Perioperative nursing: |
|---|---|---|
| • Restraint minimisation in acute settings<br>• Provision of appropriate standards of care by qualified nurses<br>• Ensuring informed consent for medical treatment and care<br>• Competency of nursing staff providing care<br>• Adequate staffing levels for safe and competent care<br>• Working with multidisciplinary healthcare team<br>• Emphasis on care across the lifespan and person-centred care | • Need for highly specialised skills and ongoing professional competence<br>• Adequate staffing ratios in intensive care areas<br>• Minimising reliance on intensive care setting apparatuses and equipment<br>• Focus on person-centred care and client assessment<br>• Decisions regarding life support or sustaining treatments<br>• Do not resuscitate orders and end-of-life issues<br>• Informed consent issues in critically ill individuals | • Anaesthetic and recovery room nursing specialised skills<br>• Ongoing professional competence<br>• Working with different individuals across the lifespan<br>• Legal liability for smooth functioning of operating room procedures<br>• Sterilisation of equipment, instrument and swab counts |
| **Gerontological/aged care nursing:** | **Community health nursing:** | **Hospital in the home:** |
| • Issues in caring for the elderly related to confusion and dementia<br>• Preventing and minimising use of restraint<br>• Physical layout and design of facilities suitable for the elderly<br>• Ensuring quality of life and choices for the elderly<br>• Protecting the rights of the elderly in residential care facilities<br>• Ensuring safety and accessibility for the elderly in different care environments<br>• Workforce issues and adequate staffing to provide appropriate standard of care<br>• Reporting of abuse | • Working with different individuals across the lifespan (e.g. family health, child health)<br>• Different role expectations in community settings (e.g. more autonomous practitioners)<br>• Working in different settings (e.g. schools, community centres, clinics, general practice settings, homes)<br>• Working collaboratively with other healthcare team members for timely and appropriate care<br>• Awareness of public and community health issues, immunisation, child abuse, workplace safety, personal safety | • Clinical specialisation<br>• Working with different individuals in their home settings<br>• Need for careful documentation of all aspects of care<br>• Initiating prompt referrals to other services or healthcare team members |
| **Rural and remote area nursing:** | **Indigenous health:** | **Accident and emergency department:** |
| • Lack of healthcare professionals<br>• Problems of remoteness, costs and limited access to healthcare services<br>• Issues of ensuring appropriate standards of care for the remote community<br>• Different role expectations as remote area healthcare professionals (e.g. lack of emergency services, sole practitioners, level of responsibility)<br>• Professional isolation and limited access for continuing professional development | • Providing culturally appropriate care<br>• Providing right type of care at the right time by the right person in the right place<br>• Lack of trained healthcare professionals<br>• Limited culturally acceptable services<br>• Problems of remoteness, costs and limited access to healthcare services<br>• Different role expectations as healthcare professionals<br>• Lack of emergency services<br>• Sole practitioners, greater level of responsibility, reporting issues | • Requirement for highly specialised skills<br>• Level of responsibility and decision making<br>• Dealing with aggressive and violent individuals, high-risk individuals, personal safety<br>• Premature departures by individuals without adequate screening<br>• Need for careful documentation of all emergency staff involved<br>• Reporting incidents to authorities (e.g. road accidents, crime injuries, abuse) |

**TABLE 2.3 | Examples of legal and ethical issues in nursing specialities—cont'd**

| Mental health nursing: | Child health: | |
|---|---|---|
| • Protecting rights of mentally ill individuals<br>• Ensuring appropriate treatment and supervision of mentally ill individuals<br>• Restriction on liberty of mentally ill persons<br>• Participation/involvement in decision making<br>• Voluntary and involuntary patients, community treatment orders, restraint<br>• Controversial treatment modalities for mentally ill persons<br>• Mental health legislation | • Specialist skills in children's health<br>• Suitability of healthcare facility areas for treating and caring for children<br>• Safety and security issues for children's wards<br>• Informed consent for treatment from parents or guardians on behalf of children<br>• Screening of healthcare staff working with children<br>• Screening of visitors in children's wards<br>• Mandatory reporting of child abuse | |

*(Crisp et al 2013; Eckermann et al 2010; Ellis et al 2014; Hutchinson & East 2014; Mathews & Kenny 2008; Staunton & Chiarella 2013; Willis & Black 2013)*

## CLINICAL INTEREST BOX 2.16 Ethical principlism

**Ethical principlism** is the view that ethical decision making and problem solving is best undertaken by appealing to sound moral principles. Four key bioethical principles guide moral reasoning in healthcare practice:

1. Autonomy
   Autonomy refers to a person's independent ability to decide. Applied in nursing and healthcare contexts, the principle of autonomy imposes on healthcare professionals a moral obligation to respect a client's choices regarding recommended medical treatment and associated care.
2. Non-maleficence
   Non-maleficence is avoiding harm or hurt. Applied in nursing and healthcare contexts, the principle of non-maleficence would provide justification for condemning any act that unjustly injures an individual or causes them to suffer an otherwise avoidable harm.
3. Beneficence
   The principle of beneficence is to act for the benefit of others; that is, to promote their welfare and wellbeing. Beneficent acts can include care, compassion, empathy, sympathy and kindness.
4. Justice
   Justice can be conceptualised in many ways, such as mercy, harmony, equality and fairness. Of pertinence to healthcare are the conceptualisations of justice as fairness and as an equal distribution of benefits and burdens.

*(Beauchamp & Childress 2013)*

## Nursing ethics

In Australia **nursing ethics** are strongly influenced by the bioethics movement. The principles underpinning moral reasoning are the 'four principles of bioethics': autonomy, non-maleficence, beneficence and justice (Beauchamp & Childress 2013). The term **bioethics** originates from the ancient Greek *bios* meaning 'life' and *ethikos*, *ithiki* meaning 'ethics'. The bioethics movement originated in the United States and its main focus is the rights and duties of healthcare clients and healthcare professionals; the rights and duties of research subjects and researchers; and the formulation of public policy guidelines for clinical care and biomedical research (Reich 1995 cited in Johnstone 2011:14). (See Clinical Interest Box 2.17.)

Nursing ethics is defined as 'the examination of all kinds of ethical and bioethical issues from the perspective of nursing theory and practice, which in turn rests on the core concepts of nursing' (Johnstone 2011:16). The nursing profession has its own code of ethics, which is a statement about expected standards of behaviour and which is used to guide ethically sound professional nursing conduct and practice. The International Council of Nurses (ICN) formulated an *International Code of Nursing Ethics* (1973) outlining the nurse's responsibilities to individuals, to society, to nursing practice, to co-workers and to the nursing profession.

The Code of Ethics is not a set of rules, but a guide for nurses to base their professional decision making upon. Society expects professional people such as nurses to behave with integrity, dignity, competence and compassion. The *International Code of Nursing Ethics* and the *Code of Ethics for Nurses in Australia* provide nurses with guidelines to assume personal responsibility for providing a standard of excellence in clinical practice. Every nurse is responsible for determining and implementing desirable standards of nursing practice and

## CLINICAL INTEREST BOX 2.17 Common bioethics topics

- Abortion
- Euthanasia and assisted suicide
- Organ transplantation
- Reproductive technology
- Person's right to privacy and confidentiality
- Informed consent
- Economic rationalisation of healthcare
- Research ethics
- Institutional ethics committees

*(Johnstone 2014)*

for following ethical standards in their professional conduct and in the care they deliver (Atkins et al 2014). The nurse has a responsibility to participate actively in developing a body of professional knowledge and the skills necessary to promote safe and effective nursing care as an integral part of continuing competence (see the NMBA website for requirements).

### Accountability and responsibility in nursing practice

Individual nurses assume responsibility for performing specific activities related to the care of individuals; that is, nurses are responsible for their own actions as professionals. It is, therefore, essential that all nurses understand the scope of functions and duties associated with their role.

The concept of **accountability** means that nurses are responsible, legally, ethically and professionally, to themselves, to individuals in their care, to their employing institution and to the nursing profession (Plant et al 2010). Whenever nurses deliver nursing care, they must be able to answer for their own actions. Even if a task is delegated to another nurse, accountability for the outcome of the action includes the nurse assigned to perform the task and the nurse delegating the task. For example, the nursing supervisor assigns the aspect of direct care to individual nurses on a shift but remains responsible and accountable for the overall supervision of the provision of care during the shift. The individual nurse is responsible and accountable for all the direct nursing care provided to the individuals during the shift.

Accountability for nurses includes the moral responsibility to report any behaviour that endangers a person's safety, providing individuals with adequate information about their care, maintaining high ethical standards in their own practice and following the policies and guidelines developed by their employing institution and their professional organisation to promote the delivery of safe and effective nursing care. The regulatory authorities can refer to the various codes to guide them when they are considering situations of alleged misconduct. The concept of accountability for nurses is incorporated into the professional standards and the codes for professional conduct and ethics.

## CRITICAL THINKING EXERCISE 2.8 Interpreting accountability and responsibility

Tom, a Registered Nurse, is the supervisor on duty at a residential aged care facility. The facility is divided into pods. After receiving handover from the night staff Tom delegates and allocates the care of residents to the team. The care team consists of Enrolled Nurses and personal care assistants. Medications are administered by delegated Enrolled Nurses for each pod in the wing. During morning tea one of the care team members finds some medication on the floor in one of the pods and reports it to Tom. The nurse tells Tom that it may be medication that was accidentally dropped this morning during the medication round.

How does the concept of accountability and responsibility apply in this situation?

In healthcare settings nurses and medical officers are a part of a greater team working for the benefit of the individuals in their care. While there is a common goal, the division of responsibility shows subtle but important differences. The medical officer is responsible for overall care of the person including assessment and investigating their medical condition, making a diagnosis and planning treatment. The nurse's role and responsibility is to participate in and supervise the implementation of the medical treatment plan both in caring for the person's physical requirements and in the administration of various therapies including medications and nursing procedures. The nurse's responsibilities also include providing feedback and advice to medical officers and allied medical personnel regarding the person's condition and progress through direct reporting, and through recorded physical observations and written progress records.

### Values

A value is a belief about the worth of a particular idea or behaviour, or something an individual views as desirable or important. Values are acquired or learned initially in childhood, from the family and other significant people and from experience. Values are derived from a number of sources such as the person's culture, society, family, education, professional training and work environment and they influence the way a person interacts with others and the decisions they make (Fry et al 2011; Rassin 2008).

Professional and personal values motivate and guide a person's behaviour and it is important to recognise that each person's set of values is unique. Some people have very few specific values while others have many and these values may change over time. Also, some values are more important than others and individuals prioritise some values over others (Fry et al 2011). People may value such things as honesty, skill, justice, responsibilities, altruism, privacy, friendship, material goods, physical wellbeing, knowledge, talent, wealth, courage and creativity. An example of an important professional value

## CLINICAL INTEREST BOX 2.18 Examples of professional values in nursing

- Caring
- Activism
- Trust
- Professionalism
- Justice

*(Weis & Schank 2009)*

for nurses is responsibility towards individuals (Rassin 2008). See Clinical Interest Box 2.18 for examples of important professional values for nurses.

Considering values becomes important when a person has to take a stand for that which they value. Ethical issues and moral dilemmas occur in healthcare when choices have to be made that involve putting one set of values against another. Morals relate to specific values and principles to which a person is committed, and a moral belief is a conviction that something is absolutely right or wrong. For example, some people believe in the value of pro-life and that abortion is absolutely wrong in all circumstances; a nurse who holds this view may choose not to work in this area.

## Ethical issues and moral dilemmas

Ethical issues arise in numerous areas of medical and nursing practice and may require nurses to be involved in resolving them. Johnstone (2014) categorises the ethical issues faced by nurses into three kinds: everyday practical ethical issues; broader mainstream bioethical issues; and the broader social justice issues associated with promoting the welfare, wellbeing and significant moral interests of highly vulnerable, stigmatised and marginalised groups of people. Clinical Interest Box 2.19 lists some of the specific and common ethical issues faced in the healthcare environment.

The complex and changing nature of the healthcare environment today generates many ethical challenges. Nurses are often faced with difficult moral dilemmas. Moral or **ethical dilemmas** are situations that involve two competing or conflicting moral choices, neither of which is a desirable option in terms of outcomes (Dahnke & Dreher 2006). Moral dilemmas in nursing practice may arise in a number of situations when there are value conflicts. For example, a nurse who values the sanctity of life who has to care for individuals terminating unwanted pregnancies, or a nurse has to care for a young person who is terminally ill and refuses treatment, but the nurse also knows that the person is suffering enormously from their condition, with a poor quality of life.

In order to correctly identify and deal with ethical issues and **moral problems** nurses must apply ethical reasoning and a moral decision-making process. The most important consideration is that nurses respond in the interests of the person and the individual's wellbeing and also act justly according to the expected standards of professional practice.

## CLINICAL INTEREST BOX 2.19 Common ethical issues

- Genetic engineering
- Artificial fertilisation
- Contraception
- Therapeutic abortion
- Child abuse
- Artificially prolonging life
- Voluntary euthanasia
- Not for resuscitation orders
- Selective non-treatment
- Informed consent
- Withholding information
- Right to refusal of treatment
- Quality versus quantity of life
- Organ transplantation
- End-of-life issues and dying with dignity
- Non-therapeutic research
- Use of restraints
- Confidentiality
- Conflict of values and beliefs between members of the health team
- Advance care planning
- Disclosing and reporting professional practice errors
- Veracity, duty and complications in truth telling
- Allocation of health resources

*(Atkins et al 2014; Fry et al 2011; Johnstone 2011; Johnstone & Kanitsaki 2009)*

## Ethical decision making

Models for **ethical decision making** in healthcare apply a problem-oriented approach, requiring rational and systematic reasoning. One of the most commonly used models for ethical decision making in nursing practice is the steps of the nursing process. This is a deliberate and systematic problem-solving approach that can be used to resolve moral problems in the healthcare environment (Crisp et al 2013). (See Clinical Interest Box 2.20.)

Often solving an ethical dilemma may seem almost impossible in some situations, but using the standards stated in a code of ethics helps the nurse to view such problems objectively. Nurses have an ethical obligation to ensure that decisions made are in the best interest of the person in their care and within professional guidelines for practice. (See Clinical Interest Box 2.21.)

When an ethical decision is to be made, the following factors must be considered:

- The ethical dilemma must be recognised and defined
- All the facts relevant to the issue and to the individuals involved must be obtained
- The people involved in making a decision must understand the relevant moral rules and principles involved and be able to apply them in an appropriate manner

## CLINICAL INTEREST BOX 2.20
## Models for ethical decision making

Ethical decision-making model:
- Clearly state the problem
- Get all the facts
- Consider the fundamental ethical principles
- Consider how the problem would look from another perspective or using another theory
- Identify ethical conflicts
- Make the ethical decision and evaluate the decision.

*(Staunton & Chiarella 2013)*

Steps of the nursing process in moral decision making:
- Assess the moral/ethical situation
- Identify (diagnose) the moral problem/s
- Set moral goals and plan a moral course of action
- Implement the moral plan of action
- Evaluate the moral outcomes of the action.

Revisit the steps from the beginning if the desired moral outcomes do not occur.

*(Crisp et al 2013)*

## CLINICAL INTEREST BOX 2.21
## Ethical challenges

Consider the following:
- The senior nurse working on a busy surgical ward is faced with the difficult decision to report the lack of adequate support and supervision for new nurses starting on the ward. This decision could mean that the number of new nurses working on that ward could be reduced. This action could cause some upset among colleagues.
- A nurse is faced with the difficult decision to withhold information from the daughter of a person in their care. The person was diagnosed with a terminal condition. He only has a few months to live. The person does not want his daughter to know because she would be very upset. The daughter is his only child and cares very deeply for her father. The daughter was very involved in her father's care during his hospitalisation and appreciative of all the care provided by the nursing staff. The individual's right to privacy binds the nurse from telling the truth if the daughter asks about her father.
- The medical code team is faced with the difficult decision of what to do next in a medical code situation for an individual in their care. The person is elderly and critically ill with a poor prognosis. Further intervention is seen as futile. His daughter has the medical power of attorney. The individual is to be resuscitated as per code status directives.

Analyse these situations within the ethical decision-making framework.

## CLINICAL INTEREST BOX 2.22
## Examples of nurses' obligations in ethical decisions

- Maximise the individual's wellbeing
- Balance the person's need for autonomy with family members' responsibilities for the person's wellbeing
- Support each family member and enhance the family support system
- Carry out hospital policies
- Protect other individuals' wellbeing
- Protect the nurse's own standards of care

*(Berman et al 2015)*

- Proper evaluation must be made of possible solutions to the problem and of the strategies to be implemented.

Moral dilemmas will continue to occur in healthcare as long as choices have to be made that involve putting one set of values against another. It is therefore important that nurses keep themselves informed and are involved in discussions and debates about ethical issues and dilemmas so that they are able to make ethical decisions in an informed way rather than on a purely emotional basis. See Clinical Interest Box 2.22 for examples of nurses' obligations in ethical decisions.

## Advocacy

In a nursing context, **advocacy** means that the nurse acts for and on behalf of the individual in their care (Cole et al 2014). To act as an advocate the nurse must ensure that the person is provided with adequate and accurate information relating to their care, and they must support the person in any informed decisions they make about their care. In this way the nurse meets the ethical requirement of honouring a person's right to self-determination. In nursing, the concept of advocacy is based in nursing ethics, and involves respecting a person's right to:
- Be informed
- Make decisions and choices
- Confidentiality
- Privacy and dignity
- Hold their own ethical and religious beliefs.

An important consideration when advocating for someone is to know when and how to advocate to ensure that the advocacy is within the legal and ethical guidelines of professional practice (Atkins et al 2014). The form of advocacy provided by nurses is informal, there is no legal power to act on behalf of the person and decisions are made by the individual. Formal advocacy involves legal capacity to make decisions on behalf of the person, such as in the case of court-appointed guardians and power of attorney. All nurses have a responsibility to ensure that, in relation to nursing practice, the person is assured of safe and competent care and that their rights will be protected. (See Case Study 2.3.)

### CASE STUDY 2.3 ADVOCACY

Mini is a 22-year-old female with a community-based mental healthcare service provider. Mini used street drugs regularly until a few months ago and ran into trouble with the law. She is now supported by the nurses from the community-based service regularly. Mini lives alone in a public housing flat and is following her treatment. Mini dropped out of school and has never held any jobs for more than a few weeks. She is separated from her family. The team of nurses looking after Mini are aware that she is interested in completing her schooling and getting some work locally.

What steps can the nurses take or how can they advocate for Mini in this situation?

## Summary

Nursing is practised within certain legal frameworks and ethical considerations that promote safe and effective care. Both are important considerations for nursing practice. Although the legal and ethical aspects of nursing are not the same, they overlap and require nurses to act within expected standards of professional behaviour. The legal aspect requires nurses to practise within the law and regulations of the profession and ethics require nurses to apply moral codes of conduct as healthcare professionals.

While the professional codes of conduct and codes of ethics for nurses in Australia provide frameworks to promote excellence in clinical practice, every nurse is responsible for determining and implementing desirable legal responsibilities and obligations and standards of practice, and for following ethical standards in their professional capacity. All nurses have a responsibility to promote safe and competent care as defined by the national competency standards/standards for practice and scope of practice.

## Review Questions

1. What are the legal responsibilities and obligations of the nurse?
2. Discuss the differences between criminal law and civil law.
3. When may a nurse be disqualified or deregistered from practice?
4. Who determines the standards of care by which a nurse should practise?
5. What must a plaintiff prove to succeed in an action of negligence?
6. How does a nurse ensure that it will not be possible to make a charge of defamation against them?
7. What is the difference between assault and battery? When could a nurse commit an act of assault?
8. When is consent for a medical procedure considered to be valid?
9. What type of information about a person is classified as confidential?
10. What action may happen to a nurse who discloses confidential information about an individual in their care?
11. What points should be remembered when documenting in a person's health records?
12. What type of information is required in an adverse event/clinical incident report? Give five (5) examples of adverse events that might be reported.
13. What are the elements of open disclosure?
14. What are some of the common ethical issues faced by nurses today?
15. What are the nurse's obligations in ethical decision making?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Advanced Care Planning Australia: http://advancecareplanning.org.au

Australian Health Practitioner Regulation Agency (AHPRA): www.ahpra.gov.au/

Congress of Aboriginal and Torres Strait Islander Nurses: www.indiginet.com.au/catsin

Health Care Complaints Commission (HCCC): http://www.hccc.nsw.gov.au/

National Aged Care Advocacy Program: http://www.agedrights.asn.au/rights/whatis_formal.html

Nursing and Midwifery Board of Australia: www.nursingmidwiferyboard.gov.au/

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CHAPTER 3

# Nursing research and evidence-based practice

*Kate Stainton*

## KEY TERMS

data analysis
data collection
ethical principles
evidence-based practice (EBP)
hypothesis
informed consent
literature review
mixed methods
nursing research
qualitative research
quantitative research
reliability
research design
research problem
research question
systematic review
validity
variables

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Define nursing research
- Explain the relevance of research in nursing
- Describe the various ways to acquire knowledge
- Understand the basic differences between qualitative and quantitative approaches in research
- Outline the steps in conducting research
- Describe the way research, education and practice relate to each other
- Identify the importance of critical thinking and critical reading when undertaking a research project
- Discuss the importance of informed consent and ethics in relation to research
- Define evidence-based practice and understand its relevance to nursing practice
- Explain how Enrolled Nurses (ENs) can participate in nursing research
- Identify future trends in nursing research

## CHAPTER FOCUS

Nursing theory and education are recognised as the main contributors to the development of an accountable and professional nurse in the healthcare environment. Research is also recognised by healthcare professionals as being equally important in influencing practice by informing decisions about the delivery of care to individuals and their families. Today's evidence-based nursing practice integrates education, theory, practice and the findings from research to provide quality healthcare. Nurses are also acknowledging the need to develop skills in critically appraising research literature to enable consideration of its application to clinical practice (Schneider et al 2016).

The purpose of this chapter is to enable Enrolled Nurses (ENs) to develop an appreciation of the significance of research to them as nurses. It introduces evidence-based practice (EBP), the principles of nursing research, basic components of a research proposal, guidelines to critiquing a research article and an overview of both qualitative and quantitative research.

## LIVED EXPERIENCE

Learning about nursing research and evidence-based practice has helped me to use a questioning approach to the everyday care of individuals. I no longer take things for granted. It allows me to use an evidence-based approach to my practical nursing care. For example, if I want to decide on the best approach to wound care for a venous ulcer, I incorporate the evidence, the information gained from individual preferences, as well as my own experience and those of my more experienced colleagues. I know how to find the information, analyse it and apply it to my practice.

**Ben, Enrolled Nurse**

# THE ENROLLED NURSE AND NURSING RESEARCH

There are opportunities for ENs to have an active participation with nursing research (Clinical Interest Box 3.1 and Case Study 3.1). ENs may come across some research findings that can be very pertinent to their practice, and may intend to introduce the findings into their professional practice; for example, the 'new' way of managing wound care. The EN may feel that the introduction of a research idea that they have critically read has relevance to their practice.

Reading, reviewing and critiquing published research studies and using this knowledge in practice is the most common contact nurses have with research. By doing this it is hoped that nurses will accept research as a normal part of nursing practice, apply research findings to clinical practice,

### CASE STUDY 3.1

During an afternoon shift, an EN was undertaking vital signs on several of the admitted people under her care using an electronic BP machine. After recording the vital signs on the individuals' charts, the EN noticed a significant change in a number of the BPs from the previous shift. As a result of this, the EN rerecorded the BPs using a manual BP machine and established that the electronic BP machine was recording some of the BPs inaccurately. In discussion with the NUM/nursing team, a small study was commenced to determine the number of times an electronic BP machine recorded BPs correctly or inaccurately. This was done by taking a BP once with the electronic BP machine then taking the BP again with a manual machine and comparing the results.

1. Is this research better suited to a quantitative or qualitative approach?
2. If the nurse wanted to research literature on this topic, what would be considered a credible source?

### CLINICAL INTEREST BOX 3.1
### Example of practical application of research

In the Pilbara, Western Australia, an Enrolled Nurse undertook research into the prevention of constipation in aged care residents. She identified the need to make changes to residents' care routines in order to reduce the need for regular taking of laxatives. As a consequence she has implemented best practice guidelines for the management of constipation in older adults. She was awarded the WACHS Innovation Award for 2009 (www.cucrh.uwa.edu.au/about/chronicle.htm 2009).

Enrolled Nurses can also participate in and attend conferences. The National Enrolled Nurse Association (NENA) promotes the value of ENs and raises awareness of ENs' role within the community, while providing a forum for all ENs to participate at a national level. Check NENA's website (www.anf.org.au/nena) for information on future conferences.

influence colleagues on the use of research data and accept responsibility for their own professional development (Crookes & Davies 2004 in Daly et al 2014). Apart from utilising research findings into the practice settings, ENs have the opportunity to participate in nursing research activity; for example, by supporting the research team with data collection and data entry, or by undertaking their own research.

## NURSING RESEARCH

The term 'research' refers to a systematic way of studying or examining an issue so that the knowledge about that issue is validated. It requires an understanding of the existing knowledge about the issue so that new knowledge can be developed. Many words and terms specifically related to research are used in this chapter; they are defined in Table 3.1.

Nursing research involves a systematic search for and validation of knowledge about issues important to the nursing profession and links theory, education and practice. **Nursing research** is important for:

- Validating nursing as a profession
- Documenting the effectiveness of nursing interventions
- Providing a scientific knowledge base for practice
- Demonstrating accountability for the profession.

Research-based or evidence-based practice is essential if the nursing profession is to deliver safe, effective and efficient care.

The goal of nursing is to provide evidence-based care that promotes quality and effective outcomes for individuals, families, healthcare providers and the healthcare system (Burns et al 2013). Burns and colleagues describe EBP as involving the use of collective research findings in:

- Promoting the understanding of individuals' and families' experiences with health and illness
- Implementing effective nursing interventions to promote healthcare outcomes
- Providing quality, cost-effective care within the healthcare system.

The National Safety and Quality Health Service (NSQHS) Standards provide topics for nursing research which are very relevant to current practice. Much of nursing research into clinical safety and quality aligns with the NSQHS.

## EVIDENCE-BASED PRACTICE

**Evidence-based nursing practice** is built on the belief that decisions about the delivery of care to individuals should be informed by the best available and most current evidence (Borbasi & Jackson 2016; Richardson-Tench et al 2014). As a nurse, you will make decisions every day that will affect the care you deliver. You will be able to make clinical decisions based on research evidence to support your decisions. Another definition of EBP is that it is a process within which clinical decisions are made by practitioners using the best available research evidence, their clinical expertise and patient preferences, with consideration also of available resources (Schneider et al 2016; Moule & Goodman 2014). (See Figure 3.1.)

### CLINICAL INTEREST BOX 3.2
### Steps in evidence-based practice:

1. Ask a focused question.
2. Assess appropriate evidence.
3. Appraise evidence for validity, impact and precision.
4. Apply evidence accounting for patient values/preferences, clinical and policy issues.
5. Evaluate/audit your practice/personal skills.

*(Moule & Goodman 2014; Hoffman et al 2013)*

The five steps universally accepted as being necessary for EBP are presented in Clinical Interest Box 3.2 and described below (Hoffman et al 2013; Moule & Goodman 2014):

### Step 1: Ask a focused question

Formulating an answerable question is the first step in EBP. PICO (Patient/Population, Intervention/Indicator, Comparison/Control and Outcome) can help provide a structure for this and guide you in developing search terms.

PICO stands for:

- P: Patient/Population—characteristics
- I: Intervention/Indicator—what the health professional plans to do for that patient/population
- C: Comparison/control—the alternative choice
- O: Outcome—what the health professional plans to accomplish, improve or influence (LoBiondo-Wood & Haber 2014; Borbasi & Jackson 2016).

For example: does education about pain relief reduce the need for medication post surgical intervention?

**P**: Individual scheduled for surgery
**I**: The individual receives education about pain relief options post surgery
**C**: Standard information about postoperative care
**O**: Comparison of pain relief required by

1. Individuals who received standard information
2. Individuals who received information about different pain relief options.

### Step 2: Assess the evidence

Find the best evidence to answer the question. This is usually done by a thorough search of the evidence. This may include people with an interest in EBP and with specialist expertise, literature (including books and journals), the internet and specialist databases.

### Step 3: Critically appraise the evidence

The three main aspects of the evidence that need to be appraised are the validity (truthfulness: can you believe the results of the study?), impact (what is the clinical importance of the evidence?) and precision/applicability (can you apply the results of the study to your situation?).

**TABLE 3.1 | Common research terms**

| | |
|---|---|
| Bias | Any influence that may alter the outcomes of a research study |
| Clinical nursing research | Nursing research that has a direct impact on nursing interventions with individuals |
| Data | Measurable bits of information collected for the purpose of analysis |
| Data collection | Gathering of information necessary to address the research problem |
| Deductive reasoning | Logical system of thinking that starts with the whole and breaks it down into its component parts |
| Dependent variable | A variable that is affected by the action of the independent variable |
| Ethics committee | Committee responsible for review of research proposals to ensure that human subjects are protected from harm |
| Hypothesis | Statement of a predicted relationship or difference between two or more variables. A hypothesis contains at least one independent and one dependent variable |
| Independent variable | A variable that causes a change in the dependent variable |
| Inductive reasoning | Logical system of thinking that begins with the component parts and builds them into a whole |
| Informed consent | An agreement by a research subject to participate voluntarily in a study after being fully informed about the study and the risks and benefits of participation |
| Instrument | Device or technique used to collect data in a research study (e.g. questionnaires or interviews) |
| Literature review | A critical summary of available theoretical and research literature on the selected research topic. It places the research problem for a particular study in the context of what is currently known about the topic |
| Nursing research | Research usually conducted by nurses to generate knowledge that informs and develops the discipline and practice of nursing |
| Population | All known subjects that possess a common characteristic of interest to a researcher |
| Problem statement | A statement that describes the purpose of a research study, identifies key concepts and sets study limits |
| Qualitative research | Used to examine subjective human experiences by using non-statistical methods of analysis |
| Quantitative research | The systematic process used to gather and statistically analyse information that has been measured by an instrument and converted to numerical data |
| Reliability | Characteristic of a good instrument; the assessed degree of consistency and dependability |
| Research | A systematic process using both inductive and deductive reasoning to confirm and refine existing knowledge and to build new knowledge |
| Research design | The overall plan for collecting data in a research study |
| Research process | An orderly series of phrases identifying steps that allow the researcher to move from asking a question to finding an answer |
| Research question | Use of an interrogative format to identify the variables to be studied and possible relationships or differences between those variables |
| Sample | A subset of a population selected to participate in a research study |
| Systematic review | A rigorous review of all the evidence on an aspect of healthcare |
| Validity | A characteristic of a good instrument; the extent of an instrument's ability to measure what it states it will measure |
| Variable | A concept, characteristic or trait that varies within an identified population in a research study |

*(Borbasi & Jackson 2016; Schneider et al 2016; Burns et al 2013)*

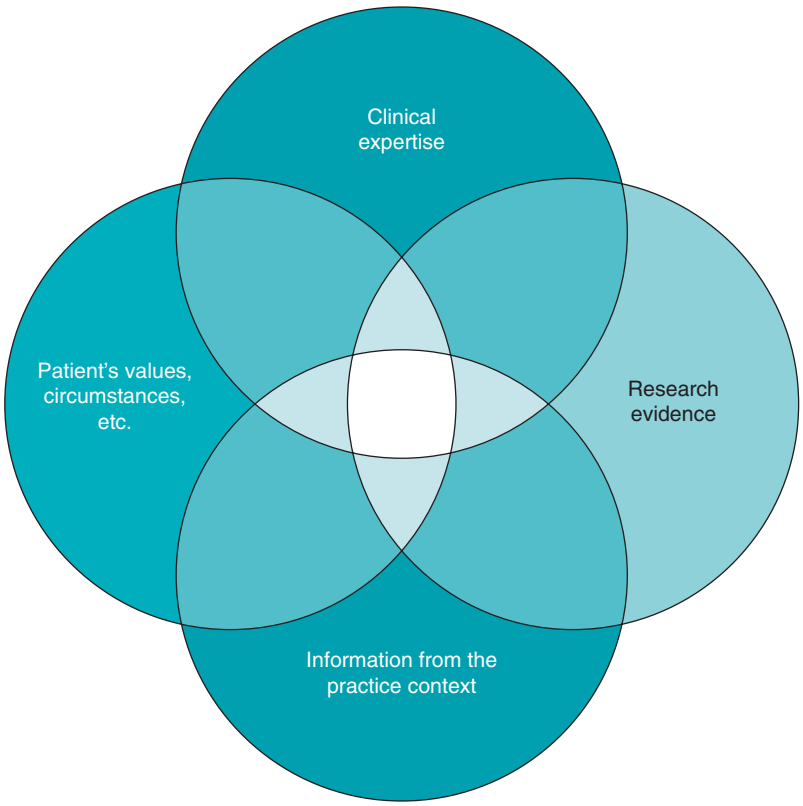


**Figure 3.1** Evidence-based practice
*(Hoffman et al 2013)*

## Step 4: Integrate/apply the evidence

Integrate/apply the evidence from the critical appraisal step with clinical expertise, the individual's needs/values, and the clinical practice context.

## Step 5: Audit/evaluate your practice

Evaluate the effect on the individual and reflect on the nurse's own performance—undertake audit or ask yourself self-reflective questions about steps 1 to 4 (e.g. Am I asking well-formulated questions? Am I searching the databases efficiently?).

In summary, the process of EBP involves synthesis of evidence, which is used to develop guidelines for practice, implement change in practice and evaluate outcomes through audit (Brown et al 2014).

## Evidence-based practice and nursing research

EBP bases current practice on research evidence. The evidence for EBP is gained by systematically searching for and analysing research reports accessed through databases and libraries. The databases include Medline, CINAHL and psychINFO, and library resources include the Cochrane Library. The Cochrane Collaboration is an evidence-based library that produces systematic reviews which inform decisions about healthcare using comprehensive, reliable and relevant sources of evidence.

There are several key organisations in Australia that focus on EBP. These include the National Institute of Clinical Studies and the Joanna Briggs Institute. The Joanna Briggs Institute (JBI) contributes to the development of an evidence base that brings together a range of practice-oriented research activities to improve the effectiveness of nursing practice and healthcare outcomes. It publishes best practice information sheets, systematic reviews, evaluation cycle reports and online practice manuals.

Clinical Interest Box 3.3 explains EBP. Table 3.2 explains the difference between a **systematic review** and a **literature review**.

### CRITICAL THINKING EXERCISE 3.1

Why is research important in informing the practice of nursing?

## The evolution of nursing research

In 1854, during the Crimean War, Florence Nightingale demonstrated the significance of research in the delivery of nursing care. On arrival at the Crimea in 1854, Nightingale

## CLINICAL INTEREST BOX 3.3 Evidence-based practice

**What is evidence-based practice?**

A process of:

- Synthesising research evidence
- Designing clinical practice guidelines
- Implementing practice changes
- Evaluating outcomes

**Why do we need evidence-based practice?**

- Rapid increase in amount of information
- Rapid increase in healthcare costs
- Determination of efficient and effective healthcare practices
- Increased emphasis on performance and outcome standards

**Where is evidence found?**

- Published research
- Systematic reviews (e.g. Cochrane Collaboration; available: http://www.cochrane.org/)*
- Special collections of EBP resources (e.g. Joanna Briggs Institute; available: http://www.joannabriggs.edu.au)

*Descriptions can be found at this website, but access to systematic reviews is by subscription only.
*(Brown et al 2014:13)*

found the military hospital barracks overcrowded, dirty and lacking in food and essential medical supplies. Men were dying from starvation and diseases such as cholera and typhus because of these conditions. By systematically collecting, organising and reporting data, Nightingale was able to implement sanitary reforms and prove a significant reduction in mortality rates. This is considered to be the first nursing research study (Berman et al 2015).

Research was slow to develop in nursing, with little formal research carried out by nurses until the late 1940s. Nursing schools evolved from military and religious roots and stressed order and obedience. Training was viewed as an apprenticeship, with long hours, and nurses had little say in their own training or work. Only when nursing began to move towards advanced education and affiliation with university settings did nursing research begin to emerge. This move began in the USA. In the 1960s and 1970s the number of nurses with advanced degrees and research skills increased and the push for doctoral preparation in nursing began. Nurses began to turn to nursing care and clinical practice to provide questions for research. Many researchers developed studies to improve nursing practice (Burns et al 2013). Nursing theories evolved; they attempted to describe and explain the practice of nursing and began to be tested by nurse researchers. Practice-related research flourished and by the end of the 1970s two new research journals were launched in the USA to handle the nursing research explosion (Borbasi & Jackson 2016).

Nursing research in Australia began to flourish in the 1970s and 1980s (Schneider et al 2016). This move was accompanied by a major increase in the level of research activity, which was directed at educational, disciplinary or professional issues, and other disciplinary areas of relevance to nursing. Recently, nurses have begun to place more emphasis on EBP. This is in part due to technology, which makes researching EBP more accessible. The goal is to use the current best evidence to deliver quality healthcare (Burns et al 2013). This involves gaining evidence for or substantiating clinical decisions through experience, trial and error, tradition, authority, logic or nursing research (Berman et al 2015). Some ideas that have been tested and demonstrated to be useful in practice are: moist wound healing; pressure-relieving devices for the prevention of pressure ulcers; patient information to improve self-care and healthy lifestyles; communication with people who are dying; and nutritional support of older people in hospital (Brown et al 2014).

### The future of nursing research

The value of research studies that increase understanding of clinical phenomena and provide direction for defining programs of research is well recognised and continues to develop in Australia. Nurse researchers and nurse leaders are visibly involved as consultants in educational, governmental and healthcare institutions to inform both professionals and consumers of best evidenced-based nursing practice (Beanland et al 2004; Schneider et al 2016).

One area in which quality research takes place is magnet hospitals, which are emerging in Australia. Magnet status is awarded by the American Nurses Credentialing Center, affiliated with the American Nurses Association, to hospitals that meet criteria designed to measure the strength and quality of their nursing. A magnet hospital is stated to be one where nursing delivers excellent patient outcomes, nurses have a high level of job satisfaction and there is a low staff nurse turnover rate and appropriate grievance resolution. Magnet hospitals aim to provide a commitment to staff development and training, effective systems for implementing and evaluating quality-based treatment and care, and sustainable long-term resourcing (Schneider et al 2016). The concept of a magnet hospital is to develop and sustain an environment where nursing- and midwifery-related EBP and practice change are more likely to occur. Three hospitals in Australia have achieved magnet hospital status. As an Enrolled Nurse, choosing to work in such a setting may increase satisfaction and retention for self and outcomes for individuals engaged in all aspects of healthcare.

## RESEARCH METHODS

Nursing research focuses on a full range of human experiences and nursing interventions and aims to improve the health status of individuals and gain understanding into differing phenomena. Nursing researchers use a wide range of approaches. The main methods used in nursing research take

**TABLE 3.2 | Difference between a systematic review and a literature review**

| | Systematic review | Literature review |
|---|---|---|
| Question/goals/objectives | Focused on a single question<br>Clearly defined and answerable<br>Eliminates bias | Can be focused on a single question, but may describe an overview or summary of topic<br>Objectives may or may not be identified |
| Background | Summaries of the available literature on a topic provided by both | |
| Inclusion and exclusion criteria | Criteria stated before the review is conducted | Criteria not specified |
| Search strategy | Comprehensive search conducted in a systematic way<br>Searches of all relevant databases performed | Not explicitly stated<br>Searches of one or more databases performed |
| Process of:<br>selecting articles<br>evaluating articles<br>extracting relevant information | Usually clear and explicit<br>Comprehensive evaluation of study quality<br>Usually clear and specific | Not described<br>May or may not include evaluation of study quality<br>Not clear or explicit |
| Results and data synthesis | Clear summaries of studies based on high-quality evidence | Summary based on studies where the quality of the articles may not be expected. May also be influenced by the reviewer's theories, needs and beliefs |
| Number of authors | Three or more | One or more |
| Timeline | Months to years | Weeks to months |
| Discussion | Written by an expert or group of experts with a detailed and well-grounded knowledge of the issues | |

*(Kysh 2013; Bettany-Saltikov 2010)*

a quantitative, qualitative or mixed methods approach (Berman et al 2015; Crisp et al 2013).

Nurse researchers use many methods because nurses are interested in acquiring knowledge about a wide range of human needs and responses to health problems. For example, a different research method may be used by a nursing researcher interested in developing a deeper understanding of a phenomenon and how it may be experienced by individuals, such as helping women deal with the consequences of incontinence after childbirth.

## Quantitative methods

**Quantitative research** methods involve the use of numbers and statistical analysis. This research approach is both logical and systematic in nature and gathers and analyses information that has been measured by an 'instrument', such as a questionnaire, and converted to numerical data (Borbasi & Jackson 2016). Quantitative nursing research is the investigation of nursing phenomena that lend themselves to a precise measurement, such as pain severity or rate of wound healing.

In quantitative research, the researcher changes one set of variables and observes the outcome or its influence on other variables.

**Variables** are concepts or traits that vary (Borbasi & Jackson 2016), such as characteristics of people or situations that can change or vary for many reasons. Temperature, pulse, respiration, blood pressure, height and weight are examples of variables. Quantitative measurement involves the magnitude of a variable as well as the unit being measured.

The variable that the researcher controls or manipulates is called the independent variable. The variable that varies or changes because of this is called the dependent variable (Borbasi & Jackson 2016). For example, consider the statement: 'Sitting upright in bed does not make breathing easy in an individual with asthma.' The independent variable relates to placing the individual in different positions, such as lying flat, semi-recumbent, lateral or upright. This is the variable the researcher can manipulate to study its influence on the dependent variable. The dependent variable is the measurement of breathing.

The main designs used in quantitative research are correlational, descriptive, experimental and quasi-experimental. Correlational research involves studies that explore the patterns of interrelationships between variables of interest, without any active intervention by the researcher. Descriptive research aims to accurately portray characteristics of

individuals, situations or groups and the frequency with which certain events or characteristics occur. In experimental and quasi-experimental studies the investigator controls the independent variable and randomly assigns subjects to different conditions. The major goal of this research is to determine causal relationships between the variables through a controlled investigation in which only the independent variable can be the cause of changes in the dependent variable. Quasi-experimental research has a lower level of control and is less powerful (Borbasi & Jackson 2016; Polit & Hungler 2013; Burns et al 2013; Richardson-Tench et al 2014).

## Qualitative methods

**Qualitative research** is a subjective approach used to explore phenomena and describe human experiences. This research approach collects data and obtains information from, for example, interviews rather than measurement (Burns et al 2013).

Qualitative researchers may wish to examine individuals and their stories and behaviour, organisations and their functioning, or cultures and their interactions and social movement. As the study methodology embraces the examination of subjective phenomena, these findings are only considered to be representative of a particular person or group of people, and in a particular setting, and not reflective of other people or other settings (Borbasi & Jackson 2016). Using the example above of the individual with asthma a qualitative approach may ask, 'What is it like for the families who provide care for relatives who suffer from asthma?'

Qualitative research may be classified by research design or theoretical perspective. The research designs most commonly used in a qualitative interpretive approach are descriptive exploratory, ethnography, phenomenology and grounded theory. Descriptive exploratory methodology is a 'general' approach that uses aspects of all qualitative approaches. Ethnography looks at the culture or subculture of a group of people. Phenomenology explores the lived experiences of people. Grounded theory explores social processes and structures. Data is collected, analysed and used to generate hypotheses for further research (Borbasi & Jackson 2016; Berman et al 2015; Moule & Goodman 2014; Schneider et al 2016). The researcher may use a qualitative critical approach such as action research, feminist or critical ethnographic. Action research is designed and carried out in the clinical setting and integrated into practice by practitioners in partnership with researchers. In nursing, action research is about improving practice and standards and generating new knowledge (Moule & Goodman 2014; Richardson-Tench et al 2014).

Table 3.3 outlines the differences between quantitative and qualitative research.

**TABLE 3.3 | Comparison of quantitative and qualitative research**

| Quantitative | Qualitative |
|---|---|
| Focuses on a small number of specific concepts and their relationships and differences | Attempts to understand the entirety or whole of some phenomenon within a prescribed context |
| Set on a predefined theoretical foundation. 'Educated guesses' made about relationship of concepts and study outcomes | No preconceived theoretical boundaries or preconceived notions about study outcomes |
| Researcher controls and interprets data | Focuses on people's interpretations of events and circumstances rather than researcher's |
| Tends to use larger samples | Uses smaller samples |
| Describes people in the study as 'subjects' | Describes people in the study as 'participants', 'informants' or sometimes 'co-investigators' |
| Uses language in a way that implies neutrality, such as writing in the third person | Can be written up using the first person |
| Uses structured procedures and formal instruments to collect information | Collects information without formal structured instruments |
| Collects information under conditions of control and manipulation | Doesn't attempt to control the context of research, but attempts to capture it in its entirety |
| Emphasises objectivity in collection and analysis of information. Attempts to exclude all forms of subjective 'bias' | Attempts to capitalise on the subjective as a means of understanding and interpreting human experiences. Is comfortable with the notion of 'bias' |
| Uses 'objective' tools to collect data | Researcher is the instrument of data collection |

*(Borbasi & Jackson 2016, Table 5.1, p. 126)*

There are strengths in both quantitative and qualitative approaches. The quantitative approach can support a theory or argue to disprove it, and can be very useful, for example, when hospitals or governments want to introduce policy changes. The qualitative approach, by contrast, has a human focus and allows researchers to know their subjects and collect information about attitudes and satisfaction levels that are vital to improve care provided by nurses.

### Mixed methods

Integration of both methods is also possible. Tashakkori and Teddlie (1998) found that the combined use of a mixed model is a powerful tool in health research. **Mixed methods** research combines methods, paradigms and qualitative and quantitative approaches, enabling a broader, more comprehensive analysis of the research topic than single method research (Schneider et al 2016; Borbasi & Jackson 2016; Moule & Goodman 2014; Richardson-Tench et al 2014; Schneider et al 2016); for example, using focus groups as well as a questionnaire to obtain rich data. If using the example of the individual with asthma, a mixed methods approach could involve the collection of quantitative data from medical records and the qualitative phase could involve focus group interviews with families to explain the qualitative results.

**CRITICAL THINKING EXERCISE 3.2**

If a researcher wanted to determine the perceptions of nursing staff of the importance of hand hygiene, what type of research method should be used for the study?

## THE RESEARCH PROCESS

There are several steps in conducting either quantitative or qualitative research.

### Step 1. The research problem

The **research problem** is refined through a process that proceeds from identifying a general idea of interest to defining a specific topic. A preliminary literature review reveals related factors that appear critical to the research topic and it should identify a gap in the literature on the specific topic. The significance of the research problem must be identified in terms of its potential contribution to both the individual and the nursing profession (Burns et al 2013). Choosing a problem that can be translated into policy is also important. Choosing the topic of interest may develop from:

- Discussing an issue of common interest with a colleague
- Reading about an issue in a journal, text or newspaper
- Identifying an area deficient in information
- An aspect of practice being introduced for the first time
- An aspect of practice that may have been observed but which needs to be validated
- Areas of work that may need to change
- Wanting to repeat a study that has already been conducted, to check the results.

### Step 2. The purpose

The purpose of the study states the aims or goals that the investigator hopes to achieve with the research. It includes what the researcher will do, who the participants will be and where the data will be collected (Berman et al 2015). An example of a purpose for a research problem investigating the link between obesity and type 2 diabetes might be 'Collect data from adults in the state of Victoria who have type 2 diabetes and compare this to their weight'.

### Step 3. Literature review

The overall purpose of conducting a review of the literature is to develop a strong knowledge base to carry out research and other consumer research activities in the educational and clinical practice settings. It is a comprehensive, in-depth, systematic and critical review of scholarly publications and available evidence focused on the research topic (LoBiondo-Wood & Haber 2014). Information may be gained from primary or secondary sources. A primary source is written by an individual(s) who developed the theory or conducted the research. Secondary sources are descriptions of studies written by someone other than the original researcher who developed the theory or conducted the research (LoBiondo-Wood & Haber 2014; Polit & Beck 2014). Therefore a literature review is often called 'secondary research', and conducting an original study is called 'primary research' (Daly et al 2014).

The literature review provides a way of checking what has already been studied in relation to the proposed study. It may also identify gaps in knowledge, and provide an understanding of the procedures, methods of analysis and variables that can influence the study (see Clinical Interest Box 3.4).

#### How to search successfully for information

To conduct a successful search for information about a particular subject, the researcher needs to define the topic of interest, select appropriate search resources and selectively review and evaluate the materials produced by a search (Borbasi & Jackson 2016; Schneider et al 2016). A search is conducted using indexes, abstracts and catalogues to find information about specific subjects. Books tend to give standard accepted information and practices. They provide good baseline data on a subject. Journals, however, provide more current information than books. They report changing trends and practices.

Several electronic indexes are used for nursing journals (see Clinical Interest Box 3.5), including the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Index Medicus (a comprehensive index of peer-reviewed medical journals compiled by the US National Library of Medicine) and its online counterpart, MEDLINE (Medical Literature Analysis and Retrieval System (MEDLARS) online). Each index has a primary area of focus and advantages and limits. Electronic databases operate with a special

## CLINICAL INTEREST BOX 3.4 Overall purpose of a literature review

- Determines what is known and not known about a subject, concept or problem.
- Determines gaps, consistencies and inconsistencies in the literature about a subject, concept or problem.
- Discovers unanswered questions about a subject, concept or problem.
- Discovers conceptual traditions used to examine problems.
- Uncovers a new practice intervention(s) or provides evidence for current practice intervention(s).
- Generates useful research questions and hypotheses for the discipline.
- Describes the strengths and weaknesses of designs or methods of enquiry and instruments used in earlier works.
- Determines an appropriate research design or method (instruments, data collection and analysis methods) for answering the research question(s).
- Determines the need for replication of a well-designed study or refinement of a study.
- Promotes development of new or revised practice protocols, policies and projects or activities related to nursing practice and to the discipline.

*(Borbasi & Jackson 2016; Coughlan et al 2013; Hoffman et al 2013; Moule & Goodman 2014; Schneider et al 2016)*

## CLINICAL INTEREST BOX 3.5 Examples of nursing research journals

*Applied Nursing Research*
*Australian Journal of Advanced Nursing*
*Clinical Nursing Research*
*International Journal of Nursing Studies*
*Journal of Advanced Nursing*
*Journal of Nursing Education*
*Journal of Nursing Research*
*Journal of Nursing Scholarship*
*Nursing Outlook*
*Nursing Research*
*Nursing Science Quarterly*
*Qualitative Health Research*
*Research in Nursing and Health*

*(Berman et al 2015; Borbasi & Jackson 2016; Richardson-Tench et al 2014)*

vocabulary. However, the computer helps the researcher to define the preferred terms to use in a search. It is important to make the search as precise as possible; if there are several key terms, they should be used. Other limits such as gender, age and/or time factors should also be set. Ask for assistance from the librarian if there is difficulty finding information. It can be a challenging process searching for literature and finding the correct search words is often difficult. Librarians can help you in your search and help you choose the correct databases for your topic. Many professional information sources are also available on the internet, where there is access to a wide variety of databases, patient and nursing education resources, as well as some nursing journals. (See Online Resources at the end of this chapter.)

### Critical thinking and critical reading skills

When an article on the research topic is found, the next step is to use critical thinking and reading skills. Within the context of reviewing the literature, critical thinking is the rational examination of ideas, inferences, assumptions, principles and conclusions drawn from the readings (LoBiondo-Wood & Haber 2014). (See Clinical Interest Boxes 3.6 and 3.7.)

Critical reading involves the following stages:

*Skimming a source*. Have a brief look at the source to gain a broad overview of its content. Skimming through the article enables the reader to make a preliminary judgment about the value of a source and to determine whether it is a primary or secondary source (Burns et al 2013).

*Comprehending a source*. This requires that the source be read carefully, with the focus on understanding major concepts and the flow of ideas within the source. On a photocopy or an electronic version of the article, highlight the content considered to be important (Burns et al 2013; LoBiondo-Wood & Haber 2014; Schneider et al 2016).

*Analysis of a source*. Through careful analysis of the source, the reader can determine the value of the content for a particular study. The reader gains an understanding of the terms and parts of the study. This leads to a deeper understanding of the content and the merit of the study (LoBiondo-Wood & Haber 2014; Schneider et al 2016).

*Synthesis of a source*. This involves clarifying and establishing a meaning obtained from the source. The meanings obtained from all sources reviewed are then combined, to determine the current knowledge of the research problem. This forms the basis of the review of literature for research study (LoBiondo-Wood & Haber 2014; Schneider et al 2016; Burns et al 2013).

**CRITICAL THINKING EXERCISE 3.3**

You are reading an article that you need to critique for an assessment task. How can you determine the strengths and weaknesses of this article?

## CLINICAL INTEREST BOX 3.6 Highlights of critical thinking and critical reading strategies

- Read primary research articles from peer-reviewed journals.
- Read secondary research (critique/response/commentary) articles from peer-reviewed journals.
- Photocopy or print copies and make notations directly on the copy.
- While reading articles:
  - > keep a research text and a dictionary by your side
  - > review the chapters in a research text on the various steps of the research process, criteria used to critique, unfamiliar terms and so on
  - > list key variables at the top of the article
  - > highlight or underline new terms, unfamiliar vocabulary and significant sentences
  - > look up the definitions of new terms and write them on the article copy, and review old and new terms before subsequent readings
  - > highlight or underline identified steps of the research process
  - > identify the main idea or theme of the article—state it in your own words in one or two sentences
  - > continue to clarify terms that may be unclear on subsequent readings
  - > make sure you understand the main points of each reported step of the research process you identified before you critique the article.
- Determine how well the study meets the critiquing criteria:
  - > ask fellow students to analyse the same study using the same criteria and compare results
  - > consult faculty members about your evaluation of the study.
- Type a one-page summary and critical review of each study:
  - > cite bibliographic information of the reference at the top of the summary according to relevant reference style (e.g. the American Psychological Association, Harvard, Vancouver)
  - > briefly summarise each reported research step in your own words
  - > briefly describe strengths and weaknesses in your own words (bibliographical databases allow you to write a narrative for each paper reviewed).

*(Schneider et al 2016:15)*

## CLINICAL INTEREST BOX 3.7 Critiquing criteria

The following guidelines can be used as a guide in critiquing an article:

- Is it easy to read and understand; that is, no jargon or obscure phraseology?
- Is the topic important and relevant?
- Have the definitions, key terms and concepts been explained clearly?
- In the background to the study, is there enough information in the introduction to set the scene? Has the purpose of the study been identified?
- How did they conduct the study; that is, what is the methodology?
  - > Is there evidence of reliability and validity?
  - > How were the subjects selected?
  - > Are they a large or small group?
- What did the researchers find, and are the methods of analysis appropriate?
- Do the discussions and recommendations relate to study? Are the author's claims justified by the data? Were the suggestions made based on personal views and not on data? Are the recommendations based on reported findings?
- Is the language used understandable?
- Is the visual material (e.g. graphs, tables, charts) easy to follow and clearly marked?
- Comment on the study's strengths as well as its weaknesses.
- Justify criticisms; offer a rationale for how a different approach could have solved a problem.
- Try to be objective; try to avoid being overly critical of a study because of a personal lack of interest in the topic.
- Is the report or study written in an objective style or are the author's biases and viewpoints apparent?
- Does the author include a reference for every citation made in the text, so that readers can refer to earlier work on the topic?
- Check the credibility of the author.
- Check the year of publication—whether it is recent or old.

*(Borbasi & Jackson 2016; Ingham-Broomfield 2014; Hoffman et al 2013; Schneider et al 2016)*

## Step 4. Theoretical framework or conceptual framework

A theoretical framework uses a theory or theories to form a foundation or frame of reference for the research study. A theoretical framework helps the researcher explain or predict study outcomes and link these to the existing body of knowledge. Not all research studies use a theoretical framework, as sometimes a theory is not available if the area of research is new. A conceptual framework is a loosely related collection of concepts that have not yet been tested (Borbasi & Jackson 2016; Schneider et al 2016).

## Step 5. Hypothesis/research questions

When research questions are used, the purpose of the study is descriptive or exploratory and a theoretical framework is rarely identified. **Research questions** identify the variables to be studied and possible relationships or differences between

those variables. An example of a research question is, 'Do nursing staff undertake more hand hygiene than medical staff?'

A **hypothesis** tries to predict the relationships between variables and the expected outcomes of the study. A hypothesis predicts the relationship between two or more variables. The researcher makes educated guesses based on the review of the literature and the theoretical framework. A hypothesis is a statement of what the researcher thinks will be the outcome of an investigation. The results of the research study will either support or refute the hypotheses established (Borbasi & Jackson 2016). An example of a research hypothesis is, 'There is a higher level of compliance with hand hygiene in nursing staff than medical staff.'

Quantitative research tends to use a research hypothesis whereas qualitative research tends to use research questions.

## Step 6. Research design

The **research design** is the overall plan that guides the way the study is conducted and analysed (Borbasi & Jackson 2016). The research question determines the approach to be used in the design. The design of the study must be able to answer the question posed by the researcher. Determining the appropriate design is also accomplished through the theoretical framework and review of the literature.

Certain key aspects should be considered in a study design. They include:

- Intervention: if there are interventions in the study, they should be part of the design. The study should say what the interventions are (e.g. giving certain medication). What will be the procedure for the intervention? What will be the intensity of the intervention? How long will the duration of the intervention be? Who will perform it?
- Comparisons: in some studies, when making comparisons the design must clearly state what the central issue of the study is
- Extraneous variables: the researcher must mention in the design what measures will be taken to control the extraneous variables (the factors that influence the issue under study)
- Timing of data collection: the design should indicate when the data will be collected in relation to other steps of the research process
- Research location: the design must clearly specify the location for data collection
- Communication with the study participants
- In the research design, information given to participants must be clearly identified. When, what and how much information will be provided about the study to the participants?

## Step 7. Sample type and size

Once the research design has been established, the subjects and the setting are then considered. The subjects of interest for a research study are known as a population. These subjects possess certain common characteristics or traits that identify them as a part of the population. Populations are usually large, so the researcher chooses a part, or sample, of the population to make the study more feasible. Subjects are selected using a sampling process. The characteristics of the sample population must closely resemble the characteristics of the population as a whole. If this occurs, the study results can be applied to the whole population (Borbasi & Jackson 2016).

## Step 8. Legal and ethical issues

One of the primary concerns in research is to protect the subjects from any harm, discomfort, duress or coercion. Ethics approval is normally required before any data are collected that involve humans. If there is more than one agency involved in the study, the researcher must obtain ethical approval from each agency. Various agencies will have their own ethical guidelines (see Clinical Interest Box 3.8). In Australia one of the peak bodies for research is the National Health and Medical Research Council (NHMRC) (www.health.gov.au/nhmrc). A *National Statement on Ethical Conduct in Human Research* (2007) was jointly developed by the NHMRC, the Australian Research Council (ARC) and the Australian Vice-Chancellors' Committee (AVCC). Research involving Aboriginal and Torres Strait Islander peoples requires particular attention to ethical issues and is governed by separate guidelines (*NHMRC Guidelines on Ethical Matters in Aboriginal and Torres Strait Islander Health Research 1991*) (Borbasi & Jackson 2016; Schneider et al 2016).

When undertaking research while working in a healthcare facility, ENs would normally seek ethics approval from the hospital or healthcare facility's ethics committee. The three ethical standards that must be adhered to are beneficence,

### CLINICAL INTEREST BOX 3.8
### The broad role of human research ethics committees

- Risks to participants are minimised.
- Risks to participants are reasonable in relation to anticipated benefits, if any, and the importance of the knowledge that may reasonably be expected to result.
- Selection of participants is equitable.
- Informed consent will be sought.
- Informed consent will be appropriately documented.
- Adequate provision is made for monitoring the research to ensure the safety of participants.
- Appropriate provisions are made to protect the privacy of participants and the confidentiality of data.
- When vulnerable subjects are involved, appropriate additional safeguards are included to protect their rights and welfare.

*(Schneider et al 2016:92)*

justice and respect for persons (Borbasi & Jackson 2016) (see Chapter 2 for further explanation of these terms). Protection regarding storage, retrieval and destruction of data and all issues of confidentiality should be clearly explained for ethical approval of the study.

The NHMRC requires that all institutions involved in conducting research on humans or animals establish a relevant institutional ethics committee. This group reviews all studies conducted in the institution to ensure that **ethical principles** are observed, and determines the risk status of all research projects.

The nurse must also be aware of and advocate on behalf of the rights of individuals under their care. Nurses who work in settings where there is research on individuals or who participate in such research must ensure the following rights are upheld: right not to be harmed; right to full disclosure; right of self-determination; and right of privacy and confidentiality (Berman et al 2015).

### Informed consent

Study participants, or their guardians in cases of children or people with cognitive impairment, need to be fully aware of what the study involves, and what the benefits and risks of participating in the study are, in order to give **informed consent** (LoBiondo-Wood & Haber 2014). LoBiondo-Wood and Haber (2014) stated that research participants should have an understanding of the:

- Research purpose
- Procedures involved
- Risks/discomforts of participation
- Benefits of participation
- Expected duration of involvement
- Maintenance of confidentiality and anonymity.

Research participants should also be aware that they have a right to withdraw from a research study without detriment and if a participant does choose to withdraw, use of their data will cease by the research team. Whether an individual chooses to participate in a study or chooses to withdraw, the individual still has a right to confidentiality, meaning that their data will not be publicly divulged (LoBiondo-Wood & Haber 2014). Subjects should also be offered the opportunity to raise any concerns about the study at any stage of the study research.

## Step 9. Instruments or measurement tools

To examine the proposed research questions or hypotheses, the researcher must be able to collect measurable data on the variables. Data are collected using an 'instrument'. Data to be collected are usually physiological, behavioural or psychological in nature. Physical measurements could include using sphygmomanometers, electrocardiogram (ECG) machines, glucometers and thermometers. Behavioural data are generally collected through observation. Psychological measurements are used to collect data about knowledge, feelings and attitudes. These variables cannot be directly observed, so instruments such as questionnaires or interviews are used.

## Step 10. Validity and reliability

A quality instrument is an instrument that is valid and reliable. A valid instrument measures what it is supposed to measure, and a reliable instrument measures the variable consistently and accurately. Instruments used in research studies should be evaluated for **reliability** and **validity** before use in a study (Borbasi & Jackson 2016). For example, if undertaking a study that requires you to measure temperature, calibrate all thermometers to ensure accuracy and similarity of the readings.

## Step 11. Data collection procedure

The researcher puts the design into action and carries out the prescribed procedures. Treatments are conducted, instruments are administered and data generated and recorded. The most common methods of **data collection** in nursing are interviews, questionnaires, observation, focus groups, rating scales and biophysical measures (Berman et al 2015). If a qualitative approach is adopted focus groups could be used to ask in-depth questions to explore perceptions or feelings. Data must be collected in an ideal manner so that they capture the concept that is being researched in a way that is relevant, credible, accurate, unbiased and sensitive. Any small change to an aspect of data collection can influence the study and interfere with its integrity. After the data are collected, the researcher organises it into an appropriate form for analysis.

## Step 12. Data analysis

**Data analysis** occurs to answer the research questions or to see whether the hypothesis was true. Computer software may be utilised to assist in analysis of the data. In the qualitative approach, the analysis will begin almost immediately when data collection begins whereas, in the quantitative approach, all data has to be collected first before the analysis begins. The other difference is that the qualitative data has a lot of narratives and there is no systematic rule for analysing it. The absence of systematic analytical procedures makes it difficult for researchers to argue the case for validity. The absence of universally well-defined procedures makes qualitative study difficult to be replicated.

In the quantitative approach, statistical analysis enables the researcher to reduce, summarise, organise and give meaning to the data. Descriptive statistics are used to describe the specific characteristics of the data, such as how many cases fall into a particular category of measurement, typical values and the degree of interrelationship or correlation among measurements. Examples of descriptive statistics include averages and frequencies.

## Step 13. Results

The result section presents the research findings and data in statistical from (quantitative research) or narrative form (qualitative research). All results from the research should be presented in a clear, logical and concise way that answers each research question and/or hypothesis (LoBiondo-Wood &

Haber 2014). Tables and figures may be used to present and summarise large amounts of data clearly and concisely (Richardson-Tench et al 2014).

### Step 14. Discussion of findings and new findings

In the discussion section, researchers discuss and interpret the research results and give further meaning to the data. The researcher draws on the research aims, research literature and the theoretical framework used and interprets all the findings/results, whether these are supported by the literature or not, to highlight the outcomes of the study (LoBiondo-Wood & Haber 2014).

### Step 15. Implications, limitations and recommendations

Once the findings are stated and discussed, the researcher then makes recommendations for further research. Recommendations provide the reader with suggestions regarding the study's application to practice, theory and future research. The researcher also discusses any problems or limitations encountered while conducting the study. Identifying limitations informs future researchers so they do not repeat them when conducting a similar study.

### Step 16. References

All references that are cited in the article or research study are included at the end of a paper. The reference list supports the material presented by identifying sources in a manner that the reader can then follow up to obtain these references for their own use or for any clarification.

### Step 17. Communicating research results

Sharing the research findings can occur through several ways, such as presenting a paper or poster at conferences or seminars at local, national and international levels; or publication of articles in nursing research or specialty journals and reports, which leads to wider circulation of the study and research findings. It is sometimes said that if the findings are not presented or shared with the people who may benefit from them, the research process is not completed or the research is meaningless (Richardson-Tench et al 2014; Schneider et al 2016).

## PROPOSAL WRITING FOR RESEARCH APPROVAL

A research proposal is a written plan identifying the major elements of a study, including the research problem, the purpose of the research, the intended framework to be used and an outline of the proposed research methods and procedures to be used. Developing a research proposal is a formal way to communicate ideas about a proposed study, to apply for approval to conduct the study and, in some instances, to seek funding to support the research (Schneider et al 2016; Borbasi & Jackson 2016; Burns et al 2013). Funding, time and resource allocation are a consideration when designing a research project; for example, How much time do you have? What costs will be involved?

**CRITICAL THINKING EXERCISE 3.4**

Identify some possible areas for nursing research that arise from your clinical practice rotations. How might nursing research improve your practice in these areas?

### Writing a research proposal

A research proposal requires planning to convey the proposed research in a clear, concise and logical way in order to support the study. The depth and development of a proposal is determined by the guidelines developed by relevant institutes such as schools of nursing and healthcare institutes, where the research is to be undertaken and the type of research you plan to do (Burns et al 2013; Schneider et al 2016). Content considered to be critical in a proposal are:

- The background and significance of the research problem
- Purpose
- Framework
- Research objectives, questions or hypotheses
- Methodology or research design
- Research production plans (data collection and analysis plan, personnel, schedule and budget).

Essential sub-components of these critical elements of a research proposal include:

- Statement of the problem. This needs to:
  - be specific enough to be solved be in the form of a question or declaration statement. For example, if the study were about neglect of oral hygiene in nursing homes, the question might be, 'What is the impact of poor oral hygiene on residents in nursing homes?'
  - provide the background of the problem, such as how the problem came to be recognised and factors that contributed to the problem.
- Significance or importance of the problem:
  - includes the implications or possible applications of the knowledge that would be gained through the study.
- The research hypothesis (where appropriate), which should be:
  - reasonable
  - consistent with known facts or theories
  - stated in such a way that it can be tested and found to be probably true or false
  - stated in clear, simple terms.
- Assumptions and definitions:
  - all unusual terms that could be misinterpreted need to be defined
  - variables considered in the study should be defined.

- Review of related literature:
  - a brief summary of previous research and writings of recognised experts is included to provide evidence that the researchers are familiar with what is known and with what is still unknown and untested.
- An outline of the research procedure, which should include:
  - research design: a brief description of proposed mode of study
  - sampling protocol: population to be sampled, approximate sample size, characteristics and type of sample
  - specification of the proposed data gathering techniques (the actual instrument need not be included). Indicate only the data-gathering procedures, conditions for context of data collection and the time frame for data collection
  - analysis of data and methods to be used
  - projected timetable for various steps of the research
  - limitations and weaknesses of the study, as recognised by the researchers.
- Proposed budget:
  - include all necessary items and estimated costs.

A copy is typed for submission and should be free from errors in spelling, punctuation or grammar. A well-designed proposal is the first step to conducting a worthwhile research project.

### Content of a student proposal

Student researchers develop proposals to convey their research plan and projects to relevant nursing faculties, universities and research review committees. The content of a student proposal usually requires much detail and the proposed study is discussed in the future tense of what will be done in conducting the research (Burns et al 2013). Clinical Interest Boxes 3.9 to 3.11 present guidelines for quantitative and qualitative student research proposals and an example of a completed submission.

## HOW IS RESEARCH UTILISED IN PRACTICE?

Research utilisation refers to translating the knowledge that has been generated by research into clinical practice. The ultimate goal is to formalise research utilisation to promote research-based policies, procedures and clinical practice guidelines (Borbasi & Jackson 2016). However, there are many barriers to translating research into practice. These may include:

- Resistance to change
- Insufficient time and resources to implement changes to practice
- Lack of supportive infrastructure
- Lack of research skills, including an inability to critique
- Lack of professional autonomy to effect change

### CLINICAL INTEREST BOX 3.9 Quantitative research proposal guidelines for students

**Introduction**

- Background and significance of problem
- Statement of the problem and statement of the purpose
- Review of relevant literature
- Framework
- Development of a framework
- Formulation of objectives, questions or hypotheses
- Methods and procedures
- Description of research design
- Identification of population and sample
- Selection of a setting
- Presentation of ethical considerations
- Selection of measurement methods
- Plan for data collection
- Plan for data analysis
- Identification of limitations
- Discussion of communication of findings
- Presentation of a study budget and timetable

**References**

**Appendices**

*(Richardson-Tench et al 2014; Schneider et al 2016; Burns et al 2013)*

- Inability to access and engage with research findings (Borbasi & Jackson 2016; Grant et al 2012; Moule & Goodman 2014).

Clinical Interest Box 3.12 lists further barriers to research utilisation.

Solutions to barriers preventing the implementation of research results into practice may include educating future nurses on the importance of keeping up to date with the latest research in nursing and the importance of not resisting change based on new research outcomes. Having access to research articles and the distribution of the results of up-to-date research in the workplace is also important.

### Approaches to research utilisation

According to Borbasi & Jackson (2016), after a research study has been located and surveyed, it must be determined:

- Whether it is relevant to the clinical area (see Clinical Interest Box 3.13)
- Whether the study has rigour and the results have merit and are applicable to the area of work (see Clinical Interest Box 3.14)
- How to implement any relevant or applicable results (see Clinical Interest Box 3.15).

The top three facilitators of research utilisation as identified by Wang et al (2013) were enhancing managerial support, advancing education to increase knowledge base and increasing time for reviewing and implementation.

## CLINICAL INTEREST BOX 3.10 Qualitative research proposal guidelines for students

A qualitative research proposal might include some content similar to that of a quantitative proposal, but the guidelines are usually more flexible and abstract to accommodate the still-emerging design of the study.

### Introduction

- Identification of the phenomenon to be studied
- The study purpose and type of qualitative study
- Study question or aims
- Discussion of the significance of the study

### Research paradigm

- Identification of the research paradigm for the type of qualitative study to be conducted
- Description of the philosophical correlates of the research paradigm
- Explanation of research assumptions

### Research methods

- Researchers' credentials for conducting a particular type of qualitative study
- Identification of the research method for the study
- Selection of site and population
- The researchers' role
- Ethical considerations
- The data collection process
- Data analysis techniques
- Plan to document the research process during the study

### Preliminary findings, limitations and plans for communicating the study results

- Summary and relevant reference literature
- Identification of biases and previous experiences with research problem
- Disclosure of anticipated findings, hypotheses and hunches
- Discussion of how procedures will remain open to unexpected information
- Discussion of limitations of study
- Identification of a plan for communicating findings

### References

### Appendices

*(Burns et al 2013; Richardson-Tench et al 2014; Schneider et al 2016)*

## CLINICAL INTEREST BOX 3.11 An example of a research proposal

### Student nurse retention and attrition in a TAFE setting

Investigator: Gabrielle Koutoukidis

### Introduction

The purpose of this descriptive study is to examine factors that contribute to the retention and attrition of students enrolled in the Certificate IV in Health (Nursing) at the Health Services Unit, Victoria University.

Factors that may impact on the issue of retention and attrition are identified and include work conflicts, personal problems, academic factors, being under-prepared versus being prepared for study, demographic factors and financial factors. The study will examine whether these factors differentiate between those who stay enrolled and those who leave the TAFE Nursing course.

A number of strategies and interventions to reduce attrition and increase retention of students have been introduced by the Health Services Unit over the past 5 years. These strategies are examined in terms of their effectiveness.

### Background to study

Focus groups and questionnaires conducted in 1997 within the Certificate IV in Health (Nursing) course at Victoria University revealed that students experienced stress in relation to study skills, time management, coping with social and

*Continued*

## CLINICAL INTEREST BOX 3.11 An example of a research proposal—cont'd

family roles, economic and financial issues. Students' inability to manage these stresses created difficulties in terms of their progression through successful completion of the course.

The Unit conducted a further study in 1997 that was quasi-experimental in design, with a non-equivalent control group to examine the effectiveness of various strategies to address the above issues. In this study the experimental group participated in an orientation program. This program aimed to provide them with knowledge about resources available on campus to assist them both academically with study and time-management skills and psychosocially with strategies and resources to cope with stress. Both groups were resurveyed 8–10 weeks later to compare their perception of stress and their level of skill, knowledge and ability to access resources available to support them. The stress reported by the experimental group was less than that of the control group.

This study made particular recommendations and from one of these has evolved an integrated 8-week timetabled academic skills assistance program to directly support students in the development of the academic skills necessary for successful completion of the course. Preliminary evaluation of this program indicates that students who attended this program had higher marks and higher course completion rates compared with students in past years, when there was no academic skills assistance program timetabled.

### Literature review

Much has been written on the attrition and retention of students in courses. McGrath and Braunstein (1997) state that causes of attrition vary and that the strategies designed to reduce it produce different results at different institutions. They recommended that administrators and faculty use surveys and focus groups to evaluate the effectiveness of the existing programs and strategies, and conduct semesterly and yearly statistical analyses to establish and measure strategic goals. They also recommended that college and university administrators and faculty should work together to conduct their own research regarding the retention of students rather than rely too heavily on findings in the related literature.

Conklin (1997), McGrath and Braunstein (1997) and Fralick (1993) state that work conflicts, personal problems, financial problems, demographic and social issues, health problems and child care difficulties are the major factors that lead to high attrition rates in courses. Fralick (1993) stated that research has shown that the most critical factor in student retention is a caring attitude by staff—in addition to orientation and advising, faculty and staff can contribute to student retention by developing advisement linkages with students through campus organisations, campus activities or college work–study programs.

### Framework

#### Aim

To explore the reasons why students decide to either leave or stay and complete the TAFE Nursing course.

#### Objectives

- To identify factors that contributed to student retention in the TAFE Nursing course.
- To identify factors that contributed to student attrition in the TAFE Nursing course.
- To recommend appropriate strategies for increasing retention within the TAFE Nursing course.

### Methodology

#### Design

This study will have a comparative descriptive survey design using questionnaires. Two questionnaires have been developed: one for students who voluntarily decide to leave the Certificate IV in Health (Nursing) course (colour-coded green (Appendix 1)); and a second questionnaire for students who complete the Certificate IV in Health (Nursing) course (colour-coded white (Appendix 2)).

The questionnaires are colour-coded to enable easy identification of the two different questionnaires when collating the data.

A comparative descriptive design examines differences in variables in two or more groups that occur naturally in the setting (Burns & Grove 1987:244).

Questionnaires were selected as the instrument because there is less opportunity for bias than in an interview (Burns & Grove 1987:311). Other advantages of a questionnaire include that subjects feel a greater sense of anonymity, that the format is standard for all subjects and is not dependent on the mood of the interviewer, and that a greater amount of data over a broad range of topics may be collected (Brink & Wood 1988:148).

A cover letter will accompany the questionnaire, explaining the purpose of the study, the name of the researcher and the approximate amount of time that will be required to complete the form (Burns & Grove 1987:313) (Appendix 3). The letter will be printed on Curtin University of Technology letterhead to add authenticity to the questionnaire.

A pilot test of the questionnaire will be performed with a small random sample of trainee students enrolled in the Certificate IV in Health (Nursing) course, who will be completing the course in July 2001. This is to determine the clarity of questions, effectiveness of instructions, completeness of response tests, time required to complete the questionnaire

## CLINICAL INTEREST BOX 3.11 An example of a research proposal—cont'd

and successfulness of data collection techniques (Burns & Grove 1987:313). In a pilot test the subjects and techniques should be as similar to those planned for the large study as possible (Burns & Grove 1987:313). This is the reason that the trainee students were chosen, and also because they will not be included in the study.

To ensure content validity, the questionnaire will also be submitted for review by three lecturers at Victoria University who are involved in nursing education and who are experts in developing questionnaires (Brink & Wood 1988:169).

### Subjects

The population for this study will be all students (male and female) who enrolled full-time and part-time in the Certificate IV in Health (Nursing) course in February 2001 (about 200 students). Both students who decide to leave the course voluntarily and students who successfully complete the course will be invited to participate in this study.

### Data collection

Stage 1. Questionnaires will be posted to the students, both full time and part time, who decided to voluntarily leave the course. A return envelope for the completed questionnaire will be included, with a return date indicated. These questionnaires will be posted when the students withdraw from the course. This mailing will start in July 2001 and continue until November 2001.

For the students who decide to complete the course, questionnaires will be administered during a class in the last week of the course in November 2001. A box will be placed in the student administration building at Sunbury Campus for students to return the questionnaires. Questionnaires will be collected daily for 1 week from this box.

Stage 2. To examine the variables that may have contributed to the retention and attrition rates of these TAFE nursing students. These may include work conflicts, personal problems, academic factors, being under-prepared versus being prepared for study, demographic factors and financial factors.

### Data analysis

Content analysis will be performed to extract meaning from open-ended questions in the questionnaire (Burns & Grove 1987:311). The categories derived from content analysis will be cross-tabulated with demographic data to examine the relationships between variables. Descriptive statistics will be used to describe sample characteristics that arise from the demographic data collected. The relationships between sample characteristics and data categories will be tested using Chi-square analysis (Brink & Wood 1988:267). Qualitative and quantitative analysis will also be performed on the data to examine the factors that contributed to the attrition and retention rates.

### Ethics

Only students enrolled in the Certificate IV in Health (Nursing) course in February 2001 will be selected for the purpose of this study. Participation is on a voluntary basis.

Participants will be informed of the purpose of the questionnaire via a cover letter, which will explain that all the information on the questionnaires will be collected anonymously. Anonymity will also be maintained through the fact that the names and addresses of participants will not be collected (Brink & Wood 1988:194). A consent form will not be required, as by completing the questionnaire, which has minimal or no risk attached to it, the participant is indicating consent (Burns & Grove 1987:353).

Confidentiality and anonymity can be further guaranteed, as the data that will be collected from the student database of the university will not include student identification numbers or names. No names will be linked to the data obtained on the questionnaires. In the data analysis, the data will be group-analysed so that individuals cannot be identified by their responses (Burns & Grove 1987:344), thus providing further safeguards for anonymity.

Data collected will be stored in a locked file for 5 years, as per recommendations from the NHMRC Statement on Human Experimentation.

**BUDGET**

| Budget items | Cost per item | Total cost | Funded by |
|---|---|---|---|
| Printing costs | 2500 pages @ 0.10 cents per page | $250.00 | Workplace & researcher |
| Supplies | | $400.00 | Workplace & researcher |
| Postage | 60 sent @ 45 cents each | $27.00 | Workplace |
| Return envelopes | 60 sent @ 45 cents each | $27.00 | Workplace |
| Travel costs (if researcher needs to fly to Perth for consultation) | | $1000.00<br>TOTAL: $1704.00 | Researcher |

*Continued*

## CLINICAL INTEREST BOX 3.11 An example of a research proposal—cont'd

**TIMETABLE**

| Tasks to be performed | Performer of task | Completion of task |
|---|---|---|
| 1. Develop questionnaire for students who voluntarily leave | Researcher | April 2001 |
| 2. Develop questionnaire for students who complete the course | Researcher | April 2001 |
| 3. Submit proposal to University School of Public Health Graduate Studies Committee | Researcher | June 2001 |
| 4. Submit proposal to Ethics committee at Victoria University | Researcher | June 2001 |
| 5. Pilot the questionnaire | Researcher | June 2001 |
| 6. Collect data | Researcher | July–November 2001 |
| 7. Analyse data | Researcher | July–November 2001 |
| 8. Interpret results | Researcher | July–November 2001 |
| 9. Submit dissertation | Researcher | December 2001 |

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### Appendices

(The appendices are the two questionnaires and cover letter, not included here)

*(Koutoukidis 2001)*

## CLINICAL INTEREST BOX 3.12 Other barriers to research utilisation

### The research itself

- Poorly designed and/or implemented research
- Research not replicated
- Relevant literature not compiled in one place
- Poorly supported results
- Poorly implemented or written statistical analysis

### Practising nurses

- Isolation from knowledgeable colleagues
- Nurses too new on the job to implement new ideas
- Lack of authority to implement changes

### Organisational settings

- No support of nursing research findings
- Changes in the healthcare environment
- Acuity rate
- Degree of nursing shortage
- Financial constraints to implement change

### The nursing profession

- Limited research-based journals
- Limited federal funding for nursing research
- Poor communication between practitioners and researchers
- Shortage of appropriate role models

*(Athanasakis 2013; Borbasi & Jackson 2016; Grant et al 2012; Moule & Goodman 2014)*

## CLINICAL INTEREST BOX 3.13 Criteria for determining clinical relevance of a study

- Is the study a clinical study?
- Is the problem being studied one you have seen in your clinical area?
- Is the setting used in the study similar to the setting you work in?
- Are the sample/participants in the study similar to individuals you work with in clinical settings?
- Do the study findings address issues that are within your scope of practice to change?
- Do they affect the activities of daily living?
- Do they have ramifications for the comfort and wellbeing of individuals under your care?
- Do they advocate system or procedural change?
- Do the study findings address issues that nursing and midwifery have the power to change?
- Are the study findings helpful to your clinical routine?
- Do they add to your knowledge base?

*(Borbasi & Jackson 2016)*

## CLINICAL INTEREST BOX 3.14 Criteria for determining clinical rigour of a study

- Are the steps of the research process followed?
- When you read the report does it clearly define the clinical problem?
- Are ideas concisely and comprehensively identified?
- Are participants, tools, methodology and types of analysis clearly defined? In other words, can you follow what was done and why it was done in that way?
- Are sampling methods clearly described? Are they appropriate to the study?
- Do the results make sense?
- Are the conclusions plausible?
- Do quantitative studies use reliable and valid instruments?
- Do qualitative studies address issues of auditability, transferability and credibility of data?
- In qualitative studies, does the final picture of the phenomena under study flow logically from the data?
- In quantitative studies, does the discussion section clearly identify who the results could be applied to? Are the findings clearly tied to existing knowledge?
- Have other studies been done that address the identified problem (that is, are there replications, meta-analysis or evidence in the literature of similar findings)?

*(Borbasi & Jackson 2016)*

## CLINICAL INTEREST BOX 3.15 Criteria for determining implementation possibilities for a study

- Who will be affected and in what numbers?
- What are the advantages of implementation?
- What are the risks of implementation?
- What are the risks of no implementation?
- Do the advantages outweigh the risks?
- How complex is the change (e.g. a simple intervention or a lengthy protocol that requires extensive retraining of personnel)?
- How much will it cost (e.g. need for staff training, equipment, supplies)?
- How many people need to be treated to observe a benefit?
- Who will be affected by the change besides nursing or midwifery (e.g. medical officers, pharmacy, housekeeping, billing, care services)?
- What are the tangible observable outcomes of the utilisation (e.g. will it decrease complications? Save money? Make the staff function better?)

*(Borbasi & Jackson 2016)*

## Summary

Nursing research improves the practice of nursing and raises the standards for the profession. Involvement in nursing research takes place in designing studies, being part of a research team, collecting data, using research findings to change clinical practice, improving individual outcomes and maintaining the cost of healthcare. Promoting research and research utilisation in practice increases the scientific knowledge base for nursing practice.

With the scope of practice constantly expanding for nurses, it is of importance that ENs are familiar with the research process, so that they can continue to provide quality care to individuals under their care. This chapter introduces some broad aspects of nursing research and its relevance to ENs.

### DECISION-MAKING FRAMEWORK EXERCISE 3.1

You are caring for Mrs Smith, a 69-year-old female who has been admitted for a venous ulcer. She tells you that her doctor has asked if she would participate in a trial of a new treatment for venous ulcers. She says she does not understand what the risks or benefits would be, but that she does not want to say no in case he refuses to treat her. How could you apply the decision-making framework for nurses to this situation?

## Review Questions

1. Explain the importance of research in nursing.
2. Summarise the main points of a literature review.
3. Outline the steps in conducting nursing research.
4. What is evidence-based practice?
5. What are the basic differences between qualitative and quantitative research?
6. What are some of the barriers to translating research into practice?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Recommended Reading

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## Online Resources

American Association of Colleges of Nursing: www.aacn.nche.edu

Australian Commission on Safety and Quality in Healthcare www.safetyandquality.gov.au Australian Journal of Advanced Nursing: www.ajan.com.au

Australian Nursing and Midwifery Accreditation Council: www.anmac.org.au

Australian Nursing Federation: www.anf.org.au

Centre for Applied Research (NSW Health): www.cs.nsw.gov.au/canr/

Evidence-Based Nursing: http://ebn.bmj.com/

Joanna Briggs Institute: www.joannabriggs.edu.au

Kingston University/St George's Hospital Medical School, London: www.healthcare.ac.uk

National Enrolled Nurse Association (NENA): www.anf.org.au/nena

National Health and Medical Research Council (NHMRC): www.nhmrc.gov.au

National Institute of Nursing Research: www.nih.gov/ninr/about.html

Royal College of Nursing, Australia: www.rcna.org.au

The Cochrane Library: www.cochrane.org.au/library

University of British Columbia Library: www.library.ubc.ca

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UNIT
2

# The contemporary healthcare environment

CHAPTER 4
Australia's healthcare delivery system

CHAPTER 5
Nursing informatics and technology in healthcare

CHAPTER 6
Understanding and promoting health

CHAPTER 7
Quality and safety in healthcare

CHAPTER 8
Communication and nursing practice

CHAPTER 9
Models of nursing care, management and leadership

CHAPTER

4

# Australia's healthcare delivery system

*Goetz Ottmann*

## KEY TERMS

aged care services
Commonwealth government
Council of Australian Governments (COAG)
disability services
e-health
evidence-based policy making
hospitals
integrated care
m-health
multidisciplinary teams
Pharmaceutical Benefits Scheme (PBS)
primary care
public health
social determinants of health
specialised health services
telemedicine
World Health Organization (WHO)

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Explain why healthcare decisions are political decisions
- Discuss the key building blocks of the WHO's conceptualisation of a healthcare system
- Outline key health policy reforms in Australia
- Explain what healthcare challenges are addressed by e-health
- Explain the main funding mechanisms of Australia's healthcare systems
- Discuss recent trends and challenges related to the healthcare workforce
- Discuss the basic components of the Australian PBS
- Explain the main components of Australia's healthcare delivery system
- Discuss the key challenges that healthcare policy makers face over the coming decades
- Discuss the idea of integrated care pathways and how they might impact on individuals

## CHAPTER FOCUS

The provision of effective healthcare requires the collaboration of health and community care professionals in many different parts of the health system. In order to provide responsive and person-centred healthcare, nurses must have a good understanding of the wider healthcare system and their role within it. This chapter provides an overview of the common building blocks of healthcare systems as defined by the **World Health Organization (WHO)** (2010) and outlines key features of recent healthcare reforms in Australia. In particular, the chapter focuses on leadership and governance, health financing, core medical products and technologies, health information systems, chronic illness management, the health workforce and health services delivery. Further focus is given to key issues facing Australian policy makers and healthcare professionals over the coming decades.

## LIVED EXPERIENCE

As an EN I started working at the local GP practice as a receptionist, where I occasionally assisted the GP with some procedures and obtained specimens. Over the years the practice has expanded and today the practice employs four practice nurses who are running chronic disease management programs (e.g. diabetes and asthma management), and one of the practice nurses runs a wound clinic. I work alongside the Registered Nurses as part of the team and am supported and supervised by them within my scope of practice.

**Madeline, 30 years old, Enrolled Nurse**

## INTRODUCTION

According to WHO, a health system consists of all the activities whose primary purpose is to promote, restore and/or maintain health (WHO 2013). Moreover, a good health system 'delivers quality services to all people, when and where they need them' (WHO 2010). While many Australians take their healthcare services for granted, health systems do not inevitably include the kind of services that give all people access to efficient healthcare that meets their needs (WHO 2010). Health systems are subject to powerful political forces and lobby groups that often override rational, **evidence-based policy making**. The outcome may be a disproportionate focus on specialist curative care; fragmentation and professional 'silos'; a multiplicity of competing programs, projects and institutions; the pervasive presence of commercial lobbies overriding the public interest; and poorly regulated systems (WHO 2010). Political actions shape the health and wellbeing of populations. Political decisions regarding the design of healthcare and welfare systems tend to affect population groups differently. This has clear implications for equity as some groups are better off, while others lose out (Duckett & Wilcox 2011). In other words, 'health policy is clearly as much about health as about politics' (Duckett & Wilcox 2011). Nurses are becoming increasingly aware of the role they can play in reshaping the healthcare system. They are important stakeholders and are able to exert political pressure to influence healthcare reform.

## COMPONENTS OF A HEALTHCARE SYSTEM

The quality of healthcare provided to citizens hinges on the quality of the healthcare system as well as underlying factors that shape the social determinants of health. **Social determinants of health** are the living conditions (i.e. access to clean water and air, income, education, employment, childhood development, food security, social connectedness, suitable housing and urban design, protection from weather and climate, trauma and accidents, workplace hazards, pathogens and toxins, and access to good healthcare) people experience. These factors have direct ramifications for a population's life expectancy, health and mortality rates. (See Table 4.1.)

WHO (2010) describes the main building blocks of a healthcare system in the following terms:

- Sound leadership and governance (stewardship)
- Health information systems
- Health financing
- Human resources for health
- Essential medical products and technologies
- Service delivery systems.

This chapter focuses on these six building blocks, explains challenges associated with improving the quality of health

### CRITICAL THINKING EXERCISE 4.1

The role of nurses in GP clinics has evolved considerably over the past decades. Nurse practitioner-led GP clinics are an example of this. GP nursing increasingly involves clinical contact and health promotion activities. Health and wellness promotion often require the collaboration of interdisciplinary teams to achieve the best outcomes. Imagine you are in charge of the chronic disease management program for older people at a GP clinic.

Which professional groups would you need to collaborate with?

**TABLE 4.1 | Life expectancy at birth and child mortality in six countries 1990–2013**

| Member state | Infant mortality rate (per 1000 live births) | | | Still-birth rate (per 1000) | Neonatal mortality rate (per 1000 live births) | | | Under-five mortality rate (per 1000 live births) | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1990 | 2000 | 2013 | 2009 | 1990 | 2000 | 2013 | 1990 | 2000 | 2013 |
| Australia | 8 | 5 | 3 | 3 | 4 | 4 | 2 | 9 | 6 | 4 |
| New Zealand | 9 | 6 | 5 | 4 | 4 | 3 | 3 | 11 | 7 | 6 |
| USA | 9 | 7 | 6 | 3 | 6 | 5 | 4 | 11 | 8 | 7 |
| Thailand | 30 | 19 | 11 | 4 | 19 | 13 | 8 | 37 | 23 | 13 |
| Indonesia | 62 | 41 | 25 | 15 | 31 | 22 | 14 | 84 | 52 | 29 |
| Papua New Guinea | 65 | 58 | 47 | 15 | 31 | 28 | 24 | 89 | 78 | 61 |
| Nigeria | 126 | 113 | 74 | 52 | 49 | 46 | 37 | 213 | 188 | 117 |
| Malawi | 143 | 103 | 44 | 24 | 50 | 40 | 23 | 245 | 174 | 68 |

(*WHO Global Health Observatory Data Repository WHO 2014a*)

**CRITICAL THINKING EXERCISE 4.2**

What do life expectancy and neonatal mortality rates outlined in Table 4.1 tell you about the health system and the social determinants of health in Malawi? What are the key issues that might contribute to these poor outcomes?

systems and discusses some of the challenges policy makers face over the coming decades.

## Leadership, governance and reform

The quality of the health system depends largely on the quality of leadership and governance provided by governments. Governments not only set up and oversee the core structures of the healthcare system; they also ensure that the system is appropriately reformed to respond to the changing needs of the population. To that end, governments might increase spending allocations, re-prioritise and reallocate resources across programs, or change funding rules to access healthcare resources. They also negotiate with and assign responsibilities and accountabilities for health services to different tiers of government (Duckett & Wilcox 2011).

Australia's healthcare system is a complex fabric of often poorly integrated public and private providers. These providers deliver a wide variety of services ranging from aged care, public health and preventative services in the community, to primary healthcare, emergency health services, hospital-based treatment, rehabilitation, and aged and palliative care (AIHW 2014a). National leadership across the system as a whole remains a structural challenge (Bennett 2013).

Structures and processes underpinning healthcare reforms change in line with political opportunity and are therefore not set in concrete. In Australia, negotiations leading up to the National Health Agreement, a document that is reviewed in five-yearly cycles, are central to healthcare reform. Whereas in the past health ministers of all tiers of government played a key role in these negotiations, in recent years the **Council of Australian Governments (COAG)** has become increasingly important in shaping the reform agenda. Other mechanisms which have emerged over the past two decades and have gained increasing importance in Australia are public inquiries, ministerial working groups and independently commissioned reports. These mechanisms are used to manage the multitude of stakeholder demands, to make authoritative (truth) claims regarding the state of the health system and to determine strategies to improve the effectiveness and efficiency of the health system. Recent examples of public inquiries are Australia's National Health and Hospitals Reform Commission, the Preventative Health Task Force and the External Reference Group of primary care experts to inform the National Primary Health Care Strategy announced in 2008. Nursing peak bodies contribute to this process through submissions to reform commissions, media releases that seek to influence public opinion and direct lobbying campaigns targeting members of parliament or senior bureaucrats. Healthcare reforms are also the focus of reports tabled by international organisations such as the Organisation for Economic Co-operation and Development (OECD) whose verdicts carry weight among global financial entities and, hence, have repercussions for central governments.

Australians witnessed the start of a major health reform with the rise of the Labor (Rudd) government in 2007. Among the core promises of the health reform was to end political wrangling over governance responsibilities and financing of hospitals ('cost and blame-shifting') and to establish clear accountability structures. The reform impetus eventually led to a new Primary Care Reform strategy as well as

to the National Health and Hospitals Network reform (*National Health and Hospitals Network Act No 9 2011*). However, the initial proposal was significantly watered down in the political process leading to its ratification in 2011. In its current form, the Commonwealth will not assume full funding responsibility for primary healthcare and community-based services. Also, the Commonwealth will not assume the 60% funding responsibility for hospitals as initially envisaged, but will contribute a 45% share of growth in the 2014–15 financial period and a 50% share of growth from 2017–18 onwards (Bennett 2013). There are first signs that this reduced commitment by the Commonwealth does not end the blame shifting game—one of the key drivers of the reform agenda (Bennett 2013).

Since 2011, hospital funding has been tied to activities and a national efficiency index creating the basis for benchmarking and the identification of inefficiencies. Over the last decade, aged and disability care has seen major changes in Australia where community support packages are increasingly made available in the form of individual-directed care (also referred to as individualised funding) affording service users greater control over the services they receive. From July 2015, all Commonwealth-funded community aged care packages have to be delivered within a Consumer-Directed Care (CDC) framework. Moreover, the roll-out of the National Disability Insurance Scheme (NDIS) over the coming decade will generate a more entitlement- and market-focused approach to disability care.

## Consumers

Consumers are the main stakeholder in the delivery of health services. Current health policy recognises that health professionals should partner with consumers and their carers to provide services that are coordinated, responsive to consumer needs, safe and of high quality. Indeed, consumer involvement in health decision making has become a cornerstone of Australian health policy. The National Safety and Quality Health Services Standards (ACSQHC 2012; 2015) make it clear that 'partnering with consumers' and carers is a key requirement. Consumers are to be involved in decision-making processes leading to service planning, the design of care and the measurement and evaluation of services. This has important implication for health professionals, such as Enrolled Nurses. Enrolled Nurses should, wherever possible, plan activities and nursing practice in partnership with individuals. Enrolled Nurses should also ensure that consumers hold relevant health information and are enabled to make informed decisions about their health and wellbeing.

The demand for greater consumer involvement in healthcare decision making emerged during the 1950s and gained in strength during the 1960s and 1970s with the emergence of the individual rights movement. More recently, based on the mounting evidence that individual involvement in decision making potentially decreases mortality (Meterko et al 2010), readmission and healthcare-acquired infection rates (Boulding et al 2011), reduces the length of stay (DiGioia et al 2007) and improves functional status (DiGioia et al 2007) and adherence to treatment regimens (Arbuthnott & Sharpe 2009), as well as reduces operational costs and improves workforce satisfaction and retention rates (Charmel & Frampton 2008), consumer involvement has become a core element of recent Australian healthcare reforms (DoHA 2009). (See Clinical Interest Box 4.1.)

### CLINICAL INTEREST BOX 4.1 How do I involve a consumer in the decision-making process?

Individual preferences regarding involvement in decision-making processes differ considerably. There are different degrees of involvement and it is your responsibility to explore the degree to which your patient wants to be involved. While some consumers want to be making all major decisions regarding their care, others prefer for medical officers or nurses to take that responsibility. In some cases, it is absolutely crucial for the individual to be involved as the implications of a decision may have huge ramifications for their quality of life.

The important thing to remember is that individuals need to receive the right information to allow them to make informed decisions. In addition, they need to be involved in a conversation that encourages them to think about different options, deliberate about their preferences and communicate them to medical officers. It is your responsibility to ensure that individuals have received relevant information and have been informed that they have a choice!

## Health and information systems

The provision of accurate and timely health information has direct implications for the safety of individuals. Australia's service delivery environment is composed of thousands of geographically dispersed units providing hundreds of millions of services each year. Reliance on traditional, 'pen and paper'-based information records, manual processes and information flows potentially gives rise to a large margin for clinical error (Australian Health Ministers Conference (AHMC) 2008). It has been estimated that up to 18% of medical errors are the result of inadequate availability of individual information (AHMC 2008). Also, health information has to be available at short notice to professionals in different locations around Australia. Electronic-health (**e-health**) has the potential to facilitate and improve these outcomes. Australia's National e-health Strategy defines e-health as 'the means of ensuring that the right health information is provided to the right person at the right place and time in a secure, electronic form for the purpose of optimising the quality and efficiency of healthcare delivery' (AHMC 2008). Examples of e-health include clinical communication systems such as online referrals and e-prescribing, and electronic health records. Chapter 5 provides an overview of how informatics is being used in Australian healthcare.

The WHO differentiates between two rapidly growing sub-domains of e-health: m-health and telemedicine. WHO's working definition of '**m-health**' or mobile health is 'medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices' (WHO 2011a). The term '**telemedicine**' refers to the use of the internet and computer technology to improve individual outcomes by increasing access to care and medical information.

The Australian government has put in place e-health strategies (AHMC 2008). However, in Australia the development of a coherent e-health approach has lagged behind other developed countries. In part this has been due to a lack of political consensus regarding the need for and how to fund the substantial outlay for basic infrastructure (e.g. fast broadband networks), concerns about privacy and data protection, lack of information regarding its cost effectiveness, a lack of demand from physicians (WHO 2011c) and the relative lack of maturity of information technology within the health sectors. Medicare Locals represents a recent step to re-organise healthcare by making use of shared electronic records, telehealth and m-health to provide more integrated, responsive care to the community (see Case Study 4.1). A review of Medicare Locals was tabled in March 2014, resulting in recommendations that, if adopted, would lead to considerable change (Horvath 2014).

## CASE STUDY 4.1

Mr K is an 89-year-old married man with a number of comorbid conditions and multiple recent falls. He and his wife were invited to participate in an interprofessional team meeting as his primary care GP was concerned about his declining health and the growing caregiver burden on his wife. The meeting consisted of the GP, a practice nurse, a dietitian, a community nurse, a social worker, a pharmacist, an occupational therapist and a physiotherapist. Mr K's condition was deteriorating while the complexity of his case was increasing; therefore, an in-depth team assessment was sought to determine the best management plan and to assess his capacity to remain at home (his expressed preference). The Medicare Local team met with Mr K and his wife for a 2-hour video-linked interprofessional assessment. A comprehensive care plan was developed including specific recommendations for implementing change. After a brief visit to a local rehabilitation clinic, Mr K's care was returned to his regular family GP.

(Adapted from Bell et al 2011)

There is growing evidence that an effective management of multimorbidities requires the involvement of an interdisciplinary team. Reflect on the extent to which such teams have been implemented within a primary health setting you are familiar with. To what degree do you think such teams are available in Australia?

It is likely that due to the significant distances between rural and remote communities and a range of health specialist services, e-health will be of central importance over the coming decade. More information regarding health information and informatics is provided in Chapter 5.

## Health financing

In Australia, universal health insurance systems provide access to high-quality, low-cost healthcare to all citizens. In 2012–13, universal health insurance covered 68.3% (down from 69.9% in 2011–12) of Australia's health expenses (AIHW 2014b). The remainder is financed by private sector and not-for-profit organisations or by householders themselves.

In Australia, universal healthcare is known as Medicare and provides:

- Free or subsidised treatment (bulk-billing) provided by general practitioners (GPs), participating optometrists and dentists (oral surgery only); a capped number of allied health (including psychologists, physiotherapists and podiatrists) appointments upon completion of a GP care plan; and nurse practitioners and midwives[1]
- Free or subsidised accommodation as public patient in a public hospital
- Seventy-five per cent of the Medicare Schedule fee for services and procedures of private patients in a public or private hospital (does not include accommodation or certain theatre fees and medicines)
- Subsidies for prescribed medicines
- Substantial grants to state and territory governments to contribute to the costs of providing access to public hospitals
- Specific-purpose grants to state and territory governments and other bodies.

Medicare does not cover:

- Medical and hospital services which are not clinically necessary, or surgery solely for cosmetic reasons
- Ambulance services (PHIO 2013).

In addition, Commonwealth general-purpose funding grants to state and territory governments flow partly to health services. Figure 4.1 gives an overview of health expenditure by area of the health system in 2012–13.

Some Australians, such as members of the armed forces and veterans, are covered by additional special arrangements while remaining eligible for mainstream Medicare coverage. Some injuries and illnesses are covered by other forms of financing: for example, compulsory workers' compensation insurance covers work-related injuries and illnesses, and injuries from motor vehicle accidents may be covered by compulsory third-party motor vehicle insurance. Individuals may also be covered by private health insurance, or be self-funding.

Residential **aged care** is financed by the **Commonwealth government** by means of subsidies paid to service providers,

[1] In order to limit its financial exposure, among other strategies the Commonwealth restricts the health workforce that can claim Medicare rebates.

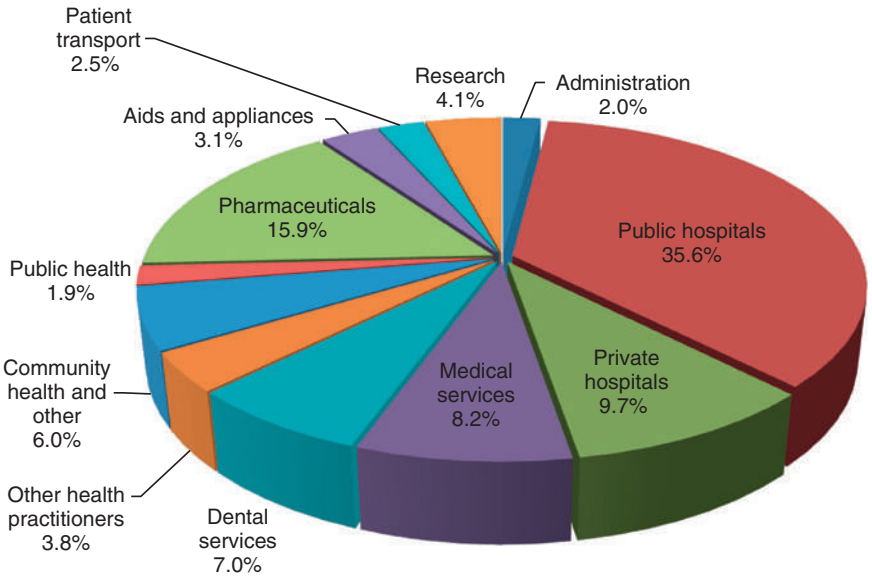


**Figure 4.1** Distribution of recurrent health expenditure by area of the health system, Australia, 2011–12 (*AIHW 2014a*)

based on the level and type of care needed by the individual. Residents have to make a means-tested contribution to care expenses.

Community care services for older citizens and people with disabilities aged 65 and over and who would like to remain living at home are jointly funded by the Commonwealth, state and territory governments. Community aged care support is available in the form of Home Care Packages. From July 2015, there will be four basic types of Home Care Packages available:

1. Level 1 (support for older people with basic care needs)
2. Level 2 (support for older people with low-level care needs—equivalent to the former Community Aged Care Packages)
3. Level 3 (support for older people with intermediate care needs)
4. Level 4 (support for older people with high-level care needs—equivalent to the former Extended Aged Care at Home and Extended Aged Care at Home Dementia Packages).

Community care individuals are charged fee contributions that vary with the individual's disposable income. At 30 June 2013, the Commonwealth funded 111.7 operational aged care places (including around 25 Home Care Packages) per 1000 people aged 70 or over. New residential care places are tendered out to providers on an annual basis.

### Specific federal government grants for healthcare services

Under Medicare the Commonwealth government provides a range of grants to government and non-government bodies to achieve specific healthcare objectives. These include:

- The provision of services to special needs groups such as people in rural and remote areas, Aboriginal and Torres Strait Islander peoples and people with mental illness
- Funding of medical services that involve the use of expensive equipment; for example, the capital component of radiotherapy services performed on specific approved equipment
- Improving general medical practitioner and associated services.

### Australia's Medicare levy

Medicare levy revenue provided the equivalent of only about 16.2% of Commonwealth recurrent healthcare expenses in 2012–13 (Australian Institute of Health and Welfare (AIHW) 2014b; Australian Government 2014). Medicare is funded by a range of taxes such as income tax, taxes on sales of goods and services and non-tax revenue, which together form consolidated revenue. Currently the Medicare levy is paid by individuals at a basic rate of 2% (including 0.5% earmarked for the National Disability Insurance Scheme) of taxable income above certain income thresholds. Taxpayers on high incomes who do not have private health insurance pay an additional 1% of taxable income as part of the levy.

## Private health insurance

Private health insurance funds a comparatively small share of healthcare expenses. In Australia, private health insurance covered about 8% of total national healthcare funding in 2011–12 (AIHW 2014a). For insured people, private health insurance provides added benefits such as choice of doctor, choice of hospital and choice of timing of procedure. Private insurance can also assist with meeting the costs of private sector services not covered by Medicare, such as dental, optical, physiotherapist and podiatrist services.

The Commonwealth government regulates private insurance policies offered by registered organisations to ensure that the principle of community rating is maintained. Community rating means that health funds must charge everyone

the same premium regardless of their health status or claims history. This ensures that private health insurance is open to a wide range of people in the community and that the aged and chronically ill are not priced out of private health insurance. To support community rating, a system of reinsurance redistributes the costs of claims for the elderly and those in hospital for an extended period across all private health insurance funds. This ensures that health funds with a high proportion of these higher-cost members are not disadvantaged.

The Commonwealth government has introduced measures to address the affordability, stability and attractiveness of private health insurance. These measures are designed to encourage people to take up private health insurance and decrease the pressure on the public system. For example, the Commonwealth government introduced a 30% rebate on private health insurance in January 1999. In 2005, the health insurance rebate was increased to 35% for people aged 65 to 69 and 40% for people aged 70+. People who join a private health fund aged 31 or older face a 2% increase in premiums over the base rate for every year they delay joining.

### Public and private hospital care

On admission to public hospitals, Australians may choose to be covered by the 'public' universal health insurance scheme or to pay expenses privately. If they choose to be 'public' patients (for non-elective surgery) they receive free medical and allied health or paramedical care from medical officers nominated by the hospitals, as well as free accommodation, meals and other health services while in hospital. Individuals who choose to be 'private' patients in public hospitals are charged fees by medical officers and are charged by the hospital for hospital care, usually at a rate less than the full cost of providing these services. If the patient holds private insurance this will usually cover all or nearly all of the charges of a public hospital. Universal health insurance pays benefits subsidising part of the cost of health professionals' fees, and private insurance pays an additional amount towards the fees charged by health professionals.

Private insurance benefits can also contribute to payment of the costs of allied health or paramedical and other costs (e.g. surgically implanted prostheses) incurred as part of the hospital stay. Individuals may choose to be treated in a private hospital and may choose their doctor. Private patients in private hospitals are charged fees by doctors and some allied health or paramedical staff and are billed by the hospital for accommodation, nursing care and other hospital services, such as use of operating theatres. If the individual holds private insurance it will contribute to these costs. If the individual is eligible for universal health insurance as a permanent resident of Australia, the medical officers' fees generally attract public subsidies.

### Publicly funded private specialist medical officers' services

For some kinds of specialist medical services (including pathology and imaging) to be covered by universal health insurance, the service has to be provided by a formally recognised specialist and a GP or family doctor has to refer the individual to the specialist. If these requirements are not met, either no benefit is payable or the benefit is lower.

## Human resources for health

Some professions within Australia's health workforce have experienced an increase in numbers. Between 2008 and 2012, the number of medical practitioners rose by 16% (AIHW 2014a). Between 2009 and 2013, the number of Registered Nurses increased by 9.8%; however, the number of Enrolled Nurses decreased by 3.5% (AIHW 2013). Projections for the workforce supply and demand for doctors and nurses reveal that by 2025, if current trends continue, there will be a shortage of a total of 2701 doctors and 109 490 nurses (Health Workforce Australia 2012, Vol. 1). When breaking down this data further, it emerges that not all roles are equally affected. For some nursing categories, the projected shortfall by 2025 will be very challenging for policy makers to deal with, even when taking a 5% productivity gain into account. For example, Table 4.2 outlines that the supply projection for registered aged care nurses for 2025 is a total of 16 618 nurses—around 10 104 nurses less than the projected demand for that year (Health Workforce Australia 2012, Vol. 2). Table 4.3 depicts the projections for Enrolled Nurses' numbers by job classification, highlighting a severe shortfall in all categories—even when taking a 5% productivity gain into account (Health Workforce Australia 2012, Vol. 2). General practitioner (GP) numbers, on the other hand, will experience a shortfall in the medium term only (Health Workforce Australia 2012, Vol. 3). Table 4.4 outlines the projected excess and shortage of GPs for 2025.

Moreover, despite numerous policy interventions, the healthcare workforce in Australia is unevenly distributed and is ageing faster than the total workforce. For example, with increasing remoteness, the numbers of GP and medical services delivered per capita declines and the average age of GPs increases. Also, in rural and regional general practice the workforce is much more reliant on international medical graduates. Indeed in 2010–11, the proportion of GP services delivered by GPs educated outside Australia in outer-regional (55%) and remote (51%) areas was much higher than in major cities and inner-regional (34%) areas (Health Workforce Australia 2012, Vol. 3). In 2013 around 70% of nurses and midwives were practising in major cities (AIHW 2014a).

Between 2003 and 2008, the share of the Australian healthcare workforce aged 55 years or older rose from 13% to 18% (equivalent figures for the non-health workforce were 12% to 15%). In 2013 the average age of Australian nurses remained 44 years (AIHW 2013). However, between 2009 and 2013, the proportion of nurses aged 50 years or older rose from 36.3% to 39.3% and the proportion of midwives aged 50 years or older rose from 53.4% to 56.6% (AIHW 2013). It is expected that this proportion of nurses and midwives aged 50 years or older will rise even further over the

**TABLE 4.2 | Projected excess/shortage of aged care Registered Nurses 2009–25, including 5% productivity gain**

| | 2009 | 2012 | 2016 | 2020 | 2025 |
|---|---|---|---|---|---|
| **Supply** | **18 656** | **19 693** | **19 371** | **17 483** | **16 618** |
| Domestic Graduates | 601 | 755 | 755 | 755 | 755 |
| International Graduates | 42 | 51 | 51 | 51 | 51 |
| Skilled Migration | 114 | 114 | 114 | 114 | 114 |
| Temporary Migration | 228 | 228 | 228 | 228 | 228 |
| Exits (%) | 3% | 3% | 8% | 7% | 6% |
| **Demand** | **18 656** | **20 623** | **23 192** | **25 441** | **28 129** |
| **Demant (5% productivity)** | **18 656** | **20 429** | **22 685** | **24 567** | **26 722** |
| **Excess/Shortfall (5% productivity)** | **0** | **–736** | **–3 314** | **–7 084** | **–10 104** |

*(Health Workforce Australia 2012a; 2012b; 2012c)*

**TABLE 4.3 | Projected excess/shortage of Enrolled Nurses 2009–25, including 5% productivity gain**

| | 2009 | 2012 | 2016 | 2020 | 2025 |
|---|---|---|---|---|---|
| Acute Care | 0 | 431 | –2056 | –7042 | –12168 |
| Critical Care | 0 | 82 | –309 | –996 | –1596 |
| Aged Care | 0 | 40 | –1700 | –4418 | –6783 |
| Mental Health | 0 | –112 | –568 | –1293 | –1986 |
| Other Enrolled Nurses | 0 | –164 | –927 | –1984 | –2987 |

*(Health Workforce Australia 2012a; 2012b; 2012c)*

**TABLE 4.4 | Projected excess/shortage of general practitioners 2009–25**

| | 2009 | 2012 | 2018 | 2025 |
|---|---|---|---|---|
| **Supply** | **26 389** | **28 386** | **34 148** | **40 929** |
| New Fellows | 409 | 652 | 1128 | 1128 |
| Permanent Migration | 780 | 780 | 780 | 780 |
| Temporary Migration | 1145 | 1145 | 1145 | 1145 |
| Exits (%) | 2.39% | 2.11% | 2.47% | 2.57% |
| **Expressed Demand** | **26 389** | **29 229** | **34 762** | **40 872** |
| **Excess/Shortage** | **0** | **–843** | **–614** | **57** |

*(Health Workforce Australia 2012a; 2012b; 2012c)*

**TABLE 4.5 | Health workforce**

| Member state | Doctors (density per 10 000 population) 2000–12 | Nursing and midwifery personnel (density per 10 000 population) 2000–12 | Dentistry personnel (density per 10 000 population) 2000–12 | Pharmaceutical personnel (density per 10 000 population) 2000–12 | Environment and public health workers (density per 10 000 population) 2000–12 | Community health workers (density per 10 000 population) 2000–12 |
|---|---|---|---|---|---|---|
| Australia | 32.7 | 106.5 | 5.4 | 10.9 | – | 0.5 |
| New Zealand | 27.4 | 108.7 | 4.6 | 7.1 | – | 13.8 |
| USA | 24.5 | 98.2 | 16.3 | 8.8 | – | – |
| Thailand | 3.9 | 20.8 | 2.6 | 1.3 | 5.7 | – |
| Indonesia | 2.0 | 13.8 | 1.0 | 1.04 | 1.8 | – |
| PNG | 0.5 | 4.6 | 0.2 | 0.5 | – | 6.2 |
| Nigeria | 4.1 | 16.1 | 0.2 | 1.3 | 0.3 | 1.4 |
| Malawi | 0.2 | 3.3 | – | 0.2 | 0.3 | 4.4 |

*(World Health Statistics WHO 2014b)*

coming years. For some professional groups, the proportion is truly staggering. For instance, about 33% of Australia's medical specialists and primary care practitioners were aged 55 years or older in 2007 (AIHW 2010) and are likely to retire in the coming decade.

While Australia will be able to cushion some of the impact of these workforce challenges (i.e. through productivity gains, health sector reforms and by improving retention rates) there will be pressure on Australian politicians and policy makers to increase the intake of skilled migrants and international medical graduates in the future. That Australia has satisfied its demand for medical graduates by attracting overseas-trained professionals is nothing new. However, the inflow of international medical graduates has increased substantially over the past 25 years. For example, the proportion of GPs based in major cities whose basic qualifications were obtained overseas has increased from 25% in 1984–85 to 34% in 2010–11. In remote areas this figure increased from 25% to 41% over the same period (Health Workforce Australia 2012, Vol. 3). The top 10 source countries of international medical graduates were the United Kingdom (9350), India (6420), the Philippines (1850), South Africa (1770), Malaysia (1570), Ireland (1560), China (1380), Zimbabwe (1180), Canada (950) and the United States (830) (Hawthorne 2012).

Most developed countries source a part of their health workforce from developing countries. Hence, healthcare workforce pressures in the developed world have global implications. Table 4.5 provides a comparison of the density of the health workforce in Australia, New Zealand and six other countries.

**CRITICAL THINKING EXERCISE 4.3**

What implications will the nursing shortage forecast for developed countries have on a family in a rural village in the Philippines? Should Australia ban the recruitment of healthcare staff in developing countries? What is an argument favouring a ban? What is an argument against a ban?

## Essential medical products and technologies

In Australia, individuals have access to heavily subsidised medicines, pharmaceuticals and technologies prescribed by medical officers. The main subsidy mechanism for medicines and pharmaceuticals is the Commonwealth **Pharmaceutical Benefits Scheme (PBS)**. Medicines and pharmaceuticals to be included in the PBS are selected by panels of experts and prices are centrally negotiated with drug manufacturers to obtain the best price. Medication is funded up to a given cost-effectiveness threshold.

Currently the PBS provides subsidies for about 900 generic drugs available in 2200 formulations and marketed in about 4000 products (brands). While the Commonwealth funds community pharmaceuticals through the PBS, public hospital pharmaceuticals are funded from multiple sources, including the PBS. Additional drugs are added when assessed as meeting safety, quality, effectiveness and cost-effectiveness criteria. The importing and supply of medicines and medical devices is regulated by the Commonwealth Therapeutic

Goods Administration (TGA) to ensure the quality, safety and effectiveness of the products. Subsidised pharmaceuticals are sold by over 5000 pharmacies across Australia, regulated by Community Pharmacy Agreements.

Under the PBS all eligible persons fall into one of two categories:

1. Concession card holders
2. General patients.

General patients pay the cost of dispensed medicines up to a maximum amount per item ($37.70 in 2015). When the dispensed price of a drug is above that maximum, general patients pay that amount and the PBS pays the balance up to the listed price. If the prescription involves a more costly but equivalent brand, the subsidy may be limited to the lower-cost brand (the minimum pricing policy). Concessional patients pay a smaller amount per item ($6.10 in 2015) than general patients, and the PBS pays the balance up to the listed price. This is also subject to the minimum pricing policy.

Pharmaceuticals have been the fastest growing area of the health budget over recent decades, amounting to 13% in 2006–07 (AIHW 2010). Between 2000 and 2009, total pharmaceutical expenditure per capita increased from $336 to $541 (assuming US$ purchasing power parity) (Department of Health 2013). Between 1996 and 2008, community prescriptions rose by 46%. About two-thirds of this increase is due to an increased use of pharmaceuticals and higher prices, and about one-third is the result of population growth (Duckett & Wilcox 2011).

The Australian government has attempted to limit the expenses associated with the pharmaceutical benefits schemes. For instance, Australia promotes the use of cheaper generic pharmaceuticals rather than more expensive brands. However, other countries have been comparatively more successful in reducing the growth of national expenditure on pharmaceutical products. For example, New Zealand has successfully introduced an aggressive mix of reference pricing (where subsidies are only available at the level of the cheapest equivalent medication) and sole-supply tendering (when PHARMAC tenders to get the best price for a generic substitute when a drug patent expires). This has resulted in a condition where the cost of a single statin (a cholesterol-lowering agent) tablet is about 5 cents in New Zealand, whereas in Australia the same tablet costs $1 (Duckett & Wilcox 2011).

**CRITICAL THINKING EXERCISE 4.4**

What do you think is the reaction of pharmaceutical companies to reference pricing and competitive tendering? Why has the Australian government not pursued reference pricing and competitive tendering more aggressively?

## Service delivery systems

There are several ways service delivery systems have been conceptualised. Two common approaches include structural and sequential approaches: structural approaches take into account the way health systems are administered or funded (i.e. public health, primary care, hospitals and specialist health services); sequential approaches focus on where the individual journey services are located (i.e. primary care, secondary care and tertiary care). In this chapter a structural conceptualisation is employed using the headings public health, primary health, hospitals, specialised health services and aged and disability care services (see, for example, Duckett & Wilcox 2011).

- **Public health** comprises a wide range of activities, such as creating safer environments (air, water, food), occupational health, reducing the risk of disease transmission and the early identification of diseases, as well as campaigns promoting healthy lifestyles.
- **Primary care** provides 'first-level care' including a wide range of services, such as screening, episodic or acute services, health promotion and services for the chronically ill. Primary care ideally involves multidisciplinary teams.
- **Hospitals** generally provide emergency and acute care services.
- **Specialised health services** include mental health services, sub-acute, transition care and other step-down programs, as well as alcohol and other drug services, and palliative care services.
- **Aged care services and disability services** comprise community care services for the aged and people living with a disability, specialist services for people with impairments, specialist community care for older people and residential aged care.

### Public health

The Australian government has built quality healthcare systems that provide appropriate services to its population. However, in spite of several attempts to strengthen the focus on public health (e.g. the Better Health Commission in the 1980s and the National Public Health Partnership in the 1990s), health promotion has remained an under-developed component of the health system. The health reforms initiated in 2007 sought to address some of these issues with the formation of the Australian National Preventative Health Agency in 2011. The agency was disbanded in mid-2014 by the Abbott government and some of its essential functions were transferred to the Department of Health. In 2011–12 about 1.7% of the total health funding was dedicated to preventative care and health promotion (AIHW 2014c). Current preventative health strategies focus on obesity, diabetes and infectious disease prevention; mental health; cancer screening; tobacco, alcohol/drug consumption; and the promotion of healthier life styles (AIHW 2014c). In addition, the Australian government has launched public health programs aimed at improving the health of the Indigenous populations.

### Primary care

Primary care is the first health service visited by individuals with a health concern. GPs and increasingly nurse practitioners/practice nurses are the 'gatekeepers' of the health

system as they authorise access to other services. The primary care system addresses the bulk of the healthcare needs of Australians. In 2011–12, 84% of Australians consulted a GP at least once (ABS 2013). Medicare provided benefits for 123 million non-referred GP consultations (2011–12 figures) (AIHW 2014a). A significant proportion (about 35%) of all problems managed by GPs relate to chronic illnesses (Duckett & Wilcox 2011). In response, primary healthcare strategies place emphasis on the development of multidisciplinary primary healthcare teams including GPs, nurses, pharmacists and allied health professionals (including physiotherapists, dietitians, psychologists and occupational therapists). About 67% of Australians reported having seen a complementary and alternative healthcare worker during the previous 12 months (National Prescribing Service Ltd 2008). The dispensing of complementary healthcare is under-regulated.

## Hospitals

Australian hospitals are very diverse regarding their ownership, size and range of services offered. In 2012–13, there were 746 public and 592 private hospitals. More than half Australian hospitals (around 71%) are relatively small and operate up to 50 beds (AIHW 2014d). While hospital beds have declined over the last decade—mainly as a result of the shift of long-term occupants out of hospitals, changes in individual management, shorter treatment cycles and increasing treatment of individuals in the community—rates of hospital utilisation have increased because of the impact of new technology and hospital organisation in reducing length of stay (OECD 2014). Waiting times for elective surgery represent one of the key political drivers of hospital policy. Yet the core business of public hospitals is outpatients and non-admitted services, accounting for more than four times the volume (about 46 million separations) compared to emergency department and inpatient admissions in Australia (AIHW 2014d).

## Specialised health services

Specialised health services include sub-acute and transition care services such as stroke recovery, rehabilitation services and palliative care. They involve multidisciplinary teams providing rehabilitation, aids and equipment, alcohol and drug programs, and mental health services in hospital and community-based settings. They have the capacity to considerably reduce re-admissions of individuals to the acute system. About two-thirds of all rehabilitative care is provided in a hospital setting. Over the past two decades, the most significant reform of mental health was the mainstreaming and de-institutionalisation of services, replacing psychiatric hospitals with community-based mental health and general hospital services, and integrating mental healthcare into different settings. This was in part framed by the first National Mental Health Strategy adopted by governments in 1992 and the opening up of the Medical Benefits Schedule to mental health under the Better Outcomes in Mental Healthcare initiative. However, the outcomes of these reforms have been inconsistent, in part due to the lack of funding in the sector. In response to stakeholder concerns, the Australian federal government recently appointed a National Mental Health Commission with the remit to conduct a comprehensive review of mental health services. Moreover, the government has pledged funding for research and the expansion of the 'headspace' youth mental health centres across Australia.

### CRITICAL THINKING EXERCISE 4.5

Imagine that a 75-year-old woman with complex care and substantial rehabilitation needs resulting from a hip fracture is discharged from hospital. What are the professional groups and services that should assist her on her journey back to being self-sufficient in her own home? What happens if these professionals fail to collaborate effectively?

## Aged and disability care services

Australia's aged and disability care systems operate largely in isolation from each other. The aged care system is structured around two main forms of care delivery. It is comprised of 186 000 residential care (accommodation and various levels of nursing and/or personal care) places and 60 000 community care packages (ranging from delivered meals, home help and transport to intensive coordinated care packages for people who otherwise would need residential care). There is a substantial shortfall between the size of the eligible target populations and level of service provision (Duckett & Wilcox 2011). Residential services are mainly operated by the non-government sector, with about 60% being operated by religious and charitable organisations. Both public and non-government (mostly religious and charitable) sector organisations provide community care services under the Commonwealth-funded packaged care (Levels 1–4). From 1 July 2015, community aged care service providers are required to deliver services within a 'consumer-directed care' framework. Refer to Chapter 15 for further discussion of aged care packages.

### CRITICAL THINKING EXERCISE 4.6

Compare how many packages the Commonwealth allocates to residential and community aged care. Out of 1000 people aged 70 or over, how many do you think would require community aged care assistance? Hint: About one-quarter of all older people are living with a severe or profound disability. Why, in your view, is the Commonwealth funding so few community aged care packages?

There are a large number of packaged care arrangements for people with an impairment. These packaged care arrangements are under the governance of state and territory governments and are delivered by private sector or not-for-profit agencies. The Commonwealth government is beginning to

take carriage of these packages in the form of the National Disability Insurance Scheme (NDIS) formed in 2013. The NDIS provides access to individualised support funding for people with disabilities. Under the scheme, resources are made available as an entitlement and not as a welfare benefit. The NDIS is being rolled out across Australia in stages with seven trial sites currently in operation. It is envisaged that by 2019 the NDIS will be fully rolled out.

## Integrated care

**Integrated care** is a policy response to the rising prevalence of chronic disease. While the prevalence of deaths resulting from some chronic diseases such as coronary heart disease, stroke and respiratory illnesses has decreased over the past decades, the prevalence of other chronic diseases such as diabetes and chronic kidney disease have remained largely unchanged or, as in the case of obesity, have increased in recent years (AIHW 2014e). More importantly still, researchers have highlighted the fact that multimorbidity is quite common and that many Australians, and particularly older people, have more than one chronic illness. For example, of 9156 individuals presenting at a primary care clinic in 2005–06, 23.3% had one chronic illness and 37.1% had more than one chronic illness (Britt et al 2008). In the same study, 75% of people aged 65–74 were classified as having a multimorbidity. Also, 58.2% of those aged 75 or older had three or more, and 33.4% had more than four chronic illnesses. In an AIHW-commissioned report, based on the BEACH (Bettering the Evaluation And Care of Health) study involving 97 800 encounters with GPs, Britt and colleagues state that chronic problems accounted for 36% of the encounters and that over half of all chronic problems managed by GPs were hypertension (15.4%), diabetes (7.6%), depressive disorders (7.3%), arthritis (6.8%), lipid disorders (6%), oesophageal disease (4.7%) and asthma (3.9%) (Britt et al 2013). In the same study, around 60% of presentations involved overweight or obese adults (Britt et al 2013). The management of chronic diseases and, particularly, multiple chronic diseases has a strong relational and educational component; its main focus is on maintaining or restoring function and the prevention of complications that would require admission to an acute care setting. Keeping this in mind, it becomes evident that chronic disease management benefits from a different care regime than the one available in a conventional acute care setting. Integrated care is widely seen as a solution to this problem.

Australia's primary care-focused integrated care strategy was ratified in 2005. Australia's approach emphasises collaborative care as well as financial incentives for GPs to develop coordinated chronic disease management plans involving, where appropriate, team care arrangements (National Health Priority Action Council 2006). The Chronic Care Model (CCM) developed by Wagner has become the template for chronic disease management in many Australian jurisdictions. The evidence underpinning the CCM, updated to accommodate evidence on the management of multiple conditions, suggests that effective chronic disease management should be based on ongoing self-management support; the use of multidisciplinary teams including lay persons; targeted assessment and interventions; shared decision making; a non-judgmental approach; guideline-based case management; collaborative goal setting and problem solving; interventions improving individual self-efficacy; and linkages to evidence-based community-based self-management programs (Battersby et al 2010).

## Multidisciplinary teams

The rationale for involving **multidisciplinary teams** and/or the establishment of service provider networks in chronic disease management is based on the insight that the multifaceted risk factors underpinning chronic disease can be better addressed by a range of professional groups than by one single professional. As a result, comprehensive primary care should, alongside general practitioners, include other disciplines, such as nursing, allied health and social work. Indeed, recent attempts to reform Australia's primary care system have focused on the expansion of skill mixes. The composition of multidisciplinary care teams can vary considerably and depends largely on the chronic disease profile(s), as well as environmental, psychological and social determinants.

### CRITICAL THINKING EXERCISE 4.7

Think about an individual with Motor Neuron Disease (MND). What roles would a multidisciplinary team caring for this individual comprise?

### CRITICAL THINKING EXERCISE 4.8

There is growing evidence that an effective management of multimorbidities requires the involvement of an interdisciplinary team. Reflect on the extent to which such teams have been implemented within a primary health setting you are familiar with. To what degree do you think such teams are available in Australia?

Only a small percentage (around 10%) of individuals who would benefit from a referral to other service providers for more intensive interventions are being referred by GPs (Harris & Lloyd 2012) (see Clinical Interest Box 4.2 and Case Study 4.2).

## Key challenges

### Ageing of the population

The number of Australians over age 65 is increasing more rapidly than that of the general population. In 2006, people aged 65 and older made up 13% of the Australian population. It is expected that this will nearly double (to 24%) over the coming 30 years (AIHW 2007). Furthermore, the increased longevity in Australia is resulting in a marked growth in the numbers of people aged 85 or older. In 2006, people aged 85 and older made up 1.6% (double that of 1986 figures) of the Australian population, a figure that is projected to increase to 5.1% by 2050 (Productivity Commission 2011). This

## CLINICAL INTEREST BOX 4.2
## Referral to other service providers by GPs

In 2009, of 74.1% of individuals whose assessment revealed nutrition issues, 29.9% were given preventative advice, 8.3% were referred to dietitian or other services and 7.3% attended a nutrition-focused program (Harris & Lloyd 2012). It is not uncommon for GPs to express doubt about the effectiveness of referral options and a preference for managing individuals within their own practice. Other barriers include ill-defined communication pathways, waiting lists for certain public services, delayed access to group programs, suitability of time and place of programs and lack of individual acceptance of referral options. By ensuring that an individual is referred to an appropriate network of services beyond the general practice, you have the capacity to contribute towards their wellbeing.

## CASE STUDY 4.2

Joan is an Enrolled Nurse working for a regional community aged care provider. Joan is asked to coordinate the care of Harold Blakey (83), who lives in Tubbut with his son Michael. Tubbut is a village located at the border of the Snowy River National Park. Michael is employed as a park ranger and is home only on weekends. Harold has been recently discharged from hospital step-down services after a fall that fractured his hip. Harold requires extensive support as he is still not mobile enough to care for himself. Having met Harold, Joan forms the opinion that his fall could have been the result of Harold's poorly managed diabetes and that he still requires further physiotherapy. There are no health or aged care services available in Tubbut. The nearest service providers are in Buchan or Orbost (where Joan is located), both around 4 hours drive from Tubbut. Harold cannot physically get to Orbost as there is no public transport. What is an appropriate course of action for Joan to take? Think about developing a collaborative approach and check your answer against the national decision-making framework.

Put yourself in Joan's shoes. What would be your course of action? Are you authorised? Do you have the required education and experience to provide diabetes education and physiotherapy?

demographic shift is associated with increases in the prevalence of multimorbid health conditions, neurodegenerative diseases and related care needs that, in turn, might impact on healthcare costs (Britt et al 2008; Harrison et al 2013; AIHW 2014e). Multimorbidity is increasingly common in primary care and is associated with increased healthcare utilisation and cost across the healthcare system (Glynn et al 2011; Marengoni et al 2011; Bock et al 2014). (See Clinical Interest Box 4.3 and Figure 4.2.)

## CLINICAL INTEREST BOX 4.3
## Healthcare expenditure in Australia

Health expenditure as a percentage of GDP in Australia has increased steadily, rising from about 6.5% in 1975–76 to 9.7% in 2012–13 (see Figure 4.2). It is expected to continue growing mainly due to the increase in chronic disease, the ageing population, new medical technologies, rising incomes and changing consumer expectations (AIHW 2014b; Productivity Commission 2015).

### Equity of access

As waiting lists for elective surgery and out-of-pocket expenses for individuals increase, and as more people who can afford it take up private health cover, access to health services is becoming less equitable. Well-educated citizens with the purchasing power to access private health insurance tend to be healthier than their less privileged counterparts (Armstrong et al 2007). A recent government-sponsored survey revealed that 6% of Australians delayed seeing a GP during 2009, 10% delayed seeing a specialist and 9% did not buy prescription medication because of cost (ABS 2010). The health of some Aboriginal and Torres Strait Islander communities is particularly precarious. The reasons for this are complex and are strongly shaped by the colonisation process which led to spiritual and material dispossession, low socioeconomic status, poor physical environments, substance abuse and other issues (Burgess et al 2005).

Other population groups, such as people living with a disability, are also disadvantaged. People living with a disability tend to have higher health needs due to multiple comorbidities. Yet health promotion and prevention activities seldom target people with disabilities. Moreover, people with disabilities have less access to health services due to a lack of affordability, limited availability of appropriate services and physical barriers, as well as lack of appropriately skilled health workers (WHO 2011b).

### Quality of care

Adverse events, medical errors and lack of continuity of care all contribute to poor quality outcomes (Armstrong et al 2007). In 2006–07 about 17% of hospital admissions in Victoria led to conditions acquired in hospital that required treatment (McNair et al 2009) and a similar percentage of Australians with significant illnesses believed that they had experienced a medical error during the previous two years (Schoen et al 2005). In 2013–14 a total of 57 individuals in the care of Melbourne health facilities experienced a critical incident, 773 minimal harm and 1775 a near miss without harm due to medication error (Melbourne Health 2014). Quality measures are essential for the improvement of healthcare outcomes. See Chapter 7 for more information on safety and quality.

## Efficiency and effectiveness

Despite significant improvements in efficiency over the past few decades, inefficiencies persist in a number of areas in the healthcare system. For example, financing arrangements encourage overinvestment in Medicare-funded services, often at the expense of more effective or cheaper services (Duckett & Wilcox 2011). Also, several recent reports have pointed out that a significant number of hospitalisations could be avoided or hospital stays could be shortened (National Health and Hospitals Reform Commission 2009). To address this, one of the key points in health reform is the better integration of health and social care services. Integrated care depends on the coordinated collaboration of a wide range of health professionals or 'networks' working in different domains of the health system (Hudson 2007). Most countries are working towards building organisational and managerial structures geared to produce a seamless integration of services across the service spectrum, from disease prevention through primary and community care to hospital care.

## Acceptability of services

The past three decades have seen the rise of health consumer movements in Australia, suggesting a greater popular awareness and attitudinal change regarding healthcare. While the Australian healthcare system is more responsive to consumer preferences and individual engagement than that of comparable countries, many voters think that the quality of services provided by the healthcare system is unacceptable. Overall, about 20% of Australians believe that the healthcare system needs to be completely overhauled and about half of the surveyed population thinks that fundamental changes are required (Duckett & Wilcox 2011).

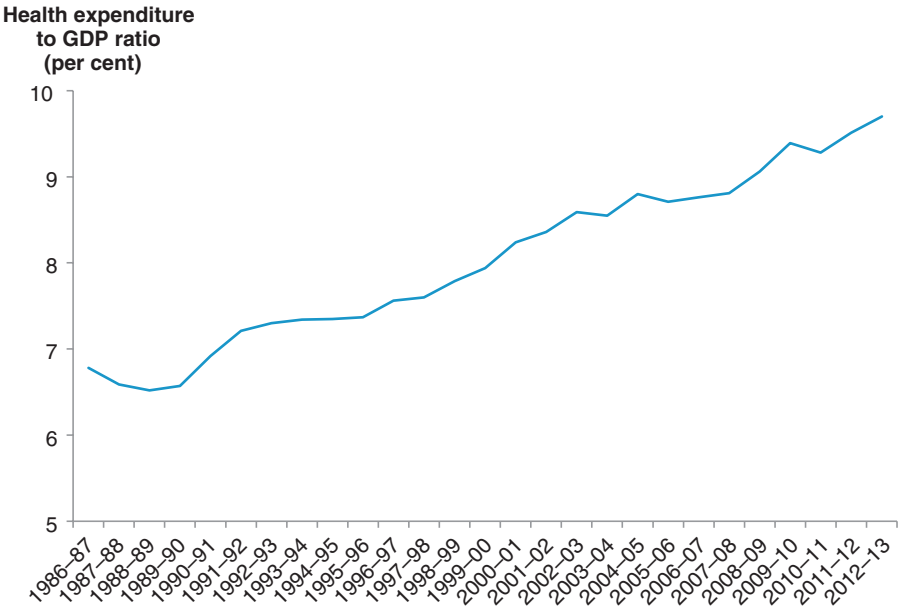


**Figure 4.2** Health expenditure ratio to GDP, Australia 1986–87 to 2012–13
(*AIHW 2014b*)

## Summary

This chapter provides an overview of the common building blocks of healthcare systems as developed by WHO. Following WHO's conceptualisation of a healthcare system, the chapter focuses on leadership and governance, health financing, core medical products and technologies, health information systems, the health workforce and health services delivery. The chapter also canvasses the development of quality standards and provides an overview of current approaches. Lastly, the chapter focuses on key issues facing Australian policy makers and healthcare professionals over the coming decades.

## Review Questions

1. What is the impact of a sub-standard healthcare system on the population of a country?
2. What is the Chronic Care Model and what are its key components?
3. What are the key challenges that will affect the healthcare system over the coming decades?
4. What is integrated care and why is it important?

*Continued*

5. What are the different funding responsibilities of the Australian Commonwealth and state and territory governments in relation to health services?
6. Why is e-health regarded as essential to the healthcare system?
7. Why was little progress made over the past decade implementing e-health in Australia?
8. Which levels of Australian government have a role in funding coordinated care for older people with chronic conditions?
9. What are the key challenges regarding the health workforce over the coming decade?
10. Which groups of Australians have a record of poor health status?
11. How is the Australian Medicare system financed?
12. What is the role and function of the PBS?
13. Identify the differences between the five levels of the healthcare services delivery system.
14. Who are the most important stakeholders within the healthcare system and what are your responsibilities regarding these stakeholders?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

For more detailed information about WHO's healthcare system building blocks, see the following websites:

www.who.int/mediacentre/factsheets/fs319/en/index.html

www.who.int/mediacentre/factsheets/fs325/en/index.html

www.who.int/topics/health_systems/factsheets/en/index.html

www.wpro.who.int/sites/hsd/

For a resource providing a basic understanding of key components of the Australian health system see:

www.ourhealth.org.au

CHAPTER 5

# Nursing informatics and technology in healthcare

*Robert M Ribbons*

## KEY TERMS

email
protocol
browser
hardware
random access memory (RAM)
business analyst
health informatics
read only memory (ROM)
central processing unit (CPU)
hospital information system (HIS)
social networks
clinical information system (CIS)
local area networks (LANs)
software
management information system (MIS)
spreadsheet
convergent technology
telehealth
telenursing
data standards
nursing minimum data sets
universal serial bus (USB)
database
Personally Controlled Electronic Health Record (PCEHR)
e-health
picture archiving and communication system (PACS)
world wide web (WWW)
electronic health record (EHR)

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define informatics, health informatics and nursing informatics
- List a brief history of computers and computing
- Discuss the fundamentals of information technology including concepts of hardware and software
- Discuss the role of the internet and world wide web in contemporary healthcare
- Demonstrate a beginning understanding of how specific software application (e.g. word processing, spreadsheet, database, presentation and statistics) may be applied to nursing practice, administration, education and research
- Describe the role of database, communication and network technology in the development, implementation and utilisation of information systems
- Understand issues related to informatics ethics, privacy and confidentiality
- Demonstrate a beginning understanding of the role of computer and network security in maintaining health information system integrity
- Describe the need for data standards and nursing minimum data sets
- Demonstrate an understanding of current trends in e-health including the use of social media and how they influence the development, implementation and utilisation of information systems
- Discuss specific clinical, administration, education and research information systems and determine their role in improving nursing care

## CHAPTER FOCUS

Today, the provision of effective healthcare by multidisciplinary teams requires access to timely, accurate health information data. As the electronic health record (EHR) becomes the source of health information and aids in the planning of individual care, it is essential that any health data generated is able to be collected, exchanged, stored and retrieved from healthcare information systems. In this increasingly technology-driven healthcare environment, nursing professionals will be required to possess not only computer literacy but, more importantly, information literacy skills.

This chapter examines the relationships between computers, information technologies and the provision of nursing care. Nursing graduates, both enrolled and registered, need to be cognisant of contemporary issues in nursing informatics and possess skills in the use of information technologies in healthcare settings.

## LIVED EXPERIENCE

I went to a seminar recently about digital hospitals. In this talk they discussed that individuals being admitted to a digital hospital will have a bar code on their identification band. Nurses will have smartphones and will scan the bar code and up on the phone will come all the individual's details, care plan, medications, medical and nursing history! These hospitals will be silent, with all messages and alerts coming up on the smartphones. Nurses will be able to find equipment—by searching on the phone—which will inform the nurse where the piece of equipment is, instead of looking everywhere for it in the hospital and phoning around wards. It sounded like something out of a James Bond movie. The emerging technologies in health are amazing!

**Siobhan Krikori, Enrolled Nurse, Acute Care Facility**

## AN INTRODUCTION TO NURSING INFORMATICS

It is hard to imagine conducting a transaction with a bank, purchasing an airline ticket or doing the grocery shopping without some involvement of computers or information technology. Information technology (IT) refers to all forms of technology used to create, store, exchange and use data, information and knowledge (Hebda & Czar 2013). IT essentially provides the infrastructure for a networked economy and in doing so forms a highly widespread component of modern society. It is so ubiquitous that often individuals are unaware of their interaction with the technology. In many respects, IT is not only taken for granted, it is expected. IT has made life easier and more convenient. At the same time, some might say it has made our lives more complex. One only needs to think how email has impacted the workplace. We are now inundated with information, much of it superfluous, but all of it requiring some form of attention.

The use of computers and information technology as a way of managing health information is also becoming almost ubiquitous (Weiser 1991) and has been the impetus for the rapid evolution of nursing and health informatics in the past few years. The development of information systems within healthcare usually involves a range of health professionals and their different practices such that we often see a number of healthcare professionals involved in the development of information systems.

**Health informatics** involves a wide collection of health professionals including doctors, nurses, radiographers, pharmacists, physiotherapists, health information managers, clinical researchers, administrators and computing professionals.

Nursing informatics works within the broader context of health informatics. In other words, nursing informatics is a sub-group of health informatics which deals with nursing-specific issues. Medical informatics is another sub-group comprised largely of doctors and dealing with health data from a medical perspective. Nursing informatics is a relatively new specialty and was first recognised as a specialty by the American Nurses Association in 1992 (Hebda & Czar 2013).

Graves and Corcoran (1989) defined nursing informatics as 'a combination of computer science, information science, and nursing science designed to assist in the management and processing of nursing data, information and knowledge to support the practice of nursing and the delivery of nursing care' (p. 227). In essence, nursing informatics is an amalgam of nursing science, information science and computer science for the purpose of managing health information to enhance the provision of quality healthcare.

Nursing informatics has had a somewhat difficult beginning and although it has been recognised as a nursing specialty for the past three decades, many nurses still do not understand the nature of this discipline. The definitions of nursing informatics have changed over time to reflect the developments in nursing practice and technologies. The most widely accepted definition now comes from the International Medical Informatics Association—Nursing Informatics (IMIA-NI) group who defined nursing informatics as 'science and practice (that) integrates nursing, its information and

knowledge, with management of information and communication technologies to promote the health of people, families, and communities worldwide' (American Medical Informatics Association 2015).

In their various roles and specialty areas, nurses handle large volumes of data; nursing informatics is concerned with all aspects of this. For example, it encompasses all aspects of access, retrieval and efficient use of data, information and knowledge to support decision making, which in turn enhances the quality, effectiveness and efficiency of nursing care. While information and communications technology is essential to nursing practice to support the development and dissemination of new knowledge, it can also support and empower an individual's decision making and healthcare choices (Conrick 2006). Nursing informatics offers a range of tools that assist in advancing nursing as a professional research-based discipline (Hebda & Czar 2013). Improved database technology enables the timely collection, storage and analysis of vast amounts of data. This is made available and retrievable as information in a manner that nurses require it to support their practice. It also allows nurses to critically review their practices based on the evidence that can be provided by these systems.

The role of nurses in an informatics context can vary from the routine user at the clinical interface, to a superuser assisting in the implementation of systems, to application specialists, system administrators and **business analysts**. In the US, suitably credentialled nurses holding postgraduate qualifications in informatics are able to take on the role of informatics nurse specialist (Hebda & Czar 2013). Recently, the Health Informatics Society of Australia, the Health Information Management Association of Australia and the Australasian College of Health Informatics have established an Australian informatics certification program in order to address the lack of formal recognition of health informatics knowledge and skills in Australia. The Certified Health Informatician Australasia (CHIA) certification ensures candidates are able to demonstrate the application of a number of health informatics core competencies to perform safely and effectively as a health informatics professional in a broad range of practice settings (Health Informatics Society Australia 2015).

## A BRIEF HISTORY OF COMPUTERS AND INFORMATION TECHNOLOGY

The history of computing can be traced back to around 5000 BC with the use of Persian clay boards. The abacus has been in use in China since around 2000–3000 BC (and is still in use today). However, the genesis of the computer as we know it today originates in 1642 with the invention of Pascal's mechanical counter. This device was able to add, subtract, multiply and divide much like a modern day calculator but with fewer functions. The history of modern computing could be considered as dating back to the 19th century when Charles Babbage created a mechanical mathematical problem-solving device and Herman Hollerith developed a punch card system where data analysis was carried out by passing long needles through trays of punch cards (Cesnik 1996). The impetus for the development of electronic computers came from the time of the World War II in the 1940s (Cesnik 1996) with the development of the electronic numerical integrator and computer (ENIAC), the first of such computers. Table 5.1 illustrates the development of computing from the 17th Century through to modern day.

Any cursory examination of the timeline of the development of computer and information technology will reveal the increasing speed of technological development. Technologies that did not exist a few years ago, such as Google Streetview, Facebook, Snapchat and Instagram, are today part of everyday life. In short, the pace of technological development continues to increase exponentially. Given the speed of development, the concept of ubiquitous computing, a notion first coined by Mark Weiser in 1991, could well become a reality in just a few years. Weiser observed that 'The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it' (Weiser 1991:94). Ubiquitous computing is comparable to writing with pencil and paper. This form of information technology is everywhere and barely requires active attention. Imagine a situation in which the use of a computer is as simple and accessible as jotting a message on a Post-it Note. Imagine the implications of this form of technology for nursing care.

## FUNDAMENTALS OF COMPUTER SYSTEMS

There is little doubt that nursing faces a plethora of opportunities and challenges in the next few years. Many of these will come in the form of increasing demands for improvements in quality and cost effective care. These demands will emanate from government, society and our colleagues in other health disciplines. Nursing needs to be in a position to address these issues within the context of an increasingly information-intensive environment. Before discussing information systems in more detail we will discuss a few fundamental computing concepts.

### Hardware

**Hardware** refers to the physical components of a computer system. Today computer systems consist of a **central processing unit (CPU)** and a variety of input and output devices. The CPU is the 'brain' of the computer and is the component that executes instructions in the form of programs, coordinates the flow of data from input devices and to output devices and directs the storage of data in memory. Memory is a temporary storage area for data and consists of **read only memory (ROM)** and **random access memory (RAM)**. ROM is a permanent (non-volatile) form of memory that remains even when the power is turned off. RAM, on the other hand, is volatile which means it requires the computer

**TABLE 5.1 | The history of computers**

| Year | Classification | Key feature |
|---|---|---|
| 1642 | Pascal's mechanical counter.<br>Pre-electrical calculator | Mechanical calculation using wheels and cogs |
| 1837 | Babbage's analytical engine pre-electrical computer | Used punched cards to execute instructions |
| 1944 | IBM Harvard Mark 1 | First large-scale digital computer |
| 1946 | ENIAC | Post-war computer capable of 5000 calculations per second |
| 1951–58 | First generation computers | Vacuum tube<br>Mainframe |
| 1959–64 | Second generation | Punch cards<br>Magnetic tape<br>Mainframe |
| 1965–74 | Third generation | Integrated circuits<br>Storage increased processing speeds |
| 1975–80 | Early fourth generation | Chemical etching onto a single silicon wafer chip<br>Apple II microcomputer |
| 1980s | Fourth generation | Mac, Apple, IBM PC (1982) |
| 1980s and 1990s | Fourth generation | Continued development of Intel chip sets |
| Late 1990s | Smaller reliable servers<br>Low cost PCs | WANs<br>The internet and WWW wireless technology |
| 1998 | Apple iMac | All-in-one design (computer built into monitor casing) |
| 2000 | Fifth generation | Artificial intelligence<br>Millennium bug<br>1 GHz Pentium |
| 2010 | Low-cost mobile devices | iPhone, iPad, android, tablet computers |
| 2015 | Wearable computing | Google Glass, Smart watch |
| 2020 and beyond | Ubiquitous computing | Computing can occur anywhere, in any format on any device |

*(Adapted from The Centre for Computing History 2014)*

to be switched on. When using a computer, it is RAM that allows programs such as a word processor or **spreadsheet** to be used. Both these forms of memory are referred to as primary storage. Another commonly used form of memory is called secondary storage. Secondary storage provides permanent storage of data and includes hard disk drives (HDDs), magnetic tape drives, compact disks (CDs), digital video disks (DVDs), Blu-ray, **universal serial bus (USB)** and cloud storage (data stored on the internet).

A computer will have a number of associated devices that allow for data to be captured (input device) or 'displayed' (output device). Input devices such as a keyboard, a mouse and a scanner and touch screen will be familiar. You will also be familiar with at least one example of source data automation from your visits to the supermarket, and many hospitals utilise barcoding to track supplies and identify individuals. Microphones, scanners and digital cameras are also input devices. There may also be technologies that you have not had the opportunity to interact with (e.g. voice recognition, radio frequency identification (RFID) and biometric recognition).

Having input data into a computer system we expect some form of output, most commonly via a monitor or a printer. However, as with input devices, there is a wide range of output devices. These include video data projectors, voice output, interactive whiteboards and music and other sound output devices.

Computers may be classified according to their size, although as Sewell and Thede (2013) commented, such classification is becoming much more difficult as new smaller computers are able to carry out the same and perhaps more functions than the bigger computers. Computer categories include:

Supercomputers: supercomputers are the most powerful computers, capable of carrying out complex and extensive mathematical calculations and processing millions of instructions per second. They focus on one task at a time, for example weather forecasting

Servers: the term 'server' is sometimes used to describe these increasingly compact units. A large healthcare organisation will typically have a series of 'servers'. Users initially interacted with a mainframe via a 'dumb terminal' but these have been replaced with thin individual PCs or desktop computers and, in a wireless (WiFi) network situation, a laptop, workstation on wheels (WOWs; Figure 5.1), notebook, iPad, tablet or smartphone to provide point of care (POC) computing

- Minicomputers: the minicomputer, with some of the processing power of the mainframe, allowed for multiple users, but was smaller and less expensive. Microcomputers were in common use in healthcare settings in the 1980s and 1990s and could be found in radiology and pathology departments
- Personal computers: personal computers (PCs) are microcomputers which are also referred to as desktop computers. PCs have an entire processing unit on one microprocessing chip. PCs may function independently or in a network situation such as when the PC may be connected to servers and other PCs
- Laptop computers/notebooks: the laptop/notebook is a version of a PC that is transportable and small enough to sit on the user's lap. Laptops are now smaller and more intelligent, and are commonly referred to as 'notebook' computers. The laptop/notebook may be plugged into a docking station on a desk which then allows for utilisation of a larger screen, keyboard and storage space, as well as connection to the Internet. in many healthcare settings these devises are mounted on trolleys to provide increased convenience and greater mobility in WiFi networks
- Wireless tablets: in a clinical environment the wireless tablet is often seen as a 'ruggedised' device roughly the size of a large laptop and usually weighing about 1 kg. These devices (such as the Motion by Xplore C5M, illustrated in Figure 5.2) are designed to withstand the rigors of use at the bedside. They can be cleaned using agents such as isopropyl alcohol and can withstand the bumps and drops that occur frequently in clinical settings. Tablets are now considered as having even greater utility than WOWs for point-of-care data entry in healthcare with their larger screens, the facilities for handwriting, individual ID scanning and digital photography functions
- iPads, iPhones and smart phones: these devices are essentially a **convergent technology** that provide computing, email, networking, voice recognition and internet connectivity. A number of healthcare applications (such as ECGs and picture archiving and communication systems) can download visual images to smartphones. This provides clinicians with the ability to review data about individuals anywhere at any time.

**Figure 5.1** Workstation on wheels
*(Source: © InterMetro Industries Corporation)*

## Software

**Software** refers to the set of instructions that operate the computer, directing the hardware to perform various tasks. Software is written in specific programming languages such as C, C++, Basic, Visual Basic, Java and SQL. Each of these languages is used to compile various programs or applications which then perform the various functions on a computer. Software can be divided into operating system software or application software.

**Figure 5.2** Motion by Xplore C5M
*(Reprinted with permission from Xplore Technologies Corporation of America. Photographer: Scott Van Osdol. © 2010)*

Operating systems are 'software in the background'. They consist of a number of programs that control the function of the computer (Sewell & Thede 2013). Application software systems are programs designed for a particular task such as word processing, rendering graphics or searching the internet. While even novice computer users tend to be familiar with application software such as word processing, operating system software tends to be less well understood.

The operating system (OS) holds the logic that controls the internal function of the computer and acts as a 'system manager'. It is responsible for directing the execution of programs that operate input and output devices (such as the keyboard, monitor and printer) and resource allocation such as multiprogramming. The OS acts as a bridge between the application software systems.

A user interface determines how the user interacts with the operating system in order to use the application software. The user interface may be MS DOS, characterised by prompts and command lines, or a graphic user interface (GUI) (e.g. Microsoft Windows and MacOS). Windows-based GUI operating systems feature icons and pop-up/pull-down menus. The term platform is used to refer to a combination of hardware and operating system software. An example of a platform would be Microsoft Windows with an Intel-based PC.

Microsoft Windows operating systems for professional use began with Windows 95. Subsequent generations are Windows 98, 2000, NT (New Technology), ME (Millennium Edition), XP and CE (Consumer Electronics). Microsoft Windows OS for home use began with Windows 95, followed by Windows 98, ME and XP. The latest operating systems from Microsoft are Windows Vista, Windows 7, Windows 8 and Windows 10.

The Macintosh operating system MacOS (1984) was the first commercial GUI. The most recent series of Mac operating systems have been OS7, OS8 released in 1997 and OS9, released in 1999. The most current MacOS is OS10.10, released in 2014. LINUX is another operating system that is popular with users who prefer to customise their computer or who may like to have a choice of operating systems. LINUX is categorised as open source software.

# FUNDAMENTALS OF INFORMATION SYSTEMS

The use of information systems can result in a number of benefits for nurses. These include the provision of data at the bedside for more informed decision making, the ability to establish workgroups, sharing data and expensive hardware and software, a reduction in the risk of data loss and reduced errors. Information systems can now store virtually unlimited data for administrative and clinical applications which can track individuals throughout a hospital stay and across geographical boundaries thanks to advances in standards and interoperability (Conrick 2006; Jonas 2013).

Information systems consist of hardware and software used to convert data into information in order to provide a solution to a particular problem (Hebda & Czar 2013). In a healthcare environment information systems generally consist of hospital information systems (HIS), administration information systems (incorporating human resources, accounting, scheduling and ancillary systems) and clinical information systems (CIS). All these systems rely on computer networks to function. These networks require a number of computers and other devices to be linked in some way.

## Hospital information systems

**Hospital information systems (HIS)** are used as the core of information for healthcare organisations. They provide critical data on individuals which other organisational computer systems are able to utilise. In many cases, the HIS is built around the patient administration system (PAS) or patient master index (PMI). These systems contain demographic information of an individual; their Medicare or Department of Veterans Affairs number; health record or UR number; information relating to their admission and discharge history; and current admission status, including treating doctor, admitting doctor, ward, bed number, next of kin, health insurance status and billing information to name but a few.

## Management information systems

The **management information system (MIS)** draws data from the PAS in order to assist management in the day-to-day running of the organisation and in future strategic planning. These systems are able to determine trends in service provision and resource utilisation. This assists all levels of management in the process of decision making. Nurse unit managers, for example, are better able to predict staffing requirements. Asset managers are able to determine when specific capital works will be required while quality and finance managers are able to monitor the effectiveness of the system in terms of individual outcomes and the cost of care.

## Clinical information systems

**Clinical information systems (CIS)** are systems which manage clinical data to support individual care and clinical decision making. The CIS is the system used by the majority of healthcare providers within the organisation. The primary goal of any clinical information system is to make information and knowledge available to healthcare providers during the process of care delivery. Data for the CIS is frequently derived from various feeder systems such as laboratory, radiology and pharmacy. The CIS is designed to assist clinicians in the provision of individual care via clinical decision support and by better managing healthcare resources.

Case Study 5.1 explores a scenario about retrieving patient history and records.

Clinical systems are purported to achieve a number of benefits including streamlining clinical workflows and eliminating repetitive tasks that reduce productivity and lead to errors (Aragon Penoyer et al 2014; Encinosa & Jaeyong 2013; Kirkendall et al 2013; Ronquillo 2012). Clinical decision support inherent in many clinical systems acts to safeguard the individual and the clinician, enhancing safe practice.

The CIS consists of a number of components including clinical documentation, order entry, results viewing and medication management. Automated clinical documentation may be incorporated in the CIS and is designed essentially to replace the traditional paper-based record. The purpose of this component of the CIS is to provide the clinician with a more time effective method of documenting individual care. Preloaded document templates provide for local customisation of documents. Standardisation of concepts in clinical documents is achieved through the integration of clinical dictionaries and clinical language systems such as the Systematized Nomenclature of Medicine (SNOMED), the International Classification of Diseases (ICD-10) and the North American Nursing Diagnosis Association (NANDA).

Order entry systems allow clinicians to electronically prescribe medications, order laboratory or radiological investigations or create referrals to other healthcare providers. Order entry systems can also save significant amounts of time as individuals' details do not need to be re-keyed into the service provider system. This also reduces the possibility of data entry mistakes. Figure 5.3 illustrates a well-designed order entry system interface. Abnormal results can be flagged in the CIS by using pre-defined rules—some systems automatically page or text an alert to the responsible clinician. Some systems will automatically re-order an investigation if an abnormal result is returned. Figure 5.4 illustrates the cumulating and subsequent graphing of pathology results in a CIS.

The use of clinical decision support systems (DSS) has been found to increase individual safety by decreasing the frequency of serious medication errors (Charles et al 2014; Encinosa & Jaeyong 2013; Forrester et al 2014; Jones et al 2014; Kirkendall et al 2013). Some of the strategies these decision support systems provide relate to performing error checks, providing relevant information quickly and improving communication to other clinicians.

A medication management system automates both the prescribing and the administration process, resulting in

## CASE STUDY 5.1 TRADITIONAL PAPER-BASED INFORMATION SYSTEMS

Mr Joe Lee is admitted to the emergency department unconscious following a single-vehicle motor traffic accident. Paramedics were able to stabilise his condition at the scene and have diagnosed a closed head injury. The ED staff are able to identify Mr Lee from his driver's licence. The admitting clerk searches the hospital patient administration system for previous admissions. The database reveals Mr Lee had an episode of care 3 years ago for the repair of an inguinal hernia. No other data is available as Mr Lee's history has been sent to the hospital's off-site archiving service.

A request is placed to have the history retrieved from the archive. However, it is 2.30 am and the storage facility is 30 km away. A courier from the storage facility has to be paged and requested to retrieve the history. The courier arrives at the facility and accesses the archive area, where the history was located, and then drives 30 km back to the hospital. All this takes more than 2 hours. In the meantime, the ED staff are 'flying blind' totally unaware of the Mr Lee's past history, allergies or regular medications.

What would have made access easier?

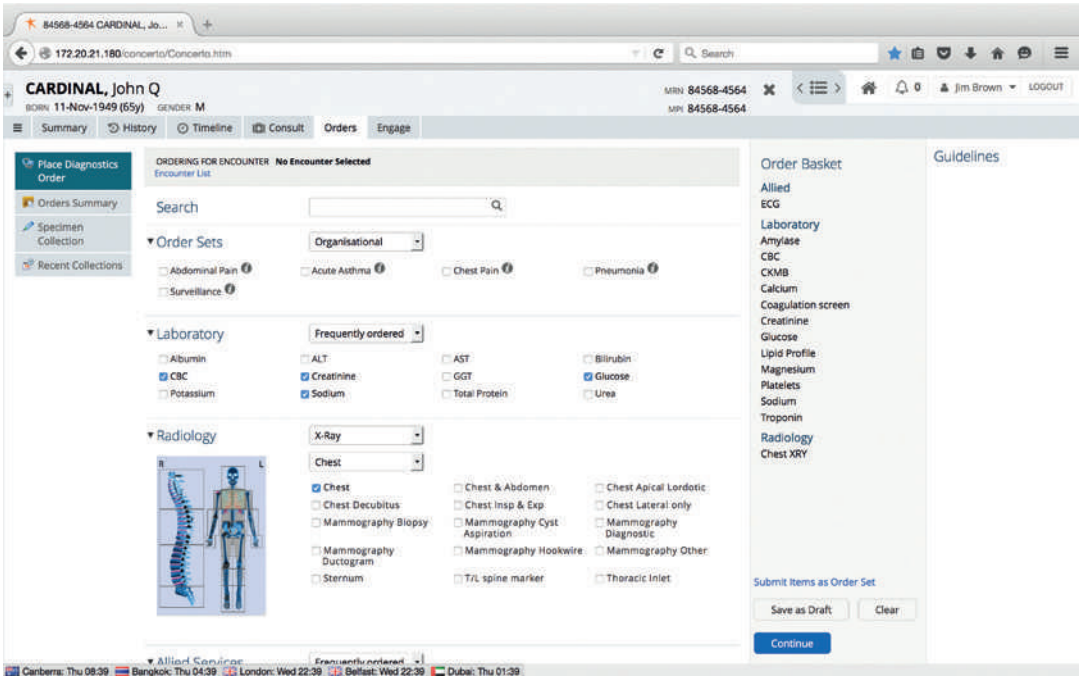


**Figure 5.3** An order entry system interface
*(© 2016 Orion Health)*

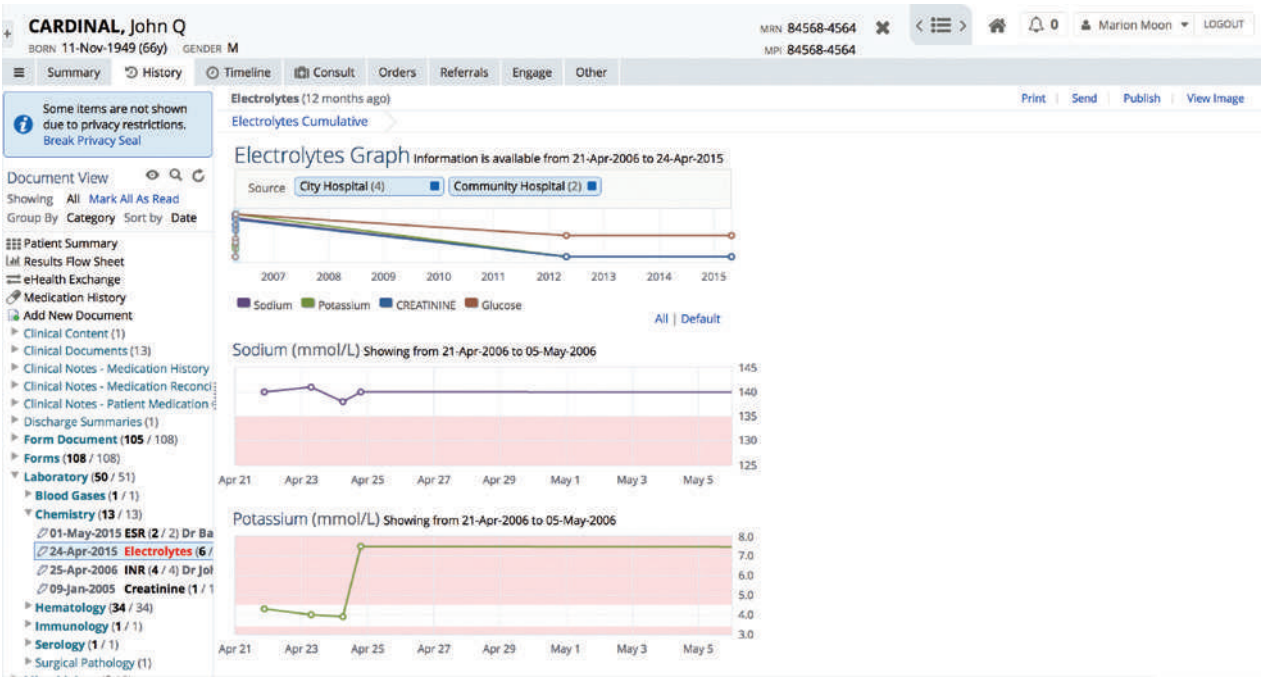


**Figure 5.4** Cumulating and graphing of pathology results in a CIS
*(© 2016 Orion Health)*

tangible improvements in an individual's safety and in the timeliness of medicating individuals (Charles et al 2014; Ghaemmaghami 2014). When coupled with barcode scanning technologies, medication management systems minimise the amount of manual documentation nurses are required to perform when administering medications.

## Ancillary systems

A number of other information systems can be found in many healthcare organisations and might include radiology information systems (RIS), **picture archiving and communications systems (PACS)**, laboratory and pathology systems and pharmacy systems. Often these systems are integrated with the PAS or with the CIS to provide data to or extract data from these systems.

### CRITICAL THINKING EXERCISE 5.1

You are working on a surgical ward. An individual arrives for admission with a number of printouts from web pages relating to their surgery. Some of these suggest alternative therapies to that for which they are scheduled. How do you deal with this situation?

# NETWORKS, COMMUNICATION TECHNOLOGIES, THE INTERNET AND WORLD WIDE WEB

## Network fundamentals

As discussed in the previous section all these systems rely on computer networks to function. These networks require a number of computers and other devices to be linked in some way. The most common form of network link is by twisted pairs of wire call unshielded twisted pair or UTP.

The other common method of connecting networks is by optical fibre. These cables consist of a central optical fibre core. This fibre is usually around the same diameter as a human hair. This central fibre is covered in glass and this layer is then covered with a protective outer layer. Data is converted to light impulses and beamed along the cable. The volume of data that can be transmitted far exceeds other types of cable. Most hospitals and health clinics now use WiFi technologies to support mobile computing applications. WiFi works by connecting the hardwired network to a wireless access point (WAP) which converts data from the hardwired network to a radio signal using a standard protocol for use with wireless (mobile) devices.

The term computer network architecture refers to the general design of both software and hardware within the network. The history of networked computers is based on mainframe technology. Mainframe computers were capable of millions of calculations per second and were used almost exclusively for financial management of hospitals. These systems initially consisted of the mainframe computer connected to a 'dumb' terminal. They were known as this because the terminal (essentially just a screen and keyboard) did not contain a central processing unit. In other words, it was unable to perform any processing functions and was therefore 'dumb'. Since the introduction of these first generation machines there has been a movement towards more sophisticated technology in the form of individual/server computing. In a client/server computing environment, information can be shared between multiple smaller computers known as

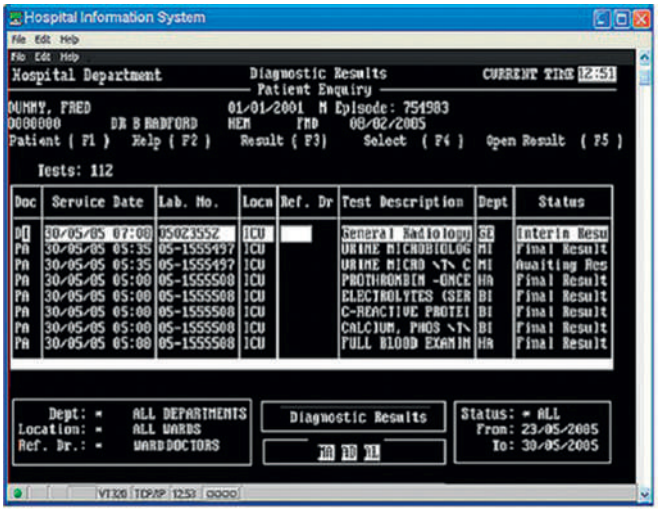


**Figure 5.5** Mock-up of a typical 'dumb terminal' character-based screen
*(R. M. Ribbons)*

clients that are all connected via a network to a powerful host computer known as a server. Figure 5.5 illustrates a 'mock-up' of what a typical 'dumb terminal' character-based screen might look like.

Any connection of computers that are physically close can be regarded as a **local area network (LAN)**. A LAN can exist in a single office with a number of workgroup users or could extend to a number of floors in the same building, the whole building or a number of buildings normally within the same geographical context. LANs can have as few as three or four users or hundreds. LANs are highly reliable even in the face of very high network demands. There are a number of reasons for this reliability. LAN software typically includes operations that detect and correct transmission errors and protect the system from a number of other errors and failures. LANs can also be set up to have backup servers, thus ensuring data is not lost in the event of the primary server failing. Users can continue to work using the secondary server while the primary server is repaired or rebooted.

Another feature of LAN technology is its ability to support a variety of security functions. LAN administrators are able to set levels of access to directories on the system based on user passwords. Some users will have access to directories that others may not even be able to see. Some networks can also utilise data encryption to enhance the security of data sent over LANs. Apart from the computers, a LAN requires three things: network software (e.g. Novell Netware, LANtastic etc.), a means of connecting the computers (e.g. Ethernet, unshielded twisted pair (UTP), fibre optics, wireless infrared or radio frequency) and a communication system or protocol.

## The internet and WWW

The internet is, in the broadest sense, a microcosm of our world. It reflects a vast variety of cultural and societal views and allows people across the planet to share ideas on a personal level never before possible. The internet is essentially a huge network of networks that interconnects computers and mobile devices located all over the world. It does not contain information itself but is the vehicle for transporting the information stored in files or documents on other computers. Some of the computers in the network are known as hosts or servers, because they 'serve' information in various ways to computer owners, known as clients or users. The use of the internet has expanded rapidly. The most recent internet users survey estimates this number to be 3 035 749 340 or 42.3% of the world's population (Miniwatts Marketing Group 2015). The same source in 1995 estimated the number of internet users was just 16 million or 0.4% of the world's population. In January 2015 the internet Domain Survey reported 1 012 706 608 host servers on the internet (Internet Systems Consortium 2015), an increase of 2 454 779 servers compared with the same time in 2014. This compares to 4 852 000 host servers just 10 years ago.

The internet consists of a number of **protocols** that exist in what is known as the application layer. These protocols represent a wide variety of applications, including the file transfer protocol which is used to transfer computer files from one host (computer) to another host over a network, such as the internet. It has been used almost since the inception of the internet to move large files from one computer to another. This is particularly useful when size of the file exceeds the limit of an email attachment. Today, FTP is built into most web browsers. This makes the transfer of files much easier than in the past.

**Email** is perhaps the most frequently used internet protocol (Hebda & Czar 2013). Email provides a communication vehicle that connects people from all over the world quickly and inexpensively. Email is a very convenient way of contacting friends, customers, employees, employers and students. While it might be seen as an efficient way of contacting individuals, the insecure nature of email prevents it from being used in health-related applications.

Hypertext transfer protocol is what makes up the **world wide web (WWW)** or 'the web'. Many people use the terms WWW and the internet interchangeably; however, the WWW is simply one part of the internet. The web is a global service supporting text, graphics, audio, videos and other multimedia content on the internet via hyperlinks. These links provide the user with access to electronic databases, web directories, search engines and online publications and journals via software applications called **browsers**.

Although the web is a sub-set of the internet, in reality, the web is in fact two separate entities. The first, the visible web, is what users access when using standard search engines such as Google, Yahoo, Hotbot or Ask. The second, the invisible or deep web, remains mainly hidden because of the inability of many standard search engines to access the type of material held there. The deep web was first described in 2001 (Bergman 2001) and is the most rapidly growing portion of the internet.

The surface web is a loosely organised collection of billions of documents on thousands of topics, written in

hypertext markup language (HTML). The deep web contains a sizeable proportion of government resources, **databases** and similarly structured materials that are not written in HTML. It is estimated the deep web is 500 times larger than the surface web; it is highly specialised, 95% cost-free and is the largest growth category on the web (Bergman 2001). The collections from the two webs are located on various websites, each containing potentially millions of web pages. These web pages use a variety of multimedia resources with a mixture of text, sound, graphics and video.

The expansion and adoption of the internet and the web have opened up vast communication, information and educational possibilities for the healthcare sector and for nurses. In fact, the web is a rich source of healthcare information for the healthcare consumer and the health professional. Increasingly, both consumers and health professionals are utilising the internet for health-related information. Specific web-based health-related information is increasing at an unprecedented rate. Not surprisingly, with this volume of information on the web, there are serious concerns about the quality, reliability, accuracy, authenticity and currency of health-related sites and the information they disseminate. For health professionals, this means the added responsibility of ensuring that the material accessed for use in professional and individual information is evidence-based and, also, that you as a health professional are able to help consumers assess material that they have accessed themselves. To do this, you will require a good working knowledge of search strategies, search engines, reliable databases and sites, as well as information evaluation tools.

## CONTEMPORARY TECHNOLOGIES AND SOFTWARE APPLICATIONS AND THEIR USE IN HEALTHCARE

The internet is changing all the time. Two things have marked its evolution recently: the social web and mobile technology. These two innovations have changed the way people use the internet. In the social web people have found a new way to communicate. For example, since its creation in 2004, Facebook has grown into a worldwide network of over 1.39 billion subscribers (Zephoria Internet Marketing Solutions 2015). Mobile technology has made possible a much greater reach of the internet, increasing the number of internet users everywhere.

### Social media

The past few years have seen the explosive growth of **social network** services on the web. Social media outlets, platforms and applications, including blogs, social networking sites, video- and photo-sharing sites, and online chat rooms and forums are now very much a part of social interaction. Services such as Facebook, Twitter, LinkedIn, Tumblr, Bebo, MySpace, Google+, Snapchat and Instagram have changed the way people interact online forever. Most social network services are accessed using a web interface or via a short message service (SMS) or mobile device application (app). These services provide a means for users to interact with other users over the internet, using communication tools such as email and instant messaging. Social network services allow individuals to create a representation of themselves on the web, usually in the form of a profile. Social media sites allow users to share ideas, activities, events and interests within their individual networks. Technologies such as Twitter have even been adopted by political parties as a way of connecting with their constituents.

The judicious use of social media can be of benefit in healthcare in a variety of ways. A number of authors have indicated social media is increasingly used to encourage professional connections and promote time-effective communication with individuals and family members (Costello 2014; Farrelly 2014). These networks may also be effective in educating and informing consumers and healthcare professionals (West & Verran 2013).

Nurses are increasingly using blogs, forums and social media sites to share workplace experiences, particularly events that have been challenging or emotionally charged. Sites such as Mahara provide a journalling and portfolio service that is transportable, much like LinkedIn. These technologies have almost become ubiquitous. So much so, that many use these communication platforms almost without thinking. Conversations that may once have remained in the tea room can now be posted and made instantly available on the internet. Nevertheless, once there, it is next to impossible to retrieve let alone delete them. Healthcare professionals using social media for personal or professional purposes must remain cognisant of the danger of inadvertently violating an individual's privacy and confidentiality (Bickhoff 2013).

## ETHICS, SECURITY, PRIVACY AND CONFIDENTIALITY

The privacy of the individual can be defined as the protection of that individual's personal mental and physical condition, to be able to determine what information is collected, how it is used and who has access to it (Hebda & Czar 2013). Individuals expect a certain level of privacy in their daily lives. In our increasingly connected global society, personal privacy is often seen as under threat. There are increasing concerns over the right to determine what information is collected, where it is stored, who has access to it and how this personal information might be used (Hebda & Czar 2013). Any potential threat to personal information has the potential to disrupt an individual's ability to maintain significant relationships that help to define that individual's personality. (See Clinical Interest Box 5.1.)

Confidentiality is an ethical as well as a legal concept. It relates to the disclosure or non-disclosure of information. Historically, a duty to honour confidentiality has been inherent in particular relationships such as between the healthcare provider and an individual (Department of Human Services 2014). Given the importance our Western culture places on privacy, it is not difficult to understand the significance of privacy in the relationship between healthcare provider and

## CLINICAL INTEREST BOX 5.1 Right to privacy

Do you have a right to privacy? While there is no reference to privacy in our Constitution, we do have a legislative right to piracy. The Privacy Act contains 13 Australian Privacy Principles which regulate the way we collect, store, provide access to, use and disclose personal information. The new Principles came into effect on 12 March 2014 and apply to public and private sector entities. The Privacy Act provides you with rights, including:

- Being told generally what kind of information is being collected and how it is to be collected
- Being told generally why your personal information is being collected
- Finding out what information is held about you and have it corrected if it is incorrect, out of date or incomplete; the Freedom of Information Act 1982 also supports this
- Ensuring that your personal information is stored securely and protected from interference or misuse (Department of Human Services 2014).

## CLINICAL INTEREST BOX 5.2 Passwords

Passwords are common tools for regulating access to information systems. These are generally safe if not passed on to others. There are some standard recommendations for selecting and using passwords. These include:

- They have at least six characters
- They combine upper and lower case letters, numbers and other symbols
- They do not contain proper names, people's initials or words taken from the dictionary
- Avoid using reversed words or syllables
- No dates, telephone numbers, vehicle registration numbers or numbers such as Medicare number
- They should never be stored in the computer, and must be kept private
- They need to be changed regularly and not reused for a significant length of time.

*(Hebda & Czar 2013)*

an individual. For example, the *Code of Professional Conduct* states that nurses have a duty to maintain in confidence personal information obtained in a professional capacity.

An effective security plan must be a balance between security of data and access to that data. Decisions regarding the level of security, disaster minimisation and/or recovery, user privileges, use of encryption, multiple passwords, system back-ups and audit trails need to be made as part of the security planning process. An attitude of 'It won't happen here' could leave the organisation vulnerable to significant risk.

With increasing growth in technology, there are people constantly attempting to find ways in which to obtain unauthorised access to information systems, or to corrupt data and information systems. We see this through regular alerts to new viruses and reports of hacking of various computer systems. As more and more health data is computerised, ongoing developments in security are also needed.

To look at data security, a good place to start is with defining people who should have access. This can be achieved in a number of ways. You probably have an ID badge that you wear within your workplace. This tells people that you are authorised to be there. Similarly, keys, badges or plastic cards are one way of limiting who has access to particular areas such as rooms where computers are located (see Clinical Interest Box 5.2). We know, however, that many ward-based computer terminals are located at the nurses' station in a relatively public area. Wearing a badge alone will generally not limit who can access these machines.

A security risk in computing terms is any situation in which there is loss or damage to computer hardware, software, data or information (Vermaat et al 2014). Social networking is a particular threat in terms of the theft of personal information (identity theft). Email is a very common method by which computers are put at risk. Many cybercriminals use malware to package and deliver computer viruses. These computer programs are intended to negatively alter the function of the device onto which it is loaded. Similar forms of malicious programs include:

- Worms. These are often downloaded from email attachments and subsequently copy themselves repeatedly, and are able to move from one infected machine to the next
- Trojan horses. These are malicious programs that purport to be a legitimate program, usually in the form of shareware. Once loaded, Trojan horses reveal themselves and infect the host computer
- Rootkit. These programs hide in an infected computer and allow someone in a remote location to take control of the computer and its functions (Vermaat et al 2014)
- Scareware. Attackers and scammers use online pop-up messages warning the user that their computer is infected. The user is tricked into downloading software to 'fix' the problem. In doing so, the user inadvertently loads a virus, worm or Trojan horse.

There are a number of strategies in place to ensure these risks either do not occur or are limited in their effect. One of the more exciting developments in information security involves the use of biometrics. This science works on measuring specific body characteristics and in doing so can verify whether a person seeking access to an area is in fact that person. Some of the ways in which this is done include fingerprint recognition, retinal scanning, voice recognition or facial recognition (Hebda & Czar 2013; Vermaat et al 2014).

Other means for promoting security of information systems include the use of firewalls, anti-viral software and audit trails:

- Firewalls employ a combination of software and hardware to create a barrier between systems, or different system parts. They increase system protection by blocking unauthorised use such as through hacking. It is also possible to obtain firewalls for individual personal computers to protect against unauthorised access through the internet.
- Antiviral software is commonly available software that searches your computer for viruses and, where possible, eliminates them or provides alternatives for the user. New viruses are always appearing that existing software will not be sensitive to. Consequently, antiviral software needs regular updating. Some companies provide downloaded upgrades from their websites after you initially purchase and install the software package.
- Audit trails allow for the tracking of data flows within a system, allowing for inappropriate use to be identified and addressed. Audits can keep records on who is accessing what data and when, for how long, and what was done to the data. Audit trails are very common in large systems where there are numerous users such as healthcare information systems.
- Cryptography is a security strategy used where data needs to be transmitted or communicated along a communications line. By encrypting data, it is encoded in a form that could not be recognised if the data was intercepted along the way to its destination. On arrival at its destination, the data is decoded by the computer that holds the encryption key, enabling sense to be made of it and the data to be read.

## DATA STANDARDS AND NURSING MINIMUM DATA SETS

Data represent the building blocks of information and, as such, reflect real world facts. As health information may be generated from multiple health speciality areas across various providers, it is important that the exchange of meaningful data be governed by a set of rules and definitions. A list of raw data is not meaningful unless it is given meaning. Computer data that has been allocated a code becomes meaningful as it can then be manipulated and managed (Conrick 2006). As the **electronic health record (EHR)** becomes the source of health information and aids the planning of an individual's care, it is essential that any health data generated is able to be collected, exchanged, stored and retrieved from healthcare information systems. **Data standards** allow for data retrieval and exchange and monitoring of quality care, and provide an avenue for the collation of clinical research data.

**Nursing minimum data sets (NMDSs)** comprise a minimum, common set of data, information, definitions and standards concerning a specific aspect or dimension of the healthcare system that should be used to collect and report data and which meets the essential needs of most users (McCormick et al 1997). Conrick (2006) elaborates on this definition by further describing a minimum data set as the least number of data elements required in a data set to do a particular job. The work of many associations and groups both here and overseas has resulted in the ongoing development of nursing minimum data sets.

The NMDS originated as a result of an attempt to standardise a collection of essential and comparable nursing data. The purpose of a NMDS is essentially to enable a comparison of data across clinical populations, settings, geographical areas and time, allowing for the prediction of trends. The NMDS enables selected nursing information from the EHR to support quality healthcare while maintaining data integrity. Furthermore, it helps to differentiate the contribution nursing makes to individual care from those of other health disciplines (Schwiran & Thede 2011). This becomes ever more important with the introduction of the EHR, as nursing's contribution to care needs to be incorporated into the EHR. The introduction of standardised nursing terminologies (SNTs) will enable more effective communication among nurses and other healthcare providers while increasing the visibility of nursing interventions. The use of data standards will improve individual care through the adherence to standards of care and provide robust data to determine the effectiveness of nursing interventions (Schwiran & Thede 2011).

## ELECTRONIC HEALTH RECORDS: PROVIDING INFORMATION ACROSS THE CARE CONTINUUM

The traditional paper-based medical record has existed now for almost a century. While the paper record has served the health system well over that time, with the increasing complexity of contemporary healthcare, more efficient ways of managing individual data need to be implemented. It has long been recognised that in order to improve overall quality of care by increasing efficiency, lowering costs and reducing the rates of medical errors a move to EHR will be required (Detwiller & Petillion 2014; Duffey-Rosenstein & Sinha 2013; Encinosa & Jaeyong 2013; Ronquillo 2012).

The term EHR causes some confusion as it tends to mean different things to different people. Some believe it simply refers to the electronic version of the traditional paper-based medical record (what might be called an electronic medical record or EMR). Others see it as a component of specific information systems such as a clinical information system or a nursing information system. Still others see it as more of a health summary document.

The benefits of an EHR are numerous. These include, for example, the ability for more than one healthcare provider to access the record at a time; the record is located where it can be readily retrieved; degrees of access will enable only authorised healthcare workers to see the entire record; there is provision for the individual to have input and ownership of the record and then there are the individual care benefits relating to improved access to appropriate care and improved quality of care based on completeness of the previous health information (Dennehy et al 2011).

The EHR is used to capture and store an individual's healthcare information to provide a more efficient, organised

method of charting and enabling immediate inclusion of information into the individual's record. Indeed, use of electronic healthcare records is proposed to significantly improve record accuracy and ongoing care for individuals (Detwiller & Petillion 2014). The use of this technology in healthcare settings can facilitate the implementation of the **Personally Controlled Electronic Health Record (PCEHR)**, now to be called 'My Health Record'. Currently an individual's health information can reside in a variety of locations: their GP's practice, hospitals, pathology and radiology providers, specialists and pharmacies. This fragmentation of the individual's health information works against the effective treatment of the individual by disrupting the continuity of care. No one health provider has the complete picture. Figure 5.6 illustrates the conceptual model of the Australian e-health record (My Health Record).

The PCEHR, which was launched in 2012, aims to provide healthcare providers with a more complete picture of the individual's health status. The system is based on a unique individual healthcare identifier. This number was allocated to all individuals enrolled in the Medicare program or those who are issued with a Department of Veterans' Affairs (DVA) treatment card, and others who seek healthcare in Australia. It is this number that allows the system to uniquely identify an individual within the system (Australian Government Department of Health 2015).

This system includes information about an individual's allergies and adverse reactions, medications and immunisations. In addition, summary information related to specific health issues, surgical interventions, investigations and pathology results can be populated from other systems (such as the GP's medical record system). Figure 5.7 illustrates the type of health information available in the health record overview screen of the PCEHR. In essence the PCEHR is an electronic summary of the individual's health information. It will provide clinicians and healthcare organisations with faster, easier access to more health information, creating a more efficient system, making continuity of care easier and improving treatment decisions.

### CRITICAL THINKING EXERCISE 5.2

The mother of a friend of yours has recently been discharged from the unit on which you are working. She knows you have access to the hospital clinical information system and asks you if you could access the system and print off a copy of her mother's discharge summary. How do you respond?

## USING IT TO SUPPORT EDUCATION AND RESEARCH

All nurses require some level of competency in informatics. While many younger nurses will be technologically literate, many do not have the informatics skills to be information literate. As a beginning nurse entering the field, there is the expectation of computer literacy and basic information management skills. These skills include but are not limited to using word processing, health databases, spreadsheets, presentation software and email. Having these basic information literacy skills enables the nurse to locate and evaluate appropriate data.

Advances in technology have provided multiple applications offering opportunities for educators to deliver content innovatively and dynamically (Conrick 2006). The benefits to learners have been researched extensively and are well supported by literature.

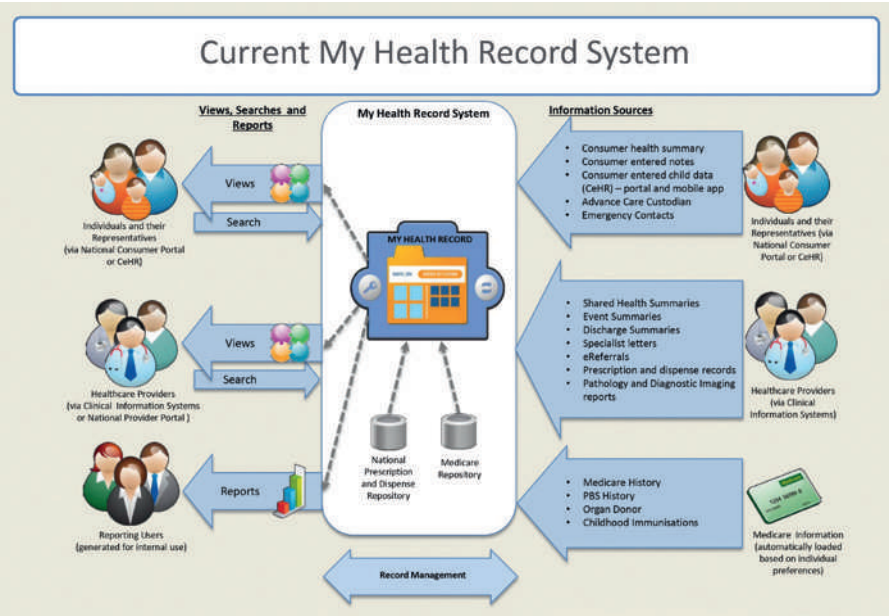


**Figure 5.6** Conceptual model of the Australian e-health record (My Health Record)
*(© My Health Record System Operator, Commonwealth Department of Health)*

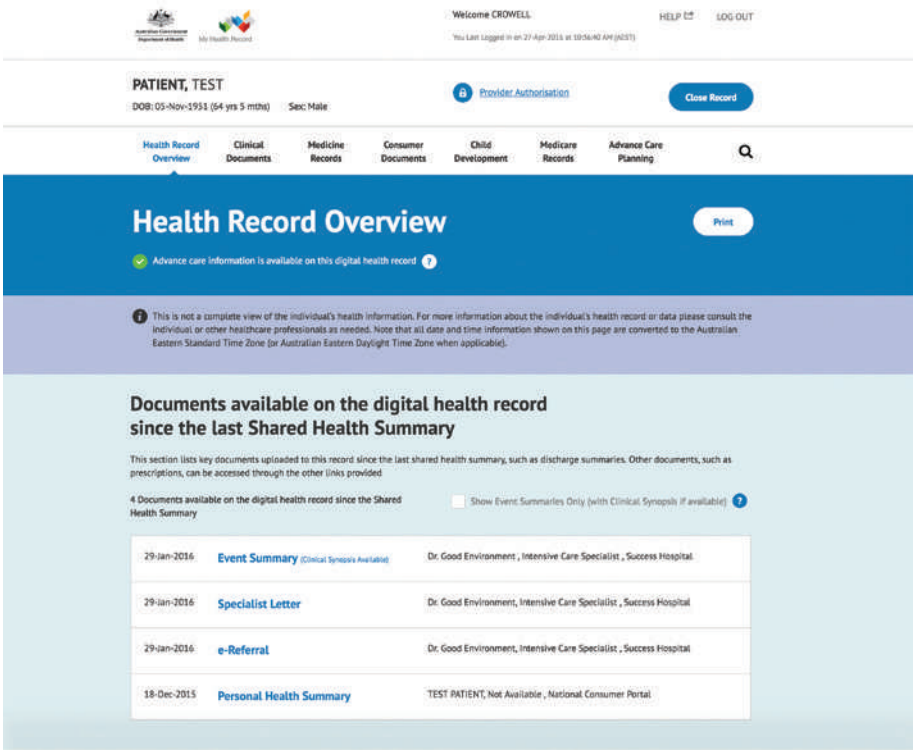


**Figure 5.7** Health record overview screen of the PCEHR
*(© My Health Record System Operator, Commonwealth Department of Health)*

With the advance of technology the opportunities for education delivery are almost endless and educators need to become facilitators of information, allowing learners to find, analyse and evaluate the information, and become a problem solver and critical thinker, which promote higher-order learning (Bastable 2008).

## Computers in education

Computers and IT provide a powerful tool to assist in the process of learning. E-learning strategies can offer multiple benefits over traditional learning. The delivery of nursing education material online allows nurses to work through academic courses and degrees while maintaining full- or part-time employment. This flexibility allows students to actively participate in educational activities while maintaining other responsibilities.

For many educational providers the delivery platform for educational material is in the form of learning management systems (LMS). These systems (such as MOODLE, Blackboard or Brightspace) provide a delivery method encompassing multimedia, social media functions, blogs, wikis and discussion forums. These systems provide a unified platform not only for the delivery of learning materials but also for submitting assignments and group work and can be used by faculty to monitor student performance and progress. Needless to say, the emergence of online education has not only been a significant milestone for information technology but for the nursing profession alike. When e-learning is utilised in nursing practice, it is vital to supplement the technological education resources with sound clinical experience and expertise to allow the learner to develop skills in the clinical environment. As technology advances the use of computer-mediated simulation will offer more realistic versions of reality that will allow nurses to engage in clinical events.

The development of e-books and the widespread introduction of bibliographic systems and databases such as the Cumulative Index of Nursing and Allied Health Literature (CINAHL) and Medline provide students with unparalleled access to information. Students now have access to learning materials all at the click of a mouse from anywhere in the world.

## Computers in research

As mentioned above, the introduction of electronic databases such as CINAHL and Medline have had a dramatic impact on students' ability to access the most up-to-date information. Students and clinicians alike are able to use these technologies to search the current literature to assist in the process of problem identification or to locate information to support evidence-based practice. The use of these databases allows the student or researcher to quickly search for specific full-text literature in a time-efficient manner. Once found, these items can be downloaded and stored on portable media such as a USB stick. No longer do students need to spend time and money photocopying journal articles, not to mention the paper that is saved. These articles can also be uploaded to bibliographic databases. Databases such as EndNote can be used when writing assignments or

conducting literature reviews to assist in managing in-text citations and referencing.

Computers are also instrumental in the development of research instruments and the collection of data. Software programs such as N-Vivo and Statistical Package for the Social Sciences (SPSS) can be used to assist in the interpretation of data. Once analysed, computers and IT can be used to disseminate research findings. Of course, findings can be submitted (electronically) to any number of journals, most of which are now available in electronic format.

## TECHNICAL TRENDS AND ISSUES IN E-HEALTH AND TELEHEALTH

The move towards increasing quantities of online health information represents the emergence of a phenomenon known as **e-health**. The term e-health has come from the use of similar 'e-words' such as e-commerce and e-business. The terms e-health, **telehealth** or **telenursing** are often used interchangeably and refer to the use of the internet, telecommunication and videoconferencing technologies in the provision of healthcare. E-health, however, does differ from telehealth (and the other tele disciplines) insofar as telehealth tends to be top down. In other words, the role of the healthcare provider (as expert) is the driving force for telehealth. E-health on the other hand has the individual/consumer as the driving force.

The World Health Organization defines e-health as 'the transfer of health resources and healthcare by electronic means' (World Health Organization 2010). It suggests there are three areas of application: the provision of health information via the internet and telecommunications, using a combination of IT and e-commerce to improve public health services and the application of e-commerce and e-business practices in health systems management (World Health Organization 2010). In short this suggests the electronic management of health information with the aim to deliver safe, efficient, better quality healthcare.

Telehealth, telemedicine and telenursing are not new concepts. They have all been utilised, to a certain extent, for a number of years. Telemedicine has been studied by governments, health departments and healthcare providers, as well as the medical practitioners who practise within the framework of telemedicine. Nurses have engaged in telehealth for many years using POTS or the plain old telephone system to maintain contact with individuals and provide advice and support. More recently, healthcare consumers have increasingly turned to the internet and the WWW for health information that healthcare professionals are being asked to evaluate and either confirm or refute. What has, however, emerged as the current challenge for healthcare providers and healthcare professionals is the enormity and rapidity of the changes and potential in the area of telehealth. Along with these dynamic and developing advances are calls for regulation, reimbursement and accountability.

## Summary

Technology is changing the way things are done in today's society and having a significant impact on the daily lives of nurses and the work they do. Nurses now need to be able to handle data to generate purposeful information, as well as be computer literate. However, with an ageing workforce, many nurses have managed for years without having to deal with technology as part of their nursing practice. They may not wish to take on the new challenges that information technology may pose. In contrast, young adults today leave school armed with well-developed computer and information-handling skills which they bring to the profession. This segment of the workforce may, therefore, be more likely to embrace the increasing use of healthcare technologies. This begs the question, then, with different generations of nurses what will the utilisation of technology by nurses look like in the next few years? Will it be resisted and put nursing behind other professions that are markedly ahead in their use of technology? Or will technology be embraced, placing greater pressures on nurses? Certainly, this is a simplistic approach with a range of other factors able to exert influence on healthcare technology. At this stage, it is hard to suggest in which direction this discussion may go.

While they are in their own evolutionary process, healthcare information technologies are advancing rapidly. Just as in other specialty areas, specialist courses need to be developed in order to meet the needs of changing nursing roles. As we witness the advent of ubiquitous computing, it is expected that information technology will eventually pervade all aspects of healthcare. In the not-too-distant future, it is anticipated that we will witness increasing use of integrated healthcare systems, with a focus on point-of-care technologies in the form of clinical decision support and documentation systems. Healthcare consumers will have greater control over their health information, where it is stored and how it is used. Genomics, data mining, nanotechnology and the use of robotics will all have an impact on clinical care. What this impact will actually look like is difficult to predict.

There is also a need for nursing informatics specialists. However, such a role in our current healthcare system is evolving and not yet well defined. Being able to describe what nursing informatics specialists do will help with guiding education and the development of the specialty. Just as we have seen with the Nursing and Midwifery Board of Australia's introduction of Standards for Practice, so too a set of practice competencies for nursing informatics specialists, which incorporates not only computer-related skills but knowledge, attitudes and other skills, will be required in the future.

## Review Questions

1. How can information technology benefit nurses and individuals to ensure improved quality of care?
2. What role do you think cloud computing and social media have in healthcare? How might security issues around these technologies be mitigated?
3. An individual indicates that they have been asked to sign up for the Australian Government Personally Controlled Electronic Health Record (PCEHR) but they are concerned about the security of their health record. How might you respond to this person?
4. What is a local area network? Explain how this technology configuration can benefit the provision of healthcare.
5. Nurses make for very effective project managers and business analysts. Why might this be the case?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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# Understanding and promoting health

*Glenda Verrinder and Lyn Talbot*

CHAPTER 6

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Discuss the difference between concepts of health, wellbeing, illness and disease
- Identify and discuss determinants of health
- Compare and contrast medical, behavioural and socioenvironmental models of health promotion
- Describe the principles underpinning health promotion practice
- Outline the action areas of the Ottawa Charter for Health Promotion
- Outline the major strategies within the Continuum of Health Promotion Practice
- Identify and source the literature on health promotion programs in Australia as it relates to nursing
- Discuss the role of the nurse in health promotion
- Facilitate person-centred education
- Utilise the nursing process in health promotion

## KEY TERMS

Australian Institute of Health and Welfare (AIHW)
Continuum of Health Promotion Practice
Declaration of Alma-Ata
determinants of health and illness
health inequalities
health inequities
health literacy
health promotion
homeostasis
illness
nursing process
Ottawa Charter for Health Promotion
prerequisites for health
primary healthcare
primary prevention
secondary prevention
tertiary prevention
wellbeing

## CHAPTER FOCUS

This chapter provides a focus for nurses from which to recognise the interrelationship of factors that determine health, wellbeing and illness. This perspective enables nurses to effectively facilitate health promotion with individuals and families and within the wider community. The chapter is presented in three parts. First, we discuss concepts of health, wellbeing and illness and what determines health. Second, we outline the emergence of health promotion, discuss what health promotion is and provide guidance for practice. Finally, we discuss the role of nurses in promoting health.

Overall the world's population is generally living longer and experiencing healthier lives. However, major disparities in health exist within and between countries. International leadership in reducing health inequalities comes from the World Health Organization (WHO) who defined health as 'a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity' (WHO 1946). This perspective of health and wellbeing leads us to health promotion practice where we employ medical, behavioural and socioenvironmental approaches depending on key priorities identified by evidence.

The role of the nurse in promoting health can be multilayered. Essentially, though, it is to gather evidence and work in collaboration with others to enable individuals, families and communities to reach their full health potential. In this chapter we introduce you to health promotion theories to guide practice; principally, the Ottawa Charter for Health Promotion (WHO 1986) and the **Continuum of Health Promotion Practice** (Talbot & Verrinder 2014), which highlight the collective role of health and other sectors, organisations and communities in achieving optimal health and wellbeing. Understanding theories that underpin health promotion practice is a key strategy for nurses in contributing to the enterprise of promoting health and reducing inequalities to improve health outcomes.

## LIVED EXPERIENCE

The refugee health program at the community health centre in which I work provides a range of services to facilitate settlement in Australia. On arrival to Australia, the lifestyle of refugees changes dramatically, including changes to diet and exercise; there is an increase in energy-dense diet and people become sedentary which increases the risk of chronic disease. In refugee camps the food is rationed and people are often hungry and high levels of incidental exercise are required to survive.

As the refugee nurse, I worked with Karen the community health nurse to develop a healthy lifestyle program. We found that the refugees in this community were not familiar with the notion of preventative healthcare. Furthermore, most health literature is in English and based on Western lifestyle. As part of the program we screened 30/32 refugees using the Australian Diabetes Risk Tool (AUSDIAB) which showed a high or medium risk of developing type 2 diabetes.

Together we worked to develop and deliver a culturally and language-appropriate program to prevent the refugees' transition from high risk to type 2 diabetes. A workbook and presenter resource material was developed along with a pre- and post-test evaluation plan. Health information was provided on diabetes and risk factors, healthy eating, physical activity, emotional wellbeing and health goal setting.

Overall the outcomes were positive. We found that people felt they had increased their knowledge. There was a slight increase in vegetable and fruit consumption and exercise, and a decrease in sugar, salt and fat consumption. As a result of the evaluation a healthy eating resource that displays culturally appropriate food is planned.

**Christine, Refugee Health Nurse**

# UNDERSTANDING HEALTH

## Concepts of health, wellbeing and illness

Health, wellbeing and illness have many different definitions and meanings. Health is often understood to be an absence of disease or illness; however, the World Health Organization's (WHO) definition of health stated above is holistic in that it considers physical, psychological, social and environmental factors. In health promotion, health is seen as a positive concept, emphasising environmental, social and personal resources, as well as physical capacities. **Prerequisites for health** include peace, shelter, education, social security, social relations, empowerment of women, a stable ecosystem, sustainable resource use, social justice, respect for human rights and equity (WHO 1978). Factors that determine health and the health of populations depend on society's ability to understand and manage the interaction between them. Furthermore, people need access to opportunities, knowledge, services and resources to be healthy. **Health**, then, may be defined according to circumstances, context and perceptions, and experiences, which may vary between individuals and between communities.

Similarly, **wellbeing** is a positive conceptualisation of health: feeling healthy, happy or doing well in life. It signifies an individual's sense of general contentment with life (Eckersley 2001; Taylor 2008). People may possess a sense of

personal wellbeing even when they are in very deprived situations, during stressful life events or confronted with acute or chronic disease. **Illness** may be described as an abnormal event in which aspects of a person's social, physical, emotional or intellectual condition are impaired (Berman et al 2015). Illness is not simply the presence of a disease process; rather, it is directly related to the whole person and their total environment. **Disease** may be defined as a disturbance in structure and/or function of any aspect of a person (Crisp et al 2013). Diseases may be classified according to their cause, the way in which they are acquired or according to the body system affected. Disease is often construed to be a medical condition associated with specific signs and symptoms. However, it may be caused by many factors and may affect people differently physically, emotionally and socially.

It is important to recognise the interrelatedness of the determinants of health on each individual's state of health. Each system and subsystem within the human body continuously exchanges information to maintain a steady state or **homeostasis** in the face of actual or perceived change. When these adjustment processes fail to maintain an adequate physiological, psychological or social balance, disease or illness may result. Responses to both internal and external challenges to homeostasis vary according to the magnitude of the challenge and the capability of each individual to cope with change (see Case Study 6.1).

Concepts of health, wellbeing and illness are based on both objective scientific measurements derived from large and varied population studies, as well as the subjective experience of individuals. Scientific data provide information related to the **determinants of health** which incorporate both physical and psychological dimensions of the individual as well as broader societal influences, socioeconomic characteristics, health behaviours and biomedical factors.

### CASE STUDY 6.1 HEALTH AND WELLNESS

Mrs N, 89, has lived on her own since her husband's death many years ago. Although her sight is impaired because of macular degeneration, she pursues an active lifestyle, walking her dog for at least 30 minutes every morning through her leafy suburb, often chatting with her neighbours. She participates in the administration of a daycare program for the elderly, even though many of the program participants are younger than she is.

Mrs N has evidence of rheumatoid arthritis in her hands, as well as loss of height from pronounced scoliosis of the spine, and often experiences pain from these deformities. She will often reflect on her sadness at no longer being able to knit, sew or garden, as well as being annoyed with the clumsiness caused by her inflamed and disfigured finger joints and impaired vision.

However, while her body has a certain frailty that comes with advanced age, her voice is vibrant as she speaks animatedly to her neighbour who has come to visit. As she prepares fresh vegetables for her dinner, the smell of freshly cooked scones for the day centre pervades the kitchen. What sets Mrs N apart from many others is her philosophy on life—her commitment to reach beyond her physical limitations by actively contributing to her community. She has embraced the opportunities available through the use of audiotapes that substitute for letter writing, as well as being able to listen to 'talking' books. Mrs N maintains an interest in world affairs and has recently learnt to use an iPad so that she can keep in touch via Skype with her daughter, grandchildren and, lately, her great grandchildren, all of whom live overseas.

## THE DETERMINANTS OF HEALTH

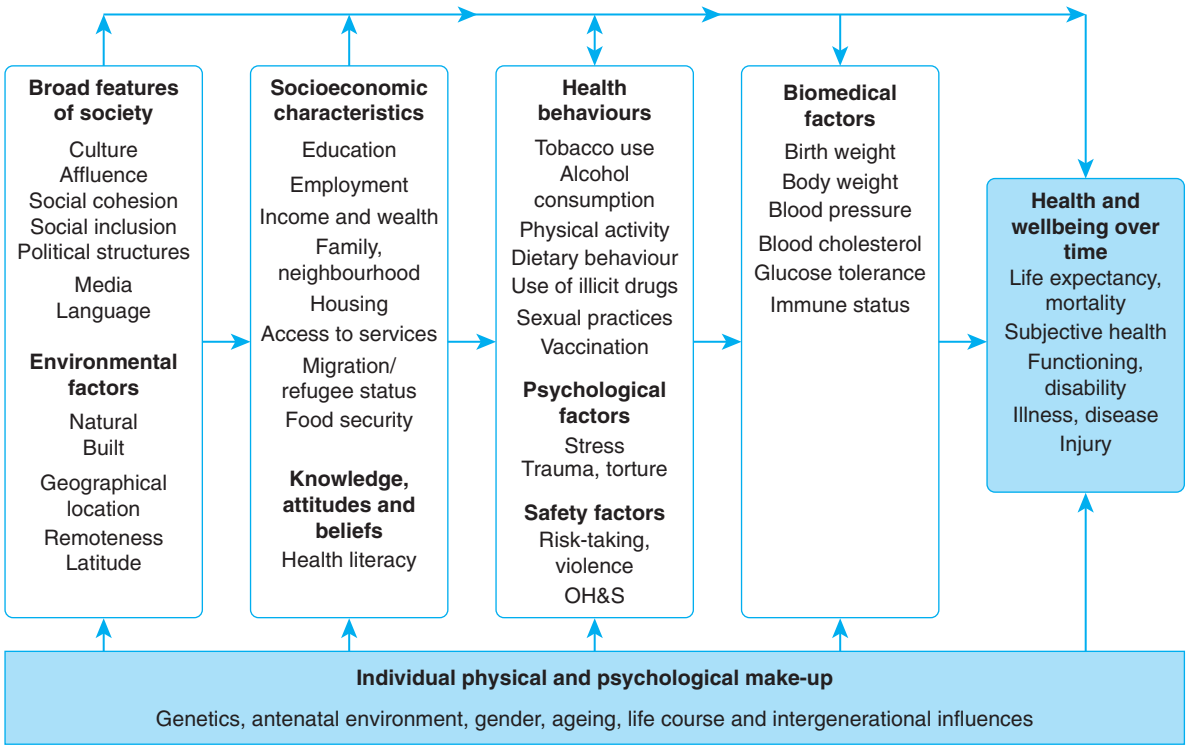
The **Australian Institute of Health and Welfare** (AIHW 2014) model for the determinants of health demonstrates the interrelationship between factors that determine health (see Figure 6.1). The determinants in the AIHW model are grouped into four main areas that show the direction of influence going from left to right. The broad features of society and environmental factors can determine the nature of another group such as socioeconomic characteristics which in turn can influence health behaviours which can then influence biomedical factors. That is, the model shows that life expectancy and how an individual experiences health, wellbeing, illness and disease is determined not only by their individual physical and psychological makeup including genetics, age and gender, but also their relationship to broad features of society such as culture and social inclusion, environmental factors such as geographical location and remoteness, socioeconomic characteristics such as education and employment, health behaviours such as tobacco use and vaccination, and biomedical factors such as birth weight and body weight.

This model is instructive for health promotion practice. For example, Australian data shows that social determinants of health explain a larger portion of the health gap than behavioural risk factors between Indigenous and non-Indigenous Australians (AIHW 2014). If we are going to promote health we need to understand the relationship between these determinants and, by necessity, we need to work in collaboration with others within and outside the healthcare system to reduce health inequalities and support vulnerable groups to reach their full health potential.

Health promoting factors include policies that facilitate generational and intergenerational equity, ensure ecosystem viability, develop convivial communities through urban planning strategies that encourage healthy lifestyles, support community inclusion and community-managed health services (Labonte 1997), as well as improving health literacy.

### Broad features of society

The broad features of society (see Figure 6.1) determine the health and wellbeing of individuals in indirect ways. Some of these features will be examined in the following section.




*Note*: Purple shading highlights selected social determinants of health.

**Figure 6.1** Australian Institute of Health and Welfare model *(AIHW 2014)*

## Spiritual factors/cultural beliefs

Cultural understandings of health, wellbeing and illness are an important factor in determining health (Julian 2009) and an essential aspect of planning healthcare. Culture can influence how illness is experienced, how that experience is communicated to health professionals and the type of care sought (Crisp et al 2013). Cross-cultural studies have shown that the experience of health can be categorised broadly in the following way:

- Feeling vital, full of energy
- Having good social relationships
- Experiencing a sense of control over one's life and living conditions
- Being able to do things one enjoys
- Having a sense of purpose in life
- Experiencing connectedness to community. (Labonte 1997)

Each culture has specific ideas about health, and these ideas are passed from one generation to another (Berman et al 2015). Traditional Chinese beliefs, for example, adopt a holistic view that emphasises the importance of environmental factors in increasing risk of disease. According to Chinese health beliefs, these factors influence the balance of the body's harmony, yin and yang. These are two opposite but complementary forces and together with qi (vital energy), they control the universe and explain the relationship between people and their surroundings. Any imbalance in these two forces, or in qi, results in illness. Spiritual and religious beliefs also affect health behaviour (Berman et al 2015). Seventh Day Adventist teaching, for example, prohibits the use of tobacco and alcohol and encourages vegetarianism. Religious coping methods such as prayer, reading of scripture, ritual meditation and talking with caregivers, ministers or clergy can have psychological, physical, spiritual and emotional benefit (Marche 2006).

Patterns of health and illness differ between people of different cultures and social classes and the health status of Aboriginal and Torres Strait Islander Australians is another example of the impact of broad features of society on health. In Australia the health status of Aboriginal and Torres Strait Islander peoples is typically worse than that of non-Indigenous Australians, although improvements in life expectancy have been made. Life expectancy is lower for Indigenous Australians by about 10 years (AIHW 2014). This is due to a constellation of features such as colonisation and the subsequent impact of displacement, Western culture and disease patterns, and culturally inappropriate healthcare systems. These broad features have, in turn, influenced socioeconomic characteristics such as housing and lower education and employment rates, as well as health behaviours in some communities such as higher smoking rates, risky alcohol consumption and poor nutrition. Furthermore, geographical location impacts on access to healthcare. The recognition of the social determinants of health is made in the National Aboriginal and Torres Strait Islander Health Plan 2013–2023. Health enablers are envisaged in this plan which includes the centrality of culture and the principles of health equality and human rights,

partnerships and accountability. These principles underpin health promotion practice.

### Social cohesion

A major determinant of health is social harmony which impacts on individuals, communities and a nation overall. Social cohesion is difficult to define but five domains have been proposed in Australian research (Markus 2014). They are:

1. Belonging: shared values, identification with Australia, trust
2. Social justice and equity: evaluation of national policies
3. Participation: voluntary work, political and cooperative involvement
4. Acceptance and rejection, legitimacy: experience of discrimination, attitudes towards minorities and newcomers
5. Worth: life satisfaction and happiness, future expectations.

Markus (2014) reports that Australia is a highly cohesive society and since 2007 evidence suggests that there has been a marginal upward movement in four of the five domains of social cohesion listed above, which tends to indicate, if correct, that policies aimed at improving these domains are working. The exception is in the social justice and equity domain which has a major impact on the health status of a nation (Wilkinson & Pickett 2009). All of these domains are highly dependent on the political structures. It is somewhat easier to understand the importance of these for health when one or more of these domains are low or undermined. Social trust is an important indicator of the strength or weakness of social cohesion (Laverack & Labonté 2008; Talbot & Walker 2007).

### Political structures

Political structures impact on health and wellbeing in significant ways and the principle of equity is key. For example, Wilkinson and Pickett (2009) examined health and social data from 25 of the richest countries in the world and 50 states of the US and found that in more unequal societies, life expectancy, educational performance and levels of trust are lower than in more equal societies. Indicators such as teenage pregnancies, homicide, imprisonment, mental illness, drug and alcohol addiction, infant mortality and obesity are higher. **Health inequalities** are differences in health status between population groups. **Health inequities** are differences in health status between population groups that are socially produced, systematic in their unequal distribution across the population, avoidable and unfair (VicHealth nda).

Talbot and Verrinder (2014) reported that key factors that influence health inequalities and health inequities within countries include equitable access to social resources. They argued that wealth redistribution through graded tax systems that impose higher taxes on the wealthiest citizens enables governments to fund more and better social services, such as universal healthcare, dental care, transport, childcare and housing assistance for their poor. Furthermore, governments who adopt a neoliberal (user-pays) approach to health policy increase health risks for vulnerable members of society by not redistributing wealth. Many autocratic governments have tended to increase the inequalities between rich and poor within the nation through their political structures and policies, including taxation systems.

Health promotion action includes increasing equity and reducing inequalities at the national level. At the organisational or local level this can mean improving access to affordable and socially acceptable services, and working with other sectors such as education, employment and housing. At the national and global level, reducing inequities and inequalities would not only make the socioeconomic system more stable but would make a major contribution to environmental sustainability (Wilkinson & Pickett 2009).

## Environmental factors

Degradation of the natural environment on which all life depends is having, and will increasingly have, an impact on human health. These are the major areas for consideration:

- There are direct and indirect, local and global, short- and long-term, negligible and devastating effects of degraded ecosystems on human health
- The associated health burden is borne by individuals and communities unequally
- The strain on the resources of the health sector is mounting because of this and we need to build capacity for predicted changes and challenges to health and healthcare.

(Talbot & Verrinder 2014:76–77)

*Environmental risk factors play a role in more than 80% of the diseases regularly reported by the World Health Organization. Globally, nearly one quarter of all deaths and of the total disease burden can be attributed to the environment … These findings have important policy implications, because the environmental risk factors … can be modified by established, cost-effective interventions. The interventions promote equity by benefiting everyone in the society, while addressing the needs of those most at risk.*

**(Prüss-Üstün & Corvalán 2006)**

There are biological, chemical, physical and social influences associated with the health of humans and the natural and built environment. Examples of biological factors include infectious agents associated with water (giardia), air (influenza), food (tetanus), zoonosis (Q-fever), pests (head lice) and infectious wastes (hepatitis-infected wastes). Indoor and outdoor pollutants and hazardous wastes such as asbestos, ozone and cytotoxic drugs are chemical hazards. Physical factors such as heat island effects, natural disasters, noise and overcrowding are major contributors to the burden of disease (AIHW 2012; Earl et al 2012:154–173). Furthermore, healthcare agencies are major contributors to waste including greenhouse gas emissions which are associated with a changing climate.

Climate change is upon us and is affecting human health. Extreme weather events are becoming more frequent and heat waves, droughts, floods, severe storms and bushfires are experienced in all regions of Australia (Bureau of Meteorology 2014). Extreme weather events impact on infrastructure and cause loss of life. The impact of climate change is felt unequally. Older people, children, outdoor workers and those

with inadequate housing, for example, are more vulnerable to heat stress. Those on lower incomes are affected more, as well as those who are already sick.

Health practitioners in Australia are among those trusted to provide truthful information (Leviston & Walker 2011) and so it is incumbent upon nurses to be informed about environmental factors that affect health. Health professional organisations often provide guidance for members; for example, the Australian Nursing Federation has a policy position on climate change (Australian Nursing Federation nd).

Nurses can contribute to health-promoting conditions in healthcare agencies which must include reducing greenhouse gas emissions and waste. At the community level, developing more walkable neighbourhoods improves the quality of life for citizens; people are more involved in their communities and have better self-reported health than those in less walkable neighbourhoods (Rogers et al 2011). People living in environments with more green space within a 1 kilometre radius of where they live have a lower prevalence for disease (Maas et al 2009). In rural areas health services and professionals need support from governments to adapt their services to meet the needs generated by the impacts of climate change so that they can in turn assist communities. Building on rural communities' local knowledge, resources and networks is an essential strategy (Verrinder & Talbot 2015).

### Geographical location

Many rural areas are vulnerable to climate change because of their direct dependence on the natural environment. Protracted drought, for example, has affected livelihoods, infrastructure and patterns of settlement of rural Australia (Verrinder & Talbot 2015). Rurality exacerbates the health status inequalities that increase with remoteness. People in rural and remote areas generally have higher rates of ill health and mortality than people living in larger cities (AIHW 2014). Refer to Chapter 47 for more information on rural and remote health. Inequality in health is due to a number of the broad features of society outlined in Figure 6.1 and partly due to greater distances to travel to appropriate healthcare. The higher proportion of Aboriginal and Torres Strait Australians in remote areas partially explains poorer health status of rural Australians too. Indigenous people are generally less healthy than other Australians; they seek medical care at a later stage in the illness, die at much younger ages and have more disability and a lower quality of life (AIHW 2014). This poorer health status is also connected to socioeconomic characteristics outlined in the next section.

## Socioeconomic characteristics

The interaction of socioeconomic determinants in health and wellbeing are far reaching and include the compounding effects of social status, physical location and standard of housing; education, employment and income levels; marital status, stability of the relationship and carer responsibilities; private health insurance; and access to, and use of, healthcare and information. These major risk conditions clearly highlight the relationship between the broad features of society on the left hand side of Figure 6.1 and health behaviours such as physical inactivity and tobacco use, which then influence biomedical factors and so health and wellbeing over time.

The health and quality of life of most Australians compares well with the rest of the world although, as we have said, there are some significant differences between population subgroups. Compared with those who have social and economic advantages, disadvantaged Australians such as Indigenous Australians are more likely to have shorter lives.

Migration and refugee status is also a determinant of health. While many migrants have better health on arrival than the average Australian because of the requirement of the immigration process, this advantage disappears the longer they have been in Australia because of race-based discrimination, different health habits from their country of origin and a lack of social support. Language barriers and cultural practices that make it difficult to access health services and participate in society more generally are challenges for refugees (AIHW 2012) and indicate a priority focus for health promotion work (see Lived Experience at the beginning of the chapter).

Exposure to ethnic and race-based discrimination is linked to poor mental health such as anxiety and depression, and physical health, such as diabetes, obesity and high blood pressure. It may affect people's ability to maintain healthy behaviours. Health promotion action includes building cultural competence within the healthcare system so that health professionals help people keep contact with their cultural communities to express and practise their faith and culture (VicHealth 2007) including culturally acceptable food.

Food security affects many Australians, especially those from disadvantaged backgrounds. Lack of security has far-reaching consequences on physical, mental and social wellbeing. Food security is dependent upon food supply and food access. Food security is when individuals or communities have regular 'access to safe, nutritionally adequate, culturally acceptable food from non-emergency sources' (VicHealth 2011). Short-term consequences of food insecurity include hunger, anxiety and lethargy. In the longer term food insecurity is related to malnutrition which can lead to a number of non-communicable diseases. Health promotion action includes ensuring fresh food is accessible which means ensuring food is affordable and can be transported, stored and cooked appropriately. This requires a systems approach by various levels of government (VicHealth ndb). Improving cooking skills, knowledge and confidence in preparing nutritious meals is part of developing health literacy overall which improves healthy choices and reduces risky behaviours.

## Knowledge, attitudes and beliefs

### Health literacy

Health literacy is a key determinant of health and one that is inextricably linked with other determinants of health such as education, income and culture. Health illiteracy follows

the social gradient and reinforces inequalities. Minority groups are most affected (Kickbusch et al 2013).

*Health literacy is linked to literacy and entails people's knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgements and take decisions in everyday life concerning health care, disease prevention and health promotion to maintain or improve quality of life during the life course.*

**(Kickbusch et al 2013:4)**

Health literacy is associated with health system costs particularly those associated with non-communicable diseases. Health literacy improves self-management of health and reduces the burden of disease overall, and so costs to individuals and societies; however, understanding disease and navigating the health system can be challenging even for the most resourceful (Kickbusch et al 2013).

Kickbusch and colleagues (2013) argued that there is a health literacy crisis but that there are promising action areas to assist in what is a system-wide and lifelong process for individuals. The promising action areas include, first, an intersectoral approach. Health literacy must be grounded in the settings of everyday life which means, second, that multiple stakeholders need to be involved. This includes community and faith-based organisations, the media, business and academic communities, adult and health educators as well as healthcare facilities. Third, developing plain language initiatives is important. Non-health professionals need to be able to understand the information the first time they hear it or read it. Attention therefore to cultures, gender and age is crucial. Finally, they suggest further research is needed to assess the 'friendliness' of health literacy systems.

Health literacy is part of health promotion action and will be presented more fully in the second part of this chapter as a key role for nurses. The aim is to enable individuals to make informed decisions about their health. This may require support in developing three levels of literacy: basic literacy skills; communicative/interactive literacy skills which require analysis that enables individuals to apply the knowledge in different situations; and critical literacy, where individuals can exert greater control over wider social situations (Nutbeam 2000; 2008). Health literacy is a precursor of developing healthy behaviours.

## Health behaviours

Health behaviours are influenced by socioeconomic characteristics such as education, income and family and broad features of society such as culture, social cohesion and political structures (see Figure 6.1). Smoking, excessive alcohol consumption, obesity, insufficient exercise and an inadequate intake of fruit and vegetables all contribute to chronic diseases such as cancer, cardiovascular disease and liver disease. These non-communicable (largely chronic) diseases account for about 85% of the total burden of disease in Australia (AIHW 2014).

Behavioural risk factors that contribute to death, disease and disability from these diseases are modifiable given the right conditions, which include policy, community and family support. Diet, activity levels and substance use are major targets for health promotion practice and comprehensive health promotion campaigns have proved successful in reducing the burden of disease for some non-communicable conditions.

### Family health practices/social support

The introduction or promotion of different healthcare practices must be commensurate with family values and lifestyle if they are to have a positive and lasting effect. Clinical Interest Box 6.1 lists examples of healthy lifestyle choices and Clinical Interest Box 6.2 is an example of a family's health beliefs. Family attitudes, values and behaviours are embedded in the cultural influences as part of the broad features of society outlined above. For children, in particular, they set the standard for how family members care for each other, the type of diet that is provided on a regular basis and the use of exercise both as a family activity and as a health routine (Crisp et al 2013). Family values also influence the use of health promotion activities such as children's immunisation schedules, age-appropriate health screening practices and conformity with road and vehicle safety regulations. Information about family health values and routines are important for nurses planning healthcare interventions.

### CLINICAL INTEREST BOX 6.1 Examples of healthy lifestyle choices

- Regular exercise
- Avoiding alcohol abuse and smoking
- Regular breast self-examination
- Seatbelt use
- Bike helmet use
- Weight control

### CLINICAL INTEREST BOX 6.2 Health beliefs

I remember my grandmother and mother applying turmeric paste, which is used for cooking in many Asian cuisines, on cuts and wounds. They used to tell me it was an ancient remedy and they believed turmeric had many therapeutic values. I still use this traditional method of wound management with my children when they come home with cuts and bruises from the playground and I have found that it is the cheapest, safest and most effective antiseptic cream you can get—straight out of the pantry.

**(Meera, mother of four young children)**

## Psychological factors

The World Health Organization's definition of health includes mental wellbeing; however, mental wellbeing is closely associated with the other determinants of health (see Figure 6.1) and health promotion action requires a multilayered approach. Mental and behavioural disorders are commonly associated with socioeconomic characteristics such as economic disadvantage, unemployment or under-employment, homelessness and reduced productivity (McLachlan et al 2013; Slade et al 2009). The disorders can be acute or chronic, severe or mild and, in Australia, rank only marginally behind cancer, muscular skeletal conditions and cardiovascular disease as causes of morbidity and mortality. Depression, anxiety and substance use are the most common (AIHW 2014:131). Mental and behavioural disorders affect individuals, families and the wider community. For those people with severe conditions, it can significantly interfere with their cognitive, emotional and/or social health. They are 'often isolated by the symptoms of their illness and may experience discrimination' (Morgan et al 2011). Health promotion action is directed at promoting psychological wellbeing in communities. Action is directed at some of the socioeconomic characteristics and knowledge, attitudes and beliefs underlying poor mental health. Working on health literacy levels and working with particular groups, families and individuals experiencing stigma and discrimination forms part of that action.

## Safety factors

### Violence

A large body of evidence shows that inequality increases the prevalence of violence within countries. The evidence is consistent across time and settings (Wilkinson & Pickett 2009).

*Where justice is denied, where poverty is enforced, where ignorance prevails and where any one class is made to feel that society is in an organised conspiracy to oppress, rob and degrade them, neither persons not property will be safe.*
**(Douglass 1889)**

It is argued that violence is associated with feelings of shame and humiliation. Status is at the heart of this notion and social inequalities feed the shame (Gilligan 1996 in Wilkinson & Pickett 2009). This inequality leads to increased social problems such as the prevalence of teenage pregnancy, drug abuse, obesity and other health behaviours. More abuse, bullying, fights and conflict are experienced by children. In more unequal societies there are intergenerational cycles of violence. Furthermore, fear of violence affects women and poor and minority groups more. Most people are not violent but most violent acts are perpetrated by men. The numbers for young men are higher than older men. Markers of status such as education, employment and housing seem to be buffers against societal violence within countries. Downward trends in violence have been seen when there have been improvements in the incomes of the poorest within a country (Wilkinson & Pickett 2009). This is consistent with other social problems such as risk-taking behaviour.

### Risk-taking

Younger people are more vulnerable to risk-taking behaviours such as substance abuse. The immediate effect of alcohol abuse, for example, 'lowers inhibitions, impairs decision-making, increases the risk of accidental injury, and increases vulnerability to unsafe situations [and] alcohol poisoning' (AIHW 2014:227). There may also be long-term consequences such as mental illness, malnutrition and sexually transmissible infections (AIHW 2014). Therefore, health promotion action includes working with people, particularly young people, to reduce these risky behaviours.

Reducing inequalities reduces social problems within countries (Wilkinson & Pickett 2009) and this lies at the heart of all health promotion action. Reducing stress in early life has an important influence of people throughout their lives. Health information, health education and creating supportive environments to improve psychological wellbeing are also part of the action. This in turn has an effect to improve some biomedical factors influencing health.

## Biomedical factors

Biomedical factors are the most obvious indicators of future health, wellbeing, illness and disability. Health promotion action is associated with immunisation to prevent disease and screening and monitoring to detect disease early or manage disease appropriately. These factors are influenced by health behaviours to the left in Figure 6.1 and mediated by individual physical and psychological factors at the bottom of the figure.

Three common biomedical factors contributing to the burden of non-communicable disease are high blood pressure, high blood cholesterol and impaired fasting glucose. These may be influenced by behavioural risk factors. For example, physical activity is recommended to improve all three biomedical factors and a diet low in saturated fats is recommended to maintain desirable blood cholesterol levels, as elevated levels contribute to cardiovascular disease. High blood pressure is considered a cardiovascular disease in its own right but is also a risk factor for stroke, heart disease and chronic kidney disease. When more than one biomedical factor is present the risks are greater and the longer a person lives with one or more risk factors, the greater the effect on their overall health and wellbeing (AIHW 2014). Health literacy is fundamentally important in reducing these risk factors.

### Immune status

'Vaccination is one of the most successful and cost-effective health interventions' (AIHW 2014:154). There are 16 diseases for which vaccines are provided free in Australia to people of particular age or risk groups such as the elderly and children. The aim is either to eliminate the disease altogether or limit severe disease in the most vulnerable. In Australia the majority of children are fully immunised; that is, they have received all vaccinations appropriate for their age (AIHW 2014).

Health promotion action aims to achieve herd immunity, which means that a sufficient pool of people must be immunised against the disease to prevent spread of that disease in the wider population (Talbot & Verrinder 2014). Improving access and knowledge, and recognising cultural factors will improve vaccine coverage. Other enablers include knowledge of services, flexibility in appointment times, public transport access and eligibility for free healthcare for newly arrived immigrants (Flego et al 2012).

### Dental health

Oral health has improved in Australia in recent decades overall and fluoridation of the water is considered to have been a major contributor to this improvement; however, recent trends indicate that tooth decay in children is rising. Change in diet that includes more sugar is considered a contributing factor to poorer oral health outcomes (AIHW 2014). Health promotion action would target diet, oral hygiene and access to affordable dental services as well as fluoridation of the water supply.

## Individual physical and psychological makeup

The health of an individual is also determined by factors such as genetics, antenatal environment, ageing, life course and intergenerational influences (AIHW 2014). These factors interact with each other and the determinants discussed in the four major groupings depicted in Figure 6.1.

### Genetics

Genetic makeup is a determinant of health. This determinant interrelates with social, cultural and environmental determinants of health. Some argue that Western culture has become 'geneticised' (Nelkin & Lindee 1995) as evidenced by the large investment in the Human Genome Project and that this impacts on investment in addressing many of the other determinants of health and the relationship between them. This project has been described as 'a logical extension of [our] medical obsession with the body as a machine' (Taylor 2012:67) and, furthermore, that genetic explanations appear to locate social problems within the individual rather than in society (Taylor 2012). However, there are individuals and families who have family histories of genetic disease and these families require accessible information, as discussed under health literacy. This information must be provided with the knowledge that concepts of genetic risks may vary considerably because of cultural and family beliefs about kinship and inheritance, and that these beliefs will influence behaviour (Taylor 2012).

### Life course

The life course perspective of health also suggests that our health is affected by the interrelationship between a wide range of determinants and can be applied to individuals, groups and communities, but it adds a historical or time dimension. It refers to the course of our lives from birth to death and the impact of one stage on another. Furthermore, the effects on an individual's health are cumulative (Fox 2012); that is, chronic diseases in adulthood, for example, are the result of cumulative development stressors in earlier life. This perspective challenges the dominance of adult health risk factors as the only determinant of health (Fox 2012) to include antenatal, intergenerational and family environments, and sociocultural aspects including gender and broader features of society outlined above. 'One way of viewing the life course is as a path or road—definitely not straight, but with corners, turns and twists' (Hutchinson 2010 in Fox 2012:215).

Health promotion action at every stage of the life course is important but it is the recognition of the critical role of promoting health in early child development and adolescents that is important to a healthy life course.

***Physical development*** At birth a baby's health depends initially on the antenatal environment, development and gestational age, genetic makeup and a healthy birth weight. These variables are largely related to maternal health, which in turn are influenced by socioeconomic status of the family as well as cultural norms and access to education. As the children grow, their health status will be influenced by exposure to disease and their immune status. Health beliefs play a part in disease prevention; for example, acceptance or rejection of immunisation schedules, and housing and sanitary conditions. Diet and exercise play an important role in further biological and psychosocial development, as do the health behaviours that are modelled by family members; for example, taking a drug, resting or massaging to relieve headache.

***Intellectual development*** The ability to critically appraise a wealth of information and to make informed choices about health practices depends on many factors; for example, cognitive development, access to adequate education and family values related to academic success, positive and negative personal health experiences, lifestyle choices and spiritual and religious beliefs.

***Emotional development*** Positive emotional experiences in early childhood influence the individual's adaptive capacities to meet the many demands of adulthood, including emotional stress and occasions of physical illness. The interrelationship of emotional and cognitive function with activation of the immune system relates to the individual's ability to heal from both biological and psychological trauma (Berman et al 2015). The body's physiological response to perceived stressful events is also initiated by the brain. The release of neurochemicals sets off a cascade of physiological reactions assisting well-balanced individuals to cope with a wide range of stress and anxiety without compromising their health beliefs and practices or their health status.

### Ageing

Healthy ageing is influenced by all of the determinants of health depicted in Figure 6.1. Arguably, each of these risk and protective factors are modifiable but the health system tends to concentrate on the biomedical factors and

health behaviours such as high blood pressure, high cholesterol levels, being overweight or underweight and substance use. While these are important determinants, enlightened approaches to health promotion for successful ageing include creating supportive environments to engage in social and productive activities and, furthermore, challenging the overall perception that ageing is more than chronic and degenerative diseases (Browning & Heine 2012). However, older Australians are affected by chronic disease more than others. Vision and hearing loss, arthritis or other musculoskeletal problems and elevated blood pressure or cholesterol levels are the most common (AIHW 2014) and so these need to be factored in to health promoting action.

'Despite the frequency of chronic disease in later life, two-thirds of older Australians aged 75 and over rate their health as good, very good or excellent' (AIHW 2014:101) and so health promotion action needs to include avoiding stereotyping older adults as unwell and incapable of change, and instead on creating environments that encourage optimal wellbeing while supporting vulnerable older citizens (Browning & Heine 2012). Many older Australians make economic and social contributions to family and community and many want to remain in the workforce. Many older people want to remain in their own homes (AIHW 2014). Facilitating social connection is important for the health of older people too. Research shows, for example, that those with internet access at home are more likely to organise spending time with friends and family and participate in their community than those without (AIHW 2014).

### Gender

The health of women and men is dependent upon all of the determinants of health but men and women experience health differently and have different health outcomes. Cultural norms and values dictate different roles and behaviours which can create gender inequalities, including inequalities in health status, health-seeking behaviour and access to healthcare. Males tend to have higher death rates at each life stage, resulting in a lower life expectancy. Gender norms and values which impact on health and wellbeing can change and reduce gender inequalities in health (WHO nd).

## Summary of the determinants of health

Understanding what determines health is part and parcel of evidence-based nursing practice. Health promotion practice should be tailored to different groups of people depending on their need. The AIHW (2014:345) suggests that while universal disease prevention is desirable for the entire population, we need to be cognisant of particular age groups such as early childhood, adolescence or the elderly, populations such as Aboriginal and Torres Strait Islander peoples, people from low socioeconomic status groups and refugees and people at high risk, such as injecting drug users or prisoners. Furthermore, to improve health outcomes all sectors need to put health on their agenda and be cognisant of the principles and actions underpinning health promotion practice, which will be the focus of the next section.

# WHAT IS HEALTH PROMOTION?

**Health promotion** is the process of enabling people to increase their control over, and to improve, their health; to help people to achieve the best possible state of wellness, and to prevent illness or detect it early so treatment can be effective. To reach a state of complete physical, mental and social wellbeing an individual or group must be able to identify and realise aspirations, satisfy needs and change or cope with the environment.

These descriptions of health promotion clearly emphasise that people take an active well-informed role in promoting and protecting their health. Health promotion is carried out by and *with* people, not on or to people. At the same time there is a clearly important role in health promotion for developing policy and organisational settings that make it easier for people to be healthy. For example, health promotion strategies encourage people to use sunscreen to prevent sunburn, and nurses have a clear health education role here but, in addition, a school health-protection policy may include outdoor sports activities being scheduled early or late in the day, and the school may erect shade sails to create a setting that shelters the students. Therefore, health promotion is not just the responsibility of the health sector but goes beyond strategies that focus on healthy lifestyles to those that promote wellbeing in order to reduce the negative impacts of all determinants of health (see Figure 6.1), that may include housing and shelter, nutrition, transport and education (WHO 1986). The World Health Organization provides leadership in promoting health internationally.

## The World Health Organization

WHO is responsible for shaping research and practice, providing technical support and monitoring and assessing health trends internationally (WHO nd). It was established by the United Nations in 1948 to deal with international health matters and concerns. There are 194 member countries of the World Health Assembly, which is the supreme decision-making body of WHO. This worldwide organisation agreed that 'Governments have a responsibility for the health of their peoples, which can be fulfilled only by the provision of adequate health and social measures' (WHO 1992). The **Declaration of Alma-Ata** came about after the 1978 WHO conference. This was to be the milestone for world health in that it set the philosophy or principles that should guide the way healthcare services are provided to all people. The declaration called for:

- Equity
- Fundamental human rights
- Community participation and maximal community self-reliance
- Use of socially acceptable technology
- Health promotion and disease prevention
- Involvement of government departments other than health departments
- Political action
- Cooperation between countries

- Reduction of money spent on armaments to increase funds for primary healthcare
- World peace.

These principles from the Declaration of Alma-Ata paved the way for the 'new' public health and health promotion action by providing the underpinning concepts for primary healthcare. **Primary healthcare** is essential care based on practical, scientifically sound and socially acceptable methods and technology, made universally accessible to people and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development, in the spirit of self-reliance and self-determination (WHO 1978). These guiding principles of primary healthcare should be applied throughout the health system and adopted by all health workers to improve the health of populations (Talbot & Verrinder 2014; Wass 2000).

To distinguish between other, often misconstrued, concepts of primary healthcare, and to understand exactly what primary healthcare is, Wass (2000) provided an explanation of what primary healthcare is *not*:

- Primary healthcare is not primary medical care or primary care. This is medical care provided for people at their first point of contact with the health system, provided in the outpatients' section of a hospital, or by a general medical practitioner. Primary medical care is not necessarily universally accessible.
- Primary healthcare is also not primary nursing, as this is a system of nursing in which an individual nurse takes primary responsibility for specific individuals. Primary healthcare is not just community-based healthcare. The primary healthcare approach has implications throughout the entire health system.
- Primary healthcare is applicable to all countries of the world, not just developing countries, and consequently cannot be referred to as simply Third World healthcare.
- Primary care is not necessarily the same as primary healthcare unless it meets all of the criteria as outlined by the Declaration of Alma-Ata and spelt out in the definition of health above.

The new public health movement arose out of the recognition that ill health arises from social, biological, economic, environmental and emotional factors; the determinants of health outlined in Figure 6.1. Health promotion is the range of activities that can be planned to meet the needs created by unequal experiences of the determinants of health. Continued improvements in health status in any country will be related to improvements in these determinants using different health promotion approaches (Talbot & Verrinder 2014).

## Primary, secondary and tertiary prevention

The concepts of health promotion and illness prevention are closely related (see Clinical Interest Box 6.3). Leavell and Clark (1965) defined three levels of prevention: primary, secondary and tertiary, and nurses can have a health promotion role in each. **Primary prevention** is activities designed to prevent illness from occurring such as tackling the inequalities in health. Much of the healthy lifestyle advice, education and policy in areas including sun protection, not smoking, being physically active and eating a healthy diet fit into this category, as does immunisation. The effectiveness of primary prevention strategies is built with a combination of policy, education and financial incentives for taking the healthier choice or sanctions for taking the unhealthy choice, such as through taxation increasing the cost of cigarettes. **Secondary prevention** is the range of activities designed to detect and treat illness early before illness problems arise. Health screening including breast and cervical cancer screening, workplace health checks and skin and bowel cancer early detection are examples. **Tertiary prevention** is the ongoing monitoring once illness has occurred that is designed to maintain optimum wellness such as blood sugar and blood pressure monitoring, and follow-up re-screening after treatment for breast or cervical cancer.

Health promotion work can be quite diverse, ranging from working with groups in a community or workplace

### CLINICAL INTEREST BOX 6.3 Health promotion and illness prevention

Primary health promotion practices and illness prevention practices aim to avoid or delay occurrence of a specific disease or disorder. Examples include:

- Obtaining immunisations
- Maintaining ideal body weight
- Wearing seatbelts or safety helmets
- Minimal exposure to the sun, wearing hats and applying sunscreen when out of doors
- Consuming minimal or no alcohol when driving.

Secondary health promotion practices and illness prevention practices consist of steps to aid early diagnosis and prompt intervention in disease, shortening the disease process. Examples include:

- Having regular Papanicolaou (Pap) smears or prostate-specific antigen (PSA) tests
- Performing monthly breast or testicular self-examinations
- Regular glaucoma testing
- Bone density tests
- Brushing teeth and getting regular dental check ups.

Tertiary health promotion practices and illness prevention practices consist of rehabilitation measures after the disease or disorder has been stabilised and treating existing diseases or disorders. Examples include:

- Cardiac rehabilitation
- Recovery from joint-replacement surgery
- Learning to walk with a prosthesis after amputation
- Learning to walk after a stroke
- Complying with treatment programs for chronic diseases such as arthritis or asthma.

setting or forming a new policy to protect health rights through to working one-to-one in a health-screening service. Nurses work in slightly different ways in each of these settings, but it is all health promotion, and there are core values, knowledge and skills that apply in all settings.

## The Ottawa Charter for Health Promotion

Almost 10 years after the Declaration of Alma-Ata, the **Ottawa Charter for Health Promotion** arose from the international conference of the World Health Organization in Ottawa in 1986. The charter arose from the recognition that although the Declaration of Alma-Ata (WHO 1978) spelt out the principles to guide primary healthcare, there was insufficient guidance for health workers and others in 'how to do' health promotion. The Charter continues to be the mainstay for health promotion work internationally and it provides a simple framework that provides a universal and accessible language and guide to comprehensive health promotion practice, irrespective of the setting.

The Charter has three main principles about how one works in health promotion to assist people in gaining greater control over their lives (WHO 1986).

### Advocacy

Political, economic, cultural, environmental, behavioural and biological factors can all affect our health. Health promotion work aims to make these factors favourable for positive health through advocacy for health improvements, especially through policy change.

### Enabling

Health promotion focuses on achieving equity in health and aims to reduce differences in current health. The Ottawa Charter states that 'People cannot achieve their fullest health potential unless they are able to take control of those things which determine their health. This must apply equally to women and men' (WHO 1986). Equity is based on the principle of 'fairness'. Ensuring fair access to health services may mean that some people whose health is especially vulnerable to the negative aspects of the determinants of health, such as sole parents, people living with disability or Indigenous Australians, will need special assistance to access the services that are more easily accessible to other sectors of the community.

### Mediation

The health sector alone cannot ensure universal access to the prerequisites and prospects for health. Health promotion requires coordinated action by all concerned: governments, health and other social and economic sectors, non-governmental and voluntary organisations, local authorities, industry and the media. People are involved as individuals, families and communities. Professional and social groups and health personnel need to mediate between differing interests in society for population health gains. Health promotion strategies and programs should be adapted to the local needs and characteristics of individual countries and regions to take into account differing social, cultural and economic systems.

Health promotion recognises the need for governments and health bodies to work collaboratively. It further recognises the need to increase community control and to consider the importance of people's environments, where and how they live, as determinants of health.

Subsequent international conferences of the World Health Organization in Adelaide (1988), Sundsvall (1991), Jakarta (1997), Mexico (2000), Bangkok (2005), Nairobi (2009) and Helsinki (2013) have expanded on these fundamental issues, but the underlying principles set down in Alma-Ata and Ottawa continue to provide the guidelines for effective practice.

## Action Areas of the Ottawa Charter for Health Promotion

The Ottawa Charter provides a framework of five interconnected 'action areas' (see Clinical Interest Box 6.4) that are designed to be used collectively to ensure that health promotion action happens across sectors, settings and systems as well as with individual capacities and behaviours. The action areas can be used in many ways, including when planning an individual session or group program, when developing new policy in an organisational or community setting, when designing components of a program, or as a framework for evaluating the effectiveness of a program or session. The action areas briefly summarised are:

**Building healthy public policy**. Policy at all levels, from international, federal, state and local government to within organisations, has the potential to influence health both positively and negatively. The aim is to use policy, however defined, as a means of enshrining the decisions that protect

### CLINICAL INTEREST BOX 6.4 The Ottawa Charter for Health Promotion

As a response to growing expectations for a new public health movement around the world, the first International Conference on Health Promotion was held in Ottawa, Canada, in November 1986. The outcome of this conference was a charter for action to achieve 'Health for All by the Year 2000 and Beyond'. This charter is known as the Ottawa Charter for Health Promotion.

The charter states that actions to promote health require:

- Building healthy public policy
- Creating environments that support healthy living
- Strengthening community action
- Helping people develop their personal skills to promote health
- Reorienting healthcare.

*(The Ottawa Charter for Health Promotion, http://www.who.int/healthpromotion/conferences/previous/ottawa/en/)*

and enhance the health of the relevant group of people even when there is potential for the situation to change in that environment. When there is legislated policy it is harder to remove it even if there is a change of the party in power. Examples could include the whole range of strategies that arise from the tobacco control policy designed to minimise the risks to health from tobacco smoking, or a workplace decision that protects the health of staff in some way which is harder to take away if it is in the strategic plan of the organisation and the position descriptions of the staff. These are examples of the capability of policy to protect and enhance health. A recent illustration is the policy decisions that have led to Medicare which have meant equal access to medical and hospital treatment for all Australians. The proposed policy change to introduce a co-payment for doctors' visits had potential to put the health of many Australians at risk unfairly compared to others, and this was the basis of wide opposition to the proposal. Analyse policy on the basis of its impact on the social determinants of health; does the policy make it easier or harder to be healthy? Think of healthy public policy as your potential ally; cite policy when seeking funding or for resisting a change that will undermine health.

**Creating supportive environments**. Health promotion action is used to create situations and places that support healthy living. By using decisions and structures for the whole of a setting (school, park, state, nation) all people can benefit without taking extra individual action. Supportive environments mean protecting and nourishing natural environment places for the future health of the planet and the population. Supportive built environments means making considered changes that support health in the daily lives of people wherever they live. This can include anything from a shade sail at the swimming pool and tactile surfaces at pedestrian crossings, to financial assistance with childcare costs.

**Strengthening community action**. This means working with communities as they identify their strengths, needs and priorities, and assisting them to build their skills to bring about the changes they desire. Communities are experts about themselves; they don't need outside 'experts' coming in and telling them how to run their lives, but sometimes they need assistance to find their way or build their capacity. Strengthening community action is a key role in community development work.

**Developing personal skills.** This health promotion action area fits most closely with health education and building health literacy. This could mean that people need assistance with accessing the necessary information, learning and skills in order to make informed choices about their health and the health of those around them.

**Reorienting healthcare**. This action area relates to the important potential for health promotion work to intervene before illness occurs or before health is put at risk. Health promotion action is everybody's business and encompasses all sectors, such as housing, transport and schools in collaboration. For the current and future health of the population there needs to be a balance between prevention, protection and illness care services.

According to WHO, health promotion strategies are not limited to a specific health problem, nor to a specific set of behaviours. The WHO Ottawa Charter action areas apply the principles of, and strategies for, health promotion to a variety of population groups, risk factors and diseases, in various settings. Health promotion and the associated efforts put into education, community development, policy, legislation and regulation are as valid for the prevention of communicable diseases, injury and violence, and mental problems, as they are for the prevention of non-communicable diseases (WHO 2009).

## Health promotion in Australian government policy

Australian government policy on health promotion activity began in the mid-1980s. In 1986 the Better Health Commission formulated Australia's response to the goal of 'Health for All by the Year 2000'. Since then, goals and targets to improve the determinants of health, risk conditions and specific population groups have been developed. Epidemiological data and other research evidence is used to identify the population risk factors. At a federal level the basis for national approaches is to address risk factors that affect the widest cross-section of the population or have the greatest impact on life expectancy and those conditions that are most amenable to intervention. Policy acts as a strong lever and this is often supported by national social marketing campaigns to increase awareness and promote acceptance of the change. Changes in government and political philosophy tend to bring changes in the identified priorities, the name of the various government agencies and the amount of funding that is allocated to health promotion. Although we are generally a healthy nation and there is a good range of medically based health protection screening and services in place, Australia does spend only a comparatively small amount on health promotion. The Australian National Preventive Health Agency that developed after the 20/20 summit in 2008 was transferred to the Department of Health in 2014 and the National Partnership Agreement on Preventive Health was terminated. It is mooted that tobacco, obesity and harmful use of alcohol will be the focus of 'preventive health' at the national level in the future.

## Continuum of health promotion practice

It is useful to consider health promotion practice as falling along a continuum (see Figure 6.2) that illustrates how the different types of health promotion action relate to each other. The different forms of health promotion are closely aligned with medical, behavioural and socioenvironmental factors approaches to health promotion underpinning the determinants of health and in the AIHW model (see Figure 6.1). Activities for an individual, which are mostly implementing medical approaches, are at one end and those that involve working socioenvironmental approaches fall at the other end. Each category on the continuum is outlined briefly below.

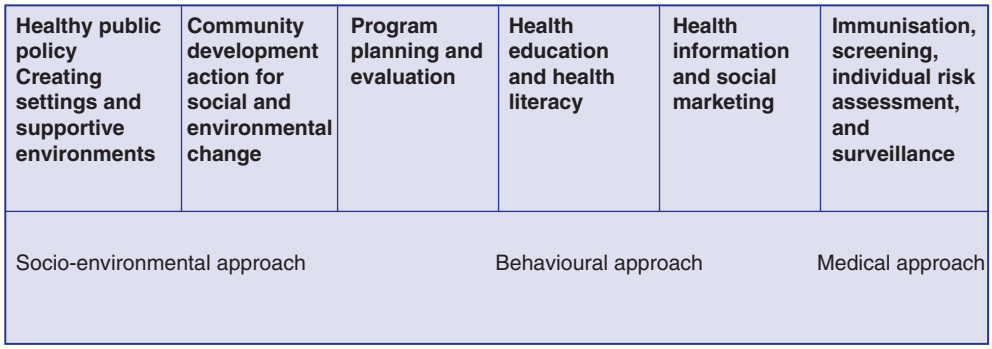



**Figure 6.2** Continuum of health promotion practice
*(Talbot & Verrinder 2014)*

## Healthy public policy—creating settings and supportive environments

Health promotion actions at this end of the continuum focus on bringing about changes in a place or an organisation that make it easier for people to be healthy. In the Ottawa Charter this is called a 'supportive environment'. Healthy public policy means the way that a national, state or local government policy or an organisational agreement can be used as a means of reducing people's health risks. There are a great many examples of this in smoking, driving and environmental legislation but policy can also apply in an organisation such as a preschool 'no hat no play outside' rule. The nurses' role in activities at this end of the continuum will mainly be in contributing to the development and implementation of new initiatives or policy that will ultimately be made possible by those with decision-making and financial power.

## Community development action for social and environmental change

Community development work involves nurses working in partnership with a community or group who have something in common, rather than being their 'leader' in charge of a project. In a nursing role the work usually happens in a community setting or with a vulnerable group that meets in an organisation such as a community health centre. The key skill in community development work is not to take over, but to let the group or community identify their needs and how they might achieve them, and then to partner with them to build their capacities and skills to achieve their aims (Green et al 2009). It can be a complex way of working because in many ways it seems more efficient to take over and do things on behalf of the community rather than letting the process unfold. In addition it is not usually possible to know in advance what skills the community development role will entail.

## Program planning and evaluation

Program planning and evaluation work encompasses the essential documentation and work steps that are undertaken to account for the funds and activities of a project or program. It may be that a new program is planned within a workplace or organisation to increase awareness about the risks to women of domestic violence, and to build the skills of staff to reduce the impacts. A series of steps are outlined, including assessing the needs so the program can be designed to meet these needs, designing the program activities, implementing it, collecting information so you can tell whether the program was implemented as planned and what worked and didn't work, reporting the evaluation and then deciding what should be changed if the program was to be implemented again.

These steps are closely aligned to the nursing process and are dealt with in more detail in the later section of this chapter.

## Health education and health literacy

In simple language **health education** means the process of effectively 'teaching' a health-related topic, whereas **health literacy** is a quality of the person being taught or who is learning, where they have understood the information to a level that enables them to be able to use it to make informed decisions about their own health or to apply and adapt that information to meet the learning needs of other people, such as family members (Nutbeam 2000). Health education to build health literacy is a key role for nurses and it can take place almost anywhere when a 'teachable moment' arises. The ability and willingness to take advantage of opportunities to enhance health learning are key skills for nurses, and they should take the opportunity to build professional skills in this area. Because of the importance of the health education role, this form of health promotion is dealt with in more detail later in this section. Health education may be anything from a brief one-to-one interaction during a nursing procedure to a formally conducted session for a group in the community, including interactive web-based health education forums for people who may be geographically distant. The main aims of health education and health literacy are that the person can make informed decisions about factors that affect their health, and can be supported to change their behaviour where needed.

## Health information and social marketing

Health information and social marketing relate to the use of marketing or advertising principles to 'sell' a health message

### CRITICAL THINKING EXERCISE 6.1

Collect a range of health information materials and resources, such as pamphlets and handouts from displays in your local community health agencies, that are designed for community members, rather than health professionals. This activity works best in partnership with at least one other student.

Ask yourselves the following questions of each resource:

1. What makes this information useful?
2. What makes you want (or not want) to read the information in full?

### CRITICAL THINKING EXERCISE 6.2

These days the internet is used as the first source of information by many people. Unsurprisingly it is also used as a deliberate strategy for social marketing.

View the YouTube social marketing clip 'Dumb Ways to Die' (see Online Resources). As you will see on the trailer, this has been an enormously popular clip.

There are no right or wrong answers to these questions, but use them for your own analysis of this clip, or as the basis for a discussion with another student.

What techniques are used to make the video attractive and engaging for viewers? What is the main message of the video—who is the sponsor?

The video takes the best part of 3 minutes to get to the core message. This would never work with other forms of social marketing (think about drink driving or Sunsmart messages for comparison).

Why does the message work in this format? How would you know the campaign was successful? Discuss the argument that this is engaging and effective as entertainment, but does not necessarily result in behaviour change (in whose view is it successful?).

(Donovan & Henley 2010). Usually health information is provided as printed materials such as booklets and pamphlets, or it may be included as pages on an internet site. Health information usually contains more detail about the risk condition and provides a detailed action plan for behaviour change and sometimes references, whereas social marketing covers the forms of materials, including stickers, give-aways and television commercials and placards that give a brief message, often accompanied by a catchy graphic, logo or tune. The purpose of health information is to support health education activities, maybe as a take-home reference after the information has been provided and explained verbally, especially with regard to creating positive attitudes to the desired behaviour. It is another way to support the development of health literacy. The aim of social marketing is to create awareness of the risk to health, reinforce positive values about a behaviour and provide a cue to initiate the activity (French et al 2009). Repetition of the message aims to make people associate the visual or tune with the positive behaviour: think of the red tick for heart healthy foods and success of the Slip! Slop! Slap! sun protection message.

### Immunisation, screening, individual risk assessment and surveillance

These health promotion activities are at the 'medical' end of the health promotion continuum, meaning that they rely on medical research and information, and medical interventions to be conducted. The nursing role is to provide care in accordance with the guidelines set down to ensure the intended outcome and no danger occurs to individuals or the wider population. A range of medical-based health promotion activities is directed at minimising the spread and health impacts of infectious diseases. There are very high risks to the population if infectious diseases are not controlled and their transmission limited, and this is the basis of immunisation programs. The aim of screening is to detect medical conditions early so treatment can be undertaken with the best chance of complete recovery. Individual risk assessment may be undertaken in workplaces or in health clinics with the aim of detecting risks the person may not be aware of, such as poor nutrition leading to hypertension, and reducing the risk through behaviour change and medical management. Surveillance is the observation of activities in the environment to detect factors that pose a risk to the population. Surveillance might include quarantine activities for animals to reduce the risk of disease.

## Theoretical models and frameworks to guide health promotion practice

Several models have been developed to provide practitioners, including nurses, with frameworks to assist people to achieve optimal health. A theoretical model is a diagrammatic representation of how various parts of a concept relate to each other to explain an outcome, or to predict what is likely to occur. A model informs the practitioner about the matters to consider when planning care, and the order in which to take actions. Models often have arrows or lines, which indicate the relationship between the different components.

Nurses' work in Australia has traditionally been influenced by Western medical models of healthcare that focus on the organic nature and cause of mental and physical disease, rather than on the influence of the many factors that determine health. This medical diagnostic-centred model centres on the individual which disregards those internal and external variables that influence health outcomes. However, the models presented in this chapter provide a broader perspective to the medical model and are discussed in the next section.

### Socioenvironmental models

We have presented a number of socioenvironmental theoretical models earlier in this chapter, including the determinants model from the AIHW (Figure 6.1), the Continuum of Health Promotion Practice (Figure 6.2) and the action areas of the Ottawa Charter for Health Promotion (WHO 1986)

that provide guidance to nursing practitioners and others. These models show the interrelationship of the determinants of health and the aim of health promotion is to address the inequalities in the broad features of society such as socioeconomic status, geographical remoteness or pollution.

## Behavioural models

Behavioural approaches to health promotion aim to improve behavioural risk factors such as poor nutrition, physical inactivity or stress management. They fit within the second and third major grouping of the AIHW model (Figure 6.1) which includes health literacy, and in the Ottawa Charter for Health Promotion (WHO 1986), behavioural approaches fit well with 'Developing personal skills'. In the Continuum of Health Promotion Practice model, behavioural approaches fit best within health education (Figure 6.2).

Many health promotion activities do not require the active involvement of people making deliberate changes to personal behaviour. Passive health promotion occurs when an individual benefits from the activities of others without necessarily acting themselves, such as in the fluoridation of drinking water. As described above these health promotion activities are designed to create a 'supportive environment' or setting, which makes it easier for people to reduce the risks to their health.

However, health promotion may require the active involvement of people in order to be effective. People will need to build the skills and motivation for change and nurses as health educators will draw on a wide range of skills. One of the challenges with behaviour-change approaches in health promotion is the assumption that, just because a person has the knowledge about a risk to their health and what would be the desirable behaviour to reduce that risk, they are able to make the necessary change. For various reasons, including peer pressure, financial barriers, culture and other social pressures, people find they are unable to make the necessary change. It is important that health promotion workers don't assume that change will automatically occur (because it's good for their health), and equally important that people are not judged negatively when they are not able to make, or sustain, a healthy change; this is called 'blaming the victim' (Mooney 2012; Talbot & Verrinder 2014).

Using a health education model helps ensure the education is well planned and will meet the learning needs of the participants. Two models are discussed in the next section.

Over a long period a number of behavioural models have been developed and refined. Some of these have been validated in research. Behavioural models have used two main approaches. The first group arose from the discipline of psychology, designed to assist individuals to understand their own risk-taking behaviour and to provide steps for guidance through a sustained change. The most widely validated of this group is the Transtheoretical Stages of Change model (Prochaska & Di Clemente 1984). The model gives recognition to how hard it is for people to make a change that would be good for their health, but would mean them giving up something they value. It is a five-step model that helps the person take one step at a time. It also builds in recognition that people may have 'false starts'. An example for using this model could be a personal plan to start regular exercise or quit smoking.

***Stages of Change Model*** According to the Stages of Change Model, the following steps make up the process individuals use to integrate change in their lives:

1. Pre contemplation—this describes when people are not yet considering change. This could be a stage where a health practitioner, such as a nurse, may ask about or suggest a change.
2. Contemplation—a person gives an indication of readiness to consider making a specific behaviour change ('I've been thinking about it …').
3. Preparation—the person is motivated to make the change and states their intention to change within the next month to another person (even better if it's in public). They have taken some steps towards this decision such as making bookings, seeking support from others or blocking out diary space.
4. Action—the stage at which the behaviour has commenced but is not yet habitual (less than 6 months); it is easy for lapses to occur at this stage. (Think of those un-used gym memberships and exercise bikes, or people having many attempts to quit smoking before they succeed.)
5. Maintenance—the change has become more of a habit and the person experiences the health benefits. They are more optimistic and positive about the change. Relapse may also be the fifth stage.
6. Termination—describes the stage, especially if it relates to an addictive behaviour, where the person has no temptation to relapse. This stage was added to the model by researchers wanting to add to the work of Prochaska and Di Clemente.

If the different stages that a person moves through when they wish to make behaviour change are well understood by the health practitioner then they can plan sessions or activities that positively reinforce the progress that has been made so far (Prochaska et al in Glanz et al 2008; Nutbeam et al 2010). Many behaviour-change therapeutic counselling approaches make use of this theoretical model.

Health education is so much more than giving information and expecting the person to be able to make, and sustain, the change.

The second group of behavioural models is designed to increase the health literacy of individuals or groups and they draw on Social Learning Theory as a basis (Glanz et al 2008; Nutbeam et al 2010). The models assist practitioners to understand factors that influence the behaviour of people with regard to their decisions about taking a health promotion action, and to design activities that build healthy decision making. The most widely used and validated model in this group is the Health Belief Model (HBM).

***The Health Belief Model*** The HBM (see Figure 6.3) (Glanz et al 2008; Nutbeam et al 2010) was developed to provide a

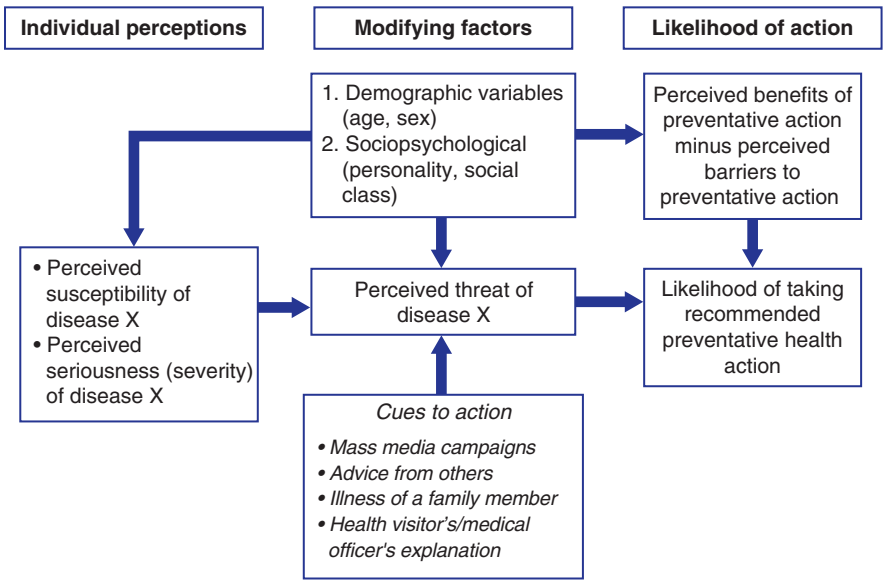



**Figure 6.3** The Health Belief Model
*(Talbot & Verrinder 2014)*

framework for explaining why some people take action to avoid a specific illness or condition and others do not. Doing a thorough analysis of the factors that may influence a person's decision provides very useful guidance about the social context and characteristics of the potential audience and about how to design a health education program that meets their needs and makes it easier for them to take the positive health action. The model is designed to be used when the health practitioner, in a top-down approach, is the 'expert'—not as part of a community development approach. As with most health education approaches, the program needs to give consideration to the wider social context of people's lives (Nutbeam et al 2010).

The relationship set out between concepts in the HBM suggests that a person, or group of people with similar characteristics will be convinced to change their behaviour based on the influence of four conceptual areas. Bear in mind this model is designed to be used in relation to one condition or situation, not health promotion generally; for example, quitting smoking to avoid lung cancer, or having a Pap test for early detection of cervical cancer. Refer to the HBM as a guide (see Figure 6.3), starting on the left side, when reading the explanation below.

1. The individual's perceptions are the person's views and current understanding about the risks and seriousness of a certain condition. Perceived susceptibility is a person's estimate of their likelihood of getting a health condition, based on their current level of understanding. Clearly, the role for the health educator is to ensure that accurate information is provided.
2. Perceived seriousness is the person's assessment of what it would be like to have the risk condition. The person may consider the impact on other people and their social situation, including work and family, so their perception will include the emotional impacts (represented by the arrow from the 'modifying factors' box). As the model also suggests the impacts of perceived susceptibility and seriousness amplify each other. Session planning would need to take account of these potential factors or else the person may be too overwhelmed to take action. For example, many women fail to attend screening for reasons such as differing cultural values, fear of the outcome or inappropriate education resources (Lee et al 2013).
3. People's views about the threat of a health risk and whether they will adopt the health behaviour change is influenced by two groups of modifying factors, as the model diagram outlines. Barriers to changing health-related behaviours include personal and financial cost to the individual, stated or anticipated family disapproval and low expectation of personal benefit related to the intended change. By recognising the subjective nature of perceived threats to health and the influence of family and cultural beliefs about health practices, the HBM can offer nurses a guide for a person's readiness to change. There is considerable evidence that people vulnerable to the social determinants of health are less likely to take health preventive behaviours (AIHW 2011) and thus health literacy programs need to take additional efforts in the planning to attract these 'difficult to engage' groups. The main purpose of social marketing strategies and resources in health education is to provide cues to commence a new behaviour. This can take the form of a reminder letter, advertisement, logo, photograph and so on. Other people, including family members, health practitioners and media stories can also be the cue.
4. The likelihood of taking action is the outcome of the individual's perceptions about the benefits of taking action to avoid or detect the condition, and whether the barriers to taking that action can be overcome.

Perceived barriers may be personal, such as fears about the embarrassment or unpleasantness, or may result from external or social factors including the costs or the change of habits. Emphasising the benefits and providing information and strategies to overcome the barriers are important components of the health education program.

The HBM assists the nurse to identify the optimal time for health education and the probability of the individual making a commitment to change. When using the HBM as a guide when planning health education approaches it is important to plan appropriate and varied content to address the concepts in each of the concept 'boxes'. Consider the way the arrows in the model relate concepts to each and use these as guides to the sequence in the way content in the program is presented.

This model may be best understood through the scenario in Case Study 6.2.

***Health education skills and techniques*** Both Registered and Enrolled Nurses play a pivotal role in health promotion, health maintenance and prevention of illness through provision of evidence-based information and education to build the health literacy of individuals, groups and communities. This requires knowledge of the range of resources available to build their skills to communicate and educate and to design sessions and programs that meet the needs of the people in their care.

Health education can be defined as 'any combination of learning experiences designed to facilitate voluntary actions conducive to health' (Green & Kreuter 2005). Health education can be any planned educational intervention people can voluntarily take that aims to look after their health or the health of others. Health education can include short spontaneous and serendipitous opportunities or more formally structured sessions for individuals or groups. Ewles and Simnett (2010) describe the dimensions of health education as:

- Concerned with the whole person, encompassing physical, mental, social, emotional, spiritual and societal aspects
- A lifelong process from birth to death, helping people to change and adapt at all stages
- Concerned with people at all points of health and illness, from the completely healthy to the chronically sick and handicapped, to maximise each person's potential for healthy living
- Directed towards individuals, families, groups and whole communities
- Concerned with helping people to help themselves and with helping people to work towards creating healthier conditions for everybody 'making healthy choices easier choices'
- Involved in formal and informal teaching and learning using a variety of methods
- Concerned with a range of goals, including giving information, attitude change, behaviour change and social change.

Refer to Clinical Skill 6.1 on health teaching.

Health education involves working with individuals, communities and society and may be guided by the principles of primary healthcare. If nurses are to influence the health of individuals and communities, they need to be clear about

## CASE STUDY 6.2 APPLICATION OF THE HEALTH BELIEF MODEL

Tom is a 50-year-old married man who has noticed a change in his personal level of fitness over the last few years. He acknowledged a gradual weight gain when his clothes were no longer comfortable and he began using the lift to his office because he became breathless when climbing a flight of stairs.

### Related health beliefs

Tom believes that weight gain is inevitable with advancing years because both his parents had become much heavier as they aged. Both Tom and his wife smoked cigarettes but were undeterred by the health warnings on the cigarette packets because no one in their family developed lung cancer or heart disease.

### Health-related event

Tom was forced to walk up stairs to his office when the lift was out of order. He was breathless from the exertion and experienced heaviness in his chest. His secretary called an ambulance and Tom was subsequently diagnosed with a myocardial infarction.

### Stimulus to change health behaviours

Tom made a good recovery but the experience had frightened him. He paid attention to the health education sessions in the cardiac step-down unit and sought advice about diet, exercise and cigarette smoking.

### Strength of the stimulus

Tom never forgot the pain in his chest and his fear of dying. He stopped smoking and gradually increased his level of fitness with the support of the cardiac rehabilitation team. His wife was scared Tom was going to die and supported him throughout his illness and rehabilitation. She cut back her cigarette smoking and didn't smoke in front of Tom but was unable to 'kick the habit'. Tom's parents were very supportive but thought they were too old to change their health behaviours.

## CLINICAL SKILL 6.1 Health teaching

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Audiovisual material/aids<br>If teaching a skill, ensure correct equipment, pen and paper, and any published written material |

| **Skill activity** | **Rationale** |
|---|---|
| Introduce self to individual, conduct a health assessment<br>Assess the individual's ability and willingness to learn—determine baseline knowledge, their cognitive status and ability to understand and speak English and culture<br>Explain the process to the individual and establish a suitable time for the health teaching to take place | Alleviates the individual's anxiety and provides reassurance<br>Ensures a baseline assessment of the individual<br>Enables resources to be organised prior to commencing any formal health teaching (interpreter, family member or carer, language/visual/hearing aids)<br>Ensures cooperation and involvement of the individual |
| **When conducting the health teaching**<br>Ensure the individual is comfortable and away from any distractions (this may be in a room away from the individual's bed area, or if in their bed/room ensure the curtains are closed or door closed)<br>Ensure only the relevant people are present<br>Ensure equipment for teaching a skill or any aids are within reach<br>Explain the purpose of the health teaching | Maintains focus and avoids distractions enabling better retention of information<br>Too many people in the room can distract the individual and cause interruptions to the process<br>Having equipment ready ensures not having to leave the individual and interrupt the session<br>Alleviates anxiety and reiterates the purpose of the education |
| Demonstration of a skill<br>The Enrolled Nurse demonstrates the skill from beginning to end with no interruptions<br>Demonstrate the skill again breaking down into steps, explaining each step clearly and as simply as possible<br>Explain the rationale of the skill and the reason for each step being performed in the way demonstrated | Shows the skill in its entirety so that the individual and/or carer can see what is involved<br>Alleviates anxiety and makes the skill easier to learn<br>Reinforces the need for accuracy and ensures the skill is learnt correctly to eliminate error |
| Ask the individual and/or carer to handle the equipment and go through each step with the nurse coaching them through it<br>If the individual/carer feels confident ask them to demonstrate again, this time coaching themselves | Gives the individual/carer the opportunity to demonstrate the skill and build their confidence with support from the nurse<br>The individual/carer may require another demonstration by the nurse if they are struggling to master the skill |
| Run through any troubleshooting issues which may occur with the equipment<br>Go through the manufacturer's guidelines with the individual/carer<br>Provide feedback | Allows the individual/carer to become familiar with some of the error readings or any issues with the equipment and what to do, care of the equipment and proper disposal of any waste<br>Promotes confidence in being able to perform the skill and may require further sessions |
| General health teaching<br>Go through the areas of health teaching pertaining to the session with the individual and/or carer using any aids or written materials<br>Ask the individual and/or carer to repeat any information in their own words and ask any questions<br>Do not overload them with information | Outlines the purpose of the health teaching and demonstrates efficiency<br>Determines a level of understanding and allows for repetition of any information<br>Too much information can confuse the individual and/or carer, making the learning harder<br>The nurse may need to follow through with another session |
| Document in the progress notes and report to the Registered Nurse and/or multidisciplinary team any relevant information | The individual and/or carer may need to be referred to other healthcare personnel for further teaching |

*Crisp & Taylor (2013); Tollefson et al (2012)*

what factors contribute to people's health and ill health. There is also a role for the individual to take responsibility for their own health, and a clear role for communities and government in tackling the root causes of ill health. The nurse needs to consider how and to what extent they can involve people in planning their own healthcare. Drawing on Adult Learning Principles (Knowles 1980), Talbot and Verrinder (2014:235) outlined the following principles for facilitating the teaching–learning process:

- Work with participants to *identify the learning needs* and preferred learning styles—allow them to direct the learning process. What the educator assumes they need to know may not be the same as what the learner needs or wants.
- *Get to know the learners' perspective*. The time spent on exploring learners' values, what they think and know about the subjects to arrive at mutual expectations about program content and outcomes will improve the outcomes for the learner.
- *Be aware of the context of people's lives* such as the social, educational, emotional factors they experience as barriers to health literacy. Use this background information as part of the learning process, and as the basis for real-life examples to illustrate the theoretical content.
- *Build on what people know*—extend learning rather than repeating what is known, or assuming they know more than they do.
- *Set realistic achievements* for the time available and what learners can do as a result of the teaching. If a new skill is being taught, the learner will need to understand the theory and have time to refine the skill with repeated practice.
- If it is a group session the educators will need to *accommodate the varied levels of learning* of the participants. A useful way to gauge current knowledge is to commence the session with a brief discussion with questions, or a pre-test in verbal or written format.
- *Present the information in a logical format*, from simpler, concrete information to more complex, conceptual information where the learner may need to adapt or apply the information into a different setting. An example of this is when teaching the principles of an aseptic technique for wound management. A session might include an explanation of the principles, a demonstration and practice in a hospital setting. This would be followed by discussion and practice in the home setting. Support this with written hand-out material where relevant.

Whether working with groups or individuals, certain skills are required to enable the nurse to facilitate health promotion and education, including:

- Use a theoretical framework as a guide when planning the content
- Gain an understanding of the person's concerns and position
- Be clear and unambiguous with simple language and relevant examples
- Be non-judgmental, be aware of other factors such as the views of significant people in the person's life and the individual's own self-esteem that could influence the communication process
- Have up-to-date knowledge and be informed of scope of practice
- Use effective communication skills such as using open-ended questions, listening, recognising any cultural implications, assessing body language and concise history taking and documentation
- Use written material to support the interpersonal communication. Ensure the cultural safety of the person and their cultural values.

The challenge for nurses is how and when to provide health education information. If a person has specific learning needs about health promotion, risk reduction or management of a health problem, it is useful to develop and implement a teaching plan with the person. A teaching plan includes assessment of the person's ability, need and readiness to learn, with identification of problems that can be resolved with teaching. The nurse then determines objectives with the person, delivers educational interventions and evaluates the effectiveness of the teaching. Clinical Interest Box 6.5 lists the principles to guide effective teaching and learning.

## Medical models

Medical approaches to health promotion aim to improve physiological risk factors such as high blood pressure, early cancer detection and immunisation. In the AIHW model (see Figure 6.1) and the Continuum of Health Promotion Practice (see Figure 6.2), health promotion action occurs on biomedical factors and health promotion action such as surveillance, risk assessment and immunisation, listed on the far right.

Other categories of models are explained briefly here, but it is recommended that students wishing to use them in their practice gain additional guidance from specialist texts on this subject (e.g. Nutbeam et al 2010; Crisp et al 2013).

### CRITICAL THINKING EXERCISE 6.3 Applying the Health Belief Model

Use the Health Belief Model as a basis to develop a plan for one session of health education for refugees who attend the community health facility where you work, which is designed to encourage them to have their children fully immunised at the free public sessions that are available.

A detailed assessment phase will be essential and the success of the program will depend on whether the program meets the issues identified in the assessment. Because of the different cultural characteristics of the potential participants, you cannot assume that a successful program offered to one immigrant group will automatically be relevant to a different group.

## CLINICAL INTEREST BOX 6.5 Principles to guide effective teaching and learning

| Principles | Teaching implications for the nurse |
|---|---|
| Allow the learner to direct the learning process. | Active participation is paramount.<br>Learning is most likely to occur if the learner sets the goals.<br>Learners need to have their say, use initiative, experiment and find out what works for them.<br>Identify which teaching technique is best for each learner.<br>The nurse is a facilitator to direct the learner to resources. |
| Get to know other people's perspectives. | Understand the background and ideas of other people.<br>Build new knowledge on past experience. |
| Be aware of the context of people's lives. | Centre the learning experience on real-life situations of the learner.<br>Readiness and motivation to learn are high when facing new tasks. |
| Pre plan. Establish agreed-on, written goals. | Develop and discuss the plan with the person. Introduce a role model to help illustrate therapeutic expectations. Enlist the aid of family and significant others. Revise expectations; learn to be satisfied with small achievements. |
| Build on what people already know. | Identify where it is easiest for the learner to begin learning.<br>Provide new material at a pace that is appropriate for the learner.<br>Treat mistakes as an opportunity to learn. |
| Planned achievements need to be realistic. | Set realistic achievable goals.<br>Find out what it is that the learner wants to know. |
| Take account of all levels of learning. | Consider whether there is a need for knowledge development, attitudes and values clarification or behaviour change and skills development. |
| Present information in logical steps. | Provide a logical sequence, whereby complex ideas are built on smaller ones. |
| Create opportunities for teaching. | Use all possible opportunities for teaching, such as when bathing or changing a dressing. Break teaching and practice into small time periods. |
| Documentation. | Carefully document what was taught and learnt. Screen teaching materials, |
| Broaden knowledge base. | Read, study, ask questions. Participate in other teaching sessions, observe more experienced nurse–teachers, attend classes. |
| Develop your own support system. | Recognise personal reaction to stress. Rely on friends and family for positive encouragement. Network with other nurses, health professionals and community leaders to change the situation. Become proactive in legislative processes affecting healthcare delivery. Advocate for time for teaching. |

*(Talbot & Verrinder 2014)*

## Holistic health models

Contemporary nursing care can be understood through a holistic model of healthcare, where the interplay of physical, psychological and spiritual dimensions of an individual's health is acknowledged and a broader reference to both traditional and non-traditional therapies is included. This model demonstrates respect for an individual's healthcare beliefs; their right to participate in their healthcare planning and the

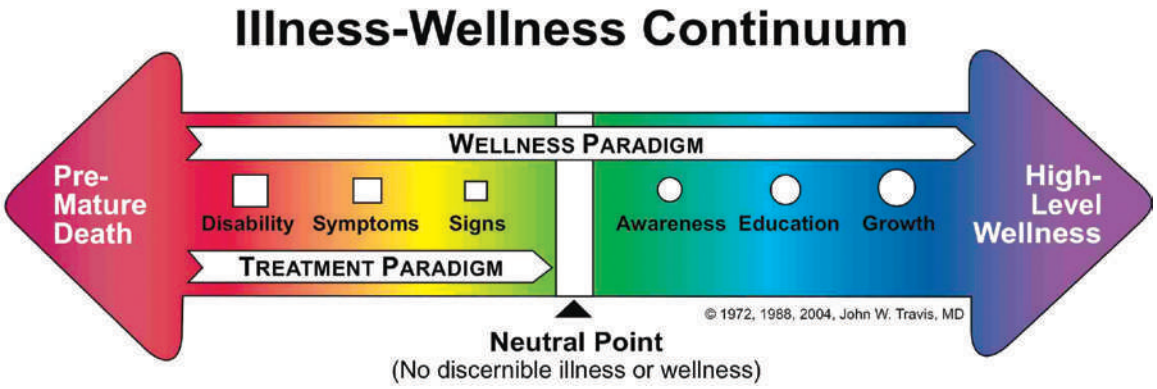



**Figure 6.4** The health–illness continuum

*(Travis & Ryan (2004). © 1972, 1981, 1988, 2004 by John W. Travis, MD. Reproduced with permission)*

need for collaboration between all carers in this planning (Crisp et al 2013). Ideally, this holistic model of healthcare delivery creates an empowering environment which enables individuals to assume a greater control over culturally appropriate healthcare options. One of the earliest models was developed in the 1940s by Abraham Maslow. He believed that a person's motivations and behaviour are formed by attempting to meet their basic needs. Maslow defined basic human needs as physiological needs, safety and security, love and belongingness, self-esteem and self-actualisation (Maslow 1970). Maslow's 'hierarchy of needs' emphasises that some needs are more basic than others and that the more basic needs need to be met before consideration of higher needs. Maslow's hierarchy has provided an important foundation for human services, including nursing, where it forms the basis of most nursing models.

### The health–illness continuum

The health–illness continuum model of healthcare is another model that can assist nurses to recognise individuals' states of health and wellness as a position on a continuum that ranges from a high level of wellness at one end to severe illness at the other (see Figure 6.4). This continuum represents mental and physical functionality based on vision, hearing, speech, mobility, dexterity, cognition, emotion, pain or discomfort rather than the continuum of health promotion practice discussed previously. The health–illness continuum model can also represent the level of individual risk for disease or illness in relation to age, socioeconomic status, cultural beliefs and geographical location. By placing high risk at one end of the continuum and low risk at the other, the comparison of age with risk of infectious childhood diseases such as mumps or rubella identifies young children as being at high risk. Population statistics identify a greater risk associated with car accidents for young people between the ages of 16 and 26 than for other age groups. Risk factors for infant mortality are related to socioeconomic status and geographical location, while the risk factors associated with tropical diseases such as malaria are much greater for people living near the equator compared with those who do not. Cultural and religious beliefs related to health practices may prohibit groups of people from the benefits of specific care options, thus increasing their associated risk factors. A continuum does not provide us with an absolute measure but, by identifying their position on the continuum, people can be encouraged to see a comparison between current and previous health states, or their position in relation to specific risk factors (Crisp et al 2013). This model describes the relationship between health and illness and provides a method of identifying an individual's level of health. This model is valuable when comparing an individual's present health status with their previous level of health and for then setting nursing goals and objectives to promote a future level of health (Crisp et al 2013).

**CRITICAL THINKING EXERCISE 6.4**

1. If the midpoint of the continuum/pathway represents the neutral point or no discernible illness or wellness, or represents little awareness of health status, where would you place yourself and/or your family members on the continuum?
2. What direction are you facing?
3. What steps can you and/or your family members take to achieve a greater sense of wellbeing?

## NURSING AND HEALTH PROMOTION

### The changing role of nursing

The focus of nursing care in the twenty-first century includes medical, behavioural and socioenvironmental models using theories and research as a basis for practice. Nursing has moved from being largely disease oriented to emphasising the importance of promoting, preserving and maintaining health. Furthermore, nurses now work in collaboration with others to enable individuals, families, groups and communities to reach their full health potential.

## The role of the nurse in health promotion

The role of the nurse in promoting health can fall anywhere within the action areas of the Ottawa Charter for Health Promotion (WHO 1986) or Continuum of Health Promotion Practice (Figure 6.2) discussed above. It is important for all nurses to work within the confines of their scope of training and practice but ways of working are summarised in Clinical Interest Box 6.6.

Nurses can make a contribution to the health and well-being of individuals by:

- Recognising there is a role for the nurse in the promotion of health and self-care
- Participating in providing health promotion interventions
- Being aware of the determinants of health when assessing and planning for individual needs
- Acknowledging the contributions of other professionals to meet the person's health needs.

Nurses can adopt a positive perspective to health promotion when nursing in the community by:

- Recognising that individuals live within families, groups and communities with specific needs
- Participating in health promotion activities
- Maintaining cultural awareness and sensitivity
- Learning and gaining knowledge about the community
- Creating empowering environments with others
- Networking and building on resources and partnerships
- Developing and improving personal skills required for practice.

## The nursing process in health promotion

Essentially, the **nursing process** is a series of planned steps that produce a particular result/health outcome. Specifically, the nursing process is a modified scientific method of systematic problem solving. In simple terms the nursing process is a method used to assess, plan, deliver and evaluate nursing care. The process of nursing, or scientific method of problem solving, remains the same whether the nursing care provided is a simple measure or a sequence of complicated nursing activities, and it can be adapted to individuals or communities. The nursing process (see Figure 6.5) can guide practice at any point along the Continuum of Health Promotion

### CLINICAL INTEREST BOX 6.6 Ways of working in health promotion

Talbot and Verrinder (2014) suggested working:

- *with* individuals, communities and populations
- *in* settings such as workplaces, schools, sporting venues and the arts
- *within* socioenvironmental, behavioural and medical models
- *around* issues including risk conditions such as discrimination, poverty and natural resource depletion, psychosocial risk factors such as social exclusion, behavioural risk factors such as poor nutrition, and physiological risk factors such as stress
- *by* policy development, community action for social change, health education, health information, screening and surveillance
- *using* frameworks such as the Ottawa Charter for Health Promotion as a guide.

To keep developing your skills and expertise in the area of health promotion you can:

- *Talk with your colleagues.* Discuss your ideas, your successes and your failures with anyone who is interested to learn with you.
- *Ask questions.* Successful people draw on the expertise of others.
- *Share your learning professionally by joining professional associations, attending conferences and presenting papers on your work.*
- *Work together, supporting and encouraging each other and promoting the health of the team.* A great many of the strategies need to be implemented within health organisations first. Developing the self-efficacy of everyone in the team is vital. Too often health workers write each other off, ignoring the strong socialisation processes that have impacted on each other. Work together, support and encourage each other and promote the health of the team. The ripples of this work will be felt far beyond the confines of the organisation and you will be able to establish a team environment that will achieve so much more than that which individuals alone may achieve.
- *Continue working to keep the development of a primary healthcare system on the agenda, and to ensure that the system develops towards a greater emphasis on the promotion of health.*
- *Reflect upon the impact of your actions*.

If **public health** or health promotion is to be a central concept in nurses' work, then nurses' role-perception, skills, knowledge and attitude to health promotion will have a vital impact on the success or failure of health promotion activities.

*(Talbot & Verrinder 2014)*

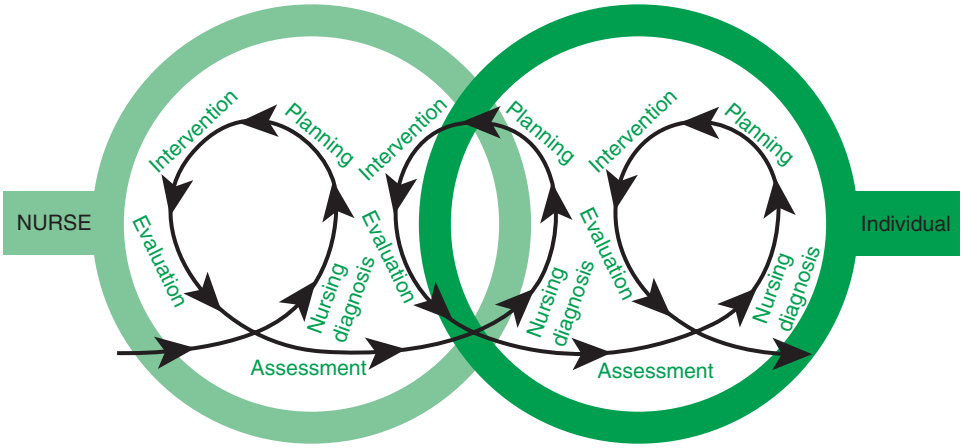



**Figure 6.5** The nursing process

Practice but it is a well-known process in program development and evaluation in that model. It is an ideal process to promote health in individuals as well as groups or communities and is essential in revising and updating any plan of care to meet an individual's or community's changing needs. By using the nursing process, specific needs are identified and a plan is developed and implemented to meet those needs. The effectiveness of any care given or program developed is continuously evaluated in terms of the individual's or community's needs. Furthermore, there must be a recognition that there may be many stakeholders such as family members, other health professionals, community members from various sectors as well as the wider community.

The overall objectives for health promotion activities can be varied to:

- Include the prevention of communicable and non-communicable disease
- Ensure that people are well informed and able to make healthy choices
- Change behaviour
- Help people acquire skills and confidence to take greater control over the factors influencing their community and their health
- Change policies such as organisational policies which foster cultural competence
- Change environments to facilitate healthy choices such as active transport
- Address the determinants of health such as poverty, housing and community inclusion.

Whether working with an individual or community the nursing process remains the same:

- Assessment—work with the individual or community to gather data
- Design the program/care—using evidence and theories and work with the individual or community to develop aims and objectives
- Develop an action plan—develop strategies
- Implement the plan
- Evaluate the goals and objectives—assessment of whether the aims and objectives have been achieved
- Redesign the program—in light of the evaluation
- Revaluation.

## Planning with an individual

Key questions to ask during the assessment phase are included in Clinical Interest Box 6.7.

After collecting the data the nurse is able to identify the problem or areas of need and is then able to make a nursing assessment based on these findings. For example, in Case Study 6.3 the nurse may make the assessment that Mary does not understand the implications of her current dietary habits and the need to make some changes. Once this has been determined the nurse is then able to plan the care needed for Mary to optimise activities to ensure health promotion.

Planning the care for Mary is the next phase. Planning involves setting goals, establishing priorities and determining nursing interventions to achieve the goals. This will require determining specific interventions aimed at achieving the ultimate goal for health promotion. There may be several levels of intervention, including individual one-on-one counselling on dietary changes, through to specialist diabetes education services. Some important questions to consider are:

- Have the issues clearly been defined?
- Who are the key stakeholders?
- What has been tried before?
- Are the goals that have been set achievable and realistic?

The principles of the nursing process can be adapted to health promotion planning at the community level. Planning tools for use in the community such as the Planning and Evaluation Wizard (http://www.flinders.edu.au/medicine/sites/pew/) can provide a step-by-step guide. Initially, research may need to be undertaken to obtain a community profile. This profile might be take into account the members of an organisation such as an aged care facility or it may be a profile of the wider community which takes into account the environment, policy, available services and resources, housing, finances and perhaps cultural considerations. Local community profiles are updated by governments and non-government

## CLINICAL INTEREST BOX 6.7 Assessment of characteristics that affect teaching individuals

**Characteristics and key questions**

**Physical**

- What are the person's age and sex?
- Is the person acutely ill?
- Is the person fatigued? In pain?
- What is the primary diagnosis?
- Are there additional diagnoses?
- What is the person's current mental status?
- What is the person's hearing ability? Visual ability? Motor ability?
- What drugs does the person take? Do they affect learning?

**Psychological**

- Does the person appear anxious, afraid, depressed, defensive?
- Is the person in a state of denial?
- What is the person's level of self-efficacy?

**Sociocultural**

- Is the person employed?
- What is the person's present or past occupation?
- How does the person describe their financial status?
- What is the person's educational experience and reading ability?
- What is the person's living arrangement?
- Does the person have family or close friends?
- What are the person's beliefs regarding their illness or treatment?
- What is the person's cultural/ethnic identity?
- Is proposed teaching consistent with the person's cultural values?

**Educational**

- What does the person already know?
- What does the person think is most important to learn first?
- What prior learning experiences establish a frame of reference for current learning needs?
- What has the person's healthcare provider told them about the health problem?
- Is the person ready to change behaviour or learn?
- Can the person identify behaviours/habits that would make the problem better or worse?
- How does the person learn best? Through reading, listening, doing things?
- In what kind of environment does the person learn best? Formal classroom? Informal setting, such as home or office? Alone or among peers?

*(Brown et al 2015)*

organisations; for example, Community Indicators Victoria (http://www.communityindicators.net.au/). Specific information about health status is updated by state and federal government departments; for example, AIHW.

## CASE STUDY 6.3 SUBJECTIVE AND OBJECTIVE ASSESSMENT

Mary, 52, has recently been diagnosed with type 2 diabetes mellitus. She states, 'I have always loved my food—in many ways it is my only enjoyment in life and now my doctor says I have to give up all the things I love to eat. I am finding it just too hard on the diet he has given me and I think I'll just give up.'

The nurse observes that Mary does not appear to have altered her lifestyle, as she eats constantly, and there are several chocolate wrappers on the bench.

Health promotion should start from the existing knowledge and beliefs of the individual. To plan the individual care needed for Mary and to begin the nursing process, it will be helpful for the nurse to first determine Mary's health beliefs and her understanding of the diagnosis she has been given. This will require building up trust and obtaining a detailed social and medical history. This phase of the nursing process is the assessment phase and basically requires the gathering of subjective and objective data.

Subjective data are the individual's, or other significant person's, perceptions, ideas and sensations about a health problem; for example, Mary has stated that she is finding it too hard and wants to give up. Objective data are the information observed or measured by the nurse; for example, the nurse has observed that Mary does not appear to have altered her lifestyle, she eats constantly and there are several chocolate wrappers on the bench.

Implementation means putting the plan into action; it is the actual performance of the activities that have been selected to help the community achieve the set goals. The community needs are reassessed continuously during the implementation stage so that any new needs can be identified and the plan modified or adapted.

After the planned interventions have been implemented, the nurse must then evaluate the results to determine whether the interventions were effective. Evaluation is the process of determining the extent to which the set goals or objectives have been achieved, and enables the nurse to monitor the effectiveness of the plan. Whether the plan was a success or not is determined by comparing the person's/community's response to the nursing interventions within the set goals and set time frame. Evaluation also enables the nurse to identify any new healthcare problems experienced by a person or the community. Clinical Interest Box 6.8 provides an example of the nursing process in an aged care facility.

Documentation occurs at all stages in the process of planning, implementing and evaluating the intervention. There are many ways of doing this. Organisations usually have their own requirements but there are some general rules. Examples of health promotion planning and evaluation templates are provided on websites recommended at the end of the chapter. Progress notes will document all aspects of the program.

## CLINICAL INTEREST BOX 6.8 Nursing process in aged care facility

An example of using the nursing process would be to develop an outline for a health promotion program you have been asked to prepare to encourage the independent-living residents in your aged facility to drink sufficient water.

### Assessment

A detailed assessment phase will be essential and the success of the program will depend on whether the program meets the issues identified in the assessment.

There are no right or wrong answers here but you may consider the assessment under 'personal' and 'environmental' headings.

Questions you will need to answer will include:

### Personal

- What is the variation in residents' current knowledge about the importance of good hydration? (A pre test may need to be prepared, or this could be gauged in an informal conversation.)
- Ask the residents what prevents them from drinking at least 2 litres of water (apart from other fluids) in a day.
- Does the age of some residents prevent them from recognising they are thirsty? (The sensation declines with age and illness, and is affected by some medications.)
- Take a detailed history of when residents drink water, and how much.

### Environmental

- Are there options for fresh water that meet the residents' needs? (hot, room temperature, cooled)
- Are people able to access their water needs? (perhaps restricted by access to designated areas, or 'rules')
- Are there prompts such as signs in dining areas, beside beds, toilet doors?
- Is water made appealing? (suitable containers and glasses etc.)

### Planning

- Collate the answers to your assessment.
- Plan to make necessary changes to the environmental limitations that will overcome stated barriers and identified barriers before you commence the education.
- Decide whether it is better to do individual or group sessions.
- Collect/prepare the necessary resources, including a prompt sheet and perhaps a social marketing prompt.
- Prepare a lesson plan using Adult Learning Principles as per the guidelines earlier in this chapter.

### Implementation

- Use different methods to create interest and relaxation, and to aid memory
- Talk through and/or demonstrate where applicable (How many mL in a glass, in a jug? What colour is healthy urine?)
- Test knowledge as you progress.

### Evaluation

How will you prepare to answer the following questions?

- Did you implement the training program exactly as you planned? Did you follow and complete the lesson plan? What was missed?
- Did the residents understand the guidelines in the session?
- Did they understand the messages and the purpose in the materials you provided them with? Were they able to put the concepts into their own words, and explain the meaning to you?
- Were they able to apply and adapt the principles for their own situation? Does weak black tea count? What about a milkshake?
- Did the program achieve the overall aim of the session? How will you know? Perhaps do a spot check on intake for the day.
- Note other forms of self-report (fluid intake, dryness of mouth, colour of urine etc.).

Using the antenatal health promotion program described in Decision-making Framework Exercise 6.1 you will have documented the goal or overall aim of the program, the objectives designed to meet that goal and the strategies that will help you meet the objectives. Strategies may change and it is important to note these for evaluation purposes and to prevent problems. For example, in your planning of the health promotion program in the antenatal service, you may have scheduled health education classes on a particular day and time and no one attended. This needs to be documented because you may now need to redesign your strategies. Why didn't people attend? Was this the best time? Does this program schedule line up with public transport timetables? Was there a cost and if so, was it beyond the means of potential participants? Were potential participants asked about these questions in the planning process? To meet the needs of potential participants better and to provide a rationale for any changes progress notes are important.

### DECISION-MAKING FRAMEWORK EXERCISE 6.1

You are an Enrolled Nurse who has just been employed in the antenatal outpatients' department at the hospital. Part of your role is to assist the Registered Nurse in charge to develop a new health promotion service to work with adolescent women who are considered to have 'at risk' pregnancies.

This role fits with the National Safety and Quality Health Service (NSQHS) Standards (ACSQHC 2012; 2015), in particular 'Partnering with consumers'.

Reflect on this developmental role and ask yourself the following questions:

1. Have I received the necessary education or training to perform this role?
2. Am I *authorised* by the regulatory authorities, laws, guidelines and policies to perform this role?
3. Do I have enough practice, experience or exposure to *competently* perform this role?
4. What strategies would you suggest to take on this role competently?
5. What action areas of the Ottawa Charter for Health Promotion would the 'Partnering with consumers' Standard of the NSQHS fit best with?

## Summary

Health promotion provides the key to minimising or eliminating disparities in world health and plays a fundamental role in achieving the goals and objectives as determined by WHO and countries such as Australia. The evidence demonstrates that political, economic, social, cultural, environmental, behavioural and biological factors can all have an impact on health. Health, then, may be defined according to circumstances, context and perceptions and experiences, which may vary between individuals and between communities.

Nurses are in an ideal position to participate in health promotion as they spend much time in professional relationships in a variety of settings. A sound knowledge of what determines health, evidence based practice, health conditions, awareness of health promotion theories and strategies and a keen eye for opportunities are key elements to making a difference in promoting and improving health.

## Review Questions

1. What is the difference between the notions of health, wellbeing, illness and disease presented in this chapter?
2. What is meant by the phrase determinants of health?
3. The AIHW (2014) determinants of health model represents the interrelationship between which major factors that affect health?
4. What is meant by primary healthcare?
5. What are the five action areas of the Ottawa Charter for Health Promotion (WHO 1986)?
6. What are the advantages of early disease detection?
7. What is the difference between screening and surveillance?
8. Why is it important to encourage mothers to make sure the full recommended infant immunisation schedule is completed?
9. Identify at least three (3) events that might influence change in a person's health behaviours.
10. Identify potential barriers to changes in health behaviours.
11. List some topics where social marketing strategies are used in the hospital or clinic setting.
12. What are the criticisms or potential shortcomings of social marketing strategies that are designed for large groups of the wider population?
13. Explain the difference between health promotion and illness prevention.
14. What is the role of the nurse in health promotion?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Recommended Reading

VicHealth (nd). *Technology and older people: findings from the VicHealth Indicators Survey*. Online. Available <http://www.vichealth.vic.gov.au/~/media/ResourceCentre/PublicationsandResources/Research/Technology-older-people-research-summary-Oct2013.ashx>.

## Online Resources

**Determinants of health**

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Wilkinson, R. (2011) *How economic inequality harms societies*. Online. Available: http://www.ted.com/talks/richard_wilkinson TED Global 2011

**Primary healthcare**

SA Health (2010) *A framework for comprehensive primary health care services for Aboriginal people*. Online. Available: http://www.sahealth.sa.gov.au/wps/wcm/connect/ac97b3804b5567bf88bafd9a087db869/PHCFramework-HSD-AH-120211.pdf?MOD=AJPERES&CACHEID=ac97b3804b5567bf88bafd9a087db869

WHO (2008) *The World Health Report 2008* - Primary Health Care (Now More Than Ever). Online. Available: http://www.who.int/whr/2008/en/

**Health promotion**

VicHealth (Victorian Health Promotion Foundation) Online. Available: https://www.vichealth.vic.gov.au/

World Health Organization: Online. Available: http://www.who.int/healthpromotion/en/

WHO Online. Available: http://www.euro.who.int/__data/assets/pdf_file/0005/98438/e81384.pdf

**Planning, evaluation and report writing tools**

Australian Indigenous HealthInfoNet (nd) *Health planning and evaluation tools*. Online. Available: http://www.healthinfonet.ecu.edu.au/health-infrastructure/health-workers/resources/health-planning-evaluation-tools

Flinders University, School of Medicine (nd) *The planning and evaluation wizard*. Online. Available: http://www.flinders.edu.au/medicine/sites/pew/

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CHAPTER 7

# Quality and safety in healthcare

*Yvonne Elizabeth Wilkinson*

## KEY TERMS

accreditation
adverse event
audit
benchmark
clinical indicators
error management
governance
human error
human factors engineering
nursing-sensitive indicators
patient safety
preventable patient harm
quality
quality improvements
second victim
standards

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Understand quality and safety in the context of the health system, the nursing profession and person-centred care
- Appreciate your role in ensuring that individuals receive safe quality nursing care
- Contribute to quality and safety activities in your practice setting
- Understand the interplay between occupational health and safety and safe quality service delivery

## CHAPTER FOCUS

In any country, healthcare is a complex environment. In Australia, the health system has been described as a 'web of services, providers, recipients and organisational structures' (AIHW 2014:32) with further complexities of varying funding models, government and non-government service providers and diverse user demands. It is often asserted that Australians enjoy reasonably good health, with an average life expectancy at birth (both men and women) of currently 82.1 years (Duckett 2014; Jeyaratnam & Jackson-Webb 2014). Against other developed countries, this outcome could be seen as an indicator of a high quality safe healthcare system. Of course, a long life expectancy is also dependent on other social and political factors, with the system healthcare being a major contributor.

Achieving optimal quality and safety outcomes for healthcare in Australia remains a challenge, particularly in the context of the ageing population, increasing prevalence of chronic diseases and high costs of new medical technologies. Additionally, in Australia's complex healthcare system, where services are delivered by both government and non-government agencies at local, state and national levels, with extraordinary efforts made to promote choices with respect to treatment options, there is potential for duplication of services on the one hand and gaps in service provision on the other. To be confident that the system is working efficiently and effectively, our system needs governance, coordination and regulation (AIHW 2014:32).

## LIVED EXPERIENCE

As a nurse, no matter where you work, you will always try to give your best. I have worked in a few places, both in Australia and the United Kingdom, where I saw poor or suboptimal patient outcomes despite passionate and committed health professionals giving their best. As I reflect on these situations, it is clear to me that the missing element from these services is a strong focus to quality and safety. Of course they had standards that they had to meet, but it was a paper exercise at best, with most attention being given to collecting or creating evidence of compliance rather than a genuine attempt at improving the quality and safety of care. In these services, it was rare to discuss ways to improve the efficiency or effectiveness of our day-to-day practices. Although my colleagues were competent with respect to nursing skill and knowledge, there was little interest or motivation in making changes to improve our care. I now work in a facility that really values the healthcare workers' input into improving the quality and safety of our service. I am excited by the new standards that focus on high-risk issues such as clinical deterioration, falls, pressure injuries and medication safety. I feel that I am part of an industry that is walking the walk, not just talking the talk. I enjoy my work so much more when I know I make a real difference and improve patient outcomes.

**Sarah, Paediatric Nursing Specialist**

## QUALITY AND SAFETY IN THE CONTEXT OF HEALTHCARE

The community expects the system to deliver the right services to the right people, at the right time, using the right workforce with the right resources. Efforts to ensure our healthcare system meets the needs of Australians are supported by a range of governance mechanisms, each with differing purpose, function and application.

The Australian Safety and Quality Framework for Health Care (Australian Commission on Safety and Quality in Health Care 2010) demands all healthcare services are always consumer focused, always driven by information and organised for safety. Our community expects to trust our health service providers to provide quality care. Those who receive our services expect to receive safe quality care from health professionals. Nurses are a highly visible contributor to outcomes of the individual under our care, and as such they consistently strive to meet this expectation, delivering safe quality care resulting in a positive experience. To meet this goal there must exist an understanding of quality and safety in healthcare.

## QUALITY IN HEALTHCARE

**Quality** in healthcare is multidimensional, and as such is difficult to define in simple terms. It is often subjective, leading people to interpret their experiences differently. Some might believe that quality is about how much the health services for individuals and populations improve the health outcome for those individuals. Does their health improve as a result of the care? Additionally, quality can be determined in the context of the service that was provided using the best evidence available to the health practitioners and whether the care meets the expectations of the marketplace—that is, those potential future users of the service (Buttell et al 2007).

Quality can be a reflection of the 'extent to which a healthcare service or product produces a desired outcome' (Runciman et al 2007). This is a simplistic perspective, most notably that of the individual or their healthcare professional. However, at a system level, a quality healthcare service needs to be safe, person-centred, timely, effective, efficient and equitable to be considered a quality service (Institute of Medicine 2001).

In Australia, the nine dimensions for the assessment of health system performance include appropriate, effective, responsive, continuous, sustainable, accessible and capable, all considered relevant (along with the safety dimension) to the quality of healthcare services (AIHW 2015).

## Quality frameworks

For decades health service leaders have been engaged in bringing to their organisation robust systems of quality assurance and control. One of the early conceptual models proposed to examine and evaluate healthcare is the Donabedian model. Avedis Donabedian in 1966 argued that quality of care could be measured through the collection of information from three categories or dimensions of care: structure, process and outcome. The model assumes a unidirectional approach to measurement, commencing at structure, then process and onto outcome. It is also proposed that this model could be applied in a variety of healthcare contexts.

Structure refers to all the elements in the contexts in which care is delivered. Types of elements include the physical environment, equipment and human resources. They also include training, information and financial systems. These elements are the foundation for the processes and outcomes, and if they are inefficient and/or ineffective they will impact on the quality in the other categories of process and outcome.

Process is every action that makes up health service provision. The process category includes specific activities such as diagnosis, treatment, rehabilitation, health promotion and early intervention. This category includes examining the process of how care is delivered (in a technical sense). The effectiveness of interpersonal interactions is observed and measured to determine quality of care. The information is collected from records, direct observation or interviews with staff and people receiving services.

Outcome is the effects of healthcare. This can be at the individual or community level. Measures of health status changes, behaviour changes, level of satisfaction of the service user (individuals and family) and reported quality of life contribute to the inferences drawn about outcomes. Achieving positive outcomes for individuals in our care is considered the most important goal for healthcare professionals and can be sometimes interpreted as the most important indicator of quality. Unfortunately, establishing a proven cause and effect relationship between process and outcome in the context of quality is complex and challenging, resulting in few true connections being made between process and outcome in the healthcare environment.

Modern-day quality frameworks are based on the three dimensions of care, with the understanding that each of the three dimensions influences the others and that individuals and environmental factors play a critical role in measuring quality in healthcare.

## Aspects of quality

There are many players engaged in the healthcare environment. They include the health service users, the individuals in our care, their families, their community; the care givers, the healthcare practitioners, non-clinical support staff; and the healthcare system, the leaders and managers of the hospitals and clinics, the funders of the services such as government agencies. Each of these groups has a different motivation in understanding the level of quality of the healthcare service.

### Measurable quality

Measurable quality is simply compliance with standards relevant to that setting. This is commonly seen or experienced by nurses when the healthcare services in which they work are surveyed by an external agency for the purpose of '**accreditation**'. Essentially an external group reviews the structures and processes of that service, evaluating the levels of conformance or compliance with an agreed set of standards suitable to that setting. Being an accredited healthcare service provider meets the requirements for funding, assures the community that the services offered meet industry standards and assures the leaders and managers of the service that their organisation is delivering quality care.

### Appreciative quality

Peer review bodies primarily undertake this type of review. As part of the journey towards clinical excellence and quality improvements in clinical care, their peers will review health practitioners' clinical decisions and interactions. These activities will vary across services. In some settings, clinical information may be uploaded into national data collections. This will allow comparisons to be made and benchmarking activities to be undertaken.

### Perceptive quality

The perspective of the user of the service and their family is used to determine the quality of the experience of healthcare. These perceptions are commonly influenced by the attitudes and direct actions of the clinical and non-clinical staff. It is essential to step into the individual's shoes and understand the healthcare experience through their eyes.

## Governance

**Governance** is a term used to capture all the policies and processes needed for a system to deliver its outputs efficiently and effectively. This term is applied to a range of industries. Governance operates at all levels of the health system. The term governance is used at the national, state or funder/purchaser level; at health service level, the term clinical or care governance is preferred. No matter where it operates, governance is still about making sure that services are person centred, timely, effective and efficient.

At a national level, the government is committed to ensuring that the health service providers deliver care in an effective and efficient way. Their focus is on both quality and safety. In Australia, the federal and state governments fund or purchase a large proportion of health services. In the healthcare setting, the term clinical or care governance is applied to the system of monitoring the provision of services through the application of policies, procedures and processes that deliver safe high-quality care to service users.

## Health system

The Australian healthcare system is a mixed public/private model. The public healthcare system, while providing universal access to all Australians via Medicare, is a complex, complicated system of legislation and funding arrangements with the Commonwealth government providing each state with funding for public healthcare via the 'healthcare agreement'. Within this agreement there are various responsibilities for the states to comply with and in recent years the Commonwealth government has become more demanding of the states to provide outcome data to demonstrate improved healthcare for Australians. Australia's private health system includes private hospitals and user-pays options for other services that individuals can access, most using a private insurance payment scheme. Chapter 4 provides more detail on the Australian healthcare system.

An integral part of the governance mechanism is the Australian Commission on Safety and Quality in Health Care (ACSQHC). It was created by Health Ministers in 2006, and funded by all governments on a cost-sharing basis, to lead and coordinate healthcare safety and quality improvements in Australia. The aim of the ACSQHC is to support healthcare professionals, organisations and policy makers who work with individuals and carers. It reports to the Council of Australian Governments (COAG) Health Council and works with the Inter-Jurisdictional Committee, which is made up of senior safety and quality managers from the Commonwealth Department of Health, and each state and territory Department of Health.

Other bodies that provide governance to Australian healthcare are the National Health Performance Authority and the Independent Hospital Pricing Authority. Both of these agencies provide governance to all Australian healthcare settings through agreements based on achieving safe high-quality services. They offer transparency to the Australian community with respect to outcomes of monitoring and measuring activities.

## Measuring quality

To ensure confidence in our systems, processes and outcomes relating to healthcare, there is a need to monitor and measure them. Not every aspect in an episode of care will be able to be measured or monitored specifically, but across the system all aspects of care need scrutiny. Although not a perfect system, there are a number approaches to measurement and subsequently opportunities to improve on what we have. Some approaches are reliant on others, and collectively there is greater confidence in the reported level of quality and safety in that setting.

***Standards*** Measurement is made possible through the development of **standards**. Nurses are introduced to standards very early in their nursing career. During nursing studies, the term is often used in the context of meeting a predetermined level of attainment which is expected of all members of that cohort. This is similar in healthcare. A standard is a statement of action or activity that is established as a measure or model that similar entities must use to be measured against, as a comparative evaluation (Miller-Keane 2003). In other words, it is being able to compare apples with apples.

A standard must be measurable as it needs to be able to quantify or qualify an achievement in order to compare it with another like product or outcome. Standards are constructed to include the domains of structure, process and outcomes. Clinical Interest Box 7.1 gives more information about National Safety and Quality Health Service Standards.

The application of standards will vary from setting to setting. There are some standards that must be complied with for some settings. For example, from January 2013 all Australian Hospitals and Day Surgeries must comply with the National Safety and Quality Health Service (NSQHS) Standards. These Standards focus on both quality and safety. In aged care, the Quality of Care Principles 2014, which are embedded in legislation through the Aged Care Act 1997, describe the Standards for all aged care services, both residential and community. These Standards are known as the Aged Care Accreditation Standards for residential services and the Home Care Standards for community aged care services.

Additionally, some health or aged care services may elect to measure their care against additional standards appropriate to their setting, such as the Australian Council on Health Standards (ACHS) Evaluation and Quality Improvement (EQuIP). It is common for some to use International Standards Organisation (ISO) in addition to the compulsory NSQHS.

### CLINICAL INTEREST BOX 7.1 An example of a National Safety and Quality Health Service Standard

*'Clinical leaders and senior managers of a health service organisation implement systems to prevent and manage healthcare-associated infections and communicate these to the workforce to achieve appropriate outcomes. Clinicians and other members of the workforce use the healthcare-associated infection prevention and control systems.'*

When unpacked, this Standard can be measured from a structure, process and outcome perspective. For example:

*Undertaking quality improvement activities to reduce healthcare-associated infections through changes to practice.*

*Actions are:*

- *Quality improvement activities are implemented to reduce and prevent healthcare-associated infections (process)*
- *Compliance with changes in practice are monitored (structure if using technology, process)*

*The effectiveness of changes to practice are evaluated (outcome) (ACSQHC 2012:29).*

*(ACSQHC 2012:26)*

One of the most useful ways of measuring compliance to standards is to conduct an **audit**, which can be an internal activity or can be conducted by an external agency. Nurses will commonly assist in internal audits seeking level of compliance with the standards identified by the service as being relevant, as well as any relevant service-based procedures. An example of this activity is medication chart audits conducted at ward level. The audit tool used has been designed to capture any non-compliance between the documents and the standards and procedures. Undertaking an activity like an audit will often lead to the design and implementation of changes to systems and processes at local (or service) level. These changes are considered **quality improvements**.

Quality improvements can originate from a range of sources, including results of audits, examination of reported incidents and hazards, and through adopting ideas from the best available evidence. All nurses are encouraged to share their ideas for more effective and efficient evidence-informed practice.

***Benchmarking*** In healthcare, a **benchmark** is the point of output or outcome that is considered to be best practice in that area of service delivery. The benchmarking process incorporates finding that point of best practice, clearly defining it and disseminating this benchmark to others in the particular healthcare setting. A benchmark is generally aspirational, a standard of excellence but quickly becomes an expectation. Given that services are actively using the benchmark as part of their quality improvement process, benchmarks are not static as best practice and resulting improved performances will move these benchmarks reasonably quickly (Kay 2007). As a nurse you may be exposed to two types of benchmarking, internal and external.

Internal benchmarking is a process whereby the benchmark is developed over time focusing on internal processes. This may occur in two different ways. Firstly it can be within one setting. The primary actions would be monitoring and measuring performance over time in response to a quality improvement activity such as a practice change. Results may be captured and graphed using a balanced scorecard approach. Secondly, internal benchmarking may also occur across similar products or outputs within the same organisation with multiple sites. The key to this type of benchmark is that the services involved in the benchmarking process must be of similar size, offering similar services and using similar workforces.

External benchmarking is where agencies who would normally be competitors share performance information with others. In the healthcare sector, this information is often mandatory reporting as part of funding agreements. This is where particular benchmarks result from the scrutiny, interpretation and analysis of the reported data around a clinical issue, for example, hospital acquired pressure injuries, and determine the national benchmark for that issue. As the reporting process is ongoing, these benchmarks will change over time.

***Clinical indicators*** **Clinical indicators** are generally specific outcomes of care that may provide an understanding of the safety and quality of care provided by a service. The Australian Medical Association (AMA) in 2012 published a position statement on clinical indicators whereby they:

> *measure the extent to which set targets are achieved. They are expressed as numbers, rates or averages that can provide a basis for clinicians, organisations and planners aiming to achieve improvement in care and the process in which patient care is provided. They can be measures of structure, process and outcome, either as generic measures relevant for all diseases or disease-specific measures that describe the quality of patient care related to a specific diagnosis.*
>
> **(AMA 2012)**

The AMA further proposes that clinical indicators are developed from evidence and in collaboration with clinicians.

The use of **nursing-sensitive indicators** is beginning to become more prevalent in nursing teams. The types of indicators that may be considered nursing sensitive are those where nurses have primary responsibility for the care provided, such as hospital-acquired pressure injuries, hospital-acquired infections, use of restraints and injuries from falls.

***Accreditation*** In simple terms **accreditation** means that the service has been assessed against an agreed set of standards relevant to that setting. In some settings this may also be called a quality review. The function of accreditation is to give the community confidence that the healthcare service is delivering care that meets recognised standards. Participating in an accreditation or quality review process sends a message to the community that the service complies with regulations and legislation as well as being engaged in a continuous quality improvement process. Additionally, in many funding agreements accreditation may be a requirement for success in the funding round.

Accreditation is a cyclical process. The process starts when the service agrees to a particular set of standards to be accredited against. However, there will be mandated or required standards to be met. The service is supported by the accreditation agency to ensure that it is equipped to demonstrate meeting the standards. Most nurses at this point will be unaware of the accreditation process. It becomes more evident when internal audits are undertaken at service level prior to the accreditation survey. Some services will have regular audits occurring as a routine activity for the purpose of benchmarking or collecting data for nursing-sensitive indicators; therefore, audits for accreditation may not be obvious.

The survey period is the most obvious of all. This is when the surveyors attend the service setting and review the evidence collated to demonstrate how the service is meeting the standards. They will also interview staff (of any designation) with respect to any of the standards. Following the survey the service receives feedback regarding its performance against the agreed standards. The survey will commend good practice and identify areas that require improvement. Action plans are developed by the service to address the concerns and the service will be required to complete all actions within a specific timeframe.

**TABLE 7.1 | Accreditation benefits**

| Group | Accreditation assists with |
|---|---|
| Community | Confidence in the service to be potentially used in the future. No hesitation to access services as needed. Trust in the knowledge and skill of service providers. This means no delays, timely care |
| Person/user<br>Family/carer | Confidence in the treatment/advice provided, trust in the service providers, enough information to make decisions |
| Your peers/professional bodies | Seeking to role model good nursing practice. Desire to be part of an effective, highly regarded nursing team, reputed to provide high-quality safe nursing care<br>Maintaining positive professional image |
| Other health professionals | Trust in the rest of the clinical team, crossing medical, nursing and allied health disciplines and workgroups<br>Potential to improve team cohesiveness |
| Your supervisor/nursing leaders | Satisfaction that the services under their leadership are providing high-quality and safe care<br>Confident that the resources are being used effectively and efficiently |
| Organisation managers and leaders | Satisfied that the service is meeting its obligations to the funding and performance agreements |

From the nurse's perspective, as the one who works at the clinical coalface, the process will be to your advantage. Table 7.1 offers thoughts regarding the benefits to accreditation.

### CRITICAL THINKING EXERCISE 7.1 Quality

Think about quality nursing care. What does it look like? Of course it will depend on who is doing the looking. Write down your thoughts regarding how the following groups might describe quality nursing care:

- Your community
- The individual and their family
- Your nursing colleagues
- Your nursing professional group
- Your supervisor/manager
- Your organisation

## SAFETY IN HEALTHCARE

*The Inquiry report categorically determined that lack of resources did not cause the tragedy but the 'extra factors were poor teamwork and management, inadequate leadership, a closed "club" culture, an absence of systems to monitor performance, a failure at the centre to listen to concerns, and some people whose behaviour was substandard'.*

**(Smith 2001)**

Safety in healthcare has attracted a great deal of attention in recent decades. The first step is to understand what is meant by the phrase 'safety in healthcare' or '**patient safety**'.

Patient safety means to avoid or reduce harm, either actual or potential, in delivery of healthcare (National Health Performance Committee 2001). Although this definition suggests that harm can be reduced or avoided, it important to understand that not all harm is preventable. Leape (1994), using results from the Harvard Medical Practice Study, suggested 69% of harm was preventable. Current rates of preventable harm are now closer to 20–25%.

In some countries funding may be associated with the provision of safe healthcare. This connection may be by way of penalty or incentive. In the United States in 2014, Medicare funding has been reduced at those hospitals that have unacceptably high rates of preventable hospital-acquired conditions such as pressure injuries, central-line-associated bloodstream infections and catheter-associated infections (Latner 2015). In Australia, the notion of penalising services that have high rates of preventable harm has not taken root. However, the funding model that is increasingly being used to fund public services across the country, activity-based funding (ABF), is reported to reward those services that provide a safe healthcare experience for service users. There are mechanisms built into the system to encourage improvements in safety and quality. The ABF model funds an episode of care based on the cost that same episode of care would require in similar conditions elsewhere in Australia. There is little evidence to date that demonstrates how this funding model impacts on rates of preventable harm to individuals (Eagar et al 2013).

In Australia, of the 10 National Safety and Quality Health Service Standards (see Clinical Interest Box 7.2), eight are focused on areas:

- That commonly cause harm
- Where there is a gap between current and best practice
- Where there exist improvement strategies that are evidence-based and achievable (ACSQHC 2012).

## CLINICAL INTEREST BOX 7.2 National Safety and Quality Health Service Standards

1. **Governance for Safety and Quality in Health Service Organisations** which describes the quality framework required for health service organisations to implement safe systems.
2. **Partnering with Consumers** which describes the systems and strategies to create a consumer-centred health system by including consumers in the development and design of quality healthcare.
3. **Preventing and Controlling Healthcare Associated Infections** which describes the systems and strategies to prevent infection of patients within the healthcare system and to manage infections effectively when they occur to minimise the consequences.
4. **Medication Safety** which describes the systems and strategies to ensure clinicians safely prescribe, dispense and administer appropriate medicines to informed patients.
5. **Patient Identification and Procedure Matching** which describes the systems and strategies to identify patients and correctly match their identity with the correct treatment.
6. **Clinical Handover** which describes the systems and strategies for effective clinical communication whenever accountability and responsibility for a patient's care is transferred.
7. **Blood and Blood Products** which describes the systems and strategies for the safe, effective and appropriate management of blood and blood products so the patients receiving blood are safe.
8. **Preventing and Managing Pressure Injuries** which describes the systems and strategies to prevent patients developing pressure injuries and best practice management when pressure injuries occur.
9. **Recognising and Responding to Clinical Deterioration in Acute Healthcare** which describes the systems and processes to be implemented by health service organisations to respond effectively to patients when their clinical condition deteriorates.
10. **Preventing Falls and Harm from Falls** which describes the systems and strategies to reduce the incidence of patient falls in health service organisations and best practice management when falls do occur.

*(ACSQHC 2012)*

## Preventable patient harm

Leape (1994) challenged medical practitioners to recognise the high level of **preventable patient harm** in the healthcare industry. He cites the socialisation of medical staff to be perfect in all aspects of practice as a barrier to improving the safety of the healthcare. The area of patient safety has been growing at a very fast rate since this was published. Previously most attention was focused on quality in healthcare, assuming that quality processes led to safe patient care. It is clear that this is not true. Having quality systems and processes in place will certainly help, but these systems and processes must facilitate safe care and to do that other factors must be considered. The most common factor, that has many variables impacting on it, is that health professionals are people.

Health professionals are human and, being human, can and will make mistakes. They make mistakes every day; no one is perfect. Despite having been trained well and having developed high-level skills and knowledge in practice, a perfect practitioner does not exist. In all work places, mistakes are made. Some result in damage, some do not. Some damage is considered to be of greater importance than others. Think of the person who cuts your hair—your local hairdresser or barber. Making a mistake such as cutting your hair too short will not commonly end up in a courtroom or in the media. Now consider a surgeon who may remove the wrong ovary and, realising the error, removes the correct one in the same operation, leaving the patient without any ovaries. It is highly likely that both litigation and media scrutiny may become a reality.

*It is important to note that the extent of harm can only be confirmed by the person who has been harmed.*

Thinking about the error made by the hairdresser above, imagine the two possible scenarios:

1. The supermodel whose work relies on her appearance. She may feel extremely damaged by the error. It could cost her some modelling contracts or a photographer may have taken a photo of her with a poor hairstyle.
2. The retired banker, who takes pride in his appearance and values a good haircut may feel annoyed. However, he will most likely vow never to return to that hairdresser or even take the philosophical approach that 'there are only 3 weeks between a good and bad haircut'.

Now think about the woman who had the wrong ovary removed. Imagine the two possible scenarios:

1. She is 60 years old, menopausal, and did not place high value on the need to keep the healthy ovary remaining in place. She may not perceive high-level harm. She may even be pleased as she does not require further surgery to remove the diseased ovary and considered this outcome acceptable.
2. She is 30 years old, recently married and eager to start her family. This will be devastating to this woman and her husband.

It is important for all nurses to understand this key point: the individual's (and family's) perception of the harm in the

context of a preventable **error** in healthcare is the most important element in the determination of the severity of that harm.

Healthcare workers are expected to always focus on the person and their experience of the care provided. Being able to see the harm from their perspective will be very important and is a key element of person-centred care. In this model of care, the healthcare worker tailors their activity to the individual. However, in earlier discussion the notion of standardisation is promoted as a key patient safety strategy. Can these two concepts co-exist? Through strong communication, where listening to and hearing the person is as important as the person listening to the healthcare worker, it is possible.

## Error management

To reduce patient harm or injury from errors, nurses must understand how errors result in the injury; this is known as **error management**. Reason (1990) suggested a simple way of understanding this process; he called it the Swiss cheese model. He asserts that errors occur at every stage of a process. By the time a patient is provided direct care, there have been many activities where one or more errors have occurred, hence the reference to Swiss cheese. The holes represent the errors.

To get to an outcome there are a number of activities that need to occur. Consider each of these activities as a layer of Swiss cheese. A slice of Swiss cheese has holes, some small, some large. Imagine the hole to be an error, either small or large, in that activity. Now lay each slice of cheese on top of one another. If there is a hole seen through all the layers, it is suggested that there will be an error at the patient level. Depending on the error, the patient may be harmed. Figure 7.1 illustrates how harm can occur when a series of errors or mistakes are made. If only one of these errors was not made then the harm would not have occurred.

Errors can be latent or active. Understanding the difference between the two will assist the nurse to focus on how to manage errors in their clinical setting. Latent errors (also referred to as latent conditions) are found in the systems and processes of the work environment. They include workforce factors around staffing (skill mix, rostering etc), equipment (purchasing and maintenance decisions) and environment (temperature, lighting, noise, furniture, workplace design, workplace culture including reporting incidents, attention to documentation and compliance with procedures etc). Basically the workplace and everything in and about it can hold latent errors. Active errors (active failures) are those actions that occur during the patient contact when the result is not what was expected. Active errors are mostly seen arising from activity undertaken by people, and usually result from human error. Figure 7.1 illustrates how seemingly benign lapses or mistakes made along a process can end up in harm for a patient.

When an adverse event causing harm does occur, it is essential to analyse each and every action, process or activity looking for latent or active errors. This process will highlight many errors—one or two may be proven to be the root cause of the adverse event, but many others will be identified as contributing to the problem rather than causing it. These other errors are called contributing factors.

### Human error

**Human error** can be described as an undesired outcome that resulted from a human action or inaction. These errors occur as a failure in the cognitive process. Humans have the ability to have two thinking (cognitive) processes running at once, known as the dual process model. This model incorporates automatic (mostly unconscious, fast, reflexive) and analytic (conscious, slow) thinking. Everyone uses both, switching between the two as the situation demands. However, when

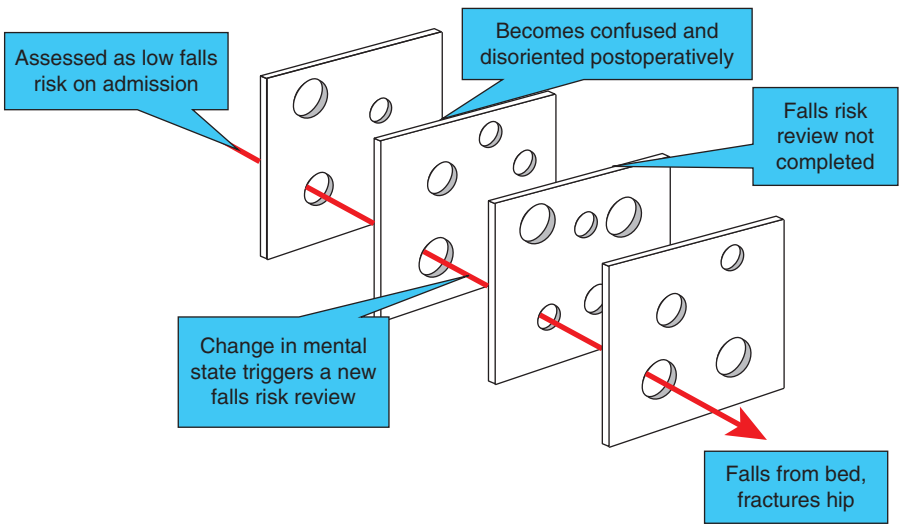


**Figure 7.1** Using the Swiss cheese model to describe an adverse event
*(Adapted from Reason 2000)*

the person is highly emotional or is tired or fatigued, then the person tends to stay on automatic thinking even when analytical thinking is required. Additionally, when there are multiple interruptions, using automatic thinking will be easier than analytical. In these situations, there is a higher likelihood that an error will be made.

Errors made by people are either mistakes (conscious action that was inaccurate from analytical processes) or slips (unconscious errors arising from automatic thinking) and are commonplace in life. On most occasions these errors do not cause harm and are well tolerated. It would be easy to find a nurse who remembers driving home from night duty and, before climbing into bed, put the car keys in the fridge or the rubbish bin, known as a simple slip. Clinical Interest Box 7.3 follows through on each of these slips.

## Human factors engineering

The Agency for Healthcare Research and Quality (AHRQ) defines **human factors engineering** (HFE) as 'the discipline that takes into account human strengths and limitations in the design of interactive systems that involve people, tools and technology, and work environments to ensure safety, effectiveness, and ease of use' (AHRQ 2015).

Applications of HFE can be most commonly seen in healthcare through the standardisation of processes and practices, systems and processes, forcing functions, usability testing and resilience efforts. Using an electronic information-management computerised system to collect information about a patient employs a number of HFE processes. A system like this uses the 'forcing function' to improve safety. The user is forced to input certain types of information in a certain order and the system may not allow the user to save and close until all the information is entered. This system also offers standardised processes and practices.

Standardisation of practices and processes is a key HFE strategy. Having the same system in place across all variations of the practice or product will improve reliability and information flow, and reduce training needs. For example, consider your experiences in driving a car. Many cars have the indicator on the right of the steering wheel. If you find yourself in a vehicle with the indicator on the left side, as it is in many European vehicles, you will find yourself making an error with respect to using the indicator. In a healthcare setting, an electronic information system ensures that all staff know how to access information in any clinical area of that setting, regardless of their usual work area.

Usability testing is used to ensure that new processes and practices are efficient and effective in the workplace. If blocks or barriers occur and create an inefficient or ineffective outcome, inevitably the nurse will find a work-around to suit their needs. Unfortunately, these work-arounds are developed on the fly and can be unsafe. All changes to systems should be tested to ensure the outcome is suitable to the staff that use them.

## Patient safety in the workplace

Many nurses work in settings that will have an established routine that could change in an instant due to an unexpected event, such as two or three new admissions arriving at once or a patient's clinical condition rapidly deteriorating. The nurse needs to be vigilant for the unexpected, but not to the detriment of the expected or routine tasks. Reason (2000) advances the notion that it is the routine tasks that are most subject to human error.

Situation awareness (SA) refers to being aware of things happening around you and being able to identify, analyse and interpret relevant information. You have lost situational awareness when you not only don't know how to fix a problem, but you are not even aware you have a problem. It is important to understand that only those around you can see you have lost SA—you cannot see it for yourself. If you accept this last point, when a colleague raises an issue with you about an unsafe practice or decision it could be because you have lost situational awareness.

It can be tricky for a nurse to point out an unsafe practice to someone higher on the authority gradient. In most clinical situations, when a doctor is present they will have a higher

### CLINICAL INTEREST BOX 7.3 Error scenarios

Consider the following similar scenarios.

Barry is an Enrolled Nurse at the emergency department of a major metropolitan hospital. After a very busy shift Barry arrived home and put the keys to the family car he had used to drive to work:

1. in the fridge instead of on the shelf. The keys were found by his younger sister who had put them on the shelf before anyone had noticed them missing. Later Barry was teased by other members of the family.
2. in a plastic shopping bag, which was then placed in the rubbish bin. Later that day all members of the household were looking for the keys, but they were unable to be found. The bin was emptied and the keys never discovered. Barry was distressed and was required to use some of his savings to replace the keys and was never allowed to drive the family car again.

Scenario 1 would not even be considered an error and would be rationalised away as Barry being tired—after all, the keys were found and no harm occurred. Now consider scenario 2. The keys ended up missing. Most people would consider it an error or serious mistake as harm had occurred, being the cost of replacing the keys as well as inconvenience. Now the misplacement of these keys becomes an issue and the culprit considered careless. The person who lost the keys would feel guilty and distressed at their action and would be punished as a result.

The cause of the error is the same—being tired—but the outcome of the scenarios was very different. It is important to remember that errors happen all the time when humans are involved.

**TABLE 7.2 | Levels of graded assertiveness and examples**

| | | |
|---|---|---|
| Level 1 | Express initial concern with an 'I' statement | *I am concerned about ...* |
| Level 2 | Make an inquiry or offer a solution | *Would you like me to ...* |
| Level 3 | Ask for an explanation | *It would help me to understand ...* |
| Level 4 | A definitive challenge demanding a response | *For the safety of the patient you must listen to me.* |

*(Curtis et al 2011:18)*

authority than the nurse. In situations where those with a higher authority have lost their situational awareness, those at a lower level must have the ability speak up and get the point across. Sometimes the communication needs to be assertive, using a method called graded assertiveness (Curtis et al 2011). Table 7.2 describes graded assertiveness using an example of how the communication may be phrased in the first instance. This type of communication will allow the relationship between the parties to remain professional into the future.

Communication and teamwork are other important mechanisms that play a significant role in patient safety. All healthcare professionals are trained in communication; however, in most programs the focus is on individual technical skills with less focus on cross-discipline communication and teamwork (Dingley et al 2008). A variety of tools have been developed that enhance communication and teamwork that have been found to be useful in healthcare settings (Dingley et al 2008; Curtis et al 2011; ACSQHC 2011). These tools include, but are not limited to:

- A situational briefing guide known as SBAR (Situation, Background, Assessment, Recommendation) or ISBAR (Introduction, Situation, Background, Assessment, Recommendation)
- Team huddles
- Briefing
- Multidisciplinary rounds
- Clinical handover using a variety of information-sharing techniques such as SBAR, ISBAR and SHARED (Situation, History, Assessment, Risk, Expectation, Documentation).

There has been a lot of discussion over the past decade regarding patient safety culture. This term refers to the healthcare workers' shared values and beliefs about and towards safe practice. If a nurse was asked to define safety culture, the response would commonly be 'The way we do things'. The culture of a work setting is impacted by a variety of elements. This will include how the healthcare workers function as a team (including the way they communicate with people inside and outside of the team). The perception of job satisfaction and stress recognition also will impact on safety culture. Importantly, the management and leadership of an organisation must actively create a positive safety culture (Wakefield et al 2008). This is achieved by:

- Being vigilant regarding opportunities to learn from errors using robust reporting systems and patient safety rounds
- Promoting a just culture regarding blame
- Dedicating resources to patient safety activities
- Involving patients and their families in safety initiatives.

Most healthcare services now have a rigorous incident-management system. These systems are commonly electronic, creating a user-friendly approach to understanding issues at a system level rather than at an individual level. Staff are encouraged to report safety concerns and both actual and potential safety events. Reporting the incident is only the beginning of the process. What happens next is what will influence the embedding of a strong safety culture. Analysis is the most important factor in understanding and learning from an incident (also called an **adverse event**) which will further strengthen the patient safety culture of the organisation. The key steps in the analysis of the incident include:

- Have all the information—access all possible sources of information. Avoid jumping to conclusions
- Understand the cause of the event. Track down all parts of the process leading up to the event. Most events have errors occurring in many points along the timeline
- Always look to the system to find the solutions to adverse events.

## WORK HEALTH AND SAFETY ISSUES

There is always potential for injuries in our workplace. The practice of nursing in itself demands a degree of physical, emotional and psychological effort. It is important for each of us to understand that standards and procedures will keep all of us safe while ensuring the care is efficient and effective. A good example of this is the trauma experienced by the people connected to an error that has resulted in serious harm, particularly those who work closely with the person who was harmed, often the nurse or the doctor. This type of harm is known as the **second victim**.

When a patient is harmed, whether it was preventable or not, the direct healthcare provider will also 'feel' the pain and stress. That person will often feel guilty, even though they are often not, and never were, in a position to have prevented the event. This person is also a victim of the adverse event, but often not recognised as being traumatised as a result of the event and subsequently not supported through the issue. Some will feel unworthy of the support, taking on full responsibility for the harm. Unresolved, these feelings will create harm and that person may suffer burnout, stress and anxiety disorders. They are a second victim to the error causing harm. See Case Study 7.1 for an example of a second victim scenario.

## CASE STUDY 7.1A INCIDENT MANAGEMENT

Nurse Dan undertook a course of study to become an Enrolled Nurse. He then further developed his knowledge and skills by working in the clinical setting over a number of years and attending professional development and training activities. He cares for his patients and works really hard. He is considered by his colleagues and other members of the healthcare team to be a 'good' nurse.

Dan is on a shift where a drug error has occurred. As he participated in the administration of a restricted drug (Morphine), excess to what was ordered by the medical officer, he was named as a party to this error. Dan is devastated. He questions his ability as a nurse.

What are your thoughts? Is Dan now incompetent because of this one mistake?

Before you can decide you may ask, was the patient harmed? Patient safety focuses on preventable patient harm after all.

In this circumstance the patient had been in severe pain and hadn't been sleeping well. The effect of the medication on the patient was that he was more heavily sedated than was necessary, and he slept deeply for 12 hours.

1. At this point, do you think the patient suffered harm?

Back to Dan. His confidence is shattered. Before you make your judgment about his level of competence, you will also need to know a little more about Dan and the shift.

- Dan was on his 8th shift in a row and was working this afternoon shift after 7 night duty shifts. This was an overtime shift and he had only an 8-hour break between the shifts. He was to have 4 days off at the end of the 7 night duty shifts.
- The ward is a very busy medical ward with 3 new admissions in the previous 2 hours.
- The patient was under a surgical team and was being cared for in this medical ward as there weren't any beds available in the correct ward.
- The incident occurred when 2 staff (of the rostered 5) were at a compulsory training session.

2. Is Dan incompetent? Explain your answer.

## CASE STUDY 7.1B

Let's follow the patient from the Case Study above. The next morning the patient is in need of going to the toilet. He rings the buzzer for assistance, but before the nurse arrives he feels he is unable to hold on and gets out of bed. On his third step towards the bathroom he falls. He suffers a fractured hip.

With just the information above, you may be tempted to attribute the injury to be a result of the excess drug. However, after analysis of the event, the following information has been identified:

- The patient had been assessed as a high risk of falling. Strategies included wearing hip protectors but he was not wearing them at this time as he had been ordered to 'Rest in bed'.
- The patient has a history of transient periods of confusion.
- The shift had just commenced and the nursing allocation had not been completed as there was a delay of some agency nurses arriving on the ward.

1. Is the drug error the cause of this preventable patient harm—fractured hip? What is your rationale for this answer?
2. What are some possible system issues relating to the drug error in the first part of the scenario?
3. What are some possible system issues relating to the fall in the second part of the scenario?

## Summary

The nursing profession has a long history of seeking out ways to give our best to our patients through monitoring and evaluating our care. Florence Nightingale was known to be one of the early adopters of quality improvement (Malone 2004). Nurses are committed to service based on evidence-based practice, clinical guidelines, professional standards and scope of practice. Nurses practise to the best of their ability. Quality and safety is not an optional extra; it should be what nurses simply do.

Nurses also, on a daily basis, participate at some level in a range of measurement activities such as audits, benchmarking, safety score cards and nursing-sensitive indicators. Their practice setting then seeks accreditation and re-accreditation with a particular accreditation agency, depending on the practice service type, relying upon nurses to collect and collate data as evidence of meeting accreditation standards.

What is the difference between quality and safety? In simple terms healthcare quality is about getting the right service to the right patient at the right time and at the right cost. Patient safety is about protecting the patient from preventable harm. The nurse is a key player in both quality and safety.

Nurses must understand quality and safety and be able to define them, identify them and measure them. The patients depend on it.

## Review Questions

1. What is your understanding of quality in healthcare?
2. What does accreditation mean for a healthcare facility?
3. Explain:
   - Benchmarking
   - Clinical indicators.
4. How is patient safety different from quality?
5. Why is the perspective of the person who was harmed important when measuring severity of harm?
6. What is the difference between active and latent errors?
7. What is meant by 'contributing factors'?
8. Why is standardisation considered a powerful patient safety initiative?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Institute for Healthcare Improvement http://www.ihi.org/topics/patientsafety/pages/default.aspx

http://www.ihi.org/resources/Pages/Changes/DevelopaCultureofSafety.aspx

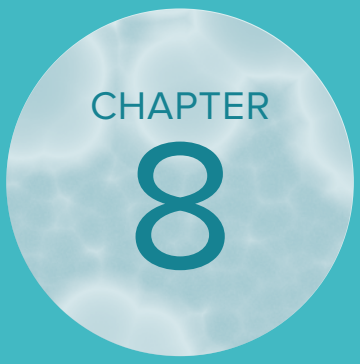
Joint Commission Center for Transforming Care
http://www.jointcommission.org

National Health Service UK Patient Safety Centre
http://www.nrls.npsa.nhs.uk/resources/patient-safety-topics/

http://patientsafety.health.org.uk

# Communication and nursing practice

*Maree Gault*




## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Identify the components of the communication process
- State the factors that influence effective communication
- Identify the factors that act as barriers to effective communication
- Identify ways to overcome barriers to communication
- State how culture impacts on communication
- Demonstrate techniques for monitoring how culture impacts on their communication
- Identify and implement communication processes that facilitate individual safety and quality care

## KEY TERMS

assertive communication
barriers to communication
culture
ISOBAR
verbal communication
non-verbal communication

## CHAPTER FOCUS

Communication is an interactive process involving the verbal or non-verbal transference of information between people. Effective communication is essential to the provision of safe, quality care in nursing and vital to the development of a therapeutic relationship between nurse and an individual (Jones 2012). This chapter has a particular emphasis on the crucial communication issues affecting the delivery of safe healthcare to individuals and the importance of health team communication in relation to individual safety.

## LIVED EXPERIENCE

I remember the last time I was in hospital. I was feeling very nervous about the procedure I was having. One of the nurses asked me how I was and I told her that I was very scared. She just told me not be silly and that nothing bad would happen. Then while she was helping me dress she talked the whole time to another nurse about what she did on the weekend. I felt like she didn't care about me and I got more nervous. By the time I got to theatre I had decided that I wouldn't go ahead with the procedure but the next nurse I spoke to was wonderful. She really listened to me and didn't dismiss my concerns. She looked at me while I was talking and asked me questions. I felt she really cared. As it turned out, what I was worried about wasn't really an issue. I was so glad she was there otherwise I probably wouldn't have had the operation.

**Elizabeth, 55 years old**

Effective communication is vital to ensure that nursing care provided to an individual meets their needs and wishes. It is not just about sharing information but should also encourage the person to talk freely about their concerns without fear. Communication is essential for quality healthcare and an individual's safety and is a key component in the Australian Charter of Healthcare Rights (Joanna Briggs Institute 2011; Iedema & Manidis 2013; Jones 2012; Department of Health and Human Services 2014).

*Through their relationships with individuals, nurses express concern, care and commitment. In the absence of interpersonal relationships with nurses, individuals can be viewed as objects, clinical conditions or a set of problems to be solved. Nursing care that is offered without a human connection is impoverished. It lacks a caring connection.*

**(Stein-Parbury 2014)**

Being an effective communicator is a highly desirable skill. It enables individuals to share important information and helps to develop and maintain relationships and friendships (Department of Health 2012). With nurses and midwives accounting for about 58% of the health workforce (AIHW 2015) the need for nurses to be able to communicate effectively with everyone in the healthcare environment, especially the people that they are caring for, becomes critical (Berman et al 2015). The ability of nurses to communicate effectively is an essential factor in ensuring an individual experience in a healthcare encounter is of the highest value and causes no inadvertent harm (Wallis 2011; Kleiner et al 2014). Nurses need to be skilful in what they do for individuals but at the same time they need to communicate with them in ways that are supportive and helpful, and promote feelings of trust (Institute of Medicine 2011).

All these aspects become of the utmost importance when you consider that approximately 10% of all people admitted to healthcare facilities will suffer an adverse event (AIHW 2015). The Joint Commission reported that in a study of over 4000 adverse events, 70% of sentinel events were caused by a communication breakdown (Wheeler 2014). There has been a new focus on individual safety in the past decade and although it is difficult to prove causation, an emerging body of literature suggests that quality of care depends to a large degree on nurses (Institute of Medicine 2011).

The focus of this chapter is to provide knowledge and strategies to enable the development of effective communication skills in nurses to ensure people receive the care that they require, the quality of care that they receive is enhanced and that they do not suffer any harm due to poor communication.

## COMPONENTS OF THE COMMUNICATION PROCESS

All communication is a two-way process in which messages are conveyed by verbal and/or non-verbal means by one person, and received by another (Berman et al 2015). All behaviour conveys some message and is therefore a form of communication. For example, even an individual refusing to speak or acknowledge the presence of a nurse conveys a message that the nurse will attempt to interpret (decode). Non-verbal communication includes the messages sent by facial expression, gestures, body posture and appearance, and has a large impact on the meaning of the message sent (O'Toole 2012). Communication is an ongoing dynamic series of events in which meaning is generated and

transmitted. Communication occurs when a person responds to a message and assigns meaning to it. During interactions people respond to messages they receive and create meanings for those messages. If the intended meaning of a message is misunderstood by the recipient, communication has not occurred effectively (Webb 2011; O'Toole 2012).

Communication takes place at many different levels and to ensure high quality and safe delivery of healthcare nurses need competence in all of them. Communication may occur at the interpersonal, small-group, organisational, public and mass communication levels (Arnold & Boggs 2011).

## ELEMENTS OF THE COMMUNICATION PROCESS

Communication is a multidimensional and complex process in which ideas, thoughts, values, knowledge or feelings are shared and interpreted. During the process people simultaneously send and receive numerous messages at many different levels. Figure 8.1 is a model that depicts the basic elements of communication. It shows that communication is a linear process between sender and receiver. The process of communication involves:

- A sender
- A message
- A channel
- A receiver.

This model depicts the sender as the individual who initiates the communication. The receiver is the person to whom the message is transmitted. The role of sender and receiver may alternate between participants at any time during the period messages are being transmitted.

The message is the information that is transmitted by the sender, and the channel is the means by which the message is conveyed (Arnold & Boggs 2011; Webb 2011; Jones 2012).

Communication between two human beings is far more complex than this in reality and is influenced by many and varied external and internal processes (O'Toole 2012). Communication between two people may comprise both verbal and non-verbal information; for example, through the visual, auditory, olfactory or tactile routes. The sender's facial expressions and body gestures visually convey a message to the receiver; for example, a facial grimace or tense body posture sends a visual message to the nurse that the individual may be in pain. The spoken word is conveyed via the auditory channel and touching a person while communicating uses the tactile channel. A nurse can convey a message of caring and compassion to a distressed individual by a simple touch of the hand. The olfactory route is particularly important in nursing. Distinct odours can indicate a variety of conditions, including incontinence, the onset of a urinary tract or other infection, and sometimes more serious events such as a smell of acetone on an individual's breath which can indicate a serious lack of insulin in the body (diabetic ketoacidosis).

Feedback helps the sender recognise whether the meaning of the message conveyed has been perceived as intended. The receiver's verbal and non-verbal responses convey feedback to the sender to reveal the receiver's understanding of the message. Feedback helps to clarify communication as it guides people in adjusting the messages they send to one another. Effective communicators continuously seek feedback from the people with whom they are communicating, to determine whether the information they are transmitting is being received and understood as intended (that there are no misinterpretations of the meaning of the messages) (Arnold & Boggs 2011).

When communication occurs and information is transmitted from one person to another, two processes must take place: encoding and decoding. Encoding refers to the cognitive processes that occur in the mind of the person who sends

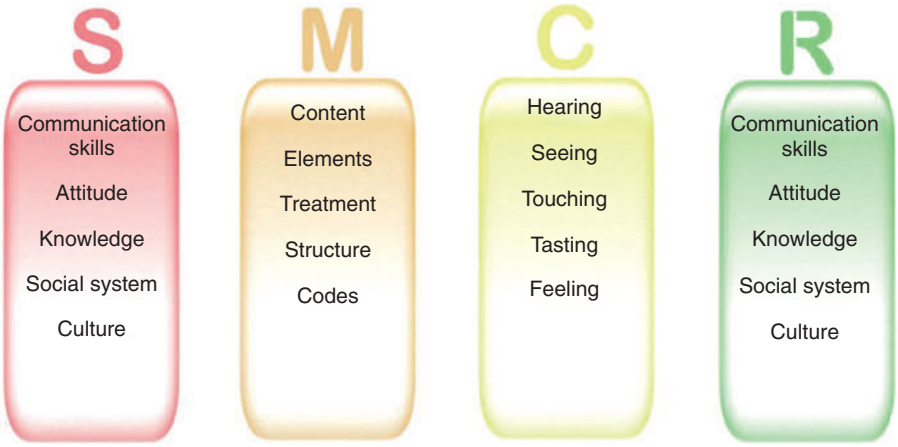



**Figure 8.1** Sender–Message–Channel–Receiver Model

*(JasonSWrench, CC BY 3.0)*

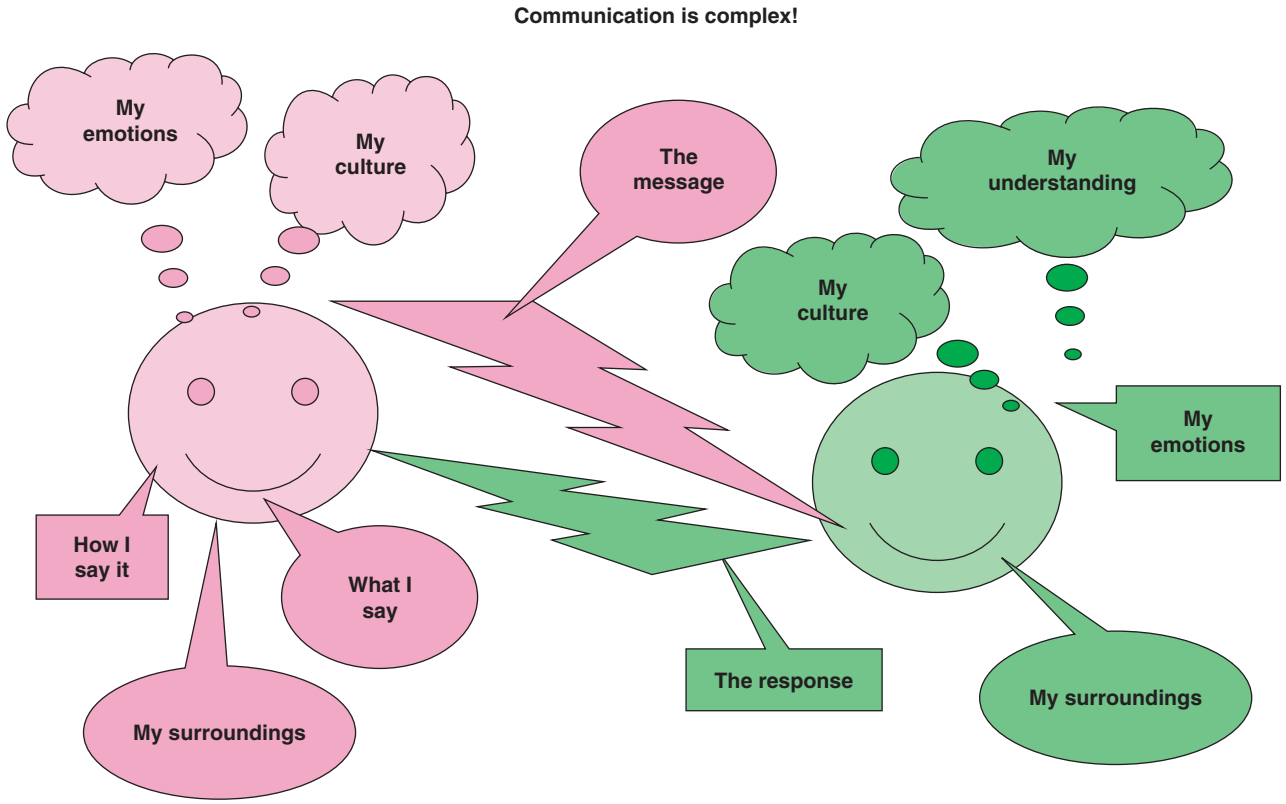



**Figure 8.2** Communication is complex
*(Queensland Health 2009)*

the message. These thoughts must be translated into a code, such as verbal language, to be transmitted to the person who is to receive the message. Decoding refers to the cognitive processes used by the receiver of the message to make sense of what is seen or heard. Generally the sender and the receiver encode and decode messages in a cyclical pattern while communication is taking place (Arnold & Boggs 2011; Jootun & McGhee 2011).

Even during a simple act of interpersonal communication between two people, many factors influence how effectively messages are conveyed and understood (Berman et al 2015). These factors relate to anything that influences or interferes with how the sender transmits a message, how the recipient perceives (interprets) the meaning of the message and the route or channel of communication.

Factors such as the setting in which communication takes place, the presence of distractions such as background noise, and the language, perceptions, values, knowledge, cultural background, role and emotions of each person taking part in the communication can influence the quality and effectiveness of the communication. These factors can enhance the effectiveness of communication between people but they are often barriers. A setting that does not provide adequate privacy such as a shared hospital room may be a significant barrier when a nurse is attempting to communicate with an individual about their personal concerns. Therefore in reality communication is more a transactional exchange as shown by Figure 8.2, which depicts the complexity of factors involved in the communication process (Queensland Health 2009). Clinical Interest Box 8.1 demonstrates the communication process in action.

## CLINICAL INTEREST BOX 8.1 The communication process in action

Mrs Ling has been in hospital for several days and is about to be discharged home. Before she is discharged, the nurse must make certain that she understands she has to attend an appointment with the medical officer in 2 weeks' time. The nurse (the sender) thinks about the best way to pass on the information (the message), and decides (encodes) to write the time and date of the appointment on a card, in addition to telling Mrs Ling. Thus, both spoken and written words (auditory and visual channels) are used to transmit the message. Mrs Ling (receiver) listens to the nurse and looks at the appointment card. Because the words used are familiar to her, she is able to understand (decode) the information. She confirms she has understood the message by asking, 'So I need to come back here and see the medical officer again at 11 o'clock on Tuesday 2nd October?' (feedback to the nurse).

# FACTORS THAT INFLUENCE THE COMMUNICATION PROCESS

## Perception

Perception is a process by which the meanings of messages are interpreted. The way messages are perceived is related to a combination of a person's social and cultural influences, gender, educational background and knowledge, and experiences (O'Toole 2012). This complex mix of influences means that no two people are likely to perceive the same message in exactly the same way. Some of the strongest influences on the way messages are sent and their meanings perceived are the attitudes, values and beliefs that individuals hold (Vorman & Cote 2011; O'Toole 2012).

## Attitudes, values and beliefs

Attitude is the way one person behaves towards another. A person's attitude can be positive or negative and unpleasant. An unpleasant attitude in the workplace makes other people feel uncomfortable and it is detrimental to the wellbeing of individuals (Lux et al 2013; Hanson 2014). Attitude can be influenced by what is happening in a person's life. For example, a fight with a friend may create feelings of anger or distress. Such feelings can be reflected in a negative, even hostile, attitude towards others, which can change the way messages are transmitted and received. Nurses have a professional responsibility to maintain a positive attitude towards people at all times, so every effort must be made to put personal concerns and feelings aside when communicating with others (O'Toole 2012).

Attitude towards others is also related to the values and beliefs that a person holds about the ideas or practices of other people in society, and they are not always consciously recognised. For example, cultural values commonly lie outside conscious awareness and are often simply taken for granted as being the right values (O'Toole 2012). It is natural for people's values and beliefs to differ within and across social and cultural groups. Nurses will encounter many situations in which their own cultural values and beliefs differ from those of the people that they are caring for. Tolerance and understanding of differences in views and cultural practices helps to facilitate these therapeutic relationships. For example, a nurse who holds strong values and beliefs about no sex without marriage will need to demonstrate acceptance that personal views are not shared when caring for a pregnant, single, woman. If the nurse is unable to accept this and put personal views to one side, it will be difficult to communicate with people in a therapeutic manner (Stein-Parbury 2014).

While a nurse's personal values can create interference in therapeutic relationships if they are imposed on people or used in judgment, they can also serve to enhance therapeutic effects. For example, a nurse who holds beliefs that all people have positive qualities and that every individual is a worthwhile person will find that such beliefs enhance the establishment of effective therapeutic relationships (Stein-Parbury 2014; O'Toole 2012).

## Differences in knowledge

When the level of knowledge between two people is different, communication can be difficult. For example, an individual's level of knowledge may be so far above that of the person being spoken to that the meaning of the message may be lost entirely. The nurse must take care to express messages in words and phrases that will be understood. For example, a nurse who is familiar with nursing or medical language, especially jargon, may forget that other people may not be, and if words or phrases are used that are not part of the person's vocabulary the message may be misinterpreted. Studies have shown that when jargon use is minimal there is an increase in comprehension by the individual. The use of specific language that is familiar to members of a subculture or profession may confuse, frighten or alienate people who are not part of that subculture or profession. For example, not every man will know what the nurse means when asked, 'Do you need a bottle?' The word bottle is nursing jargon used to describe a portable male urinal but it could easily be perceived as meaning something entirely different (Lin et al 2014; Al Sayah et al 2014; O'Toole 2012).

## Past experiences

Past experiences can have a powerful effect on a person's perceptions of the meaning of messages. For example, an individual who has had a previous traumatic and painful experience in hospital may discount, distrust or disbelieve messages from the nurse that pain after surgery will be controlled. The nurse can help by talking with the individual about the past experience and explaining fully every measure that will be implemented to ensure adequate pain relief (O'Toole 2012; Stein-Parbury 2014).

## Emotions

Emotions strongly influence how a person relates to other people, and the power of emotion in communication should not be underestimated. Nurses must also be aware that if they become too emotionally involved with the suffering experienced by an individual they may be unable to effectively meet that person's needs. This aspect is one of the most difficult situations faced by nurses, as on the one hand nurses must become emotionally involved to assist people, while on the other hand personal emotions cannot be allowed to adversely affect individual care (Stein-Parbury 2014). All nurses need to be aware of their emotions, and many find it helpful to talk with other experienced nurses about what they are feeling and experiencing (Leavy et al 2011).

It is also important to realise that, if people cultivate 'emotional distance' in an interpersonal interaction, they prevent any deep sharing of meaning and may even arouse animosity. For example, if an individual feels that a nurse is treating them as an 'interesting case' or a 'problem' rather than as a person, they are likely to feel resentful, and therapeutic communication is not likely to occur (Hanson 2014; O'Toole 2012).

People receiving healthcare services can often be anxious or upset, and strong emotions interfere with the ability to absorb the information in messages such as those given by medical officers or nurses. There would be little point, for example, in a medical officer informing a woman about treatment plans immediately after telling her that her breast biopsy revealed a malignant breast tumour. It would not be surprising if her anxiety level increased to such an extent on hearing the diagnosis that it prevented her from absorbing any of the following information about the proposed treatment. The nurse can help in this situation by ensuring the information is repeated when she is less anxious or distressed and by providing the information in written form so that it can be absorbed more effectively at a later time (Renske van Bruinessen et al 2013; Arnold & Boggs 2011; Moola 2014).

### Relationships and roles

There are numerous types of interpersonal relationships, including those between friends, acquaintances, work colleagues, family members and partners. It is usually only when there is enough trust in a relationship that totally honest communication occurs, when ideas, judgments and emotions can be revealed without fear of reprisal, humiliation or rejection.

Trust in the nurse needs to develop quickly and is essential if the relationship is to be therapeutic. People in hospital may not say what they are thinking or feeling if there is a lack of trust in the nurse; often this means that the person has a fear of being judged. A therapeutic relationship means demonstrating unconditional acceptance of all people, without judging. The nurse accepts the person as worthwhile even if the individual's behaviour is challenging. As a nurse's communication skills develop they become increasingly effective and therapeutic, but even when these skills have been learned and practised they may still be difficult to apply in some particularly challenging situations (Stein-Parbury 2014; Arnold & Boggs 2011).

### Environmental setting

Effective communication is more likely to occur if it takes place within a setting that is conducive to listening and concentrating. An area that is at a comfortable temperature, private and free from noise and other distractions is suitable, whereas an area where there is noise or a lack of comfort or privacy may create tension and confusion, making effective communication difficult. For example, background noise and the movements of other people in the environment may distract the listener, and even missing one or two vital words in a sentence can result in the meaning of a whole sentence being lost.

Ideally individuals should be able to communicate with health professionals and other people in a private room, but this is sometimes difficult to achieve in busy healthcare facilities. Nurses should, whenever possible, talk with people about personal issues in a private area such as an interview room or even a quiet garden area to gain privacy. The very least that nurses can do if the person does not have a single room is to close the curtains surrounding the bed, speak quietly and avoid discussing personal details while visitors are in the area (O'Toole 2012).

### Physical discomfort

Communication is likely to be less effective if one or both participants are experiencing fatigue, pain or other physical discomfort. Like its emotional counterpart, physical discomfort can distract a person so that it is not possible to concentrate on what is being said. The nurse who is about to engage in a therapeutic dialogue with an individual is advised to ensure that the person is free of pain, lying or sitting in a comfortable position and not needing to go to the toilet. It is also important to consider that some medications, including those administered for pain relief, can affect an individual's memory and the ability to concentrate or to think clearly (Arnold & Boggs 2011; O'Toole 2012).

### Pressure of time

Because most people have many pressures on their time, the urge to speed up communication is increasing. Nurses often feel the need to complete other tasks while communicating with people and this results in less effective communication (Ghorbani et al 2014). It is not always easy, but even a few minutes of attentive listening can be very therapeutic for an individual. Not all interactions with people need to be lengthy but it does take time to explain, to listen, to reduce fears or anxieties and to assimilate facts. A person who senses the nurse's need to get on with other things is unlikely to raise any issues of concern that need to be talked about. It is one of the major challenges in contemporary nursing practice to prioritise tasks and manage time so that the psychological as well as the physical needs of individuals are met (Arnold & Boggs 2011; O'Toole 2012).

Clinical Interest Box 8.2 provides examples of communicating effectively with individuals.

## FORMS OF COMMUNICATION

Communication is the process of sharing information and understanding, using verbal and non-verbal methods. **Verbal communication** involves the use of words and the way they are delivered. Words can be written or spoken. **Non-verbal communication** involves facial expressions, body posture and gestures, touch and the use of space.

### Verbal communication

In addition to the words used, verbal communication involves the tone and pitch of the voice, the rate and volume of speech, the use of pauses and sounds. These additional components are referred to as paralanguage (Arnold & Boggs 2011).

#### The words

Messages are only understood if the words used are familiar to the sender and the receiver. Nurses in Australia often care for people for whom English is not a first language, and it

## CLINICAL INTEREST BOX 8.2 Guidelines to facilitate effective communication

- Be clear about the message to be conveyed, and how and why it will be conveyed
- Use the most appropriate medium (channel) for conveying a message
- Use language that is appropriate for the recipient's level of intellectual understanding, emotional status and culture
- Choose the right timing and length of message for each occasion
- Use specific skills to gain and interpret feedback from the other person
- Use active listening skills to listen for what is said
- Use keen observation skills to determine what is not being said; for example, be aware of non-verbal communication
- Observe for clues and contradictions in the verbal and non-verbal messages from the other person
- Encourage and wait for questions, and answer them clearly and honestly
- Ask appropriate questions and actively listen to the response
- Be sensitive to individual differences in communication behaviour and, as far as possible, adjust the style of communicating to accommodate these differences
- Identify and minimise the barriers to effective communication.

*(Stein-Parbury 2014)*

may be necessary to get help from an interpreter (Department of Health and Human Services 2014). Even within a cultural or sub-cultural group the meaning of many words can be ambiguous and one word can have two meanings in the same culture, so that remarks can easily be misunderstood. For example, a 5-year-old boy was being prepared for a surgical operation and the nurse told him he would be going to the theatre in 2 hours time. Imagine his distress when he arrived in the operating room to have his tonsils removed, when he thought that he was being taken to see a film.

### Sounds

In addition to words, sounds made by the voice can deliver very strong messages about a person. Sounds can convey pain (groans, moans), distress and sadness (crying, sobs), boredom or despair (sighs), excitement or fear (screeches and screams) or a range of other emotions. The meaning of a sound can easily be misinterpreted, as most sounds can express more than one emotion. A moan might not always express pain—it may be a moan of pleasure or disappointment. The nurse must always validate the meaning of a sound individual; for example, the nurse might ask, 'That sounds like you have pain, Mrs Jacobs. Do you have pain?'

### Tone and pitch

The tone and pitch of the voice can have a powerful effect, sometimes more so than words. No matter what words are being said, a loud aggressive voice will send a strong message. A nurse's tone and pitch of voice and the inflections used add meaning to words. Tone and pitch of voice can display anger, apathy, disgust, enthusiasm, excitement and other emotions. An individual can often determine more about another person from the way in which the words are spoken than from the actual words used. Loud, rapid, forcefully spoken words can intimidate and communicate aggression, a patronising tone can communicate condescension or contempt, and expressionless speech can communicate lack of interest. People can discern much about each other from their respective voices, especially the tone and pitch which can convey messages about emotional feelings and energy levels (Arnold & Boggs 2011; O'Toole 2012).

### Rate and volume

Rate and volume of speech are best kept at a moderate level. Speaking too fast, too slowly or too loudly is not conducive to comfortable conversation, and messages may be lost or misinterpreted. Nurses frequently care for people with hearing and cognitive impairments; these people need to be consulted and assessed to determine the most successful rate and volume of speech to facilitate therapeutic communication (Department of Health 2010; Department of Health 2012).

### The use of pauses

Pauses can provide time for individuals to think about what they want to say, but pauses that are too long (more than 10–15 seconds) may seem awkward or uncomfortable (O'Toole 2012).

In normal conversation the style of communication that individuals use is generally not thought about consciously. When engaged in therapeutic relationships, nurses need to consciously evaluate the way they communicate and develop a conscious awareness of the tone, pitch, rate and volume at which they speak. Other basic aspects of verbal communication that are helpful to be aware of are the need to:

- Be brief: short pieces of information make understanding easier—the fewer words, the less the risk of misinterpretation
- Keep the messages clear, simple and direct: complicated information leads to confusion and unnecessary words detract from clarity; for example, additions such as 'you know', 'OK', 'and that' or 'um' are best avoided
- Enunciate words clearly: make messages clearly heard; mumbling makes them incoherent
- Use examples to clarify meaning: an example often makes it easier for the message to be understood. For example, the nurse might clarify, 'By aids to help you at home I mean things like a seat that fits across the bath, grip rails in the bathroom for you to hold onto and perhaps a ramp instead of steps at your back door.'
- Time the delivery of the message appropriately: timing is important when giving information of any sort.

Trying to tell an individual about what will happen in surgery just as the pathology nurse is taking a blood sample would demonstrate poor timing, as the individual's concentration would not be totally focused on the message (Al Sayah et al 2014; Lin et al 2014; Arnold & Boggs 2011).

## Non-verbal communication

In nearly every interaction, words are accompanied by simultaneous non-verbal messages that the sender may not be consciously aware of. **Non-verbal communication** refers to messages transmitted without using words. They include those transmitted via:

- Facial expressions
- Posture, body movements and gestures
- Eye behaviour
- Touch
- Use of space (proxemics).

(Arnold & Boggs 2011; O'Toole 2012)

Non-verbal messages form the most significant component of communication and together with paralanguage can make up to 80% of the meaning of a message (O'Toole 2012). During interpersonal communication with people it is essential for the nurse to look as well as listen. Concentrating only on words means that much of what could be discerned is being missed. Non-verbal communication comes from many sources and it is easy to miss something significant. For example, while watching a person's foot tapping, a significant hand gesture or eye movement may not be noticed. Generally, non-verbal messages are not received in isolation and they are interpreted subconsciously but nurses need to develop the skills of consciously considering verbal and non-verbal messages, together and in context, and validating the meanings perceived in the messages (Arnold & Boggs 2011).

### Facial expressions

Facial expressions convey emotional states, and therefore a great deal of information can be obtained about individuals' feelings by observing their facial expressions (O'Toole 2012). For example, a frown or an eyebrow raised in disbelief reveals something of how an individual is reacting to what is being said. Some specific facial expressions of emotion seem to be universal across cultures. They are those that convey surprise, fear, disgust, anger, happiness and sadness. Facial expressions provide the nurse with continual non-verbal feedback from most individuals, but some people have expressionless mask-like faces that reveal little or nothing of what they are thinking or feeling. This may be a person's usual demeanour but sometimes it is due to the effects of an illness such as Parkinson's disease, Alzheimer's dementia or severe depression. In such cases the nurse must detect the person's mood from other clues such as body posture, activity level and appetite, or simply by asking how the person is feeling.

Individuals are often very sensitive to the facial expressions of the nurse and it is imperative that, even though it is sometimes difficult to control, nurses make every effort not to facially express feelings of shock, alarm, repulsion or any other negative emotion in front of the individual (Arnold & Boggs 2011). Imagine the effect on an individual with a stoma, an amputation or serious burns who detects repulsion on the face of a nurse. Additionally, nurses need to develop awareness of the effect their facial expressions may have on people during procedures and interactions of any sort. For example, a nurse frowning in concentration while dressing a wound may be interpreted by the individual as the nurse being worried and concerned about the look of the wound.

### Posture, body movements and gestures

The way individuals move, walk, sit or stand communicates information about their mood, attitude, state of mental and physical health and self-esteem (Arnold & Boggs 2011; O'Toole 2012). An upright posture together with decisive, quick and purposeful movements communicates a sense of wellbeing and self-confidence. A slumped posture, hesitant movements and a slow shuffling or stumbling gait may indicate depression, physical illness or impairment or that a person is substance-affected or fatigued.

Some basic communication gestures convey the same message in almost every culture. For example, nodding the head is almost universally used to indicate 'yes', or affirmation.

Conversely, a specific gesture may be meaningless or assume a different meaning in another culture. Even within one culture a meaning may be different according to whether the gesture is made in certain ways. In most European countries the V sign means victory when gestured with the palm facing away from the body, and a rude 'shove it' when the palm is facing towards the body of the person gesticulating (O'Toole 2012). See Chapter 10 for more information on cultural differences.

### Eye behaviour

Eye contact is one of the most crucial aspects of communication. How often people make eye contact or how long they hold a gaze can make a vital difference to the quality of an interaction. Eye contact and behaviour can convey openness and sincerity, and an individual's emotional state and level of interest in a person or what is being said, and a failure to make eye contact can reduce the effectiveness of communication. A commonly held perception is that failure to make eye contact can mean the person is lying; however, there are many reasons why people may avoid making eye contact (Arnold & Boggs 2011). These could include shyness, nervousness, low self-esteem, embarrassment and defensiveness.

The norms about what eye contact means, how often it should occur and with whom, differ in varying degrees from culture to culture and generation to generation. Some Aboriginal or Torres Islander Strait people may avoid eye contact if they are in pain and many cultures have rules about eye contact according to status, age and gender. Nurses therefore need to consider cultural differences when using eye contact themselves or when interpreting eye contact given by people (Arnold & Boggs 2011).

Looking down on a person from a higher position can be intimidating. When people are in bed it is preferable for

the nurse, or any other health professional, to sit down and make eye contact at eye level because communicating at eye level indicates equality and helps develop trust in a relationship (Stickley 2011; Webb 2011).

## Touch

Touch (tactile communication) is one of the most powerful and personal forms of expression. A person's first comfort in life comes from touch, and so, frequently, does their last, as touch may communicate with a dying person when words cannot. There is no way to practise nursing without touching and, in nursing, touch may be the most important of all non-verbal communications. Touch occurs in everyday procedures such as taking vital signs and assisting people with showers or baths. It also occurs at times of joy, fear, stress and loss. How nurses use touch while providing care conveys a great deal about the way they feel towards people and their illnesses.

In nursing, touch can be used therapeutically to transmit positive feelings of understanding, compassion or reassurance. To be effective, tactile communication must be used at the appropriate time and place. Not all people like to be touched and all individuals consider a certain amount of space around them as private. Touch can be seen as an invasion of that privacy unless it is desired. Touch must be used at the right time and in the right way, otherwise the message may be misinterpreted. Nurses always need to assess and be sensitive to how comfortable a person is with being touched (Albardiaz 2014).

## Space

The concept of 'space' is important in communication, as it determines the distance a person usually keeps between themself and other people. The individuals involved, and the context or situation, dictate acceptable distance zones. People surround themselves with their own 'informal' personal space, which is invisible and mobile, and nurses need to be aware not to impinge on another person's personal space (Arnold & Boggs 2011; O'Toole 2012). The categories of personal space or zone are shown in Figure 8.3.

The intimate zone (between 15 cm and 45 cm from the body surface) is the most important to a person, who guards it as if it were personal property. Usually only those who are emotionally close to the person are permitted to enter this zone, such as spouses, partners or lovers, parents, children, close friends and relatives. The personal zone (between 46 cm and 1.2 m) is about the distance individuals keep between them at friendly gatherings and social functions. The social zone (between 1.2 m and 3.6 m) is the distance individuals keep between themselves and strangers or people who are not well known to them (Arnold & Boggs 2011).

The nature of nursing practice means that nurses frequently invade an individual's intimate or personal space. Many people will be uncomfortable with this closeness, and nurses should observe and respond to the person's non-verbal cues to ensure that any discomfort can be identified and dealt with. Conversely, such necessary closeness when handled sensitively may promote rapport between a nurse and an individual.

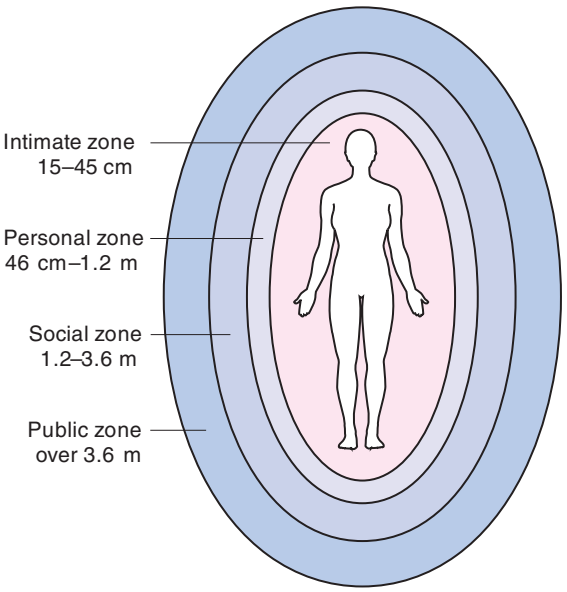



**Figure 8.3** Personal space zones

## Summary

In summary, although non-verbal communication provides information on how a person is feeling, it is a mistake to interpret a single movement, gesture or facial expression in isolation. For example, a person with arms folded across the chest and stomping about might simply be protecting himself from the cold, but if this was accompanied by sobbing, shouting or a facial grimace it may indicate severe pain, distress or anger. All non-verbal clues need to be observed together when considering what is really happening.

When a person's actions or gestures do not match spoken words, the messages are said to be incongruent. This means that the body movements or gestures are conveying one message, while the verbal words are conveying a different message. When an individual conveys incongruent messages it is important that the nurse tries to clarify what is happening even though it may at first feel awkward doing so. Conversely nurses should also ensure that the non-verbal cues that they provide are congruent with what they say. Imagine a nurse asking someone if they have any questions but not looking at them and walking away before the person can answer. The nurse's behaviour indicates disinterest which contradicts the words spoken. When this occurs the non-verbal messages take precedence as they are considered to be more truthful (Arnold & Boggs 2011). Clinical Interest Box 8.3 provides an example of how a nurse can explore incongruence between verbal and non-verbal messages.

# CONFLICT AND COMMUNICATION

The very nature of nursing means that nurses will inevitably have to deal with a situation of conflict. The conflict that nurses may have to deal with could be between themselves

### CLINICAL INTEREST BOX 8.3 Recognising verbal and non-verbal communications

Andrew, 40, was admitted to hospital for overnight observations after being concussed in a motor vehicle accident the day before. The nurse was concerned because, although there seemed to be no problems from his concussion, she had observed Andrew limping and grimacing when he was walking. When she asked if he had any pain he said no. The nurse began exploring the incongruent messages being received by saying, 'I am concerned about you because even though you say you have no pain you seem to have trouble walking.' After talking with Andrew for only a short while he admitted he had considerable pain in his foot, but did not want to tell anyone because he could not afford any more time in hospital and thought it was probably only bruising that would get better without treatment. X-rays revealed that Andrew had broken two bones in his foot which, without correct treatment, could have resulted in permanent disability.

and other nurses or other healthcare professionals, or the people that they are caring for or their relatives. Unresolved conflict between nurses has been identified as a major contributing factor as to why nurses leave the profession and can contribute to the reduced care of an individual. Regardless of the parties involved, a breakdown in communication is the major cause of situations of conflict (Brinkert 2010). In the healthcare setting it can result from people misunderstanding their prognosis or treatment, or being given inconsistent, confusing, too much or too little information. Nurses are often communicating with people during times of high stress or severe physical or mental impairment and all these factors can contribute to ineffective communication and a situation of conflict (Arnold & Boggs 2011; Weissman et al 2010). Often in these situations people's emotions rule their behaviour. They may feel tired, annoyed, irritated, frustrated or angry. Other factors that can lead to a situation of conflict include past experiences (previous negative experience), lack of trust or cultural differences (expectations are different). It is important that situations of conflict are dealt with appropriately to ensure that the relationships between nurses and the people that they are caring for remain therapeutic. Nurses require skills that identify situations where poor communication has led to conflict and must be able to recognise the emotion that the person is feeling so they can use appropriate conflict-resolving strategies (O'Toole 2012).

## PASSIVE, AGGRESSIVE AND ASSERTIVE COMMUNICATION

The style of communication that people adopt in a situation of conflict can be categorised as passive, aggressive or assertive.

### Passive communication

Nurses tend to use a passive style of communication where they avoid conflict and pretend that it is not really occurring (Mahon & Nicotera 2011; Pavlakis et al 2011). Individuals who are passive don't adequately communicate their feelings and needs to others. They tend to fear conflict and let their needs go unmet in order to 'keep the peace'. They let others win while they lose out; consequently the conflict is never resolved and often recurs or leads to resentments. The person who is passive continues to avoid confrontation, becoming increasingly angry until, when they finally do say something, it comes out aggressively. The other party does not know there is a problem until the individual who was formerly passive virtually explodes. This leads to hard feelings, weaker relationships and more passivity (O'Toole 2012; Arnold & Boggs 2011).

### Aggressive communication

In contrast, individuals behaving aggressively will tend to employ tactics that are disrespectful, manipulative, demeaning or abusive. They make negative assumptions about the motives of others and think in retaliatory terms, or they don't think of the other person's point of view at all. They win at the expense of others, and create unnecessary conflict. An aggressive person will shout or impose their opinion on others and insist on having their own way (Ellis & Abbott 2013; O'Toole 2012; Arnold & Boggs 2011). Responding to a person who is aggressive with aggression will only serve to inflate a situation of conflict. Nurses should ensure that they do not get caught up in the emotion of a conflict situation and become defensive, argumentative or abusive themselves (Stein-Parbury 2014; Collopy 2011).

### Assertive communication

**Assertive communication** is the best approach to take when dealing with a situation of conflict. It helps to facilitate beneficial communication outcomes and improves relationships (O'Toole 2012). Assertiveness is the ability to express one's feelings and assert one's rights while respecting the feelings and rights of others. Assertive communication is appropriately direct, open and honest, and clarifies one's needs to the other person (O'Toole 2012; Stein-Parbury 2014). Assertiveness comes naturally to some, but if it doesn't it is a skill that can be learned. People who have mastered the skill of assertiveness are able to greatly reduce the level of interpersonal conflict in their lives, thereby reducing a major source of stress (O'Toole 2012; Ellis & Abbott 2013).

The key to assertive communication is the 'I' message. It sends a different message to the 'you' message. Imagine a nurse saying this to another nurse 'You are so lazy' instead of 'I feel that I am not getting enough help from you'. The 'I' message does not lay blame and the person owns how they are feeling. In contrast the 'you' message does the reverse and tends to inflame situations of conflict (Stein-Parbury 2014). To further explore other assertive communication strategies see Clinical Interest Box 8.4. See Table 8.1.

## CLINICAL INTEREST BOX 8.4
## Assertive communication skills

Use these steps to help you develop an assertive response:

1. Express empathy

*'I can see that ...'*
*'It must be difficult for you ...'*

2. Describe your feelings or the situation

*'I feel upset that ...'*
*'It seems like ...'*

3. State expectations

*'I would like you to ...'*
*'What needs to happen is ...'*

4. List consequences

*'If this happens then ...'*
*'Then we will be able to ...'*
*'If it doesn't happen then ...'*

Example

*'I understand that you are upset because you would like to accompany your wife into the operating theatre but you cannot go in because of the infection risk. I would like you to wait here and I will let you know when you can see her. This will help ensure that she stays healthy.'*

*(Arnold & Boggs 2011)*

# THERAPEUTIC COMMUNICATION

The development of a therapeutic relationship between an individual and a nurse is vital to effective nursing care (Punjani & Bhanji 2014). A therapeutic relationship is about meeting the healthcare needs and wishes of the individual. For a therapeutic relationship to occur there must be mutual understanding and this arises from the development of respect, empathy and trust. Underpinning all therapeutic relationships is therapeutic communication, an essential element of nursing practice (O'Toole 2012; Kleier 2013).

Clinical Interest Box 8.5 provides examples of some techniques for therapeutic communication.

# SKILLS TO FACILITATE THERAPEUTIC COMMUNICATION

## Active listening

Active listening is not an automatic ability. It is a skill that develops with practice and perseverance. Active attentive listening is as important to the process of therapeutic communication as speaking and it could be said that the art of therapeutic conversation lies in the ability to listen with perception.

Active listening requires attention and concentration, to hear not only the words but the feelings or meanings that are often hidden behind the words. Active listening involves being tuned in and ready to receive messages (Arnold & Boggs 2011). Nurses can demonstrate readiness to listen by

**TABLE 8.1 | Assertive behaviour versus aggressive or passive behaviour**

| Aggressive | Passive | Assertive |
|---|---|---|
| Raised voice | Looking away from speaker | Eye contact |
| Blaming | Saying yes reluctantly | Nodding and giving feedback to a speaker |
| Pointing | Turning away from speaker | Showing respect for the other speaker |
| Shouting | Hiding under the desk | Explaining clearly why a suggested deadline might not be possible |
| Standing with hands on hips | Waffling | Taking responsibility for one's own feelings |
| Talking over a speaker | Shuffling feet | Acknowledging the other person's position/ feelings |
| Standing over a seated person | Avoiding confrontation | |
| Constantly 'topping' a person's story | | |
| Public criticism | | |
| Standing too close to a person | | |

*(Arnold & Boggs 2011; Collopy 2011; O'Toole 2012)*

## CLINICAL INTEREST BOX 8.5 Therapeutic communication

Therapeutic communication techniques in nursing are those that:

- Convey respect and acceptance of individuals, no matter what situation they are in or illness they have
- Encourage the expression of the views, feelings and ideas of others
- Demonstrate a non-judgmental attitude towards the situations, views, feelings and ideas of others.

They include the skills of assertive communication, active listening, asking questions, providing feedback, paraphrasing, clarifying, reflecting, using silence and summarising (Arnold & Boggs 2011; Joanna Briggs Institute 2011).

minimising environmental distractions and adopting a posture as detailed below. The acronym SOLER is a useful way to remember these following points:

- **S**itting at a comfortable distance away from the person and facing them
- **O**pen, relaxed posture (arms not folded and legs not crossed)
- **L**eaning slightly forwards
- **E**ye contact
- **R**elaxed posture.

Active listening incorporates simultaneously listening for the content, or facts, of the message, and the feelings in or behind the message. Sometimes feelings are expressed openly, for example, 'I'm really fed up and I am scared that this ulcer on my leg will never heal', but often feelings are only hinted at, implied or talked around. Sometimes it is the way something is said that reveals how an individual is feeling; for example, 'My doctor was here just now; he said everything is going fine, according to plan' might be said in a way that reveals the individual is happy about the news, or in a way that indicates the individual doubts the truth of the news. Sometimes feelings are deliberately concealed or expressed only non-verbally. Active listening requires the nurse to:

- Stay mentally alert
- Focus on the speaker's ideas
- Pay close attention to what is said
- Avoid interrupting the other person's speech or being anxious to butt in
- Avoid thinking about what to say next while listening
- Remain alert for an unexpected remark
- Keep an open mind.

Communication strategies that indicate active listening include eye contact, nodding or smiling to encourage the speaker to continue, prompting the speaker by using expressions such as 'go on' or 'then what?' and asking questions to clarify what has been said (Hayes & Collins 2013; Stickley 2011).

## Asking questions

Nurses ask questions to gain information from individuals. The responses provide the data from which care is planned and implemented. Questions also assist in the development of trust and rapport if they are the right question asked at the right time. The type of questions asked depends on the situation and the type of response required. Some questions call for simple and direct responses, while others are more probing in nature (O'Toole 2012).

### Closed questions

Closed questions are those designed to elicit a simple 'yes' or 'no' or a very short and factual answer. They often start with 'who', 'where' or 'when'. For example, 'When did you last see your medical practitioner?' is a closed question, and the expected response to this question would be merely a date. Closed questions limit options but are useful in emergency situations when the goal is to obtain information quickly; for example, 'How severe is the pain on a scale of 1 to 10 where 10 is the worst pain imaginable?' Closed questions are not designed to elicit extensive detail or to discover or explore feelings or attitudes (Arnold & Boggs 2011; Stein-Parbury 2014).

### Open-ended questions

Open-ended questions are designed to evoke a long answer. They enable a person to choose how much or how little information to reveal and can be seen as less threatening. Open-ended questions often start with 'why', 'what' or 'how'. Open-ended questions are more effective in encouraging a person to elaborate on a topic, as such questions cannot be answered with a simple 'yes' or 'no' (Williams 2008). This style of questioning invites the person to reveal personal perceptions, views, thoughts and feelings (Ellis 2009). For example, 'What were your reasons for choosing to move from Alice Springs to Melbourne?' is an open-ended question. The nurse should always allow the individual to fully answer each question before moving on to a follow-up question or changing the topic. Open questions may also begin with inquiries such as 'Can you tell me more about …' which encourage the individual to elaborate (O'Toole 2012).

### 'Why' questions and leading questions

It may hinder the development of a therapeutic relationship to use questions beginning with 'Why?' because they may seem judgmental. For example, 'Why don't you want a shower?' can sound accusatory to an individual. The 'why' question could make a person feel that they have to justify themselves or that there is something wrong with what they are feeling. It is better to ask, 'I'm concerned that you don't feel up to a shower; how are you feeling?' (Stein-Parbury 2014).

It is also recommended that the use of leading questions be avoided. Leading questions are rhetorical because they have an implied answer and are often used to confirm what nurses think they know (O'Toole 2012). For example, individuals might find it easier to answer 'Yes' to a leading

question such as 'You're all right, aren't you?'; while they might feel obliged to answer 'No' to the question 'You don't need any more pain relief, do you?' Individuals might interpret such leading questions as the nurse not caring or not being interested in how they are really feeling, or not having the time to be concerned.

When individuals are admitted it is usual for the nurse to ask a range of questions. Most interviews comprise a mixture of closed and open-ended questions, but nurses need to be sensitive to the fact that overuse of closed questions can seem like an interrogation. Being bombarded with multiple closed questions as a nurse completes an admission form can feel dehumanising because it does not provide an opportunity for individuals to talk about issues that might be important and of concern to them. It is often a more relaxed and friendly approach to ask questions less directly. A gentle command could be used instead; for example, 'Tell me about your health over the past few years' may elicit most or even all the information needed but gives some control to the individual. Skilful questioning, using mostly open techniques, can be a way of beginning a meaningful relationship with an individual.

## Feedback—paraphrasing, clarifying and reflecting

Other techniques that help the communication process are clarifying, paraphrasing and reflecting. All these are methods of providing feedback. Feedback is a very important component of the communication process. If a listener is not providing any feedback, the sender has no way of knowing whether a message has been received or how well it has been understood (O'Toole 2012).

Facial expression and body language can provide some feedback from the listener to the sender, or the person who is sending the message can obtain feedback by asking the listener to verbally express their understanding of what was said, or to demonstrate understanding. For example, after a nurse has taught an individual how to use an aerosol inhaler, the individual can be asked to demonstrate understanding by showing the nurse that they can use it effectively. Alternatively, the listener can describe their perceptions of a sent message by using the skills of clarifying, paraphrasing and reflecting, all of which give the sender the opportunity to correct any misperceptions.

### Paraphrasing

Paraphrasing is a technique whereby the listener reiterates what the sender has said in their own words, more briefly whenever possible. Paraphrasing is a means of sending feedback to the sender of the message that lets the person know whether or not the meaning of the message was received as intended. Paraphrasing can be very effective for checking understanding of the content of a message, as it gives the individual an opportunity to correct any misunderstandings. It also helps build trust as the person recognises that the nurse is interested in gaining a full understanding of what the individual is trying to communicate (Arnold & Boggs 2011; Stein-Parbury 2014). For example:

*Individual: 'I'm on 10 medications in the morning and two at lunch and then six in the evening. There are two pink ones in the morning and the rest are white. I think there might be a blue one at night. Oh yeah, and some shiny red ones. I don't know what half of them are for.'*

*Nurse: 'You sound like you would like to know a little more about the medication that you are taking.'*

Paraphrasing can also be in the form of a reflective question. For example, 'Didn't you say that you had your heart attack before you were diagnosed as having diabetes?'. Progress Note Example 8.1 illustrates how a nurse might ask an individual to paraphrase to ensure effective understanding.

### Clarification

Clarification is used in situations in which there is a lack of sense about what an individual means, to the degree that it makes the use of paraphrasing impossible. Clarifying reinforces that the nurse is trying to gain an understanding, and the nurse should not continue until clarification has been managed. The nurse must be careful not to put blame for lack of clarification onto the individual; for example, saying, 'You're not being very clear about how this happened' would be unhelpful, might alienate the individual and would not facilitate a therapeutic relationship. It would be better for the nurse to take responsibility and say, 'I'm having some trouble following what you mean'.

When needing to clarify it is possible to ask a direct question such as 'What do you mean?', but this is best avoided because it may sound critical and accusatory to individuals. Whatever way clarification is sought the tone and pitch of

**PROGRESS NOTE EXAMPLE 8.1**

| | |
|---|---|
| 10/09/2016<br>1500 hrs | On admission Mary was not able to explain to me the medical procedure she was having today. She told me she was very frightened and thought she might die. I explained the procedure to her again and answered her questions. She was able to explain it back to me and told me that she didn't feel as anxious anymore. I also contacted her surgeon, who came down to the ward to explain the procedure to her as well. She stated that she will go ahead with the procedure. She informed me that she suffers from anxiety and is very worried about how she will cope when she is discharged.<br>***J. McArdle* (McArdle) EN** |

voice, facial expression and body language used can make a difference to how the individual feels about not being understood (Stein-Parbury 2014).

### Reflecting

Reflecting is another skill that can be used to check that a message received has been correctly interpreted and works particularly well to reiterate the individual's feelings. Reflection is the mirroring of feelings the nurse believes have been expressed by individuals. The feelings are reflected by the nurse's words as a way to check that perception of an individual's feelings is correct. For example, an individual may say 'Just look at me, I've lost so much weight since I've been in hospital.' The nurse might reflect back the feelings perceived by using a reflective question, 'You're anxious about how much weight you have lost?' The individual may confirm with a 'yes' or correct a misperception by saying, 'Oh no, I feel good—I've been trying to get to this weight for years.'

Reflecting feelings is especially important in nursing because it conveys that the nurse recognises and accepts an individual's emotions as a valid part of the illness experience which furthers the trusting relationship (Arnold & Boggs 2011). For example, an individual may say, 'This hip of mine doesn't seem any better now than before the operation.' The nurse may reflect, 'You seem pretty frustrated (anxious/worried) about your lack of progress.' This validates the individual's feelings and at the same time provides permission for the individual to talk more about what is being experienced. Reflected feelings should be stated tentatively, no assumptions should be made about what an individual is feeling unless stated directly, and often they are only implied or hinted at. It is quite difficult to select the right words to describe a feeling and the intensity of it. The nurse should not proceed with dialogue about an individual's feelings until the individual has verified that the nurse's perception of what the individual is feeling is correct. Care is also needed not to underestimate or overestimate the intensity of the feelings that an individual is experiencing (Stein-Parbury 2014).

It is often helpful and therapeutic for an individual to be able to share what they are feeling with the nurse. But not all individuals want to talk about what they are feeling. They may prefer to keep those feelings under control or share them with someone else—a partner, close family member, friend or priest, for example. The nurse must respond sensitively to the messages given out by individuals when they initiate discussion of feelings, and individuals should never feel coerced into talking about feelings they prefer to keep contained.

## The use of silence

Silence, used correctly as a communication tool, can be as effective and as supportive as words (Arnold & Boggs 2011). There are instances where words seem inadequate when a person wishes to convey thoughts and feelings to another person. In such instances, it may be most helpful simply to sit quietly with the person and share the silence. Just to be with another person at moments of grief, sorrow, conflict or joy may be more helpful than trying to fill the silence with useless words or clichés.

In some situations silence is not productive and can cause discomfort. Silence can be used to indicate approval or disapproval of a situation, or it may be used to punish or hurt another person. In such instances silence causes **barriers to communication** and may cause a person to feel inferior or rejected. There are times in nursing when silence is not therapeutic. During interviews with individuals there may be times when the nurse cannot think how to respond to what an individual has said. It is understandably difficult to know how to respond when an individual says something such as 'I don't want this baby' or 'I know I'm going to die' or 'my life will never be the same now'. If what is called 'a stumped silence' ensues after personal information or strong views or feelings have been revealed, the individual may feel awkward and perceive that the nurse is expressing negative judgment or disapproval. Rather than have an uncomfortable stumped silence it is better to use the skill of paraphrasing or reflecting feelings, touching gently or saying something such as 'I wish I knew what to say to help'. Nurses need to develop awareness of stumped silences and practise communication strategies that help avoid them, and ways to use silence therapeutically.

## Summarising

Summarising is a way of briefly highlighting the key aspects of a conversation. It is a skill most often used before terminating an interaction or nurse–individual interview. In addition to clarifying, paraphrasing and reflecting feelings, it is another method of allowing the nurse to check understanding of what has been shared and discussed, and to have that understanding confirmed or corrected by the individual. Summarising is a helpful strategy in that it also informs the individual that the interaction is coming to a close and provides the opportunity for the individual to raise any issues of concern not yet discussed (Stein-Parbury 2014).

Summarising is important because it is not uncommon for individuals or relatives to present the most significant aspect of what has been happening to them just as the interview is about to end. This is probably because the significant aspects are often those that are embarrassing or that elicit the most intense emotions. These things are not easy to share and, as the nurse summarises, individuals realise that the opportunity to do so will soon be gone. The nurse should factor this possibility into the time allocated for interactions. Summarising and permitting the individual to raise issues not previously mentioned enables the individual and the nurse to feel a sense of satisfactory completion at the end of the interaction (Arnold & Boggs 2011).

Summarising can also be useful at the beginning or midway through an interaction. Sometimes it is helpful for the nurse to summarise the content of a previous interaction, for example, 'When we last spoke you told me you were anxious about who was looking after your home and your dog while you were in hospital and that you were going to contact your neighbour about keeping an eye on things. How

have things worked out?' This serves to focus the interaction into the area needing further exploration.

Midway through an interaction it may be helpful to summarise before moving on to a new topic; for example, 'Before we talk about what will happen after your surgery, just let me see if I have things clear. You haven't had anything to eat or drink since 6 o'clock this morning. You haven't taken your medication that was due at lunchtime, and you are worried because you were so unwell after your last anaesthetic. The only other thing is that you want me to make sure the anaesthetist is coming so that you can talk to him about that.'

A summary can take the form of a question or a series of questions and answers to make sure that an accurate understanding has taken place; for example, 'Let me see if I have understood what you have told me. You had a heart attack when you were aged 47, the following year you were diagnosed with diabetes, and now you are having problems keeping your blood sugar levels within the recommended range?'

In addition to confirming or correcting the content of the interaction as perceived by the nurse, this can help individuals recall what has been said so far and prompt questions they might wish to ask while the issues are fresh in their mind. Whether the summary is at the beginning, midway or at the termination of an interaction, sufficient time should be allowed for the individual to expand on a point, clarify misperceptions or add something new (Lin et al 2014). Refer to Clinical Interest Box 8.6.

## Conveying empathy

Empathy refers to the ability to recognise and understand the essence or reality of an individual's experience and to communicate that understanding back to the individual. Empathy is considered to be different from sympathy. Sympathy is seen by some as subjectively sharing the feelings of the other person and thinking 'How would I feel if I was going through this', whereas empathy is seen as 'reaching out' and understanding the other person's experience without equating the intense feelings with past personal experience. In nursing, empathy is often viewed as a more desirable response because the focus is on the other person, not what the nurse is feeling and nurses are encouraged to be empathetic rather than sympathetic (Stein-Parbury 2014).

Empathy can be communicated by touch, by direct, clear and accurate statements that reflect understanding of the core of an individual's experience and by skills such as reflecting feelings. Expressions of empathy foster feelings of trust. If a person is able to demonstrate an understanding of how another person is feeling, rapport is established between them, and this promotes mutual trust. Trust is a belief that a person will respect another's needs and will behave towards them in a responsible and predictable manner. When people trust each other they feel more comfortable in their relationship, and communication is more effective (Joanna Briggs Institute 2011). Empathy also fosters higher patient satisfaction and improved mental health outcomes (Lelorain et al 2012).

## Self-disclosure

Self-disclosure refers to the skill of sharing personal experiences, feelings, thoughts, ideas and views with individuals in a way that is comforting. It can be comforting because it communicates understanding of the individual's situation and feelings and reinforces that the experience is not unique (O'Toole 2012). Self-disclosure should only be used when it is helpful to the individual, the purpose is to benefit the individual and the focus should not remain on the nurse after self-disclosure has occurred. For example, the nurse might say, 'I had a premature baby 2 years ago and was overwhelmed with the constant demands. I was lucky I had a lot of support. What sort of support will you have with your baby?' Self-disclosure can be used as a means of prompting and encouraging individuals to express their own fears, feelings and experiences. It also sends a message that the nurse trusts the individual with personal information, which may help the individual to feel comfortable enough to reciprocate that trust (Stein-Parbury 2014).

## The use of humour

Fun and laughter can be very therapeutic, but humour needs to be used with caution and, initially, tentatively when people are ill or upset and vulnerable, because not all people share or appreciate the same sort of humour. Humour has the potential to:

- Release tension and reduce anxiety
- Reduce embarrassment
- Reduce depression by stimulating the release of endorphins from the hypothalamus
- Stimulate immune system functioning
- Reduce pain by decreasing serum cortisol levels.

The use of humour can promote rapport between nurse and individual and facilitate communication that is relaxed

### CLINICAL INTEREST BOX 8.6 Summarising as an effective communication technique

A community health nurse might summarise an interaction in an individual's home: 'So, to sum up, your mum has now been diagnosed with Alzheimer's dementia. As well as looking after your own home and your two children you are currently doing all the shopping, cooking and cleaning for your mum, and there is no-one else who can help. You agree for me to arrange a visit from the Aged Care Assessment Services to see what help is available.'

After waiting for points to be clarified and the summary to be confirmed or corrected, the nurse might then ask, 'Is there anything else you would like to ask or tell me before I go?'

*(Arnold & Boggs 2011)*

and comfortable. However, it should be used to benefit the individual and never as a mechanism to hide behind when nurses are ill at ease in particular situations (Arnold & Boggs 2011; O'Toole 2012; Tremayne 2014).

## COMMUNICATING WITH CHILDREN, ADOLESCENTS AND OLDER ADULTS

In addition to the skills previously explained, there are further aspects to consider when communicating with children, adolescents, the older person and the individual's relatives and friends.

### Children

Ability with language and the processing of concepts and thoughts differs according to a child's age and developmental level. The nurse needs to adapt the style of communication according to these differences. Table 8.2 presents some basic guidelines for communicating effectively with children.

### Adolescents

As when communicating with anyone, all the skills that enhance effective communication are employed when talking with adolescents. Adolescents may be very sensitive to feelings of being judged or criticised, so it is important to be open minded when listening attentively to their feelings, ideas and opinions. It is helpful for adolescents to have expectations clearly explained and it enhances self-esteem when praise is given appropriately. Chapter 13 provides more information to assist the nurse when interacting with adolescents.

### The older person

Older people may need more time to respond during conversation or to answer questions because they have a large

**TABLE 8.2 | Guidelines for communicating effectively with children**

| Action | Rationale |
|---|---|
| Address parents first at the initial meeting, then the child | It is courteous to address the parents and the child at the start of the interview, but the focus should then move to communicating directly with the child |
| Put children at ease; for example, by asking their name, stating yours and talking about their friends/toys/pets/school | A child who is relaxed generally communicates quite freely |
| Talk directly to children (do not continually direct remarks or questions to the parents) | Demonstrates respect for the child. Sometimes in their anxiety parents tend to answer for their child; talking directly to the child helps to avoid this and demonstrates respect for the child and the child's feelings and opinions |
| Talk at eye level | Standing above a child is intimidating |
| Ask children questions that they can answer on their own. If parents are present, the nurse should look to them for confirmation or reply only when necessary | Establishes a relationship with the child and begins to develop trust |
| Explain any procedures or activity to be performed in terms the child can understand. Include the child in the discussion when a plan of care is being explained to the parents | Children are more likely to accept interventions if they know what to expect |
| Talk with a child as you would an adult; for example, be honest, do not disregard any information the child offers. Provide older children with the chance to speak without the parents present | Demonstrates respect for the child |
| Answer a child's questions honestly whenever possible. For example, if a child asks if a procedure is going to hurt, it is much better to be honest | If a child has been told that a procedure will not hurt, and it does, trust in the nurse will be reduced |
| Respect a child's confidences. If a child reveals information necessary for a parent to know, explain why this is so and suggest the child tells the parent. Otherwise seek the child's permission to talk to the parent about the matter (Arnold & Boggs 2011; Webb 2011) | Failing to respect a confidence destroys trust |

repertoire of experiences to draw on and sorting through them requires time. The process of retrieving a memory of an event and the words needed to express themselves may be slower than in previous years. This may be due to memory impairment associated with normal ageing. It may be mild, and many older people adapt to this change, but at times of stress, tiredness or when situations are demanding, the slowed ability to recall events and words may be much more noticeable. The nurse needs to be patient and allow older individuals adequate time to respond. If sure of a word the individual is searching to remember, it may help, after waiting a few moments, to provide it.

Older adults sometimes find it takes longer to absorb new knowledge, especially if the information does not connect to familiar concepts. Older and younger individuals alike find it more difficult to absorb information while anxiety levels are high. Giving new information to older individuals while they are ill, upset or anxious is likely to mean that they will be unable to recall it Nurses also need to consider that many older individuals will have age-related changes to hearing and vision that also impact on communication. Some older people may require written information with pictures to aid in recall and understanding (O'Toole 2012).

## COMMUNICATING WITH AN INDIVIDUAL'S RELATIVES, FRIENDS AND SIGNIFICANT OTHERS

The loved ones and friends of a sick person will often need support to help them cope with that person's illness. A person's illness can be a very disruptive episode in the lives of their significant others. They may need to discuss their concerns and share the frustrations of the illness. Table 8.3 and Clinical Interest Box 8.7 provide some general guidelines for communicating effectively with relatives, friends or others who are emotionally close to an individual who is unwell or who has died.

**TABLE 8.3 | General guidelines for communicating effectively with relatives and friends**

| Action | Rationale |
|---|---|
| Introduce yourself to the relatives and inform them that you are helping to look after their loved one | It is a common courtesy to greet all visitors regardless of whether or not they need support or information |
| Provide them with opportunities to express any concerns and anxieties | Simply having concerns heard can reduce stress |
| Include them in discussions about the individual's care when appropriate; for example, only when certain that the individual approves | Relatives have often been providing care at home for individuals before their admission to hospital and will often continue care after the individual is discharged from hospital. It is rude and dismissive of their care work to exclude them from care planning decisions |
| Offer opportunities to assist with care activities as appropriate | Often relatives like to feel useful, needed and involved |
| Answer their questions as appropriate (be aware of confidentiality issues) or refer questions to the nurse in charge | The unknown is often very stressful. Information is important in planning for what is still to come |
| Demonstrate warmth; for example, by touch, close proximity, body posture and facial expressions. This is of particular relevance when relatives are confronted with a loved one who is seriously ill or dying | When a loved one is sick or dying it helps to know others empathise |

## BARRIERS THAT INTERFERE WITH THERAPEUTIC COMMUNICATION

Several aspects of communication can impair effective communication, hinder the development of trust in a therapeutic relationship and damage an existing one. In addition to the inappropriate use of humour mentioned earlier, some other communication pitfalls act as barriers to therapeutic relationships that nurses need to be aware of and avoid. They are not hard to fall into inadvertently, but also they are not hard to avoid once aware of them. Using the basic communication skills previously outlined, together with avoiding the pitfalls, will enhance every relationship and facilitate therapeutic relationships between nurses and individuals. Because of the emotional content of many nurse–individual interactions, the potential for nurses to inadvertently put up barriers if they are not aware of them is high. Sometimes nurses unknowingly use communication barriers as a way of protecting themselves from uncomfortable feelings. Examples of these include changing the subject inappropriately, offering false reassurances and using clichés (Arnold & Boggs 2011; Stein-Parbury 2014). A list of barriers that block effective communication is provided in Clinical Interest Box 8.8.

### Changing the subject inappropriately

People sometimes change the subject when they are uncomfortable with, or unwilling to discuss, a specific topic. For example, an individual may say to a nurse, 'I feel so weak, I don't think I am going to be around for much longer.' If the

## CLINICAL INTEREST BOX 8.7 Communicating with family and friends after a loved one has died

- Be aware that people who are grieving will tend to work through five stages: denial, anger, bargaining, depression and acceptance. Each person moves through theses stages at a different rate or sometimes remains in one stage. Provide support regardless of the response.
- Listen and reflect feelings
- Avoid using platitudes or clichés (e.g. 'It will be OK', 'It was for the best')
- Don't give advice (e.g. 'Calm down', 'Don't think about it')
- Give honest and complete answers to questions
- Avoid ambiguous phrases such as 'He has gone to a better place'
- Express empathy (e.g. 'I am so sorry for the loss of your mum', 'It must be such a shock for you')
- Offer practical assistance and accommodate their needs as much as possible (e.g. 'Is there anyone you would like me to call?', 'Would you like me to stay with you?')
- Ensure that your non-verbal signals indicate that you have time to listen and support the grieving person
- Don't change the subject if the grieving person wishes to talk about their loved one.

*(Arnold & Boggs 2011; Dosser & Kennedy 2013; Scott 2013)*

## CLINICAL INTEREST BOX 8.8 Barriers to effective communication

- Stereotyping, labelling or pre-judging the speaker
- Talking, not listening
- Becoming distracted or daydreaming
- Asking leading questions
- Asking 'Why?' questions
- Asking too many probing (perceived as prying) questions
- Listening only to content; not hearing feelings
- Not attending to non-verbal cues
- Overuse of closed questions
- Finishing the other person's sentences
- Offering false reassurance or using clichés
- Criticising and judging
- Preaching or moralising
- Interrupting
- Advice giving
- Jumping to conclusions
- Incongruent body language
- Being defensive
- Changing the subject inappropriately

*(O'Toole 2012; Stein-Parbury 2014; Renske van Bruinessen et al 2013)*

nurse feels unable to deal with the feelings the individual has raised, they may abruptly switch the conversation to a more comfortable area by saying, 'You shouldn't dwell on that. Let's get you washed—where are your things for the shower?' The individual gets the message, accurate or not, that the nurse is not sensitive to their concerns. The nurse misses the opportunity to be helpful because the individual is denied the opportunity to discuss their feelings, and therapeutic communication between the two is blocked.

### False reassurance

A nurse may try to alleviate emotional discomfort with an individual's concerns, or an inability to cope with what an individual is expressing, by giving false reassurance. Such responses are often automatic, trite, and in the form of clichés or platitudes, such as, 'You'll be right' or 'Don't worry, it'll work out'. These do nothing to allay anxiety. In fact, the individual may become more anxious, wondering if the nurse is trying to hide something about their condition. As with inappropriate changes of topic, responses that offer false reassurance can make individuals feel that their anxieties are being dismissed and do not matter, and that as a person they are of no importance to the nurse. Because platitudes and clichés are often automatic, the nurse may need to rescue the situation if one has been uttered without thinking. For example, after saying, 'Don't worry, you'll be right' the nurse might rescue the situation by saying, 'Still that's easy for me to say, isn't it? You sound as though you are really worried that things are not going well'.

It is, of course, appropriate to provide comforting reassurance when it is needed, but reassurance should always be based on honesty, and the individual's feelings should be explored and clarified. It would, for example, be appropriately reassuring to say, 'Don't worry, it is usual to be weak after the operation you have had, and it is usual to get stronger within a few days'. Nurses need to listen for the feelings being expressed by individuals, and respond appropriately to those feelings and anxieties, no matter how disturbing they may be. It is only by doing so that nurses can communicate caring and offer the comfort that individuals need. It is one of the challenges of nursing to develop a range of skills to respond therapeutically to the many intimate and intense emotions expressed by individuals. Many nurses choose to undertake courses specifically designed to develop self-awareness and extend basic counselling skills (Stein-Parbury 2014).

### Being defensive

A defensive response is most often the result of a nurse feeling judged negatively or unfairly when an individual complains, or feeling the need to defend other members of the healthcare team who are being criticised. For example, when an individual says something like, 'I've been waiting ages for someone to redress this leg ulcer, this is the third time I've asked for it to be done', it might be tempting to retaliate and say, 'Well, it's not my fault, we're short-staffed and we've been run off our feet today.' Retaliation such as this is a defensive and

antagonistic response and likely to annoy the individual further. It brings the focus on to the feelings of the nurse rather than those of the individual. By being defensive rather than demonstrating an understanding of the individual's point of view, the nurse becomes an adversary rather than a therapeutic helper. It is more helpful to reflect the individual's feelings with a reply such as, 'Yes, I'm sorry, it's upsetting to have been waiting so long.'

Being defensive when criticised implies that the individual does not have the right to show feelings or state an opinion. When individuals complain, the nurse can defuse negativity and anger by listening uncritically to what the individual has to say. It is often appropriate for the nurse to explore whether or not there are deeper concerns underlying the cause of an individual's complaint. In a therapeutic relationship the nurse might choose to facilitate the individual expressing deeper feelings or concerns by tentatively saying something such as, 'You sound as if you feel you are not getting the care you need.'

In certain situations individuals may not be in control of their angry feelings. (Chapter 39 focuses on mental health and incorporates strategies that can help the nurse to cope with and help individuals who are aggressive or demonstrate other unacceptable ways of communicating.)

### Offering advice or giving an opinion

When an individual asks a nurse for advice such as, 'What would you do?' it is appropriate and therapeutic to share information about available options and provide an opportunity to discuss them. When advice or a personal opinion is offered, the focus moves onto the nurse. This may mean that the individual is swayed to do what the nurse considers best and may not consider all the options effectively in relation to themself and their own life situation. What may be the right decision for one person may not be the right or best decision for another. It is empowering and therefore therapeutic for individuals to have control of decisions and make their own informed choices. Providing information about options and educating individuals are important components of a nurse's role, but providing advice is different and can cause problems. For example, giving advice or a personal view about treatment options may lead to an individual accepting that advice as expert advice and later blaming the nurse for a real or perceived negative outcome.

Using the communication skills of active listening, asking questions, clarifying, paraphrasing and reflecting and avoiding the communication pitfalls are important in all interactions with individuals and others.

## CULTURALLY SAFE COMMUNICATION

Individuals who do not speak the same language as the nurse or who come from a different cultural background also have special requirements, and it may be necessary to communicate through an interpreter (Department of Health and Human Services 2014). Culture influences how each individual perceives and responds to the world, and performs and interacts with others. Although there are many definitions of **culture**, it may be defined as 'a complex social concept that encompasses the entirety of socially transmitted communication styles, family customs, political systems, and ethnic identity held by a particular group of people' (Arnold & Boggs 2011). Nurses must have an understanding of the importance of culture as it relates to communication and be aware of their own beliefs and how this might affect the care given to people from a different culture. It is especially important that nurses are aware of any stereotypes they have about different ethic or cultural groups. This may severely impact the level of care provided. For example, if a nurse believes that a woman complaining of pain is exaggerating because 'this is how people from that country behave' then proper assessment and intervention will not occur. Culturally sensitive nursing skills and knowledge will be necessary to provide competent care to the rapidly changing multicultural population (Stein-Parbury 2014).

To value cultural and ethnic diversity involves the appreciation of variations in culture as well as negotiating skills for effective communication. Communication with individuals from diverse backgrounds is especially complex because of the influence of culture on language and communication. When communicating with individuals, the nurse should be aware of cultural beliefs and behaviours and communicate (both verbally and non-verbally) in a way that meets the individual's cultural needs. Strategies include not assuming English proficiency, taking time, speaking clearly and slowly (avoiding the use of jargon and colloquialisms), observing non-verbal cues and checking for understanding (Department of Health and Human Services 2014; O'Toole 2012). Be aware that checking for understanding involves more than asking a closed question such as 'Do you understand?'. Individuals may lie and say 'yes' because they feel ashamed or do not want the nurse to 'lose face'. See Chapter 10 for further reading on cultural diversity.

### CRITICAL THINKING EXERCISE 8.1

Mrs Jackson, 75, was admitted with anaemia for investigation. She underwent a colonoscopy and a rectal mass was found. Her surgeon has just told her that it is most likely malignant, but that they will need to wait for the biopsy results before a definitive diagnosis can be made. After he leaves she is visibly upset. How can the nurse help to communicate with Mrs Jackson at this time?

## INDIVIDUALS WITH SPECIAL REQUIREMENTS

A variety of conditions can impede the ability to communicate effectively. Individuals with these conditions have special requirements. Some of the more common of these conditions include alterations in vision, hearing and speech ability,

cognitive impairment or a total inability to communicate, generally associated with the individual who is unconscious or dying.

## Alterations to vision

Some individuals will have partial or total inability to see what is in the environment. When individuals have reduced vision it can interfere with the ability to see another person's body language, so verbal communication must be particularly clear, and touch used as effectively as possible. Individuals with vision impairment experience vision loss differently, so careful individual assessment is necessary to determine needs. The aim of care for every individual with reduced vision includes promoting a sense of security, ensuring safety and comfort, and facilitating effective therapeutic communication. Table 8.4 provides advice for facilitating effective communication with individuals who have reduced vision. Entering a new environment for the first time can be a frightening experience, and even more so when vision is reduced, so effective and clear communication explaining who and what is in the environment, especially potential dangers, is vital.

## Alterations to hearing

The individual who is experiencing hearing loss, either temporary or permanent, needs assistance to adjust to the physical and psychosocial implications. The main way to assist the individual with impaired hearing is to maintain and improve the ability to communicate. Table 8.5 provides advice for facilitating effective communication with hearing-impaired individuals. If an individual has a hearing aid it must be maintained in good working condition and used correctly.

## Alterations to speech

Imperfect articulation of speech (dysarthria) is related to neurological damage that causes alterations to the muscles (primarily of the mouth and tongue) involved in the act of forming words. People with a condition called receptive aphasia (often resulting from damage to the temporal lobe of the brain or a central lesion) are unable to understand what someone else is saying. For example, the person may hear the word fork and recognise it as a familiar word but be unable to attach the word to the object it represents. If individuals have expressive aphasia (often caused by damage to the frontal lobe of the brain) it means they are unable to clearly express what they want to say or what they are feeling. For example, the individual may say the word 'yes' when meaning 'no' or may cry instead of laugh. Often individuals have receptive and expressive aphasia together. This is very frustrating for them and the nurse has an important role in communicating in a way that promotes rehabilitation. When caring for individuals experiencing speech difficulties, the nurse usually collaborates closely with a speech therapist. Table 8.6 provides advice about communicating therapeutically with individuals experiencing speech difficulties.

A range of practical communication aids can help individuals with visual, hearing or speech impairments. Some examples are provided in Clinical Interest Box 8.9.

## Alterations to cognitive abilities

The first step in communicating with an individual who is cognitively impaired is to assess the level of impairment. This may range from a minor difficulty in remembering the meaning of words or simple phrases to a total inability to comprehend what is being said, or to express thoughts and ideas. The nurse adjusts communication techniques according to the needs of individual individuals. Depending on the level of impairment it may or may not be necessary to:

- Speak more slowly
- Make gestures more pronounced
- Remind individuals who you are each time you address them
- Use very simple one-step-at-a-time instructions; for example, when assisting individuals to get dressed or clean their teeth

### CLINICAL INTEREST BOX 8.9 Communication aids for individuals with visual, hearing or speech impairments

Communication aids to help visually impaired people:

- Magnifiers
- Talking books (novels as audiobooks, etc)
- Braille books and documents
- Guide dogs
- Enlarged-print books
- Modified telephones
- Canes.

Communication aids to help hearing-impaired people:

- Hearing aids
- Telephone, radio and television amplifying devices
- Telephone typewriter devices
- Picture boards
- Television caption devices
- Shake awake clocks.

Communication aids to help people with impaired speech:

- Call bells and alarms
- Sign language
- Pen and paper or magic slate
- Electronic voice devices
- Communication board with commonly used words, letters or pictures that indicate needs (e.g. a drink, toilet)
- Use of eye blinks for simple responses (e.g. one blink indicating yes, two blinks indicating no)
- Artificial voice box (vibrating device helpful for individuals who have had a laryngectomy).

*(Arnold & Boggs 2011; Department of Health 2012)*

**TABLE 8.4 | Facilitating effective communication with visually impaired individuals**

| Action | Rationale |
|---|---|
| Address the individual by name as you approach | Alerts the individual to your presence |
| Introduce yourself each time you enter the individual's room or area | Reduces stress when individual knows who is there |
| Tell the individual when you are leaving the room or area. If the individual enters an area where you are, alert them to your presence | It is courteous to let the individual know when you are leaving the room or when they have entered the presence of someone unseen |
| Orientate the individual to others who are in the area | Facilitates communication with others, reduces sense of isolation |
| Orientate individual to what items and sounds are in the area | Reduces stress from the unknown |
| Leave things where they are | Reduces risk of injury from trips or spills, increases individual's sense of security |
| Use a normal tone of voice | There is sometimes a tendency to speak loudly to visually impaired people, but it is of no help and can be irritating |
| Address the individual by name when addressing questions or remarks to them. In a group situation, each person should address each other by name as they speak to one another | Alerts the individual to who is being spoken to |
| Give step-by-step explanations of procedures as they are performed | Reduces fear of what is happening and prepares individual for the physical feelings associated with the procedure |
| Ensure the call bell is always within reach | Increases safety and sense of security |
| Do not assume a visually impaired person needs assistance—ask before initiating help | Many visually impaired people have adapted to their condition and function independently. They may resent an assumption that help is needed when it is not |
| If the individual needs assistance moving around an area:<br>• Stand just in front of the individual with your elbow bent at a 90° angle<br>• Have the individual grasp your elbow and follow<br>• Alert individual to potential dangers such as stairs, changes in levels and other barriers<br>• Guide the individual's hand to handrails or other useful aids that might facilitate them moving around more independently | This method of assisting visually impaired individuals is safe because the nurse is looking towards the front. It is respectful because the individual actively follows rather than being pulled by the arm or hand, which might feel degrading<br>Maintains safety; for example, prevents accidental falls<br>Independence promotes a sense of wellbeing |
| To assist the individual to sit in a chair, place one of their hands on the back or arm of the chair and give them time to locate the seat area | Assists the individual to sit down with minimal assistance. Demonstrating understanding of how to communicate information enhances therapeutic relationship |
| Explain the location of food and beverages on the table. The clock face technique can help describe food on the plate; for example, the potato is at nine o'clock | Communicating this information clearly aids independence and enhances mealtime pleasure. Communicating the practical information establishes a trusting relationship that prepares the way for communication of other deeper and more personal issues |

**TABLE 8.5 | Facilitating effective communication with hearing-impaired individuals**

| Action | Rationale |
|---|---|
| Reduce or eliminate background noises | Minimises competing sounds |
| Ensure adequate lighting | The individual can see facial expressions and body language clearly to receive non-verbal messages |
| Approach from the front or the side, not from behind | Approaching from behind can startle the individual |
| If necessary gain the individual's attention by gently waving your hand in their line of vision or lightly tapping their shoulder | Communication is not possible until the individual is actively concentrating on the communicator |
| Face and look directly at the individual when speaking. Allow a clear view of your face by placing yourself near a light source | Clear vision is essential to read facial expressions and body language. Shadows and glares affect the individual's ability to see your face clearly |
| Ensure spectacles, if they are worn, are clean | Individuals who can lip-read need a clear view of the communicator's lips |
| Check hearing aids are in place and working effectively | Individuals do not always wear hearing aids all the time |
| Speak towards the individual's ear that has the greater hearing capacity | This uses remaining hearing ability to advantage |
| Speak clearly and at normal or only slightly higher volume than normal. Speak at normal rate unless the individual indicates that speaking slowly is a help: do not shout or over-exaggerate speech | Louder sounds mean a higher pitch of voice is used. A higher pitch means that vowels are accentuated and consonants become concealed. Therefore a loud voice or shouting does not help. If a louder voice is used, a lower tone and pitch must be used |
| Rephrase if words are not understood | Rephrasing the statement with different words may make lip-reading easier |
| Keep your hands away from your mouth and avoid chewing or smoking while speaking | Covering the mouth reduces the ability to lip-read |
| Clearly state the topic of conversation | Individual can focus on the topic—knowing words likely to be included in the conversation may facilitate easier recognition of words associated with the topic |
| Do not turn or walk away from the individual while still talking | Reduces individual's ability to decipher messages from facial expressions or to lip-read |
| Consciously use gestures and body movements to help clarify meanings | A large proportion of communication occurs via facial expressions and body language |
| If there continues to be difficulty, use written communication or other communication aids | Resorting to other methods of communication is less frustrating for the individual than not receiving messages at all or receiving them inaccurately |

- Ask only very simple closed questions
- Give very clear and basic explanations.

When people cannot comprehend what is being said or cannot find the words to express their own thoughts, it can be very frustrating and embarrassing for them and also challenging for the nurse. It can sometimes take patience and effort to include cognitively impaired individuals in conversations, and nurses should be wary of excluding them, for example, by speaking to each other over or across the individual. Excluding individuals who are cognitively impaired from conversations reinforces feelings of low self-worth; conversely, including them promotes feelings that they are valued and worthwhile. Disorders that cause dementia, such as Alzheimer's disease, are among the most common causes of cognitive impairment.

Table 8.7 provides advice to facilitate communication with individuals who are experiencing some of the more severe symptoms of a dementing illness. These include

**TABLE 8.6 | Communicating therapeutically with individuals experiencing speech difficulties**

| Action | Rationale |
|---|---|
| Face directly and make eye contact. Listen attentively, allow time for responses. Do not take over and complete sentences for the individual | The aim is to help individuals re-learn how to speak—they need to work hard at this and they need to practise. They may give up if nurses deter efforts by pre-empting what they are about to say |
| Use short phrases and simple, closed questions | This encourages progress |
| Let the individual know that you do not understand: never pretend that you do | Honesty demonstrates respect for the individual. The individual can sense when not understood and feels patronised and upset if the nurse is not honest about it |
| Be consistent, use the same words and gestures each time you give an instruction or ask a question | Consistency promotes success in communicating effectively and this encourages further practice |
| Clearly match up items with words | Aids rehabilitation |
| Use a communication picture board only as a back-up resource | The aim is to encourage the individual to practise verbal expression |
| Take care not to exclude individuals from conversations | It takes patience to communicate with and encourage speech-impaired individuals, it may be easier to exclude them but it is not therapeutic and it does not promote rehabilitation |
| Ensure only one person is speaking at a time | The individual will have difficulty focusing on more than one speaker and may become dejected when unable to follow and join in conversation |
| Do not shout or speak loudly | A raised voice does not help and can cause distress |

significant memory loss, decreased sense of personal identity, loss of language and communication skills, disorientation and difficulty with visual perception. Individuals with a dementing illness are most commonly in the older age group and so frequently experience the additional difficulties of reduced hearing and vision associated with the normal ageing process. This means that, in addition to using dementia-specific communication skills, the nurse must use the communication skills specifically relevant to vision and hearing impairment. In particular this means that the nurse must be aware of which individuals need to wear hearing aids or glasses, as the individuals themselves may no longer remember that they need them or how to put them on. Case Study 8.1 explores communicating with people who have dementia.

### Individuals who are unable to respond

Some individuals are unable to communicate at all; for example, those who are not conscious. It may be difficult at first to speak to a person who does not respond, with whom you have no eye contact and from whom you receive no feedback of any sort; however, it becomes easier with only a little practice. Even when individuals are unable to respond it should be assumed that they can hear when spoken to and feel when touched (Arnold & Boggs 2011).

Effective communication with individuals who have special needs involves assessing and responding to the individual needs of each individual. Planning effective measures includes adapting basic therapeutic communication techniques and adding extra communication strategies relevant to the individual's particular impairment. These strategies need to be implemented and other appropriate communication aids accessed, including other health professionals, such as speech therapists. The success of care is evaluated by how well the individual feels able to communicate needs, feelings and thoughts. Signs that the individual is withdrawn, anxious, aggressive or frustrated indicate that therapeutic communication may not be at a high level. When a nurse feels frustrated or irritable with an individual it may indicate the same thing, and that means communication techniques need to be reviewed and improved.

## COMMUNICATION WITHIN THE HEALTHCARE TEAM

There is now much evidence that communication within the healthcare team is essential to the provision of quality care and individual safety (Kleiner et al 2014; Wheeler 2014).

The Australian Commission on Safety and Quality in Health Care (ACSQHC) has placed emphasis on the clinical

## TABLE 8.7 | Facilitating communication with individuals with dementia

| Action | Rationale |
|---|---|
| Ensure that you can be seen and heard before addressing the individual by name. Sit, stand or kneel so you gain eye contact. Touch the individual gently to attract attention if necessary | Individual may not respond if simply called by name without the other cues |
| Minimise distractions | Damage to the brain leaves little ability to screen out extraneous noise |
| Introduce yourself each time you communicate with the individual, if necessary | The individual may not remember who you are from one encounter to the next |
| Be aware of how you present yourself | When words are not understood, facial expression, body language and appearance are what the individual responds to most. A smile rather than a frown is appealing |
| Be aware of the feelings you transmit and the atmosphere you create; for example, keep tone of voice warm and low, move about calmly | Feelings of tension, irritability or a sense of being rushed will upset and may frighten a disoriented and confused individual. A calm, relaxed approach helps the individual remain relaxed. Relaxed individuals are more likely to agree to what the nurse is asking of them. A nurse who is rushed or agitated will create the opposite effect |
| Begin your conversation socially; for example, talk about a reassuring topic such as the weather—don't rush into asking the individual to do things, and always ask, do not order | Helps to gain the individual's trust. Gaining trust before asking the individual to agree to tasks, such as having a shower, facilitates cooperation. The individual is more likely to agree when asked rather than directed to do something |
| Keep messages short, simple and specific. Give one message at a time | The individual may have only minimal understanding of words |
| Use questions that require a yes/no answer, rather than open-ended questions | A question such as, 'Is this the dress you would like to wear today?' is less complicated to understand and answer than, 'What would you like to wear today?' |
| Use statements more than questions | Asking questions that an individual cannot remember how to answer may trigger a negative response and the individual might interpret questions as 'prying' and feel resentful. Statements may be more acceptable and they tend to elicit interest; for example, 'That cat looks hungry.' |
| Back up words with gestures. Show as well as tell; for example, point to clothes that are placed ready to put on | Aids understanding |
| Pause between sentences and allow plenty of time for the information to be understood. Wait for a response | Allows time for a damaged brain to process messages |
| Repeat or rephrase the message if there is no response—several times if necessary | Some words may be recognised when others are not |
| Look and listen for other cues when speech doesn't make sense; for example, facial expressions and gestures can reveal emotions | Detecting the individual's underlying feelings provides clues as to an appropriate response |
| Respond by reflecting feelings | Reflecting feelings; for example, 'That makes you feel angry, doesn't it?' shows understanding even if you are not sure of what caused the emotion. Being understood has a positive effect on self-esteem |

**TABLE 8.7 | Facilitating communication with individuals with dementia—cont'd**

| Action | Rationale |
|---|---|
| Break tasks down into small steps | Everyday tasks are made up of a series of complicated actions stored in the memory. The individual may feel overwhelmed at not being able to remember how to manage a complete task; for example, to get undressed. But may manage independently if prompted what to do at every step; for example, undo buttons, take this arm out of the sleeve, etc. This approach enables tasks to be completed successfully and can be satisfying and pleasurable for nurse and individual |
| Use touch therapeutically, provided that the individual does not indicate a dislike of being touched | Touch is a powerful medium to impart caring and can be reassuring when words are not understood. An arm around the shoulder or a squeeze of the hand can convey more than words. A hand or foot massage can have a calming effect |

## CASE STUDY 8.1

Isabelle is an 87-year-old resident at 'Happy Days' nursing home. She has dementia and is very confused and often agitated. You and another nurse are caring for the residents this morning. Both of you are from a nursing agency and have not cared for Isabelle before. You notice her walking along the corridors with her walking frame. She is trying to open all the doors leading outside but to no avail. She stops whoever walks past her and demands that they help her. You can hear her yelling, 'They've got me prisoner. Please help me get out. I have to get to my children'. The other nurse rushes up to Isabelle and with her face close to hers yells in a loud voice, 'Stop being silly. You are not being kept prisoner!. You are annoying everyone. Get back to your room'. Upon hearing this Isabelle lets out a scream and starts moaning and crying and tells the nurse to leave her alone and becomes more agitated and distressed. Witness to all of this is Isabelle's daughter who has just arrived to visit her mother. She approaches the nurse and looks very angry. She yells, 'You stupid nurse! How dare you speak to mother like that!' The daughter turns to you and says, 'I've had enough of this. You're all incompetent and don't care about anyone!'

1. What are some communication strategies that should be used when communicating with people who have dementia?
2. What could you have said to Isabelle when you initially saw her becoming increasingly distressed as she was trying to leave?
3. What non-verbal strategies would you have used?
4. What resources could you have used to assist you in communicating with Isabelle?
5. What strategies would you use to resolve the situation of conflict with Isabelle's daughter?

handover as the lynch pin to improving inter health team member communication. As such they have produced the 'OSSIE guide to clinical handover' (ACSQHC 2012) as a framework to assist clinicians improve health team communication. OSSIE is a mnemonic which equates to a framework for change management. Each letter in the mnemonic stands for a change phase:

- **O**rganisational leadership
- **S**imple solution development
- **S**takeholder engagement
- **I**mplementation
- **E**valuation and maintenance.

The framework was developed to improve clinical handovers in healthcare. The OSSIE guide states: 'Current handover processes are unreliable and highly variable. Standardisation of handover content and process will improve the safety of handover by ensuring consistency in critical information exchanges.' It defines clinical handover as 'the transfer of professional responsibility and accountability for some or all aspects of care for a patient, or group of patients, to another person or professional group on a temporary or permanent basis'.

The basis of the framework comes from the SBAR communication model. The SBAR acronym stands for **S**ituation **B**ackground **A**ssessment **R**ecommendation.

SBAR is an organised and systematic process to ensure effective communication when relating an individual's condition to other members of the healthcare team.

The OSSIE guide to clinical handover expands further on this technique and has developed the **ISOBAR**:

- **I**dentification
- **S**ituation
- **O**bservations
- **B**ackground
- **A**ssessment and action
- **R**esponsibility.

## CRITICAL THINKING EXERCISE 8.2

Using the SBAR communication tool detailed in Table 8.8, how would you hand over the details of the following situation? What recommendations would you make?

Mr Jones, 48, had a right total knee replacement 2 days ago. About 1 hour ago he started complaining of chest pain. His pulse is 116 and his blood pressure is 126/58. He is restless and short of breath. You have just started oxygen at 4 L/min via the nasal prongs.

See Clinical Interest Box 8.10 for a detailed explanation of ISOBAR.

On completion of this chapter, review Nursing Care Plan 8.1. This sample demonstrates that effective communication was vital to developing appropriate nursing care.

## CLINICAL INTEREST BOX 8.10 ISOBAR

| | |
|---|---|
| I | Identification of individual<br>This step, which ensures individuals are correctly identified, should include three identifiers; for example, individual name, date of birth and medical record number. |
| S | Situation and status<br>This step includes the individual's current clinical status (e.g. stable, deteriorating, improving), advance directives and individual-centred care requirements including the prospect of discharge or transfer. |
| O | Observation<br>This step ensures the incoming team is informed of the latest observations of the individual and when they were taken. It serves as a checking mechanism to identify deteriorating individuals for emergency response assistance. Unit members need to be aware of local emergency response call criteria and process. |
| B | Background and history<br>This step provides the incoming team with a summary of background; history (the presenting problem, background problems and current issues); evaluation (physical examination findings, investigation findings and current diagnosis); as well as management to date and whether it is working. |
| A | Assessment and actions<br>This step is to ensure that all tasks and abnormal or pending results are clearly communicated. Most importantly, there must be an established and agreed management and escalation of care plan, which could include:<br>• A shared understanding of what conditions are being treated or, if the diagnosis is not known, clear communication of this fact to everyone<br>• Tasks to be completed<br>• Abnormal or pending results (must include recommendations, the agreed plan and who to call if there is a problem)<br>• A plan for communication to the senior in charge<br>• Clear accountability for actions. |
| R | Responsibility and risk management<br>Clinical handover must include the transfer of responsibility as staff are leaving the institution.<br>This can only be achieved through acceptance of tasks by the incoming team, which is best ensured by face-to-face handover. Where risks are identified for an individual, clinical risk management strategies (such as for infectious disease alerts or alerts for DVT prophylaxis) should be clearly communicated.<br>Responsibility transfer and task acceptance ideally includes accepting handover sheets or signing of handover sheets.<br>Read back of critical information is helpful, especially in situations where face-to-face handover is not possible.<br>Risks and management plans should be included in handover when required. |

## NURSING CARE PLAN 8.1

Mary was not able to explain to me the medical procedure she was having today. She told me she was very frightened and thought she might die. I explained the procedure to her again and answered her questions. She was able to explain it back to me and told me that she doesn't feel as anxious any more. She stated that she will go ahead with the procedure. She informed me that she suffers from anxiety and is very worried about how she will cope when she is discharged.
**Assessment:** Anxiety due to concerns about ability to cope upon discharge
**Issue/s to be addressed:** Medication review—at present not on anti-anxiolytics or anti-depressants
**Goal/s:** Mary verbalises reduced level of anxiety and is able to state processes which are in place to improve her ability to cope when discharged

| Care/Actions | Rationale |
|---|---|
| Spend time with Mary encouraging her to discuss her worries and concerns | If interest and concern are demonstrated Mary will be more likely to talk about her worries. Verbalising concerns decreases anxiety |
| Explain the role of allied health and the assistance that they will be able to provide | Knowledge of the support services available will provide reassurance to Mary |
| Provide empathy and develop a therapeutic relationship with Mary | Mary will be more willing to discuss her concerns if she feels accepted and trusts the caregiver |
| Collaborate with allied health | Improved health outcomes occur when all healthcare professionals collaborate and share knowledge |
| Provide information regarding the action and side effects if anti-anxiolytics or antidepressants are commenced | Increased knowledge will reduce anxiety |
| Monitor for negative side effects if anti-anxiolytics or antidepressants are commenced | Early intervention will ensure strategies can be implemented such as further education or change of medication |

**Evaluation**

Mary reported a much lower level of anxiety since admission
Mary was able to state the services and support that she will receive at home after discharge

## TABLE 8.8 | SBAR

SBAR is a communication tool that can be used by any/every discipline, and in any situation—routine or emergency.
Routine examples include:
- Ward nurse to pharmacy
- Medical to allied health referral
- Hospital to community referral

| | |
|---|---|
| **S**ituation | I am calling about … (state individual name and location) |
| | The individual's condition is … (code status) |
| | The issue/problem I am calling about is … |
| | I have just assessed the individual personally: Vital signs are: Blood pressure _____/_____, Pulse _____, Respiration _____ and Temperature _____ |
| | I am concerned about the: (state the abnormal findings, e.g.:)<br>• Blood pressure because it is over 180 or less than 90 systolic, or 30 mmHg below usual<br>• Pulse because it is over 140 or less than 40/min<br>• Respiration because it is less than 10 or over 30/min<br>• Temperature because it is less than 35.5°C or over 38°C. |
| **B**ackground | The individual's mental status is: (give examples, e.g.:)<br>• Alert and oriented to person place and time<br>• Confused and cooperative or non-cooperative<br>• Agitated or combative<br>• Lethargic but conversant and able to swallow<br>• Stuporous and not talking clearly and possibly not able to swallow<br>• Comatose, eyes closed, not responding to stimulation. |

*Continued*

**TABLE 8.8 | SBAR—cont'd**

| | |
|---|---|
| | The skin is:<br>• Warm and dry/pale/mottled/diaphoretic<br>• Extremities are cold<br>• Extremities are warm. |
| | • The individual is not or is on oxygen.<br>• The individual has been on _____ (L/min) or _____ (%) oxygen for _____ minutes (hours)<br>• The oximeter is reading _____%<br>• The oximeter does not detect a good pulse and is giving erratic readings. |
| **A**ssessment | This is what I think the problem is: (say what you think is the problem, e.g.:)<br>• The problem seems to be cardiac/infection/neurological/respiratory _____<br>• I am not sure what the problem is but the individual is deteriorating<br>• The individual seems to be unstable and may get worse—we need to do something. |
| **R**ecommendation | I suggest or request that you (say what you would like to see done, e.g.:)<br>• Transfer the individual to critical care<br>• Come to see the individual at this time<br>• Talk to the individual or family about code status<br>• Ask the on-call family practice resident to see the individual now<br>• Ask for a consultant to see the individual now. |

## Summary

Communication is a process of sharing experiences, ideas, attitudes, values and feelings. It occurs at different levels, and communication at the interpersonal level is core to the provision of effective nursing care (Berman et al 2015). Messages between people are communicated via visual, auditory, tactile and olfactory channels, but many other factors or variables come into play. The individual attitudes, values and beliefs, levels of knowledge, past experiences and current physical and emotional status are some of the many variables that influence the effectiveness of communication between people. It is now an accepted fact that communication and individual safety go hand in hand (Kleiner et al 2014; Wheeler 2014), so it is therefore essential for nurses to gain an awareness of their own level of communication competence and the skills necessary to enable effective therapeutic communication (Webb 2011).

Some of the essential skills include interpreting verbal and non-verbal messages, the use of open and closed questions, clarifying, paraphrasing and reflecting feelings to ensure communication with individuals and others in the workplace promotes high-quality, safe care (Thomas et al 2009). Additional skills are needed to communicate effectively with individuals who have special needs, such as those who are experiencing sensory and cognitive impairments. The most effective nurses, as communicators, listen to individuals and are able to explore what the illness experience really means to each individual, facilitate understanding and foster the development of a helpful and therapeutic relationship.

The nurse who has effective communication skills:

- Listens attentively to others
- Assists individuals to communicate their needs
- Clearly communicates information to individuals, their relatives and other members of the healthcare team
- Accurately relays information to personnel in other healthcare agencies
- Responds empathically to feelings experienced by individuals and their relatives
- Considers culture, both theirs and the individual's, as a barrier to effective communication (Jones 2012).

## Review Questions

1. Identify the components of the communication process.
2. List the factors that influence effective communication.
3. What are the factors that act as barriers to effective communication?
4. What communication aids can be used for individuals who have visual, hearing or speech impairments?
5. Why is communication an essential determinant in the success or failure of a nurse–individual relationship?
6. What is the benefit of open questioning?
7. Convert the following to open questions:
   Do you feel angry?
   How many siblings do you have?

Do you love your partner?
Do you agree with your parents often?
Are you sick?
Do you like being in hospital?

8. What is paralanguage and why is it important?
9. Choose which of these responses would be most appropriate. Why? Explain why the other responses act as barriers.

Scenario 1

'I'm just so fed up with being sick and in pain. I'm tired of having to rely on the nurses all the time.'

a. Just relax and let us help you
b. Come on, now. Stop being so negative.
c. Sounds like all of this is really starting to get you down.
d. Well, if you don't want my help I'll go.
e. What is bothering you the most?

Scenario 2

'I never really looked after myself. Now look how I am suffering.'

a. There are lots of people worse off than you.
b. Well, you would have looked after yourself if it mattered to you
c. Sounds like you feel upset that you neglected your health?
d. Seems like you are angry with yourself?
e. Let's get you out of bed and into the shower. That will make you feel better.

Scenario 3

'Don't bother with me. I'm going to die anyway.'

a. You sound really fed up with everything.
b. Don't talk like that. You are not going to die.
c. Tell me more about how you are feeling.
d. The doctor says you could have at least 3 more months. I think you should be more positive and try to enjoy your last days.
e. You're old now so it's natural to want to die.

Scenario 4

'The surgeon explained everything about the operation, but I didn't understand what he said. I didn't even know what to ask.'

a. Let's get your medications organised.
b. So you feel worried because you don't understand what's going on with the operation.
c. What information was confusing to you?
d. If I were you I would tell the surgeon that I want some answers.
e. Don't worry about it. You don't need to know that stuff. It's too complicated for you to understand.

Scenario 5

'I get so tired looking after David day after day. There is all the physical care, but I think the mental strain is the worst. I worry constantly about where he is and what he is doing. I'm sure he is sick of me looking over him. The worst thing is that it's constant. There is no relief.'

a. The constant worry seems to be really getting to you and it is the thing that is wearing you down the most. You feel like you just can't seem to get away from it.
b. Oh, I get tired too. That's life. You'll be OK.
c. Try to put the worry out of your mind at least once each day. Make yourself a cup of tea, sit down and just relax.
d. You sound a bit guilty. Maybe you're thinking about the times that you could have been more supportive of David.
e. It's never-ending for you and you're exhausted.

10. Write down what you might say to this person using assertive communication. Use the 'How to communicate assertively and resolve conflict' handout as a guide. In situations where there is a potential for conflict what else would you do?

a. Your friend is driving too fast and dangerously while you are a passenger in his car and you would like him to slow down.
b. Mr James had a TKR (total knee replacement) 8 days ago. He is waiting for the physiotherapist to assess him before he can be discharged from hospital. He has been pacing up and down the corridor all morning and has yelled at you twice that he's 'sick of this bloody place and hanging around here doing nothing'.
c. A patient (Jess) is very demanding of your time and keeps pressing the buzzer and asking you to do tasks that she can easily do herself. As a consequence you are falling behind with your work and are running out of time to administer medications to all of your patients.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Nursing and Midwifery Board of Australia: www.nursingmidwiferyboard.gov.au/

CHAPTER 9

# Models of nursing care, management and leadership

*Gabrielle Koutoukidis*

## KEY TERMS

autocratic (authoritarian) leader
bureaucratic leader
case management
charismatic leader
democratic (participative, consultative) leader
emotional intelligence
executive-level managers
frontline managers
individual allocation or total individual care
laissez-faire (non-directive, permissive) leader
leader
manager
mentor
preceptor
middle-level managers
models of care
primary nursing
shared leadership
task-oriented nursing
team nursing
transactional leader
transformational leader

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Compare and contrast leadership and management
- Compare and contrast different leadership styles
- Identify the characteristics of an effective leader
- Discuss the roles and functions of nurse managers
- Identify the skills required for effective nursing management
- Appreciate the nurse's role in managing and coordinating care
- Describe the role of the manager in planning for and implementing change
- Explore the role of the Enrolled Nurse in management and leadership
- Understand the relationship between leadership, management and mentoring
- Develop an understanding of the different models of clinical nursing care
- Discuss the factors that influence an individual's leadership style
- Discuss the competencies required for future nurse leaders

## CHAPTER FOCUS

Nurses in contemporary healthcare organisations are at the forefront of planning and managing care, directing the agenda of healthcare delivery in the policy setting as well as managing and delivering care in the preventative, acute, community and residential care settings (Crisp et al 2013).

As part of the disciplinary team, the nurse is often in a leadership position and frequently delegates aspects of care to others. There are opportunities within the nursing profession to become leaders at various levels and also many situations in which the nurse functions as a manager and as a change agent (Berman et al 2015).

This chapter focuses on the nurse as a leader and manager, leadership and management styles, models of nursing care and the skills and competencies of nurse managers required both today and for future workforce needs. This will assist the Enrolled Nurse to have a greater understanding of leadership and management in the work environment and their role and scope of practice within management and leadership roles, including models of care.

## LIVED EXPERIENCE

I come from a family of nurses, so it was no surprise that I followed in their footsteps and became an Enrolled Nurse. I undertook my nursing education at Caritas Christi Hospice in Kew, Melbourne, where I found it to be both a privilege and an inspiration to assist people as they prepared to depart this world. I am passionate about enrolled nursing because that's where I firmly believe I make a positive contribution to the community and the profession.

I have been a member of the Royal College of Nursing (now ACN) since 1996. When the RCNA established the inaugural Advisory Council I was appointed to represent Enrolled Nurses' interests. During my career I have been the Enrolled Nurse representative on the National Board and the President of the National Enrolled Nurse Association of Australia (NENA). As part of these roles I was asked at both a federal and a state level to give advice regarding Enrolled Nurses in terms of their education and roles in the workforce. When I first commenced my Enrolled Nurse education over 30 years ago, I would never have thought that I would have opportunities to be in national leadership roles for Enrolled Nurses.

**Maryanne Craker, Former President, NENA**

## THE NURSE AS A LEADER AND MANAGER

Often nurses are required to assume the role of leader and manager. Nurses undertake management and leadership roles through directing, delegating and coordinating nursing activities. Nurses need to be knowledgeable about how and when to delegate, as well as the legal requirements of delegation and the acceptance of this delegation. Nurses must also evaluate the quality of care provided (Huber 2014).

Carney (2009) states that nurses are often ill-prepared for their roles as clinical, administrative and academic leaders and at times take on these roles without academic preparation and with a lack of support from their organisation. It is thought that early experience of leadership and support for and in the role are important for future success in the leadership role.

A **leader** is defined as someone who influences others to work together to accomplish a specific goal. They are often visionary, informed, articulate, confident and self-aware. Leaders usually have outstanding interpersonal skills and are excellent listeners and communicators. They have initiative and the ability and the confidence to innovate, motivate and facilitate, and to mentor others. Within their organisations, nurse leaders participate in and guide teams that assess the effectiveness of care, implement evidence-based practice and construct process improvement strategies (Berman et al 2015).

Nurses assume leadership roles to:

- Improve the health status of individuals or families
- Increase the effectiveness and level of satisfaction among professional colleagues
- Improve the attitudes of the general public and legislators towards the nursing profession and their expectations of it.

(Berman et al 2015)

A **manager** is defined as someone who is given authority, power and responsibility for planning, organising, coordinating and directing the work of others and for establishing and evaluating standards. Managers control human, financial and material resources. They set goals, make decisions and solve problems and initiate and implement change (Berman et al 2015).

As managers, nurses are responsible for managing individuals' care. Some nurses assume a position within the organisation as a nurse manager, supervisor or manager of nursing services. As a manager, the nurse is responsible for:

- Efficiently accomplishing the goals of the organisation
- Efficiently using the organisation's resources
- Ensuring individuals receive effective care
- Ensuring compliance with institutional, professional, legal, regulatory and governmental standards.

(Berman et al 2015)

A comparison of the roles of managers and leaders is outlined in Table 9.1.

**TABLE 9.1 | Comparison of the roles of leaders and managers**

| Leaders | Managers |
|---|---|
| Are developers of people and passionate about helping their people to be the best they can be | Generally manage people in the interest of achieving specific performance outcomes |
| Motivate people to generate solutions for the problems they present | Spend the majority of time solving their people's problems for them and focusing on operational issues |
| Embrace and adapt to change | Provide the process for change |
| Gain commitment from their people by ensuring that they regularly take action to fulfil individual values at work | Do not differentiate between individuals and respond to everyone in the same way |
| Focus on strategic outcomes and provide vision | Focus on daily targets |
| Work from an elected base | Are appointed to the position |
| Have confidence in people | Define performance accountability |
| Provide direction | Are concerned with control |
| Are people focused | Are process/systems focused |
| Influence others towards goal setting | Carry out predetermined policies, rules and regulations |
| Are interested in taking risks and exploring new ideas | Manage resources |
| Manage relationships | Maintain an orderly, controlled, rational and equitable structure |

*(Adapted from Berman et al 2015)*

## MODELS OF NURSING CARE DELIVERY

When commencing work in an organisation, nurses should have an understanding of what the model of care delivery is within that organisation, and have an understanding that within the same organisation there could be a variety of models of nursing care in different wards/departments/sections. It is important to know this, so that each nurse is aware of each other's roles and responsibilities when working within the model.

Key goals of nursing **models of care** should be to promote an individual's independence and wellness and incorporate interventions and strategies for:

- Promoting an individual's understanding of their clinical condition, treatment plan and anticipated trajectory of their condition
- Developing an individual's skills and opportunities necessary for negotiating and following a care plan in partnership with their health professionals
- Providing resources and knowledge for monitoring and managing the signs and symptoms of the individual's conditions
- Adopting lifestyles that promote risk factor modification and focus on prevention and early intervention to promote health and wellbeing
- Increasing access to support services including social and financial support (Crisp et al 2013).

Nursing care relates to a set of activities that are performed by nurses for individuals. For example, a nurse on a ward may undertake to assist with all showers and another may do all the medications. Nursing models of care should be flexible and responsive to the needs of individuals and the healthcare system.

Models of care may include:

- Task-oriented nursing
- Team nursing
- Allocation of individual or total individual care
- Primary nursing
- Case management.

(Crisp et al 2013)

**Task-oriented nursing** is a model of care in which nurses undertake specific tasks related to nursing care across a group of individuals.

**Team nursing** occurs when experienced nurses are teamed with less-experienced nurses or casual staff to achieve nursing goals using a group approach. The team leader in each group is responsible for assigning individual care and has overall responsibility for person care by team members. All team members work together, each performing the activities for which they are best prepared.

It is reported that team work is critical in assuring the safety and quality of care of individuals within healthcare organisations (Kalisch & Lee 2010). In addition, nurses stay in jobs where team work is effective, they are more

**TABLE 9.2 | Strengths and limitations of models of care in nursing**

| Model of nursing care | Strengths | Limitations |
|---|---|---|
| Task-oriented nursing | Nurses become proficient in a designated task. Potential for efficiencies in time management | Lack of an integrated approach to care management. Individual needs subsumed in organisational demands |
| Team nursing | Accommodates a range of skill mix and scopes of practice. Allows for a collaborative approach and uses a range of expertise | Less involvement by Registered Nurses may impact adversely on an individual's outcomes. Dependent on high-level organisational, delegation and coordination skills of the Registered Nurse |
| Individual allocation or total individual care | High level of coordination of care. Access to high-level clinical skills and decision making | Increased costs associated with high numbers of Registered Nurses. Decreased capacity for skill development in more junior members of the nursing team |
| Primary nursing | Strong person-centred model of care promoting autonomous decision making. Promotes continuity of care and interdisciplinary communication | Efficacy of the model dependent on the quality of the care plan and communication within the healthcare team. Greater dependence on Registered Nurse models of care. Potential for role burden for the Registered Nurse |
| Case management | Promotes continuity of care. Optimal for individuals with chronic and complex care needs. Creates a point of contact for individuals and the healthcare team | Need for communication structures such as regular team meetings which can be time consuming. Dependent on coordinating and communication skills of case manager |

*(Adapted from Crisp et al 2013:129)*

productive, less stressed and there are fewer errors (Kalisch et al 2009).

**Individual allocation** models were developed because nurses recognised the need for **total individual care**. Rather than caring for individuals as a series of tasks, nurses get to know the whole individual. A nurse is allocated to specific individuals and undertakes all nursing care for these individuals.

**Primary nursing** allows the nurse to provide individualised direct care to a small number of individuals during their entire stay. In primary nursing, the nurse provides care, communicates with individuals, families and other healthcare providers and carries out discharge planning.

**Case management** focuses on the management of a group of individuals. The nurse who is the case manager is usually a clinical specialist, and the caseload consists of individuals with similar healthcare needs. As case manager, the nurse makes appropriate referrals to other healthcare providers and manages the quality of care provided, such quality including accuracy, timeliness and cost. The case manager is also in contact with the individuals after discharge, ensuring continuity of care and health maintenance.

Some models work better when there are sufficient numbers of highly qualified staff to deliver care; others may focus on supporting less experienced staff using a team approach (Crisp et al 2013).

The strengths and limitations of these models of care are summarised in Table 9.2.

## LEADERSHIP STYLES

It is thought that leaders develop a particular leadership style through education, training and life experiences.

An **autocratic (authoritarian) leader** makes decisions for the group, believing that individuals are externally motivated and are incapable of independent decision making. The autocratic leader determines policies, giving directions to the group, which may feel secure under this leadership style because procedures are well defined and activities are predictable; productivity may also be high. This style is effective when urgent decisions are necessary (e.g. during a cardiac arrest), when group members are unable or unwilling to participate in decision making and when a project must be completed quickly.

A **democratic (participative, consultative) leader** encourages discussion and decision making, acting as a catalyst or facilitator, actively guiding towards achievement of group goals. The participative leader focuses on providing constructive feedback, offering information, making suggestions and asking questions; productivity and satisfaction are high as group members contribute to the work effort.

The **laissez-faire (non-directive, permissive) leader** recognises the group's need for autonomy and self-regulation, assuming a 'hands-off' approach. However, group members may act independently and at cross purposes because of a lack of cooperation and coordination. This style is most effective for groups whose members have both personal and professional maturity so that, once a decision has been made, they become committed to it and have the required expertise to implement it.

The **bureaucratic leader** trusts neither self nor others to make decisions and relies instead on the organisation's rules, policies and procedures to direct work efforts.

Effective leaders are those who can adapt their leadership style to the situation. They make a conscious choice between use of directive and supportive behaviours; consider the staff members' abilities; know the nature of the task and are sensitive to the context or environment (Berman et al 2015). Clinical Interest Box 9.1 illustrates the characteristics of effective leaders. Clinical Interest Box 9.2 outlines the factors that can influence a leadership style.

### Leadership styles and emotional intelligence

Vesterinen et al (2009) believe that a leader needs emotional resources and the ability to change when creating an environment that promotes commitment to work. **Emotional intelligence** has been defined as the ability to observe one's own and others' feelings and emotions, to discriminate between them and to use this information to direct one's thinking and actions. Emotional intelligence is composed of both personal competence and social competence.

Nurse leaders who possess emotional intelligence can easily form relationships with others, read employees' feelings and responses accurately and lead successfully. Self-awareness and self-management are reflections of personal competence and influence the way the leader manages themself. Social awareness and relationship management reflect social competence which affects how the leader manages relationships with others.

## CONTEMPORARY LEADERSHIP THEORIES

Contemporary leadership theories are as follows:

A **charismatic leader** creates an emotional relationship between themself and the group members. The powerful personality of the leader evokes strong feelings of commitment to both the leader and the leader's cause and beliefs.

The **transactional leader** has a relationship with followers based on an exchange or some resource valued by the follower. These incentives are used to promote loyalty and performance. For example, the nurse manger entices a nurse to work night duty shift in exchange for a weekend off.

A **transformational leader** fosters creativity, risk taking, commitment and collaboration by empowering the group to share the organisation's vision. The leader inspires others with

### CLINICAL INTEREST BOX 9.1 Characteristics of effective leaders

Effective leaders:

- Use a leadership style appropriate to the task and the members
- Assess the effectiveness of their behaviour on others and the effects of others' behaviours on themselves
- Are sensitive to the forces acting for and against change
- Express an optimistic view about human nature
- Are energetic
- Are open and encourage openness, so that real issues are confronted
- Facilitate personal relationships
- Motivate and inspire
- Are consistent in behaviours towards group members
- Delegate tasks and responsibilities to develop members' abilities
- Involve members in all decisions
- Value and use group members' contributions
- Encourage creativity
- Encourage feedback about their leadership style
- Assess for and promote the use of current technology.

*(Berman et al 2015:574)*

### CLINICAL INTEREST BOX 9.2 Factors that influence leadership style

- Experience with previous managers/supervisors
- Values—individual's own and those of the organisation
- Communication of information—how it is disseminated
- Collaboration—both managerial and collegial support
- Employees—experience, support required
- Education.

*(Vesterinen et al 2009)*

### CRITICAL THINKING EXERCISE 9.1

A nurse leader informs staff that there has been a major road accident and that the hospital needs to prepare for major casualties. The nursing team members begin to display high levels of anxiety and disorganisation.

What would be the most appropriate leadership style for the nurse leader to assume?

### CLINICAL INTEREST BOX 9.3
### Nursing leadership

Reflect on:
- What makes a leader?
- Why do some individuals who do not have a formal leadership position appear to be leaders, while other individuals in leadership positions do not?
- Why are some managers not seen as leaders?
- Who do you respect as a leader and why?

a clear, attractive and attainable goal and enlists them to participate in attaining the goal.

**Shared leadership** recognises that a professional workforce is made up of many leaders. No one person is considered to have knowledge or ability beyond that of other members of the work group (Berman et al 2015).

Clinical Interest Box 9.3 asks you to reflect on nursing leadership.

## MANAGEMENT

A manager's responsibility encompasses planning, organising, coordinating and directing the work of others.

### Levels of management

The three levels of manager are as follows:

**Frontline managers** are responsible for managing the work of non-managerial personnel and the day-to-day activities of a specific work group or groups. This level manager communicates staff issues to upper administration and reports administration messages back to staff. Titles may include nurse unit manager or team leader.

**Middle-level managers** supervise a number of first-level managers and are responsible for the activities in the departments they supervise. They serve as liaison between frontline managers and executive-level managers. They may be called supervisors, nurse unit managers, nurse managers or service managers.

**Executive-level managers** are organisational executives who are primarily responsible for establishing goals and developing strategic plans. Nurse executives, whose titles may include manager of nursing services and manager of clinical services, are Registered Nurses who are responsible for the management and practice of nursing within the organisation (Berman et al 2015).

Clinical Interest Box 9.4 looks at the Enrolled Nurse as leader.

### Management functions

The following management functions help to achieve the goal of quality individual care.

### CLINICAL INTEREST BOX 9.4
### Enrolled Nurse as a leader

Enrolled Nurses can be team leaders in a variety of settings:
- As the leader of a team of unregulated workers in aged care settings
- In wound care. The Enrolled Nurse may have undertaken professional development in a wound care course and may be the leader of a team in wound care

At all times the Enrolled Nurse must work within their scope of practice and within the decision-making framework.

#### Planning

Planning is an ongoing process that involves assessing a situation; establishing goals and objectives based on assessment of a situation or future trends; and developing a plan of action that identifies priorities, delineates who is responsible, determines deadlines and describes how the intended outcome is to be achieved and evaluated. An example of planning is risk management: having in place a system to reduce danger to individuals and staff. The steps of risk management include anticipating and seeking sources of risk; analysing, classifying and prioritising risks; developing a plan to avoid and manage risk; gathering data that indicate success at avoiding or minimising risk; and evaluating and modifying risk reduction programs.

#### Organising

Organising is also an ongoing process. After identifying the work and evaluating human and material resources, the manager arranges the work into smaller units. Organising involves determining responsibilities, communicating expectations and establishing chain of command for authority and communication.

#### Directing

Directing is the process of setting strategic directions for others to follow in order to accomplish the organisation's mission and objectives. This executive function includes establishing a vision, setting goals and managing interfaces with other organisations.

#### Coordinating

Coordinating is the process of ensuring that plans are carried out and outcomes are evaluated. The manager measures results or actions against standards or desired outcomes and then reinforces effective actions or changes ineffective ones (Berman et al 2015).

### Principles of management

A manager has authority, accountability and responsibility.

Authority is an integral component of managing. It is determined largely by the situation and it is always associated with responsibility and accountability.

Accountability is the ability and willingness to assume responsibility for one's actions and to accept the consequences of one's behaviour.

Responsibility is an obligation to complete a task. Managers are responsible for utilisation of resources, communication to subordinates and implementation of organisational goals and objectives (Berman et al 2015).

## Skills and competencies of nurse managers

To be effective managers, nurses need to think critically, communicate well, manage resources effectively, enhance employee performance, build and manage teams, manage conflict, manage time and initiate and manage change (Berman et al 2015).

### Critical thinking

The nurse manager reasons with logic, exploring assumptions, alternatives and the consequences of actions. See Chapter 16 for further discussion of critical thinking.

### Communicating

Good communication is essential, determines the manager's success as a leader and is core to effective nursing practice. Managers use both verbal and written communication skills.

### Managing resources

Budgeting and determining variances between the actual and the budgeted expenses are crucial skills for any manager.

### Enhancing employee performance

Managers are responsible for ensuring that employees develop through appropriate learning opportunities, whether by providing in-service education, facilitating attendance at professional workshops and conferences, or encouraging achievement of advanced education such as diplomas or higher degrees.

Managers can provide day-to-day coaching and act as a **mentor** or **preceptor**. Mentors give their time, energy and material support to teach, guide, assist, counsel and inspire a new graduate nurse.

Mentoring involves a voluntary, mutually beneficial professional relationship. In this relationship, one person is an experienced and knowledgeable leader (mentor) who supports the transition of a less-experienced person (mentee) to a new organisation culture and expectations of role (Bally 2007). Mentoring responsibilities include teaching, counselling, confirmation, accepting, friendship, protection, coaching and sponsorship (Bally 2007).

Mentor programs are thought to stimulate professional growth, career development, staff morale and quality within nursing workplaces, all areas that are thought to assist in recruitment and retention of nurses in the workforce. For mentorship to be effective, positive nursing leadership is required (Bally 2007).

In the clinical area, the term 'preceptor' is used to describe relationships in which the experienced nurse assists the new nurse in improving clinical nursing skills and judgment (Berman et al 2015). Clinical Interest Box 9.5 outlines the models of clinical supervision and support for enrolled nursing students.

### CLINICAL INTEREST BOX 9.5 Models of clinical supervision and support for enrolled nursing students

The type of clinical supervision and support a student Enrolled Nurse may experience may include the following:

- Clinical facilitator
- May be supplied by the education provider or by the host organisation. The clinical facilitator will provide regular checks on how the student is progressing, group debriefing sessions and one-on-one time for skill assessments.
- Mentor
- Will provide a relationship that facilitates a student's personal growth and development. The student needs to be able to communicate their learning needs to help attain goals. The mentor may provide information to the clinical facilitator about the student's performance to assist with completing the student's overall performance on placement.
- Preceptor
- Preceptors work the same shifts as the student. They plan orientation, negotiate learning experiences, monitor students' progress and provide feedback and assessment on performance.

*(Government of Victoria, Department of Health 2010)*

### Building and managing teams

Familiarity with the group processes facilitates the manager's ability to lead the group and enhances development of the group into a work team. A range of factors contribute to developing an effective team and many of these factors are dependent on the aptitudes and capabilities of clinical leaders (Berman et al 2015). Clinical Interest Box 9.6 outlines some of the characteristics of effective teams and leaders and Clinical Interest Box 9.7 lists the factors that can impact on positive practice environment.

In addition, having an understanding of the different attributes of each generation may also assist the manager to delegate and communicate more effectively within a team. Clinical Interest Box 9.8 describes the attributes of the different generations of nurses that could be working together on a team.

### Managing conflict

There are many methods that a manager can use to manage conflict. Compromise, negotiation and collaboration are

## CLINICAL INTEREST BOX 9.6 Some of the characteristics of effective teams and leaders

- Negotiating goals and intended outcomes of nursing interventions
- Leading by inspiring, enabling and motivating rather than dominating
- Communicating strategies and processes for sharing information effectively
- Clarifying roles, responsibilities and accountability of team members
- Collaborating and seeking external opinion and expertise
- Reflecting regularly on team progress and how this relates to the team goals
- Taking the time to celebrate successes and support each other when things are not going well.

*(Crisp et al 2013)*

## CLINICAL INTEREST BOX 9.7 Factors that can create a positive practice environment

- Leadership and support at all levels along the health spectrum
- Effective formal and informal communication processes that are transparent
- Participation in decision making regarding an individual's and organisational decision making in respect of clinical care delivery models
- Promoting a safe work environment that provides adequate education and opportunity for personal and professional development and recognition of achievements
- Implementation and monitoring of equitable and manageable workloads.

*(Crisp et al 2013)*

commonly used. Basic principles for all types of conflict management include demonstrating respect for all parties, avoiding blame, allowing full discussion, using ground rules during meetings to promote fairness, encouraging active listening, identifying the themes in the discussion and exploring alternative solutions (Berman et al 2015).

### Managing time

Strategies that the manager and all nurses can use in order to use time well involve setting goals and priorities, delegating appropriately, examining how time is used, minimising paperwork and using regular schedules that avoid interruptions and set time limits on activities.

## CLINICAL INTEREST BOX 9.8 The generation gap and management

In nursing there may be up to three generations of nurses working together in a particular clinical area. Each generation has its own set of expectations, values, goals and motivators. The different generations are as follows:

- Baby boomers (born 1945–1964). They are often ambitious, loyal and optimistic. They are highly committed to their employer, are regarded as workaholics and are reluctant to change jobs
- Generation X (born 1965–78). They try to balance career, family and leisure activities. They tend to be sceptical, competitive, autonomous, image conscious and in need of regular feedback about their performance. They value fun and humour in the workplace
- Generation Y (born 1978–2000). They are highly aware of their rights and work entitlements. They expect their employers to be flexible and to accommodate individual needs. They are conversant with technology, altruistic, ambitious and independent.

**Implications**

Understanding the differences between each generation can assist the manager to delegate and communicate more effectively.

*(Berman et al 2015:579)*

## CRITICAL THINKING EXERCISE 9.2

You have just received the morning shift handover report on the individuals you will be caring for. You have been assigned the following individuals:

- Stephanie, a 75-year-old woman who is day 2 following a total hip replacement. She has a patient-controlled analgesia infusion
- Bill, a 69-year-old man admitted to hospital for a fractured femur who has new onset shortness of breath and is becoming agitated
- Bec, a 44-year-old woman admitted to hospital with a stress spinal fracture due to metastases. She has a morphine infusion and she has just reported a score of 8/10 for pain.

In what order do you attend to these individuals? Justify your response.

Managers need to consider work–life balance for themselves and staff. Work–life balance requires providing employees with flexible work arrangements to enable them to both participate in the workforce and fulfil their family and lifestyle commitments (Berman et al 2015).

### Cultural needs

There is an increasing recognition that nursing practice and research needs to take into account cultural competence,

## CLINICAL INTEREST BOX 9.9
## Culture, leadership and management in nursing

Indigenous Australians comprise 3% of Australia's population (ABS 2010). Managers must understand and demonstrate sensitivity to cultural issues and promote supports available to their Indigenous staff, such as the Congress of Aboriginal and Torres Strait Islander Nurses (CATSIN).

Managers from Indigenous backgrounds face many challenges adjusting to a leadership role in the nursing profession.

*(Berman et al 2015)*

cultural safety and culturally congruent approaches to ensure that appropriate healthcare interventions and practices are established in healthcare (Berman et al 2015).

Clinical Interest Box 9.9 describes culture, leadership and management in nursing.

### Managing change

Change can involve gaining new knowledge or skills or adapting what is currently known in the light of new information. Change is an integral aspect of nursing and nurses are often change agents; they initiate, motivate and implement change (Berman et al 2015).

## CLINICAL INTEREST BOX 9.10
## Factors for the nurse to consider when delegating to non-nursing staff

- The delegation of care and supervision is lawful
- The individual has been assessed prior to delegation of care
- The individual is medically stable
- The task is considered routine for this individual
- The task does not require a substantial amount of scientific knowledge or technical skill
- The task is considered safe for this individual
- The task has a predictable outcome
- The delegation complies with the employing organisation's procedures and policies about delegation
- The nurse fully understands the scope of practice and the knowledge, skills and job description for each healthcare discipline represented on the team
- The nurse is aware of the diversity in work abilities
- Expectations about performance and reporting are clear
- There is an atmosphere that fosters communication, by encouraging staff to ask questions, listening carefully to their concerns and making use of every opportunity to teach.

*(Berman et al 2015)*

## THE NURSE AS A DELEGATOR

Delegation is the transference of responsibility and authority for an activity to a competent individual. The delegate assumes responsibility for the actual performance of the task and procedure. The delegator retains accountability for the decision to delegate and for monitoring outcomes. The National Framework for the Development of Decision-making Tools for Nursing and Midwifery Practice (2007) was developed to assist nurses and midwives in making decisions about delegation and supervision (NMBA 2013).

Delegation is a tool that allows the delegator to devote more time to strategic initiatives that cannot be delegated. It also enhances the skills and abilities of the delegate, which builds self-esteem, promotes morale and enhances team work and attainment of the organisation's goals. In nursing, delegation refers to indirect care—the intended outcome is achieved through the work of someone supervised by the nurse—and involves defining the task, determining who can perform the task, describing the expectation, seeking agreement, monitoring performance and providing feedback to the delegate regarding performance.

A nurse who delegates a task to another healthcare worker is accountable for selecting an appropriately skilled caregiver and for continued evaluation of the individual's care. The nurse should understand the role and function of the healthcare worker to ensure the tasks being delegated do not exceed the limits of their education, competence, experience and legal authority (Berman et al 2015).

Registered Nurses are accountable for making decisions about who is the most appropriate person to perform an activity that is part of the nursing plan of care. Enrolled Nurses are accountable for making decisions about their own practice and about what is within their own capacity and scope of practice (NMBA 2013). Principles regarding the nurse's decision to delegate ensure the safety and quality of outcomes. Once the decision has been made to delegate, the nurse must communicate clearly to the staff member and verify that the staff member understands:

- The specific tasks to be done for each individual
- When each task is to be completed
- The expected outcomes for each task
- Who is available to serve as a resource if needed
- When and in what format a report on the task is expected (Berman et al 2015).

Clinical Interest Box 9.10 outlines factors to be considered by the nurse when delegating work to non-nursing staff.

*Competency Standards for the Advanced Enrolled Nurse* (ANF 2006) have been developed and describe the role of the advanced Enrolled Nurse as:

- Having post-enrolment training, education and qualifications

- Having a breadth or depth of clinical experience and knowledge
- Undertaking a greater scope of delegated responsibility which may include clinical and management responsibilities
- Being able to practise competently with indirect Registered Nurse supervision
- A role model and resource to others in their area of practice
- An active member of the nursing profession.

The advanced Enrolled Nurse with appropriate additional education and experience may be able to undertake a broader range of responsibilities including overseeing the practice of student Enrolled Nurses and unregulated health workers. These Enrolled Nurses may also assist in evaluating individuals'/residents' needs, develop care plans and provide care for groups, as well as teach individuals, family members and/or carers how to perform simple healthcare procedures. It should be noted that this role exists only in some states and territories in Australia. While Registered Nurse supervision is a legal requirement for Enrolled Nurses in most states and territories, the nature of supervision may vary according to the context of care, level of education and experience of the individual Enrolled Nurses (ANF 2006). See Decision-making Framework Exercise 9.1.

Clinical Interest Box 9.11 outlines how an advanced skill Enrolled Nurse can contribute to the education of others.

## PREPARING NURSE LEADERS FOR THE FUTURE

Huston (2008) states that contemporary nursing and healthcare leaders should identify skill sets that will be needed by nurse leaders in the future and begin now to create the educational models and management development programs necessary to ensure these skills are present. Essential nurse leader competencies for the future are thought to be:

- A global perspective or mindset regarding healthcare and professional nursing issues
- Technology skills
- Evidence-based expert decision-making skills
- The ability to create organisational cultures that provide quality healthcare and individual/worker safety

### CRITICAL THINKING EXERCISE 9.3

Beth, a newly registered Enrolled Nurse, is caring for an individual who has just reported central chest pain and is diaphoretic. Beth takes a full set of vital signs, performs a 12-lead echocardiogram and administers glyceryl trinitrate. Beth believes the individual is suffering from a myocardial infarction and informs the medical officer. The medical officer asks Beth to administer a bolus dose of thrombolytic therapy. This is outside her scope of practice as she has not completed the administration of intravenous medication course. Beth informs the medical officer of this and he becomes irate and argumentative.

1. What should Beth do?
2. Who should she contact to seek support and clarification?
3. How should she communicate with the medical officer?

### CLINICAL INTEREST BOX 9.11 How an advanced skill Enrolled Nurse can contribute to the education of others

An advanced skill Enrolled Nurse is expected to contribute to the education of others. This can be demonstrated through:

- orientating new staff to local practices
- being a preceptor or mentor of new graduate Enrolled Nurses, student Enrolled Nurses and Assistants in Nursing
- assisting with the development of educational material for a ward.

*(Government of Western Australia, Department of Health, Nursing and Midwifery Office 2012)*

### DECISION-MAKING FRAMEWORK EXERCISE 9.1

You have just been employed at a healthcare service as an Enrolled Nurse. The ward you have been assigned to uses individual allocation as the model of nursing care. On this shift there are two (2) Registered Nurses, three (3) Enrolled Nurses and two (2) Assistants in Nursing. A Registered Nurse asks you to look after two (2) individuals who are 3 hours postoperative requiring IV medications, an individual requiring an insertion of an indwelling catheter and another individual requiring a blood transfusion. You have completed the intravenous unit as part of your Diploma of Nursing course, but the healthcare service has a policy stating that Enrolled Nurses are unable to administer IV medications. In addition, you have never looked after an individual with a blood transfusion and have only inserted an IDC in the nursing laboratory during your course.

Using the decision-making framework:

1. Do you accept these individuals as part of allocation?
2. What strategies could you use in this situation?
3. Considering the staff on this shift, is the model of nursing care appropriate?
4. If the model of care is not appropriate, what model would you suggest would work?

- Understanding and appropriately intervening in political processes
- Highly developed collaborative and team building skills
- The ability to balance authenticity and performance expectations
- Being able to envisage and proactively adapt to a healthcare system characterised by rapid change and chaos.
  (Huston 2008)

## Leadership skills for nursing students

A strategy for preparing nurse leaders and managers is to ensure leadership training is included in undergraduate nursing education, for both Registered and Enrolled Nurse. Students can commence developing clinical leadership skills by using critical thinking strategies (see Chapter 16) for making effective clinical decisions through clinical assessment, appraisal of the evidence and assessment of individual needs, learning from their own mistakes and those of others, actively seeking guidance and mentorship, collaborating closely with professional nurses and striving to improve their performance during each individual interaction. A nursing student can learn to use certain leadership skills such as clinical care coordination, team communication, delegation and knowledge building. In addition, seeking feedback from preceptors, facilitators and fellow students can be helpful in developing coordination and communication skills (Crisp et al 2013).

## Summary

Nurse managers have an important role in developing and leading nursing. Their role is changing and they require information and knowledge on budgeting, healthcare legislation, employment conditions and future planning (Vesterinen et al 2009). Nurse managers use a variety of leadership styles, and knowledge of these styles and the factors influencing them is important for nurse managers who provide future leadership and management education. In addition, Enrolled Nurses within their scope of practice have an ability to take on management and leadership roles.

## Review Questions

1. A nurse assigns appropriate work activities to other members of the team. What role is being illustrated?
2. What are the four (4) functions of management?
3. What are the characteristics of an effective leader?
4. How do the characteristics of leaders and managers differ?
5. What factors should be considered by the nurse when delegating work to non-nursing team members?
6. Where do managers add most value to the performance of your organisation?
7. What are the benefits of team nursing as a model of care?
8. Why is it important to have a mentoring culture in nursing?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

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UNIT
3

# Health beliefs, cultural diversity and safety

CHAPTER 10
Cultural competence and safety

CHAPTER 11
Australian Indigenous health

CHAPTER 10

# Cultural competence and safety

*Denise Wilson and Lesley Seaton*

## KEY TERMS

communication
contested knowledges
cultural competence
cultural diversity
cultural relativism
cultural responsiveness
cultural safety
culture
dehumanisation
discrimination
Indigenous
marginalisation
prejudice
racism
stereotypes
trivialisation
world view (values, beliefs, attitudes)

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define key terms
- Critically reflect on the place of culture in their own personal, community and professional life
- Analyse and appraise the literature related to culture
- Explain structures, practices and relations within a range of nursing and health care professional settings
- Examine the impact of the culture of health systems on individuals, communities and workers
- Develop the capacity to provide a culturally appropriate environment for users of health services
- Critically analyse their own models of intervention within the context of cultural difference

## CHAPTER FOCUS

This chapter assists students to increase their awareness of, and ability to critique the construct of, culture within themselves as individuals, their profession and the communities in which they work. They are encouraged to explore their own culturally embedded values, beliefs and practices and will be expected to develop an understanding of how culture impacts on the way they work and how they can work more appropriately and effectively across cultures.

## LIVED EXPERIENCE

As a student nurse belonging to the 'dominant' cultural group, I struggled to understand my own cultural location when learning about the role and importance of culture and health. I had always yearned to be Māori (the Indigenous peoples of Aotearoa). They always seemed happy—singing, laughing and being together as a whānau (extended family). I liked the thought of eating hangi, the food Māori cooked in the ground and often featured in tourist promotion material.

When the lecturers asked about my own culture, I initially denied having a culture. In fact I said that my family did not have a culture as such. But I was prompted to consider what things I valued in life, what were the beliefs that I learnt growing up and that continued to influence my daily life; how we did things such as having dinner; what food we ate; and what events we celebrated, and when. I slowly came to realise that I valued individual achievement, education, money, family, caring for others and travel, and as a family we celebrated Christmas and Easter and each member's birthday. I also became aware that I believed that people controlled their own destiny and, therefore, were solely responsible as individuals for their health and wellbeing.

I realise now that I held a rather romanticised view about other people's culture, focusing only on the interesting or mysterious aspects of their culture. I realised that all I really understood about the cultures of Māori peoples was what was contained within tourist brochures. Importantly, by examining my own cultural values, beliefs and practices I have come to see how some of my beliefs, like my belief that people are responsible for their own health, could be potentially harmful to people from different cultural backgrounds. For example, I could inadvertently deny people the involvement of their family members in their healthcare experience, or blame those individuals who do not adhere to their treatment regimen.

**Maria, Enrolled Nurse**

## INTRODUCTION

Health beliefs and practices are firmly embedded in people's social and cultural lives and backgrounds, and, therefore, vary between individuals. This chapter focuses on encouraging student nurses to develop an understanding of their own culture and the importance of integrating this knowledge into their nursing practice. Culture, particularly the things that people ordinarily take for granted, varies within and between groups and influences people's health beliefs and how they go about keeping healthy.

It is unrealistic for nurses to believe that they can 'know' every person's culture, especially those aspects important to their health and wellbeing. What is important is that nurses develop an understanding of culture, including their own cultural background. This will enable them to be in a better position to respect the differences impacting on how individuals seek healthcare. Nurses are also prompted to explore how their personal beliefs and professional understandings about culture impact their ability to provide appropriate and effective healthcare for individuals. In addition, the professional cultures of nursing and other health professions, along with healthcare services, are also considered. Students are encouraged to explore their own culturally embedded values, beliefs and practices by turning their gaze from 'others' to look at themselves. This helps students to understand how culture influences the way they work, and consider how they can work more appropriately and effectively within diverse cultures.

All students come with their own personal cultural background, which will be shaped by nursing's professional culture and that of the healthcare system. Understanding what goes into developing nurses' personal and professional identity and how this impacts on their work practice is crucial for working effectively with culturally diverse groups. Learning about your own culture is an interesting activity, albeit challenging, particularly for those belonging to the dominant or largest cultural groups in Australia. It is a common human way of behaving to think that your own way of doing or seeing things is the most obvious, the most right and the most logical.

For most people culture is a challenging concept. Many people see and use the word culture frequently. They use phrases like 'go to the theatre for a "bit of culture"'; individuals may work with other cultural groups; may criticise the culture of their workplace; or hear or read in the media about the so-called self-oriented and materialistic culture of Generation Y. Most commonly, the first thing many people think of when they hear the word culture is to think of somebody different to them, someone who looks physically different, usually racially different, maybe even exotic, but certainly someone who is 'other' (not us).

## VALUES, BELIEFS AND ATTITUDES

Underpinning culture are the values, beliefs and attitudes that are important for understanding individuals' and group's cultures. Prior to discussing what culture is, we will begin by explaining what these are. Values are commonly used to denote worth or goodness of various aspects of life. They are those things in life that are important to individuals and the groups they belong to. They vary from person to person and group to group, and become standards people use to judge their own and other people's actions. Value and belief systems are embedded in people's culture and the meaning that individuals ascribe to these. Values inform how individuals think things ought to be or how people ought to behave, especially in terms of qualities such as honesty, integrity and openness. Beliefs, on the other hand, are individuals' views about themselves and other people, based on the expectations they have about how things should be or are in the world. People's beliefs stem from their own cultural and life experiences and reflect their values.

Attitudes are evident in the manner or disposition individuals display or articulate about people, events or situations and are linked to their values and beliefs. Attitudes are usually established ways of responding to situations, commonly referred to as behaviours. These have been learned from others and through various experiences. They are usually based on the beliefs, values and assumptions individuals hold, whether they are substantiated or not.

Beliefs, values and attitudes are linked. Individuals' beliefs and values influence their attitudes and behaviours. These are moderated by a person's emotional intelligence so their attitude is positive and their behaviour adjusted in particular situations (Taylor & Guerin 2010).

## WHAT IS CULTURE?

When talking about culture, nurses need to be clear about the differences between race, ethnicity and culture because these terms are invariably used interchangeably by many people. Clinical Interest Box 10.1 outlines the differences between race, ethnicity and culture. Race and ethnicity are generally used to classify large numbers of people into groups. These terms are limited, however, because they tell little about what health beliefs and values individuals may have, for instance, or how they carry out their daily life. In Australia, many people are categorised under these broad categories. For example, many immigrants are classified as 'Asian' implying that these people are all the 'same'. This approach ignores the fact that 'Asia' is a large continent made up of many countries, which are made up of people belonging to different ethnicities. In actual fact, many different cultural groups exist within a country.

How is culture defined? While there are many definitions for culture, generally culture:

- Consists of ideas, meanings, values, attitudes and beliefs shared within a group
- Is evident in the behaviours, relationships and other symbolic forms that reflect a person's or group's values and beliefs
- Is learned
- Is dynamic and constantly changing.

It is also widely held that generally there are no valid standards by which cultural principles and practices can be judged.

It is important to recognise that while some cultural groups share similar values, beliefs and characteristics they are not all homogenous or the 'same'. Individuals and groups of people belonging to a cultural group can differ in their beliefs and practices. Viewing cultural groups as homogenous can erroneously lead to stereotyping individuals and making unsubstantiated assumptions that oversimplifies people and their behaviour. Thus, when referring to culture in nursing practice it is important to remember that **cultural diversity** (between people) exists between the many different cultural groups (intercultural) as well as within such groups (intracultural).

An example to illustrate this comes from the **Indigenous** peoples of Australia. There are cultural differences between Indigenous peoples and the degree to which they have been able to retain traditional cultural customs and practices through colonisation; those who live in urban and rural or remote settings and in the different areas of Australia; and the degree to which social and technological changes have influenced changes in cultural beliefs and practices. Culture will vary across and within these different groups. Indigenous peoples speak different languages and dialects, and have varying religious and healing practices, family traditions and

### CLINICAL INTEREST BOX 10.1 The differences between race, ethnicity and culture

*Race* uses broad classifications based on the shared and similar physical traits that people possess, such as skin colour, facial features, hair and body build. Some common racial classifications include people belonging to Caucasian, Micronesian, Melanesian and Polynesian groups, for example.

*Ethnicity* comprises socially determined categories based on common ancestral, social, cultural or country experiences that people feel they either belong to or identify with. People are asked to indicate their ethnicity when they complete Census questionnaires in Australia. It is important to be mindful that ethnicity does not reliably indicate a person's culture.

*Culture* refers to the values, beliefs and customs that people carry out on a daily basis. These are generally learned within families and communities, and are adapted as we encounter other social and technological experiences. Culture is invariably transmitted from one generation to the next through participation and language.

*(Wilson et al 2012)*

## NURSING CARE PLAN 10.1

**Assessment:** Mrs Erueti is a 70-year-old woman who has been admitted for a lower limb amputation on her left leg. She was accompanied by her family (son, daughter-in-law and two grandchildren). Mrs Erueti identifies as Māori and New Zealand European ethnicity, and speaks both te reo Māori (Māori language) and English. When asked about important beliefs and practices to be observed during her stay, she said she wanted to have the opportunity for karakia (prayer) with her family prior to going for her operation, have her amputated limb returned and have her extended family close. She has asked for her family to be present when all important information is shared. It is noted that Mrs Erueti needs clear and simple explanations and prefers to speak te reo Māori.

**Issue/s to be addressed:** Contact the multicultural team and alert them about Mrs Erueti's admission and the possible need for an interpreter when her family are not present.

- Liaison with the operating room/theatre regarding Mrs Erueti's:
  - > Need for karakia with her family prior to going to theatre.
  - > Request to have her amputated limb returned.
- Work with Mrs Erueti's son about a spokesperson for the family to coordinate communication with the various members and to ensure their needs are met.

**Goal/s:** Mrs Erueti will feel that her cultural needs have been responded to, and she feels culturally safe during her stay in hospital.

| Care/Actions | Rationale |
|---|---|
| Promote optimal communication by using clear and simple language, and an interpreter if needed | Optimal communication is essential for Mrs Erueti to understand information and care instructions |
| Ensure Mrs Erueti is able to have: (a) karakia prior to her surgery; (b) a process for the return of her amputated limb | Meeting Mrs Erueti's spiritual needs is an important part of her feeling spiritually and culturally safe |

**Evaluation:** Work with the multidisciplinary health team to ascertain that Mrs Erueti's needs have been met, and any areas for improvement.

community structures (McMurray & Clendon 2011). This is why throughout this chapter there is reference to Indigenous 'peoples and cultures', rather than Indigenous 'people and culture'.

Cultural diversity can also be seen within ethnic groups. Nurses can mistakenly treat all people belonging to an 'immigrant' group the same without recognising that there can be great variations in those who have recently immigrated and those who are second- or third-generation Australian-born. Similarly while Indigenous peoples from Australia have shared histories of colonisation, different tribal groups have different experiences. This means that some Indigenous peoples have retained their cultural traditions and languages, while others have become disconnected from their culture and have lost their languages. These examples highlight the importance of nurses identifying the important cultural beliefs or practices for each individual and including these in their nursing care plan (see the Nursing Care Plan 10.1 example provided and Case Study 10.1 to explore these ideas further).

Culture extends beyond ethnicity. People also belong to groups that are defined by gender, age, sexual orientation, occupation, socioeconomic status, disability, organisation and profession. Each of these groups also have distinct beliefs and customs. Furthermore, people also belong to multiple cultural groups at the same time. For example, a young student nurse may belong to her family of origin that identifies with one or more ethnic groups, while at the same time

### CASE STUDY 10.1

You have been asked to take the initial vital signs for Mr Kumar, a 56-year-old Indian man who is a recent immigrant. This is the first time he has sought healthcare since being in the country. He has come to the healthcare service with his son, Suvir, because he has been feeling unwell for the past 2 weeks. He appears to be nervous and unsure of what is happening, and you observe that he does not have a good command of spoken and written English. You note that it is Suvir, not Mr Kumar, who is completing the forms, and that he is speaking to his father in an Indian language. You realise that you will need to discuss with him whether his son will be acceptable as an interpreter or whether you need to contact one. Based on these observations, you talk to the Registered Nurse about how to proceed with Mr Kumar, particularly with regard to identifying and meeting his cultural needs. However, the Registered Nurse informs you that you should just treat him like all other individuals using the healthcare service; she says flippantly, 'When in Rome do as the Romans do.' She goes on to say, 'Besides, all you need to know is that they eat curries!'

1. What are the key issues confronting Mr Kumar and his son, and you as his nurse?
2. How should you proceed?

identifying as belonging to a youth group, as a woman, and learning the professional cultural norms of nursing.

Professional culture relates to those cultural behaviours and understandings that are developed within the contexts of the nursing profession and the workplace. Evident in healthcare services are distinct cultures, such as the medical culture, hospital culture and nursing culture. These different cultures influence what individuals learn, know and practise, which importantly dictates what constitutes appropriate behaviours in the workplace.

The dominant cultures of Australian health services are rooted in a western biomedical world view, which influences the nature of health service delivery. This world view focuses on individuals and relates to the causation and curing of disease and illness. A key belief is that causes of disease and illness can be found in people's bodies, which can then be by and large cured. Individuals seeking healthcare are often rendered passive and silent; however, Lupton (2003) points out that:

*... most patients do not have free access to biomedical knowledge, they do not necessarily come to the doctor-patient encounter as empty vessels passively awaiting the wisdom of the doctor. People's understandings of illness, disease and good health states are dynamic and sometimes incoherent, changing in response to personal experiences and circumstances such as emotional states. Most individuals develop health beliefs derived from folk-models of illness, alternative forms of medical practice, the mass media and 'common sense' understandings derived from personal experience or from consultation with friends and family and continue to subscribe to these beliefs while consuming orthodox health care. (p. 108)*

While the world view of nursing can vary between the different healthcare settings within which nurses practise, they generally draw on the values such as holism, caring and person-centred care (Dempsey et al 2009). Despite nurses having a professional culture with various values and beliefs, the reality is that most practise within the dominant culture of the health system and with other professions such as medicine, which has its own world view and culture. In this situation, nurses can be forced into conforming to the dominant culture that dictates how healthcare services will be structured and delivered. In doing so, they need to be mindful that practising in a biomedical way tends to reduce people's health to a disease process or illness that ignores their cultural and spiritual needs (Wilson & Barton 2012). For those people belonging to minority cultural groups with different world views that influence their beliefs about health, interactions with health services and professionals can be both stressful and a source of conflict. Cultural conflict can be based in either personal or professional cultures, but if it is left unattended it can impact on nurses' abilities to care for individuals and their families in ways that meet their culturally based needs, and uphold their rights to quality healthcare (LaVeist et al 2013).

A common cause of conflict for nursing staff and individuals and their families is **communication** challenges, because communication patterns are also culturally embedded and determined. A common frustration is an individual's inability to grasp what one is trying to say, leading to others thinking 'they just don't get it'. This usually indicates that the sender's message has been poorly conveyed, and rather than blame the other person it signals the need to explore other options. For example, Australians are known for being 'upfront' and speaking their mind; this differs from Japanese people who, by comparison, are much more formal, reserved and polite in their communication approach, and Indigenous peoples who can use extensive non-verbal patterns of communication. Communication is explored more detail in Chapter 8.

**CRITICAL THINKING EXERCISE 10.1**

What communication strategies can nurses use when they are working with someone from another culture?

## Ethnocentrism

Culture can influence a person's daily life in ways they are unaware of because it is often hidden and taken for granted. It is not unusual for nurses to come across a person or situation that confronts their cultural values and beliefs, which leads them to make judgments and assumptions that are often based on their own or their professional cultural values and beliefs. This process helps us to determine how we see and make sense of the world. It is from individuals' world views and cultural positions that we perceive, interpret and make judgments about situations or the behaviours of others, which may or may not be accurate. Functioning in this way from one's own personal or professional cultural backgrounds is known as **ethnocentrism**. Bizumic et al (2009) state that:

*Ethnocentrism is an attitudinal construct that involves a strong sense of ethnic group self-centeredness and self-importance ... Intergroup expressions involve the central belief or sentiment that one's own ethnic group is more important than other ethnic groups, whereas intragroup expressions involve the central belief or sentiment that one's own ethnic group is more important than its individual members. Intergroup expressions often involve preferring ethnic ingroups over outgroups, a belief in the superiority of one's ethnic group over outgroups, the wish for ethnic purity within the ethnic ingroup, and the acceptance of exploitation of outgroups when this is in ingroup's interests ... (p. 874)*

In this way, ethnocentrism enables people to stereotype and form prejudices about those belonging to different or other cultural groups. It can also contribute to nurses inadvertently or deliberately practising in ways that are either unhelpful or prejudicial, especially when we belong to the dominant cultural group. Ethnocentrism is associated with words such as dominance, superiority, power and authority, and is closely linked to the power and authority held by the dominant group. Such stances immediately put other people belonging to minority cultural groups in positions of inferiority and can render them passive in their healthcare experience.

What a person thinks of other societies and cultures has an impact on their personal and professional self. It is worth keeping in mind that ethnocentrism was one of the key components of European colonisation of Australia, thus setting the tone for interactions with **Indigenous** inhabitants. This has also played out in various ways with the subsequent waves of immigration.

In contrast to ethnocentrism, **cultural relativism** involves attempting to understand an individual's culture from their own standards. It is underpinned by the notion that there is no universal standard to measure cultures—people view and interact with the world differently—no one way is more right or wrong than other ways. Therefore, all cultures are equally valid and must be understood in their own terms, in a respectful manner. Sometimes this can be challenging for nurses, especially when some culturally embedded behaviours appear inexplicable and difficult to comprehend, and are seen to cause distress, disease or death. Clinical Interest Boxes 10.2 and 10.3 provide examples of cultural relativism as it applies to nursing practice.

**CRITICAL THINKING EXERCISE** 10.2

What strategies could a nurse working with a family seeking to have their son circumcised take to resolve the cultural conflict that may arise from not wanting to judge this family or condone a practice unaccepted by the dominant culture?

## Prejudice, discrimination and racism on people's health and wellbeing

When individuals belonging to minority groups and their families access healthcare, some encounter health professional attitudes and actions that result in them being treated differently to others, for no apparent reason. Treating people differently compared to others affects not only their quality of care and treatment, but negatively impacts health outcomes (Johnstone & Kanitsaki 2009; Rumball-Smith & Hider 2013; Ziersch et al 2011). Nurses need to reflect on their own practice, and recognise ways they may be practising that result in differences in the quality of care for some groups of people. Practising in ways that are prejudicial, discriminatory or racist is inappropriate, unprofessional and breaches every person's right to optimal standards of healthcare (Universal Declaration of Human Rights 1948). Clinical Interest Box 10.4 highlights how failing to acknowledge the existence of racism is a false premise or, as Johnstone and Kanitsaki (2009) indicate, an 'illusion'.

**Prejudice** is a process of forming opinions, preconceptions or judgments about other people that are unfounded or unreasonable because they are not based on facts or information that dispute these. In some situations, people form prejudices without any direct or actual experience, facilitated by ethnocentrism. Such opinions are generally negative and serve to disadvantage the group of people they are directed towards. Importantly, when nurses do not attempt to understand the cultural perspectives of individuals seeking healthcare services, they risk prejudices influencing their practice.

### CLINICAL INTEREST BOX 10.2
### Cultural relativism in action

Circumcision of male children for religious and cultural reasons is a practice undertaken by some families who have immigrated to Australia. While once an accepted practice in Australia, debates in the early 1970s that were grounded in human rights, ethical issues and a lack of evidence supporting this practice being beneficial resulted in circumcision becoming unacceptable (Royal Australasian College of Physicians 2010); that is, a shift in culture occurred. Recently in New Zealand, because it is difficult to get their boys circumcised, some people belonging to the Pasifika community have been having this done at home. This has led to boys being hospitalised with infections.

*(Johnston 2015)*

### CLINICAL INTEREST BOX 10.3
### Cultural relativism in action

A continuing source of conflict for nurses is the presence of family members, in the capacity of either visitors or support persons, when an individual attends a healthcare appointment. Most healthcare service cultures tend to restrict the number of people visiting people in hospital settings or acting in the role as support person. This stance is generally enforced by nurses, many of whom support such an approach. However, for families who belong to cultural groups with collective orientations, whereby members have responsibilities and obligations to support an individual who is unwell, the imposition of such practices causes them stress and distress. Nurses can avoid an ethnocentric approach to visiting and support by understanding the cultural positions of those people with obligations to support other family members, and negotiate with the family in a way that facilitates meeting their need to be present.

### CLINICAL INTEREST BOX 10.4

*'Despite the universal right to health, people of minority racial and ethnic backgrounds experience commonplace and significant unjust inequalities in their health and health care. A key reason for this rests on what might be described as "the illusion of non-racism in health care"—an illusion that rests on the frequently articulated belief that "racism is not an issue any more".'*

*(Johnstone & Kanitsaki 2009:63)*

Prejudicial opinions are often evident in the stereotypes we hold about other people who are seen to be different.

**Stereotypes** are permanent and simplistic generalisations about groups of people that are held by a wide range of people. Stereotypes are a way to cognitively process complex information about groups of people in order to simplify our social world by categorising them. However, these categories tend to become fixed and resistant to change, even in the face of contrary evidence or logic; are unproven and negative; and become accepted fact. Stereotypes are usually more than just personal beliefs about a group; they become part of the broader set of dominant cultural beliefs about others (Thompson 2003). It is important to realise that while stereotyped beliefs may apply to some people in a group, generally they do not apply to all people belonging to that group.

### CRITICAL THINKING EXERCISE 10.3

Think about the groups of people who access health services in your area, such as those who are young or old, belonging to different ethnic or occupational groups, and ways in which they are considered. For example, some people shout and talk excessively slowly to older people based on the belief that they are either deaf or cognitively impaired in some way.

What prejudices and stereotypes do you hold about each of these groups? What evidence exists to validate the stereotypes you have identified?

**Discrimination** involves acting on our prejudices and stereotypes that classify people based on factors such as, for example, age, gender or ethnicity. Such actions deny those subject to discriminatory actions full involvement in activities or access to needed services that others in society have. Discrimination involves processes like stereotyping, marginalisation, invisibilisation, dehumanisation and trivialisation (Thompson 2003).

When one or more groups of people are excluded from aspects of society, they are pushed to the margins—this includes accessing and using healthcare services. For example, it is not unusual for the Indigenous peoples of Australia to be marginalised from health services, evident in their lower access to primary healthcare services but over-representation in avoidable hospitalisations (Australian Indigenous Health InfoNet 2012).

**Marginalisation** manifests when nurses and health professionals ignore, push aside or trivialise individuals' concerns and issues; present health-related information in a language or medium that they have difficulty in understanding; and exclude individuals from decision making related to their treatment options.

When individuals who are marginalised present to health services, it is not unusual for them to be blamed or accused of being non-compliant for their poor health status as nurses and health professionals draw on stereotypes to justify their accusations. In addition to being marginalised, people belonging to minority groups are often rendered invisible, particularly when they are seen by those belonging to dominant cultural groups as lacking power, status, reputation and influence.

Another discriminating process used is **dehumanisation**. This occurs when people are treated in detached and objective ways that lack empathy, and are impersonal and disrespectful. Dehumanisation is evident in the language that nurses and health professionals use. For example, rather than referring to a person by his or her name, they may be called 'they' or by their illness or condition (e.g. 'the appendix'); or their use of body language (such as dismissive gestures and facial expressions) that conveys that they are not valued. Such acts are disempowering and highlight the need for nurses to be sensitive to the verbal and non-verbal language they use. Associated with dehumanisation is **trivialisation**, a process whereby nurses can divert attention away from what is important for an individual or the information they are trying to share. Nurses can do this by ridiculing or devaluing what individuals have to say as lacking relevance, validity or importance. This leaves individuals feeling unsupported, isolated and disempowered; for example, when a nurse planning an elderly woman's discharge does not attend to her concern that her medication makes her feel dizzy by dismissing her concern as nothing to worry about.

**Racism** is the enacting of discriminatory practices. It is a system of power that structures and values opportunities according to people's race. It is evident in various ways in healthcare services; that is, institutional, healthcare workers and individuals accessing health services. Jones (2000) describes three levels of racism that nurses need to be aware of.

*Institutional racism* refers to the way in which the government and health service planners ensure equitable distribution of necessary determinants of health, and also plan and deliver healthcare that results in differential access to necessary determinants of health and healthcare services. Critically examining the structure and delivery of healthcare services whereby some people are under-utilising services, for example, can uncover inequities. These forms of racism can be identified in the decision-making processes, the misuse of evidence, deficit in cultural competence and consultation, and the use of dominant cultural lens against which to make judgments and decisions (Came 2014).

*Personally mediated racism* refers to the different assumptions and prejudices held by healthcare professionals, such as nurses, and the discriminatory practices that target people belonging to a particular group. Such practices may include being disrespectful or not asking questions during an assessment, which influences the quality of care that people receive.

*Internalised racism* refers to people belonging to groups whereby they have internalised negative, discriminatory and racist messages evident in society, which result in a sense of hopelessness and helplessness. In some cases, people believe the messages that are conveyed.

It is important to realise that it is not only doing something (commission) that is discriminatory or racist, but not doing something (omission) can be equally damaging. For instance, neglecting to determine an individual's cultural

### CRITICAL THINKING EXERCISE 10.4

Determinants of health are generally those things that people need to lead full and healthy lives, but sit outside the healthcare system.

What are determinants of health? Why are determinants of health important for ensuring people are well and healthy? Who in your country and local health area is less likely to have equitable access to necessary determinants of health?

### CRITICAL THINKING EXERCISE 10.5

Sometimes nurses claim they treat all individuals the same.

What advantages and disadvantages are there in adopting such an approach? What approach is needed to meet individuals' cultural needs?

needs for whatever reasons potentially compromises the quality of care that they receive. Moreover, racism has detrimental effects on individuals' health and wellbeing (Harris 2012; Pauly et al 2009). Health effects include individuals feeling stressed, having raised blood pressure, being anxious, mistrusting healthcare professionals and feeling unsatisfied and that their health needs were unmet. These things can contribute to future avoidance and under-utilisation of healthcare services. Crucially, once an individual's and their family's trust has been breached, it is difficult for healthcare professionals to re-establish it (LaVeist et al 2013). Nurses can play an important role by being aware of prejudices, discrimination and racism, and avoiding engagement in such behaviours.

## Summary

In summary, nurses should engage with each person as an individual—while learning specific aspects of people's cultures may seem alluring, it is potentially dangerous. Labelling or assigning people to boxes compromises the quality of individuals' healthcare, and can negatively impact their health outcomes. While culture involves shared values, ideas and beliefs, cultural groups invariably have subcultures within them as well as their members holding differing perspectives. For example, some of the many subcultures in the dominant cultures of Australia include different social classes, LGBTQI (Lesbian-Gay-Bisexual-Transgender-Queer-Intersex) communities, the elderly, single mothers, IV drug users, teenagers, football players—the list goes on. Furthermore, people generally belong to more than one cultural group at a time, meaning the various cultures they belong to intersect, blurring the boundaries between them. In this way, cultural groups cannot be considered as clearly defined entities. Thus, it is important for nurses to always be mindful of the diversity that exists not only between groups but within cultural groups, and that people invariably belong to more than one cultural group at any one time that can influence the expression of their culture.

# CULTURE AND WELLBEING

Our **world view** relates to how we know about, function in and relate to the 'world' that we live in. Simply it is how we see the world, and depending on where we are in the world

### CLINICAL INTEREST BOX 10.5
### The role of culture in individuals' experiences of pain

Despite pain being a universal, physiological experience, Flaskerud (2015) highlighted the role that individuals' culture has on how they respond. It helps explain why a woman from one cultural background remains silent during labour and childbirth, while another is very vocal during contractions. Flaskerud states:

*Culture affects the pain response in several ways: cultural endorsement of stoicism vs expressivity; cultural conceptualizations and descriptions of pain; cultural beliefs about managing pain; and culturally prescribed roles for patient and healthcare professionals ... Understanding the patient's cultural beliefs and practices will lead to a better assessment of pain, and incorporating the cultural beliefs and practices that are beneficial or neutral into the management plan may enhance pain control. Because culture is such an important part of a person's identity, respecting cultural norms promotes a feeling of being valued. In turn, this improves communication, which will improve pain outcomes.* (p. 76)

influences how we see it. It is linked to our ways of knowing and what constitutes knowledge about health. How individuals view and know their world strongly influences how they will make sense of it. World views influence our beliefs about health and how we understand health, wellbeing, illness, life and death and dying. In this way, people's concepts of health are constructed within the sociocultural contexts that we live in. We begin to learn about health growing up in our families of origin, which is then moderated as we interact with others (such as school teachers, nurses, doctors and friends). Health beliefs and behaviours are embedded as part of our cultural beliefs and practices, and vary among individuals accordingly. World views influence understandings about all aspects of life, including health: how we experience health and illness, what it means to be well, what we do when we get sick, who we talk to and how we understand the cause/s of our conditions. Clinical Interest Box 10.5 provides an example of how individuals' cultural beliefs and practices can influence our experience and expression of pain.

Nevertheless, world view is also tied to the concept of different knowledge systems. As well as there being different

ways of perceiving the world there are also different ways of 'knowing' about the world, which will influence understandings of all aspects of life, including health. Negotiating between different knowledge systems is central to understanding about working in a variety of cultural contexts. However, **contested knowledges** refers to an individual's way of seeing and understanding the world, that they believe constitutes the 'truth'—it is their reality.

The healthcare system in Australia is where contested knowledges are evident. As mentioned earlier, these healthcare systems operate under a Western biomedical world view—one that has come to dominate knowledge in the health arena. Consequently, knowledge is only considered valid if it is generated using objective and systematic observation and scientific processes. Knowledge is then ordered into a hierarchy that reflects the quality of evidence based on the research design used. This way of knowing is promoted by those belonging to dominant cultures, and has become a 'valid' way of knowing. As a result, other forms of knowledge and ways of generating knowledge have been disregarded and viewed as invalid.

This means that people belonging to minority cultures whose healthcare practices are embedded in holistic and eco-spiritual world views can have their cultural beliefs regarding health dismissed. Research has shown that Indigenous peoples who hold holistic and eco-spiritual world views and for whom relationships and obligations to other members are valued highly are marginalised by healthcare professionals (see, for example, Wilson & Barton 2012).

Nurses should be aware of contested knowledges and the need to respect individuals' cultural perspectives on health. In order to do this, it becomes important to develop relationships with individuals and their families in order to understand their world view and health-related understandings, as well as the influences these are likely to have on their health experience. Furthermore, also being aware of their historical, social and cultural contexts is crucial in planning care that will be relevant and achievable.

## Indigenous knowledges

Without question, the colonisation of Australia has been detrimental to the health and wellbeing of their respective Indigenous peoples (i.e. Aboriginal and Torres Strait Islander peoples). Colonisation has negatively impacted their cultural traditions and customs; people's cultural identity and connections; traditional languages; and people's social wellbeing and health status. Similar to other countries that have been colonised, Indigenous peoples of Australia have poorer social and health outcomes compared to others living in their respective countries. While their health status is explained in terms of negative stereotypes, victim blaming and deficit explanations, the evidence shows us that not only do many Indigenous peoples have inequitable access to the necessary determinants of health and to health services themselves, but they are subjected to differences in the quality of care they receive and to discriminatory practices and healthcare professionals. The reality is that Indigenous peoples do not have access to affordable and accessible healthcare services, are more likely than others to have avoidable hospital admissions and to die prematurely of avoidable or preventable health conditions.

All people have the right to quality healthcare under the United Nations Declaration of Human Rights and the Declaration on the Rights of Indigenous Peoples. Advocating for access to timely and appropriate healthcare services and the quality and nature of the care they deliver are areas in which nurses can make a difference for Indigenous peoples. Understanding local Indigenous cultural beliefs and practices (e.g. the importance of tribal lands, known as country, for Aboriginal and Torres Strait Islander peoples) is essential for nurses to improve the quality of healthcare that they deliver to Indigenous individuals and their families.

Dominant health service cultures tend to privilege an individual orientation, which is contrary to Indigenous (and some other minority groups') perspectives whereby relationships are of the utmost importance and individuals are part of the collective group. This is evident in Wilson and Barton's (2012) work, whereby Indigenous people of New Zealand, Māori, stressed the importance of their whānau (extended family) and their wairua (spiritual wellbeing) while in hospital. Indeed, this study showed that because of how individuals were treated by healthcare professionals, they were cared for by their whānau during their hospital stay who concluded it was not a conducive environment for their healing.

Western scientific knowledge has long been held up as the ultimate truth and used as the measuring stick against which to measure every other form of knowledge. However, its dominance has served to objectify, marginalise and silence other ways of knowing, thereby invalidating Indigenous knowledges while perpetuating power imbalances (Chilisa 2012; Smith 2012). However, Indigenous knowledges are legitimate in their own right and this concept needs to be recognised when working in cross-cultural contexts. For example, one of the features of Yolngu theory of knowledge, and the theory of knowledge of Indigenous peoples throughout Australia, is the notion that 'knowledge belongs to people'. It is not an abstract or universal thing. It is tied to people, places and history, and is held by right, as is land, history, ceremony and language. It is constructed by people who have lived in and observed their environment and complemented by knowledges handed down from their ancestors through prayer, song, dance and artworks, for example. It is localised and is collective, and varies between Indigenous groups. By contrast, an objectivist view tends to present knowledge as an abstraction, separated from people. These concepts of knowledge and world view are very important to understand, as they are fundamental to understanding culture.

When thinking or talking about health, people often assume that a shared meaning of the concept exists. On closer examination the term 'health' not only has more than one definition, but its meaning will differ between individuals, both within and across different cultures. This has important implications for nurses and healthcare and services. For example, the *National Strategic Framework for Aboriginal and Torres Strait Islander Health* describes:

*For Aboriginal and Torres Strait Islander peoples, health is not just the physical well-being of the individual, but encompasses social, emotional, spiritual and cultural well-being, community capacity and governance. A holistic approach that also recognises the diversity of Aboriginal and Torres Strait Islander cultures is central to improving Aboriginal and Torres Strait Islander health.*

**(NATSIHC 2013)**

This definition shows that for many Indigenous peoples, health does not focus on the individual, as is usually the case in Western societies. Rather, an individual's health is tied up with the health of the community, which is also inseparable from the health of their country.

Commonly held Indigenous beliefs propose that when factors that influence social wellbeing and harmony within groups are maintained, people are healthy. However, when social, emotional and cultural wellbeing is disrupted, ill health results. Indigenous spirituality was and still is land centred. While this broad definition of health is emphasised by Indigenous people in different ways, they believe that health cannot be disassociated from self-determination, land rights and cultural vitality; and it cannot be neatly divided into mental and physical aspects (NATSIHC 2013).

## EFFECTIVE COMMUNICATION

A nurse working in a healthcare setting needs to be able to use a wide range of communication skills within a variety of relationships. Nurses also need to acknowledge the variables that may impact on the quality of that communication. There is an imperative to deliver effective and appropriate care to the culturally diverse population in most healthcare settings to improve people's health outcomes and their health experiences. Underpinning this is a fundamental need for culturally appropriate methods of obtaining, interpreting and understanding information people share that will be used to determine the most effective and appropriate care to be provided by the nurse.

The relationship between the person (and their family members) and the nurse in any encounter plays a crucial, but often under-acknowledged, role in communication. The nature and quality of communication itself has an important influence on the dynamic between any individual and groups with whom the nurse is interacting. Control of people's interactions in healthcare services is primarily located with its staff, such as nurses. The holder of power, in this instance the nurse (who has knowledge of and access to the healthcare system) has a significant influence on communication, especially in terms of controlling interactions, accessing and sharing information and decision making about actions to be taken.

Problems in the area of cross-cultural communication have long been widely and readily acknowledged (Higgins 2009; Taylor et al 2013; Wilson & Barton 2012), yet they persist. Effective communication requires a shared understanding between a person and the nurse. Difficulties exist not only with language barriers. Many people in Australia are linguistically diverse, meaning they may not understand English well or at all. Language barriers become even more evident in healthcare settings, where there is a heavy usage of medical terminology and increasingly complex therapeutic regimens. In addition, there may be misunderstandings arising from people holding differing beliefs and practices regarding health and illness that may vary from those working in healthcare settings.

But the problems also extend to the nature of the communication between a nurse and an individual. For example, the most common way to gain information about a person and their condition or progress is to ask a series of questions. However, this is often at odds with the way people from different cultural groups might communicate and lead to potential misunderstandings between the nurse and individuals and their families. Such issues related to communication are often amplified because of heavy workloads: nurses not having or taking the time needed for giving individuals a full explanation of a diagnosis and treatment plan, and people not feeling as though they had sufficient opportunity to ask questions of the nurse.

Communication across cultures is recognised as an ongoing issue, often with individuals and healthcare staff talking past one another. Yet, the extent and ongoing impact of communication is not always recognised or addressed, which can lead to low standards of communication becoming the norm. The outcome of ineffective communication between a person and a nurse is likely to be unsatisfactory for both parties. Communication is explored in more detail in Chapter 8.

### Implications of cultural diversity for practice

People with different experiences, values and life ways are likely to have different ways of understanding the world, making judgments and understanding the meaning of statements made. They might hold different ideas about what is more or less important in a conversation. Most lay people will very likely have different ideas to the nurse about what criteria they will use to make a decision or reach a conclusion about what is being said. They will also use different factors when considering what information or evidence to use when making decisions about their health. Given that healthcare professionals will invariably explain the same information in slightly different ways, depending on their own disciplinary background, the challenges for both individuals and professionals when communicating are exacerbated.

When nurses work with individuals receiving care it is important to discover the unique perspective of that person, family and/or community. Therefore, it is important to work in a culturally responsive manner that will enable communication to be meaningful and helpful. Ideally it should take place in a mutual way, and in a 'safe' space for the person. If this is not achieved, most communication with healthcare providers is at risk of being meaningless, and may even place an individual at risk of negative outcomes or potential harm. Nurses must work with individuals, their families and

communities in ways that are inclusive of their diversity, responsive to their wishes and respectful of individuals' preferences and decision making (Taylor & Guerin 2010). When dealing with people from culturally diverse backgrounds, it is crucial to ask who provides care at home, and who is responsible for making decisions within the individual and family context. For example, for most Indigenous peoples, this means taking into consideration the kinship and family structure and what determines acceptable social behaviour (Best & Fredericks 2014).

It is vital that individuals seeking nursing services feel listened to, informed and supported; and that clear, concise and jargon-free language is used. This ensures people feel cared for, and facilitates their fully understanding the information given and received (Taylor et al 2013). Education about the whole healthcare experience is essential as the person and their family may be in an unfamiliar environment and context. They may be feeling uncertain and in doubt about their illness or disease and its physiology, progression and symptoms, along with the treatment options and their potential side effects. It is a universal human reaction to be fearful of the unknown, therefore the more information people have about their situation and the available choices (e.g. understanding their diagnosis, the treatment modalities and pain management available), the more straightforward the decision-making process should be for themselves and staff.

When working with people who have a different ethnicity, cultural background or life way to the nurse, it is crucial to acknowledge that the person's, their family's or community's viewpoint may vary from that of the nurse. It is important to focus on the individual or group you are working with to develop the trust and respect necessary to enable individuals to share the information required to provide individualised and appropriate care that is most relevant for them. It is useful to note that just as there is diversity between cultural groups, there is also diversity within them. Therefore, it is best to avoid using stereotypes or trying to memorise specific and complex cultural mores for any number of different cultural groups that a nurse may work with during their professional lifetime.

The following components of culturally responsive and effective nursing care are essential when working in any healthcare context, and specifically in the increasingly culturally diverse environment seen today:

- Respecting an individual's culture, knowledge, previous experiences and level of healthcare literacy
- Avoiding any assault on a person's identity, including not acknowledging it
- Treating all individuals with respect and dignity, notwithstanding your own personal beliefs.

Clear communication is essential when providing individual care to cultural minority groups for whom the use of English may be a key issue. Clinical Interest Box 10.6 provides an outline of the five key clinical issues that have been identified as most significant in cultural interactions.

## CLINICAL INTEREST BOX 10.6 Common cross-cultural communication issues

### 1. Language barriers

These are the main obstacles in obtaining an accurate health history and pain score, communicating reasons for delays, arranging appointments by telephone, explaining medications and their side effects, or diagnosing and communicating problems. Written instructions and medication labels also present a problem. This is not limited to those with English language difficulties—such problems are experienced by the elderly and those with neurological or perceptual problems.

### 2. Low levels of literacy (general and health) and high levels of anxiety

Anxiety and impaired health literacy means that individuals are not able to accurately articulate problems and require more time for explanations, including frequent repetition. Low literacy, poor vision, dyslexia, arthritis and general frailty exacerbate problems. This contributes to a lack of confidence in individuals with poor English, those belonging to Indigenous or ethnic minority groups, or those who are older or adolescent. People belonging to these groups are likely to delay seeking help until crisis point is reached, and often have greater difficulty coping in the community.

### 3. Lack of understanding

This is a significant issue, especially for individuals who are immigrants. They are unfamiliar with the healthcare system, hospital procedures and the role of healthcare professionals and the expectations they have of individuals accessing a health service. This leads to problems with treatment choices and modalities, waiting to be seen, making appointments and what is interpreted as non-compliance to treatment regimens.

### 4. General attitudes, gender attitudes and health beliefs

Factors such as how gender-based roles are diversely understood, family composition and its impact on decision making, expression of sexuality and lifestyle, age-based differences and differences in religious or other beliefs can lead to misunderstanding and misinterpretation. This in turn can lead to nurses or individuals seeking help failing to interact because of a fear of offending or alienating others.

### 5. Retention of information

Stress and anxiety associated with healthcare encounters affect a person's ability to remember, recall and interpret information. This is compounded if a person's English is acquired or little used. This can lead to an inability to recall instructions given, self-administration medication errors and readmission to the healthcare service.

*(Adapted from Taylor et al 2013)*

## CULTURE, THE INDIVIDUAL AND THEIR PROFESSION

Nurses should keep in mind the different cultures of the various professions that the health professional interacts with and/or belongs to. They should think about what unites professionals and what differences they may have. This will help develop understanding of their own and other professionals' cultures.

Managing cultural diversity in the workforce does not feature prominently in the preparation of professionals for the workforce (Kiely & Main 2011). Yet, Australia is one of the most culturally diverse nations today globally. One-third of Australians identify as being born outside the country, more than 200 languages are spoken and there is a high level of intercultural marriage (Australian Bureau of Statistics 2013). The nursing workforce is undeniably multicultural and the number of immigrant healthcare professionals practising in Australia will continue to rise. An ageing workforce and skills shortages in nursing has led to a continuing reliance on overseas countries to recruit nurses. Australasia is an attractive destination for immigrants, and as families settle and integrate into the community, cultural diversity is increasingly becoming a hallmark of the nursing profession as well as the people accessing healthcare services. Healthcare will become part of the new globalised world, and professionals must adapt accordingly.

### Values, beliefs and attitudes

Nurses need to bear in mind the different cultures of the various professionals and allied healthcare providers that they must interact and work with collaboratively. They should think about what unites professionals as well as what differences they might have. This will help to deepen understanding of nurses' and others' professional cultures.

When beginning in any of the healthcare disciplines, individuals are acculturated into the values, beliefs and understandings of the professional culture. These values are outlined in the relevant codes of practice, ethics and professional conduct that provide individuals with a valuable tool for reflecting on the required professional standards and how best to meet these.

Nurses should make sure they are familiar with and refer to their own codes and regulations and those of other professions they will work closely with. Some of these are listed at the end of this chapter, but they are frequently amended, revised and updated. It must be a part of maintaining professional competency to ensure continued familiarity with them (AHPRA 2013).

### Healthcare in a contemporary context

Nurses and all healthcare professionals want what is the best outcome for individuals, families and communities. Multiculturalism needs to be substantially embedded in the workplace. It is no longer a 'minority' issue, but rather a whole of population concern (Queensland Health 2010). To achieve this, nurses, similar to other health professionals, need to accept the diversity within their own professional group in order to collegially work together to improve outcomes for those people accessing healthcare services.

Increased cultural diversity in healthcare organisations will invariably lead to greater complexity in communication, decision making and workplace relations. These complexities are predominantly evident in the variability in both verbal and non-verbal communication styles, attitudes to decision making, approaches to completing tasks and decision-making processes (Kiely & Main 2011). Difficulties in all these areas can potentially lead to confusion and uncertainty for individuals seeking healthcare.

Moving into the future, the healthcare workforce will need to shift from utilising current mono-cultural organisational practices to those that recognise diversity. This requires input from across the organisation and the people seeking help with their healthcare. Policy and practices that promote strong cultural awareness must be implemented to assure social inclusiveness as well as compliance to legal and ethical responsibilities. It is imperative that nurses know how to work with and across diverse cultures given the demographic changes within our countries, and consequently the healthcare workplace (Hawthorne 2012).

### Multidisciplinary teams

The structure of healthcare teams differs considerably within organisations and across services. Some are hierarchical (or vertical) profession-specific structures, as often seen in urban hospitals. In these structures there is a line of authority descending from the person(s) in charge to the most junior team member. Primary healthcare or community healthcare teams, however, generally have a more horizontal structure, with most or all of the team members at a similar level of responsibility and authority. Leadership in horizontal structures may rotate between members, depending on circumstances and the type of service.

Despite the structures used in healthcare settings, there is always a sense of authority, generally based on the level of professional knowledge held by the various group members. However, the nature of healthcare education and preparation predisposes professionals to authoritative and sometimes autocratic positions being taken by the different team members. This can contribute to cultures that differ from an egalitarian power-sharing ideal, especially in urban tertiary hospitals.

Cultural responsiveness involves all health professionals examining hierarchy or power relationships with individuals and their families, and realising the detrimental effects these can have on health outcomes. Professionals may not be fully aware of the power and authority associated with their role, which may have an adverse cultural effect on others. Clinical Interest Box 10.7 outlines the importance of appropriate communication in a person's care.

## CLINICAL INTEREST BOX 10.7

*'Offering services in a way that is sensitive and respectful is likely to be experienced as "safe" and consequently is more acceptable and effective. It is therefore important to recognise cultural diversity and how treatments need to be culturally appropriate: sometimes the "best" treatment option may not be the most culturally appropriate, e.g. a patient refusing treatment for cancer because of spiritual beliefs. There are many cultural realities and ways of thinking which need to be respected. Openness and engagement of other cultural realities leads to the establishment of trust which results in successful negotiation.'*

*(Skellett 2012:383. © Pharmaceutical Society of Australia Ltd)*

# CULTURAL DIVERSITY AND INDIVIDUALS' EXPERIENCES OF THE SYSTEM

Some of the difficulties individuals, their families and communities experience when accessing healthcare and professional services are primarily the result of differing and often competing world views, language barriers and misunderstandings that arise as a result. Major factors that influence healthcare access and equity in a service are its appropriateness for its user group; individuals' previous experiences, both within wider society and healthcare services; and the degree of cultural responsiveness and safety evident within the service itself.

## Understanding the experiences of another person

It is useful to have an understanding of prejudice and discrimination, as such experiences can have a profound effect on how people see themselves in a social world. This also has the potential for significant impact when individuals seek healthcare from mainstream organisations that are staffed predominantly by persons from the dominant culture.

It is not hard to see how difficult it can be for some members of minority and culturally diverse groups to access mainstream services in Australia (Rumball-Smith & Hider 2013; Thackrah & Thompson 2013; Ware 2013; WHO 2008; Woodland 2011). Most practising nurses have recognised and seen that some of these biases and prejudices exist within all people and groups of people, in both the workplace and broader society. Many individuals are able to identify times when they felt uncomfortable or unsafe in some situations in work, social or service environments.

This discomfort is more likely to occur in situations where an individual is not in the same category as the group of people around them—whether this be by gender, sexuality, ethnicity, class, income or profession—which makes them different. On some of these occasions there will be nothing overt in the behaviour or environment of the group that can be identified or described, only a sense of unease felt by the 'different' individual. At other times that person may feel this discomfort more strongly and that they are, in fact, being discriminated against.

In some cases individuals can choose whether or not to disclose their being 'different'. For example, they can decide not to tell the GP (general practitioner) that they use recreational drugs (for fear of being labelled a 'drug user'); they might not tell their next-door neighbour that they are homosexual (for fear of being judged or subjected to homophobia); they might not tell their workmates that they are a devout Christian (for fear of being discriminated against for their religious beliefs); or a teenager might not disclose that they have had an abortion (for fear of being judged as promiscuous or stupid). These individuals still suffer marginalisation and **discrimination** from dominant group members (or those belonging to other minority groups), but physically they may attempt to 'blend in with the crowd' as much as possible.

Those people who look physically different from the dominant cultural group cannot hide their identity or choose not to disclose their difference. Every time they come in contact with mainstream groups they are made aware of their difference. These experiences, which may begin in childhood or when relocating to another country or social context, contribute strongly to their sense of identity and sense of self. That is, they will feel 'side-lined', may feel excluded, and often express that they feel others view them negatively or demonstrate prejudice towards them. These experiences are built upon and reinforced over time (Meucke et al 2011).

## Interactions with the healthcare system

In Australia, the healthcare system has developed from an allopathic biomedical scientific model. This model is based on an understanding of health and the body derived from a curative, evidence-based and rationalist paradigm. It is not surprising, therefore, that individuals with a different world view or from another type of cultural background face challenges when they interact with such a system. This can, in turn, have a significant impact on the way that individuals utilise the healthcare system, and understand or misunderstand their diagnosis and treatment.

There is increasing recognition in healthcare services that providing services without taking into account individuals' social, cultural and environmental contexts and influences is ineffective. Furthermore, many have argued that the biomedical approach of the healthcare industry is too focused on pathology. That is, disease is viewed as an organic condition, causes of illness or disease can be found within the body or biology and, accordingly, an ill person will respond to prescribed medical treatments. The biomedical model used in mainstream healthcare requires individuals to rely upon and trust 'expert' professionals and their knowledge (Adrian 2009; Thackrah & Thompson 2013). Using this approach, the health professional as the expert determines the individual's needs and offers advice, education and other strategies to address these needs (see Clinical Interest Box 10.8).

### CLINICAL INTEREST BOX 10.8
### Guiding healthcare principles

*'Good health care matters because people matter. Health care and nursing practice must be guided fundamentally by principles that promote, establish and protect human dignity. Protection of dignity is central to all that nurses engage in ... each person and their family have integral value ... their uniqueness and importance must be acknowledged.'*

*(Daly et al 2010:231)*

The expert model has been increasingly challenged, as it fails to recognise or respect the centrality of the individual's role in determining their own health. It also fails to address problems that relate to the cultural, social, historical or environmental contexts and subsequent influences on people's health and wellbeing. In an area as complex as healthcare, the expert model fails to recognise the multiple layers of complexity that influence an individual's or population's health and wellbeing (Thackrah & Thompson 2013).

## CULTURE IN PRACTICE

Many of the problems encountered by individuals, their families and the community with healthcare services are systemic and it is appreciated that individual nurses are limited in their capacity to influence these. However, there are some steps that individual nurses can take to improve services for people from minority or ethnically different groups.

### It's all about you/me and them/us

Attitudes of service providers, such as nurses, and the relationships that are formed between the service provider and individuals seeking healthcare can often be the most influential factor in achieving positive experiences and outcomes for individuals.

Overt discrimination has become increasingly unacceptable and is not tolerated under specific legislation in Australia. Nonetheless, individuals frequently report instances of alienation and social discomfort when using healthcare services (Muecke et al 2011; Wilson & Barton 2012). It is difficult for those who do not experience such discrimination to see it, but many individuals report such instances and nurses have a responsibility to respond to these accounts.

We all have beliefs, biases and prejudices in lesser or greater degrees. Understanding one's own point of view, bias and prejudices enables nurses to take responsibility for how stances might affect their delivery of care to individuals, their families and communities. Being aware of, and revising, our responses to the individuals we care for significantly influences and mediates improving services for individuals and groups who are marginalised within the healthcare system. Most healthcare professionals do not deliberately intend to be discriminatory, but can inadvertently discriminate when confronted with persons who have life ways significantly different to our own. Nevertheless, working with individuals who are very different from ourselves does not require an over-emphasis on the differences—such an emphasis could in fact impede the development of relationships of trust between the nurse and an individual.

### Working in authentic partnerships

An alternative approach lies in the partnership model. Working in partnership requires us to transfer the focus of professional attention away from problems, deficits and weaknesses and towards the strengths or power of the person or community. This orientates the nurse towards developing a collaborative and equal partnership with individuals, focusing on building an individual relationship. A major emphasis of the partnership model is that all individuals have strengths and capabilities and are more likely to respond to interventions that resonate with their belief systems, and build on their innate strengths, than rely on those that identify weaknesses and deficits (Kimpton 2013; Ware 2013).

An important component of the partnership model is that rather than the expertise lying with the professional or nurse, there is an increasing emphasis on the capability of individuals, their families and communities. The assumption is that with support they will discover their own way, rather than learning to adopt the approach of the nurses or learn the 'right way' defined by an expert. Individual or person-centred care involves professionals and individuals and their family working together to achieve common mutually determined goals that are based on shared decision making and responsibility, and mutual trust and respect (Spencer 2012).

Another important feature of the partnership model is to develop rather than threaten the person's self-esteem. Working in a strengths-based partnership does not deny the expertise of the nurse or professional; it merely identifies the complementary expertise of individuals and their families in terms of their own needs. Importantly, it also utilises their capacity and capability in how best to meet their requirements.

The partnership model is particularly important when working with marginalised groups, such as Indigenous peoples, who are historically mistrustful of 'experts' or authority figures (Queensland Health 2010; Thackrah & Thompson 2013). An important component of empowerment, embedded within the partnership model, occurs when the professional identifies and believes in individuals' ability to understand, learn and manage their own situation. The aim is to focus on strengths and increase individuals' capabilities and feelings of self-worth, rather than perceptions of themselves as less competent and dysfunctional, and as such increasingly ostracised within the mainstream healthcare model. The mainstream healthcare system, by its very nature, reinforces the notion that professionals diagnose, treat and cure. This creates dependence and fosters isolation of individuals. It is essential that services based on a partnership model build skills and capacity rather than create dependency.

Nurses and all health professionals should examine their own communication style and biases for their own judgments and prejudices that will impact on their ability to work in partnership. If nurses believe that individuals are unable or unwilling to take part in or manage their own lives, long-term health gains will be difficult to achieve. Healthcare professionals may have a heightened sense of their own authority that is incompatible with respecting individuals as being expert on their own lives and health.

Working in partnership requires that nurses assist individuals with a genuine intent to develop, secure and use strategies and practices that will promote or foster a sense of control and self-efficacy. Shared decision making between nurses and individuals is important and the personal qualities and attitudes of staff are pivotal to ensuring good outcomes and health gains.

### CRITICAL THINKING EXERCISE 10.6

1. How can you ensure that you are a culturally responsive nurse and communicate effectively?
2. List three (3) steps that you could take to ensure that you enhance your communication with individuals and their families who are from a different culture to your own.

## Cultural responsiveness and cultural safety and what they mean for nurses

Cultural responsiveness refers to a way of delivering healthcare that is receptive to and inclusive of individuals' needs. It requires nurses to be culturally competent, and involves responding to people within their own cultural contexts (Gill & Babacan 2012; Werkmeister-Rozas & Klein 2009). It involves nurses establishing relationships with individuals that respect and include their cultural values and beliefs. It also involves their support networks and community.

**Cultural responsiveness**, **cultural safety** and **cultural competence** are all concerned with how to create and maintain contexts for nursing care in which individuals, families and communities can access and experience healthcare provision from healthcare professionals without, in any way, having their cultural identity compromised.

The experience of working as a nurse in culturally diverse environments or with members of marginalised groups is both an interesting and a challenging experience. There are both similarities and differences, and varying degrees of commonalities within any cultural group. Those who work in such contexts, as nurses are increasingly called to do, need to recognise that their own cultural beliefs, values and behaviour will impact the care they provide as a professional.

Cultural safety is a term that has been widely used in nursing and forms a crucial part of nurses being culturally competent. It is a requirement in Australia for a nurse to demonstrate the capacity to work in a culturally competent manner for continued registration as a nurse. Cultural safety, first defined by Irihapeti Ramsden (2002) in the 1990s, has been defined by the Nursing Council of New Zealand (2011) as:

> *the effective nursing practice of a person or family from another culture, and is determined by that person or family. Culture includes, but is not restricted to, age or generation; gender; sexual orientation; occupation and socioeconomic status; ethnic origin or migrant experience; religious or spiritual belief; and disability.*
>
> *The nurse delivering the nursing service will have undertaken a process of reflection on his or her own cultural identity and will recognise the impact that his or her personal culture has on his or her professional practice. Unsafe cultural practice comprises any action which diminishes, demeans or disempowers the cultural identity and well-being of an individual.*
>
> **(Ramsden 2002:7)**

In summary cultural safety means providing an environment in which individuals feel spiritually, socially and emotionally safe, as well as being physically safe. By contrast, unsafe cultural care is any action that diminishes, demeans or disempowers the cultural identity and wellbeing of an individual or group. Culture is also defined as being more than ethnicity; it is wider in intent, embracing individuals from marginalised groups including those different from the nurse in, for example, age, religion, socioeconomic group or intellectual disability.

### DECISION-MAKING FRAMEWORK 10.1

You have been employed as an enrolled nurse in a healthcare service that serves an ethnically diverse population. Two of the goals of the service are to ensure that individuals attending the healthcare service have their cultural needs both identified and attended to, and that they understand the information they receive. The aim is to improve people's health outcomes.

Using the following decision-making framework to assist you:

- What factors do you need to ensure are part of your practice when engaging with individuals who are from a culture that is different to your own?
- What strategies might you use to manage the cultural diversity that you will encounter working as a nurse?
- What information related to individuals and communication do you need to collect and document when undertaking assessments of individuals?
- What strategies and information can you use/access to be responsive to an individual's unique needs?
- If you encounter difficulties in communicating with individuals, what alternative approach(s) can you take?

## The nursing role

A nurse's effectiveness in working with those seeking healthcare depends largely on the manner in which they interact with individuals. This does not mean that they should ignore systemic issues that place constraints on how they practise or how to improve individuals' experiences of the healthcare service. Nor can nurses ignore their professional duty of care to provide high-quality services to all people. This requires practitioners to be mindful of their personal and professional values, beliefs and experiences, and how these impact their interactions with people from cultures different to their own.

The importance of addressing ethnocentrism and ameliorating the impact of prejudices cannot be emphasised enough. There are many aspects of society and mainstream healthcare services that individuals cannot change, but the attitudes of a non-judgmental, caring and empathetic service provider can make a significant impact on the experiences of individuals, their families and communities.

## Summary

This chapter presents a number of complex and challenging topics, ranging from the place of culture in the nurse's own personal and professional life to theories of cross-cultural care, prejudice and marginalisation, as well as discussing the structures, practices and complex relationships within healthcare settings. The broad impact of a healthcare system's culture on individuals, families and communities contributes to not only the behaviour and practices of healthcare professionals but also the access to and quality of services they deliver. Nurses are asked to reflect on their own models of interaction and intervention with minority and marginalised individuals and groups, particularly how they can make changes to improve these.

This chapter aims to assist nurses to increase their awareness of and ability to critique the construct of culture within themselves, their profession and the communities in which they work. Nurses are encouraged to explore their own culturally embedded values, beliefs and practices and to develop an understanding of how culture impacts the way people work and how they can work more appropriately and effectively across cultures.

## Review Questions

1. What does culture mean?
2. How is cultural safety defined?
3. What other terms are used in health when discussing cultural safety?
4. How can ethnocentrism influence nursing practice?
5. Consider how your own nursing practice is culturally responsive. What areas would benefit from further development?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Allegories of Race and Racism Camara Jones (TEDxEmory) Online. Available: https://www.youtube.com/watch?v=GNhcY6fTyBM

Australians for Native Title and Reconciliation (ANTAR) *Racism and Health Facts*: www.antar.org.au/node/222

The Gardener's Tale by Camara Jones: https://www.youtube.com/watch?v=1QFCcChCSMU

## Codes of Ethics

Aboriginal Health Workers (2008) Code of Ethics: www.health.nt.gov.au/library/scripts/objectifyMedia.aspx?file=pdf/12/50.pdf&siteID=1&str_title=AHW%20Code%20of%20Ethics.pdf

Australian Association of Social Workers (2010) Code of Ethics: www.aasw.asn.au/document/item/740

Australian Medical Association (2004) AMA Code of Ethics: www.ama.com.au/codeofethics

Nursing and Midwifery Board of Australia (2005 & 2008) Codes of Ethics for Nurses and Midwives: www.nursingmidwiferyboard.gov.au/

Nursing Council of New Zealand (2011) Guidelines for Cultural Safety, the Treaty of Waitangi, and Maori Health in Nursing Education and Practice, Online. Available: http://www.nursingcouncil.org.nz/Publications/Standards-and-guidelines-for-nurses

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CHAPTER
11

# Australian Indigenous health

*Juanita Sherwood and Jodie Hughson*

## KEY TERMS

Aboriginal and Torres Strait Islander peoples
Closing the Gap
colonisation
country
health
human rights
Indigenous Australians
Indigenous peoples
respect
social determinants
social justice

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Understand the continuing effects of colonisation on Indigenous health and social and emotional wellbeing
- Outline the impact of particular historical, social and political processes on the health and social and emotional wellbeing of Indigenous people in Australia
- Discuss traditional and contemporary Indigenous healthcare knowledge and practices
- Discuss contemporary issues associated with Indigenous health and health service delivery

## CHAPTER FOCUS

This chapter aims to provide some valuable information for making a difference when working with Aboriginal and Torres Strait Islander peoples in and out of the health setting. Indigenous **health** in Australia is most often written about as a bad news story. This can often make the reader feel overwhelmed and unable to anticipate how they can personally make a difference. This chapter aims to deliver a story that you can engage with and that enables you to feel confident about your role in working with Aboriginal and Torres Strait Islander peoples. Working with Australia's First Peoples in achieving improved health outcomes in all dimensions requires health professionals to support the Indigenous person to determine the health partnership that they want and need. An important part of wellbeing for Aboriginal and Torres Strait Islanders is being able to express themselves through music, art and storytelling; this is reflected within this chapter by the presence of a number of works and stories from Indigenous people (see Figures 11.1 and 11.2).

Essentially, Aboriginal and Torres Strait Islander people's current health is very different from that of most Australians. This is because their circumstances historically and today have been significantly impacted by past and present government policies which specifically targeted **Indigenous Australians** in a negative and harmful manner. These policies and a universal lack of access to culturally safe and competent care have contributed to the high burden of morbidity and mortality. Most Australians have had the ability to be in control of their lives and make choices about their lives that ensured that they and their families enjoyed a life of freedom and wellness; this has not been the case for most Indigenous Australians. The reasons for this are not often explored; however, this chapter aims to enlighten you as to the many structural barriers that continue to ensure there is a significant gap and difference between the health and wellbeing of Indigenous Australians and the health and wellbeing of those who inhabit a developed nation.

It is important to know about the health issues that impact on the lives of Aboriginal and Torres Strait Islander peoples; however, this is not enough to make the difference. It is necessary to have:

- positive engagement with Indigenous people
- respect for the ways Indigenous people view health and social and emotional wellbeing
- the building of relationships to ensure effective communication is achieved between yourself and the Indigenous person
- the growing of trust between the health professional and the Indigenous person.

This is a powerful and important working-together strategy that will make a difference for yourself and Aboriginal and Torres Strait Islander peoples or other individuals.

**Figure 11.1** Artwork by the late Aboriginal artist Ningura Napurrula

*(www.sydneycatholic.org/news/latest_news/2014/201455_750.shtml © Ningura Naspurrla)*

**Figure 11.2** Artwork by renowned Indigenous Artist Morris Gibson Tjapaljarri

*(© Morris Gibson Tjapaltjarri licensed by Aboriginal Artists Agency Ltd. Image courtesy Papunya Tula Artists Pty Ltd)*

## LIVED EXPERIENCE

I came from Ngarluma country to a hospital in the big city. They told me I had heart disease and gave me lots of pills to take. I call it poison. I believe I have a curse and this is why I am sick. I don't believe in the white man's medicine so I don't take it.

**Tom**

See Figure 11.3.

The land we now call Australia is home to the oldest surviving cultural groups in the world. Before 1788, these comprised over 500 language groups living as separate nations with their own traditions. **Colonisation** saw these peoples and their culturally specific names for themselves dismissed as irrelevant (Smith 1999). These names were replaced with Western terms such as 'Aboriginal' and 'Indigenous', imposed by the colonising forces (Best 2014:8). Appreciating that English and the Western dominant communication modes are and were not those used by Aboriginal and Torres Strait Islander peoples—even down to the names given to these peoples—is a worthy point of consideration when attempting to communicate effectively with Indigenous Australians in the health setting and beyond. Many health professionals are unaware that English is not commonly used in remote Indigenous communities and that interpreters are essentially required to ensure that Australian Indigenous peoples receive a well-informed health account that can be trusted and understood.

Storytelling and yarning is an important form of communication and is used a great deal by **Aboriginal and Torres Strait Islander peoples** and **Indigenous peoples** across the world. It is a way of sharing knowledge and has been used for many thousands of years, pre-dating current English literacy. It is a less direct communication approach, and offers an informal and meaningful way of sharing knowledge about yourself in context with your family and community (Bessarab & Ng'andu 2010; Fredericks 2003; Geia et al 2013; Kovach 2009).

*When strangers visit our country, we observe with a keen interest the way they respond and react to the panoramic view stretched out before them. What are they really seeing and thinking? We reckon they may be thinking about the beautiful scenery or just simply enjoying the peace and quiet or the wide-open spaces. Together we stand gazing at the same scenery. We look beyond the pristine beauty of the bush out in all its glory. The land contains our stories, it's enriching and powerful.*

**(Rose et al 2011:vi)**

**Figure 11.3** Ngarluma Country is located in the West Pilbara region

*(Photographer Sharmila Wood, Courtesy FORM, Ngarluma Ngurra: Aboriginal Culture on the map)*

It is from appreciating their stories and experiences that we hope you will gain further knowledge of the importance of working with, and not on, Australia's Indigenous peoples.

## WORLDVIEWS

The way we view our world is important to how we think about things and reflect on information we have had shared with us. Appreciating that there are many ways of knowing the world is an essential first step in opening up effective communication lines. When we discover through our studies that there is not one right way or one truth we can become concerned. However, when we uncover that there are many ways of knowing and that these many different ways and truths are important to each person, we can start to grasp the value of recognising how worldviews can influence the way we may view and perceive health and health professionals.

## LAND AND COUNTRY

**Country** always was and remains central to Indigenous Australians' health and wellbeing. Indigenous Australians' ways of knowing about land and country are very different from the Western ways of thinking and knowing land. Country is acknowledged as the mother, the source of all resources, a profoundly spiritual essence and framework for living sustainably that requires respect and ceremony to celebrate her gifts and storylines. This way of knowing and talking about country and place is very different from the ways of understanding country and place of non-Indigenous peoples (Burgess & Morrison 2007). 'Place provides the context to relate to other Indigenous peoples and places and to enter dialogue, both nationally and globally' (Burgess & Morrison 2007:180).

*In Aboriginal English, the word 'country' is both a common noun and a proper noun. People talk about country in the same way they talk about a person: they speak to country, sing to country, visit country, worry about country, grieve for country and long for country. Country is a living entity with a yesterday, today and tomorrow, with consciousness, action and a will toward life. Because of this richness of meaning, country is home and peace; nourishment for body, mind and spirit; and heart's ease.*

**(Rose et al 2011:12)**

Living on country and looking after country requires a great deal of knowledge to ensure all aspects of the ecosystems remain in balance to ensure sustainability. The applications of knowledge and actions are sophisticated and are evidence based and so have scientific rigour, and as such these practices require time and respect in relation to the benefits they ensure and provide for all Australians. Some of these vital knowledge applications are fire stick burning and farming; fashioning breeding and harvesting environments; harvesting and growing of plants and tubers; and establishment of sanctuaries for animals (Ranzijn et al 2009:57).

Contrary to ill-informed government ideologies we have learnt through research that living on country is good for Aboriginal people's health. Burgess et al's research evidenced that self-reported involvement in caring for country provided significant positive health outcomes.

*Greater Indigenous participation in caring for country activities is associated with significantly better health ... [O]ur findings suggest that investment in caring for country may be a means to foster economic development and gains for both ecological and Indigenous peoples' health.*

**(Burgess et al 2009:567)**

## Indigenous concepts of 'country' and the importance of caring for country

For Indigenous peoples 'country' encompasses an interdependent relationship between them and their ancestral lands and seas. Country is multidimensional—it consists of people, animals, plants, Dreaming, underground, earth, soils, minerals, waters, air etc. 'People talk about country in the same way that they would talk about a person: they speak to country, sing to country, visit country, worry about country, feel sorry for country, and long for country' (Rose et al 2011:12).

'Caring for country' means participating in interrelated activities on Aboriginal lands and seas with the objective of promoting ecological, spiritual and human health. It is also a community-driven movement towards long-term social, cultural, physical and sustainable economic development in rural and remote locations, simultaneously contributing to the conservation of globally valued environmental and cultural assets.

By combining customary and contemporary knowledge, Aboriginal landowners deliver a broad suite of environmental services of national and global significance, including:

- Border protection
- Quarantine services
- Wildfire abatement/carbon sequestration
- Control of invasive weeds and feral animals
- Biodiversity conservation and fisheries management
- Sustainable commercial use of wildlife
- Cultural maintenance activities (Burgess et al 2009:567).

# DEMOGRAPHICS

The following data has been projected by the Australian Bureau of Statistics (ABS) from the 2011 Census for 30th of June 2013. The Australian Indigenous population was estimated by the ABS to be 698 583 people, being 3.1% of the total Australian population. It was projected that NSW has the largest Indigenous population of all states in 2013, being 216 612 people (Australian Indigenous HealthInfoNet 2014:v). The map in Figure 11.4 demonstrates the percentages of Aboriginal and Torres Strait Islander populations in 2011. Some of the figures are surprising to many as it is often assumed that Aboriginal and Torres Strait Islander populations are found more in the outback areas of Western Australia, South Australia and the Northern Territory than in more heavily populated states like New South Wales. Even more astounding is the fact that Sydney, a highly urban city, has the largest Australian Indigenous population in Australia.

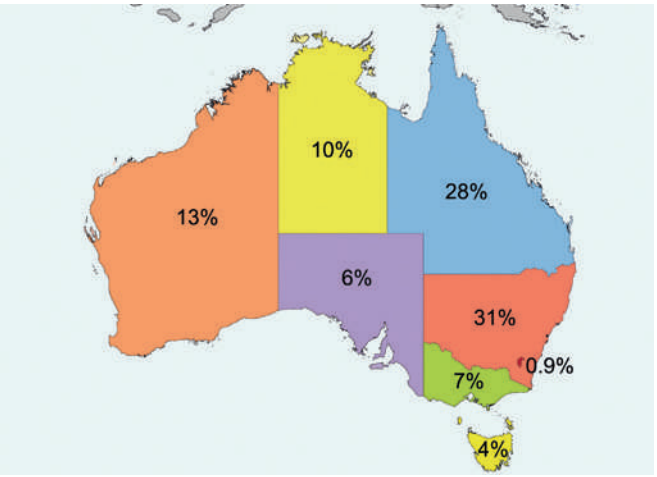


**Figure 11.4** Aboriginal and Torres Strait Islander population by state and territory 2011 (preliminary)

**CRITICAL THINKING EXERCISE 11.1**

Why do you think these figures and demographics could be different from what you thought you knew about Australia's First Nation peoples?

It was further projected for 2013 that the Northern Territory (NT) had the greatest proportion of Indigenous peoples, being some 30% of the total NT population. It was noted that in 2011 approximately 33% of Indigenous Australians lived in cities (Australian Indigenous HealthInfoNet 2014:v).

Figure 11.5 illustrates there were many nations of Aboriginal and Torres Strait Islander peoples who lived in and cared for this continent. Each nation group had and has its own legal, economic, education and health systems, as well as multiple languages. Traditions varied considerably from one nation to the next.

English was a foreign and introduced language to Australia. It has become the dominant language now used in this continent. However, there are many languages spoken in Australia that are not English. These are the First Australians' languages and those of peoples who now live in Australia and came from countries where English was not the dominant voice taught or used.

In healthcare systems we are aware of the essential requirement of ensuring health messages are heard and comprehended. We should always make sure that the individual has understood what we have explained to them. This can be very difficult if the message is in a language that is not their first language.

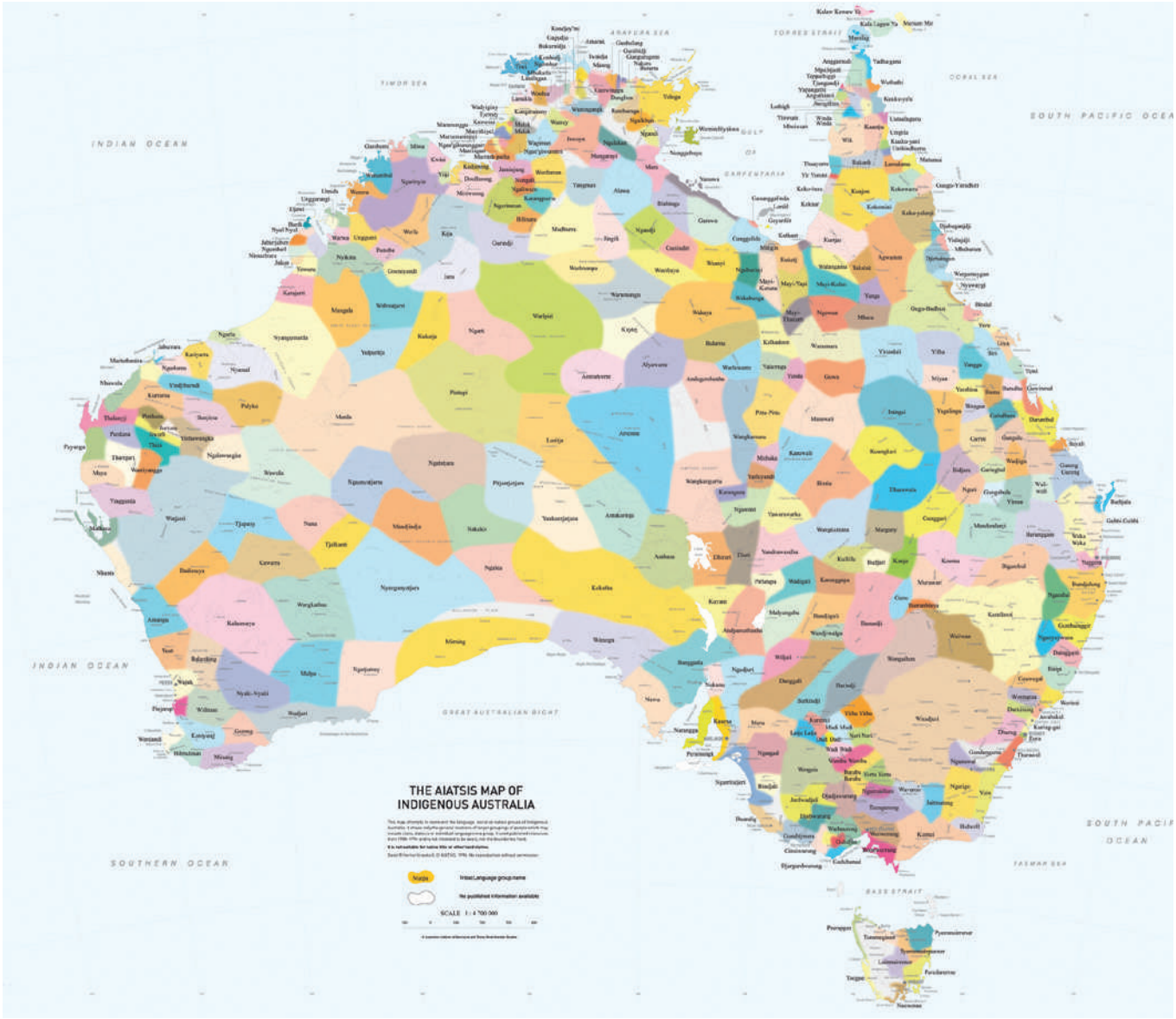


**Figure 11.5** Map of Aboriginal and Torres Strait Islander Australia: nations and language

This map attempts to represent the language, social or nation groups of Aboriginal Australia. It shows only the general locations of larger groupings of people which may include clans, dialects or individual languages in a group. It used published resources from 1988–94 and is not intended to be exact, nor the boundaries fixed. It is not suitable for native title or other land claims. David R Horton (creator), © Aboriginal Studies Press, AIATSIS, 1996. No reproduction without permission. To purchase a print version visit: www.aiatsis.ashop.com.au/

## DIVERGENT WORLDVIEWS

Unlike the cooperative, collective and holistic natures of Indigenous cultures, Western cultures are considered to be autonomous, self-assured, individualistic and competitive. This results from many centuries of Western religious, political and academic warfare (Ranzijn et al 2009:23).

Western medicine is a paradigm that is newly evolved and has developed its own language and skill sets (Foucault 1994). Western health research has built up many effective ways of dealing with disease, cancers and chronic and acute conditions. It is a way of knowing, being and doing that many

### CRITICAL THINKING EXERCISE 11.2
### Land and country reflective questions

How does Aboriginal and Torres Strait Islander peoples' view of Australia and their own countries differ from your own?

Considering the information provided on 'caring for country', do you need to reflect further on the impact that being off country will have on the wellbeing of an Indigenous person?

How can you make sure that an Aboriginal or Torres Strait Islander person has understood you?

different health professions and their respective professionals undertake to participate in health agency and improving outcomes for their individuals. These many different professions and their particular health focus can make the health story a confusing one for those not trained in its logic and language, especially the focus on separation of body parts and conditions versus the entire holistic body.

It is important to accept that this way of knowing a person may be very foreign to an individual's worldview of health. Richard Trudgen, author of *Why Warriors Lie Down and Die*, has reasoned that many health professionals are not taught that their way of viewing health may elicit a 'communication gap' between themselves and the person they are caring for who does not share the same dominant Western background (Trudgen 2000:76). This is very important as the communication gap works in dual ways.

## Communication and cultural security

The accommodation of health knowledge is designed to shift your ability and capacity to engage in health-improving activities. You may not be aware that you are speaking a foreign language to those you are caring for. This is the skill base you have spent years studying to acquire. This skill base is not shared by other non-health professionals and therefore they may have great difficulty in understanding the way you try and share this knowledge (Best 2014:64–68).

### CRITICAL THINKING EXERCISE 11.3
### Health worldview clash reflective questions

Communication is a tricky thing and there are many ways to improve your communication skills. This chapter is focused on the gaps that you may not be aware you are creating because of your expert knowledge base. Your health worldview will be very different from that of other health professionals you work with or may have worked with. You may have already had experiences where these worldviews and assumptions have clashed.

Recall how you felt in this situation and how you dealt with it. Did you walk away feeling you were heard and understood or did you come away angry, confused and lacking confidence?

These are feelings and experiences you can create for the people you are caring for by not appreciating what they may not know, or know on a different level or through another view of the world.

What can you do to ensure that you do not generate this uncomfortable and unsafe experience for Aboriginal and Torres Strait Islander persons?

Respect is a very powerful word and practice in Aboriginal and Torres Strait Islander peoples' culture. **Respect** is an overarching value and protocol that is central and fundamental to developing a meaningful and ongoing relationship. This relationship process has been laid by Aboriginal law, and this is because '[l]aw belongs to people and to country' (Bird Rose 1996:32). The law and knowledge through respect embody our ways of knowing, being and doing honourable living. Respect is an ethical/moral space and a term we share in being principled.

*Respect, in the Indigenous sense, means to listen and to hear and value what we have to say about ourselves and our experiences, even if what we have to say challenges your ways of knowing. Respect means you're open enough to acknowledge that there are many ways of being in this world, and that they all have their own authority. (Sherwood 2010:261)*

Respect is very important to Indigenous Australians and acts considered to be disrespectful can and do cause harm.

Many people do not access health services because of poor treatment and poor communication experiences. Many do try again to access services and are sent away. There have been many deaths of Indigenous Australians as a result of poor communication and culturally unsafe health service provision (Cox 2007), and people continue to die in Australia for these reasons today.

### CRITICAL THINKING EXERCISE 11.4
### Respect and health reflective questions

Being disrespectful can contribute to the worsening of health outcomes by reducing a person's trust in the system and your partnership.

What do we mean by respect? How you can show it? How are health outcomes for an Indigenous person affected if you are disrespectful?

# CULTURAL RESPECT, SECURITY AND COMPETENCE

The Australian government states that:

*High quality health care must be accessible and appropriate for the needs of Aboriginal and Torres Strait Islander people, acknowledging that those with disability may have additional barriers in accessing health care. Coordinated, culturally appropriate health services across health care, hospital care and aged care will improve the patient journey and health outcomes for Aboriginal and Torres Strait Islander people and their families.*

*A culturally respectful and non-discriminatory health system*

*'Discussion about racism is difficult and highly charged in the Australian community and action should be focused on the development of respectful relationships and non-sanctioning of discriminatory behaviour, policies and practices, including within the health system*[1]*.'*

*Goal*

*All health care, whether government, community or private, is free of racism.*

[1]The Lowitja Institute Submission: The Lowitja Institute 2012, Submission to the Australian Government for the development of a National Aboriginal and Torres Strait Islander Health Plan.

*Context*

*Racism is a key social determinant of health for Aboriginal and Torres Strait Islander people and can deter people from achieving their full capabilities by debilitating confidence and self-worth, which in turn leads to poorer health outcomes. Evidence suggests that racism experienced in the delivery of health services contributes to low levels of access to health services by Aboriginal and Torres Strait Islander people.*[2]

*There are a number of pathways from racism to ill-health—experiences of discrimination, linked with poor self-assessed health status, psychological distress, depression and anxiety, and health risk behaviours such as smoking and substance misuse.*

*Experiences of racism are compounded by the traumatic legacy of colonisation, forced removals and other past government discriminatory policies. The consequences of these events have been profound, creating historical disadvantage that has been passed from one generation to the next.*[3]

**(Australian Government 2013:14–15)**

Many Aboriginal and Torres Strait Islander people and their health professionals and social scientists have argued that **social determinants** are central to the continuing disease encountered by Indigenous Australians (Anderson 2007; Bailie & Myfawny 2001; Behrendt 2012; Saggers & Gray 2007). The Australian Institute of Health and Welfare (AIHW) has further verified this argument through its analysis of data. The AIHW is proposing that the central reason for the gap between the health and wellbeing of Indigenous Australians and those who are non-Indigenous is social determinants rather than health risk behavioural factors. Social determinants are considered responsible for 33% of the gap as opposed to 11% for health risk behaviours (Close the Gap Campaign Steering Committee 2015:37).

Most of these health determinants are out of the control of the health sector and require a holistic or a whole of model of care and management system that engages with and works very closely with Aboriginal and Torres Strait Islander people who have been selected by Aboriginal and Torres Strait Islander peoples to represent them. This is a request made regularly by Indigenous Australians and their organisations, particularly the Aboriginal Community Controlled Health sector. This is because Aboriginal and Torres Strait Islander peoples are the experts in what works for them and what does not. A fundamental barrier to improving health outcomes has been the inability of governments and services to listen to Aboriginal and Torres Strait Islander peoples and follow up with responding to their requests.

## Cultural safety

Cultural safety is a model of care developed by the Nursing Council of New Zealand. It has five principles, which are also used in Australia:

1. Reflect on your practice
2. Seek to minimise power differentials
3. Engage in discourse with the person
4. Undertake a process of decolonisation
5. Ensure that you do not diminish, demean or disempower others through your actions (Best 2014:64–68).

## Cultural competence

The journey towards cultural competence requires both motivation and willingness in order to advance cross-cultural communication and effective practice. The following definition of cultural competence is one that has credence:

*A set of congruent behaviours, attitudes and policies that come together in a system, agency or among professionals and enable that system, agency or those professionals to work effectively in cross-cultural situations.*

**(Cross et al 1989 cited in Walker et al 2014:200)**

Cultural competence is importantly not an end state but rather a continuous process. The process is a lifelong journey that requires the processing of new knowledge, the gaining of skills, the uptake of values and the actioning of attributes.

The following continuum provides a framework for understanding the steps and shifts that are required to be undertaken to improve cross-cultural communication:

- **Cultural incompetence:** lack of knowledge of the cultural implications of health behaviour
- **Cultural knowledge:** learning the elements of culture and their role in shaping and defining health behaviour
- **Cultural awareness:** recognising and understanding the cultural implications of behaviour
- **Cultural sensitivity:** the integration of cultural knowledge and awareness into individual and institutional behaviour
- **Cultural competence:** the routine application of culturally appropriate healthcare interventions and practices
- **Cultural proficiency:** the integration of cultural competence into one's repertoire for scholarship (e.g. practice, teaching, research) (Wells cited in Walker et al 2014:203).

Walker and colleagues recommend that cultural competence is about adopting a particular standpoint—a state of mindfulness, humility, sensitivity, authenticity and a willingness to really listen and learn from others (Walker et al 2014:204).

# INDIGENOUS WAYS OF VIEWING HEALTH

Indigenous peoples universally across the world view health through a holistic lens. This is because of the way they have lived for thousands and thousands of years.

*Indigenous people teach us about the values that have permitted humankinds to live on this planet for many thousands of years without desecrating it. They teach us about holistic approaches to health that seek to strengthen the social*

[2]Awofeso, N 2011, 'Racism: a major impediment to optimal Indigenous health and health care in Australia', *Australian Indigenous Health Bulletin*, vol. 11, no. 3.
[3]Australian Bureau of Statistics 2010, *National Aboriginal and Torres Strait Islander Social Survey*, ABS Cat. No. 4704.0, Canberra.

*networks of individuals and communities, while connecting them to the environment in which they live.*
**(Gro Bruntland 1999 cited in Burgess & Morrison 2007:178)**

The National Aboriginal Health Strategy's Working Party embarked on a far-reaching consultative process to bring forward the first well-informed text on Aboriginal health that became the pivotal agenda for setting guidelines for action to improve the health and wellbeing for Aboriginal and Torres Strait Islander peoples. The strategy brought forward an Aboriginal-informed description of the way Aboriginal health could be explained and viewed. See Clinical Interest Box 11.1.

This social system for living with all other matter living and non-living is known universally across Australia as the Dreaming, although each language group has its own name for this system. Jukurrpa is the language term used by nations in central Australia for Dreaming. The Dreaming was established by creator beings that encrypted the law into the land to ensure the survival of all beings including people, animals, plants and rocks, mountains, rivers, sky, waterholes, etc. This law requires everything to be cared for, to sustain the balance for survival of all.

Swan and Raphael brought forward, in their seminal *Report: Ways Forward*, a number of principles for working with Aboriginal and Torres Strait Islander people with mental health issues. Swan and Raphael are both consummate and experienced mental health professionals who undertook a national consultative project regarding Aboriginal and Torres Strait Islander mental health. The findings of this national process demonstrated that health professionals and specifically mental health workers required a further explanation of the way Aboriginal health was viewed, as they were not effectively working with Aboriginal and Torres Strait Islander peoples and their social and emotional wellbeing health issues. The following first principle of the report delivers a succinct definition of cause and effect:

*Aboriginal concept of health is holistic, encompassing mental health and physical, cultural, and spiritual health. This holistic concept does not merely refer to the 'whole body' but in fact is steeped in the harmonised inter-relations which constitute cultural well-being. These inter-relating factors can be categorised largely as spiritual, environmental, ideological, political, social, economic, mental and physical. Crucially, it can be understood that when the harmony of these interrelations is disrupted, Aboriginal ill health will persist.*
**(Swan & Raphael 1995:19)**

Although these explanations have been provided to inform health action, government policies throughout the past 200 years have ensured that most Indigenous Australians do not have a sense of control over their lives (Carey 2013), a vital determinant of health and wellbeing.

The following section will provide you with some information to assist you in considering the current status of Aboriginal and Torres Strait Islander health and wellbeing with a context of Indigenous Australian history, colonisation and its continuation and problematic policy implications (Saggers & Gray 2007).

## CLINICAL INTEREST BOX 11.1

'Health' to Aboriginal people is a matter of determining all aspects of their life, including control over their physical environment, of dignity, of community self-esteem and of justice. It is not merely a matter of the provision of doctors, hospitals and medicines, or the absence of disease and incapacity.

Prior to colonisation Aboriginal peoples had control over all aspects of their life. They were able to exercise self-determination in the purest form. They were able to determine their 'very being', the nature of which ensured their psychological fulfilment and incorporated the cultural, social and spiritual sense.

In Aboriginal society there was no word, term or expression for 'health' as it is understood in Western society. It would be difficult from the Aboriginal perception to conceptualise 'health' as one aspect of life. The word as it is used in Western society almost defies translation but the nearest translation in an Aboriginal context would probably be a phrase such as 'life is health is life'.

In contemporary terms Aboriginal people are more concerned about the 'quality of life'. Traditional Aboriginal social systems include a three-dimensional model that provides a blueprint for living. Such a social system is based on inter-relationships between people and land, people and creator beings, and between people, which ideally stipulates inter-dependence within and between each set of relationships (NAHSWP 1989:ix).

## HISTORY TAKING: THE CONTEXT

The taking down of the history of an individual is an essential nursing skill. This history offers you vital information that can assist you and your health peers in delivering culturally safe and relevant healthcare to Australia's First Peoples.

Many health professionals have not had access to the history of Australia from an Indigenous perspective. This lack of knowledge is very common and is mainly a result of what most of us were not taught at school. This lack of knowledge, however, has become a stumbling block in improving the health and wellbeing needs of Aboriginal and Torres Strait Islander peoples.

### Considering the context

Having access to this history is important and can assist you in appreciating why there is such a high level of poor health status among Aboriginal and Torres Strait Islander peoples. Australia is the oldest continent in the world and boasts to have the oldest and longest living cultural groups in the world. Aboriginal peoples have looked after country and survived a very harsh environment because of their deep respect for the land/country. This deep respect of country continues today, as it is central to life and wellbeing. Looking after country is and has been always an extension of looking after self and community. Connection to land and country is

central to the wellbeing of Indigenous society. Ensuring country is looked after ensured that country looked after you. Country was and remains ingrained with law. This law is known as the Dreaming and articulates responsibilities that are required of people to maintain a sustainable environment. People were generally healthy and well. There has been no archaeological evidence of the diseases that exist today apart from trachoma. Other diseases came about with the disruption of land tenure and caring for country.

Keeping people off country has resulted in not looking after country and this has ensured that both people and country have suffered. Settlement significantly disturbed tenure to land as the following text illustrates. Aboriginal people's ways of knowing, being and doing, and consequently living were informed by laws laid down by the Dreaming. This way of living has been greatly changed; however, Indigenous Australians continue to have a strong connection with their land, ancestors and matter, living and not living, that can be difficult for those not from this culture and worldview to appreciate or understand.

Australia's colonial story established and enforced Aboriginal and Torres Strait Islander peoples to become refugees in their own country. These acts did not occur overnight; rather they have been rolled out over the past two centuries under many Acts, laws, policies and actions. These were foreign laws from England that were brought to the shores of Australia to sanction the occupation of a country that was not British. Australia had its own laws; these laws are written in the land and were followed by Aboriginal Australians from time immemorial. When the British arrived these laws and principles were largely ignored and broken, resulting in conflict.

A conflict of warfare was maintained from 1788 through to 1838 (Connor 2003) in the east of Australia, although massacres of Aboriginal clans continued widespread up until the 1860s in NSW and the 1890s in Queensland. Tasmania's black war raged from 1804 through to 1832, instigated by a massacre of Aboriginal clansmen; 1000 black and white people were killed (Ryan 2012). Professor Ryan has stated, 'I think people have largely been in denial about frontier violence. There's a lot of puzzlement about it. There's a degree of embarrassment.' 'It would signal a new understanding among Australians in general and Tasmanians in particular that violent bloodshed on home soil has been an important part of our history' (Darby 2012). Western Australia and the Northern Territory were settled later than the eastern seaboard; however, they both suffered many massacres up until 1926 and 1928 respectively.

National warfare and free settlement ensured Aboriginal Australians were uprooted from their countries, their way of living and surviving, and were left as itinerant refugees to survive as best they could manage. The killing of livestock to survive often resulted in reprimands from settlers and the paramilitary, which would often result in large-scale massacres (Reynolds 1987; 1989; 2003). Disease brought to this country and lack of food ensured many Aboriginal Australians died before their time.

In 1838 a Bill was passed in Britain in order to halt the large-scale massacres and 'to protect the natives' (Ella et al 1998:29). The Bill required that each state establish a Protector whose role was to prevent further massacres. This was not enacted until 1882 in NSW when a board was established under the jurisdiction of a Protector. The Protection Board sanctioned and enforced the incarceration of Aboriginal peoples onto reserves and missions throughout NSW and the rest of the country (Ella et al 1998). The missions received minimal government funding for the building and maintenance of housing and/or food, healthcare or education. Housing conditions were subsequently poor and became a significant determinant in relation to Aboriginal Australians' health and wellbeing, as people were forced to live together in close and often overcrowded conditions that enabled contagious diseases to spread easily. Many died from communicable diseases such as TB, measles, influenza and pneumonia. Indigenous housing continues today to be poorly funded and remains a source for infection through overcrowding.

Food was provided through a ration system and those who lived on the reserves and missions were expected to work for their keep. This new diet of white flour, sugar, tea and perhaps some meat was a far cry from the nutrients Aboriginal people were able to consume prior to white settlement. Starvation and poor health due to poor nutrition ensured greater levels of diseases and deaths. Importantly many Aboriginal Australians died as a result of this new dramatically different but enforced lifestyle. This newly prescribed lifestyle would have long-term implications for forthcoming generations. The devastating high rates of chronic disease such as circulatory disease and diabetes, respiratory disease and obesity can be linked back to this dramatic shift in diet and life style (Mitchell 2007).

Poverty resulted directly from being taken off country and being forced to work for rations and not money. The Protection Board had pretended to take care of the wages of Aboriginal people across the country for safe keeping. Instead these stolen wages were used for mainstream services (see Clinical Interest Box 11.2). Aboriginal wages funded hospitals and schools that they were not allowed to access or use (Kidd 2000). Those who were able to continue to work on their lands as drovers and farm hands were equally disadvantaged financially, often being paid in rations that could include tobacco, rather than a wage (Morrissey 2003).

Poverty was entrenched both historically and socially. This was a direct result of government and non-government practice and policy regarding Aboriginal and Torres Strait Islander peoples, not just in Queensland but all over the country.

For families living on the missions and reserves, they also lost their freedom, and were prevented from speaking their languages or maintaining their law, health and educational practices. English became the dominant and enforced language. Requests had to be made to the police and/or the Aboriginal Protector if they wanted to get married, apply for a job, buy a dress or access any form of healthcare. Often healthcare was refused.

## CLINICAL INTEREST BOX 11.2 Excerpt from the Queensland stolen wages fact sheet

Since the 1897 Protection Act the Queensland government could declare any Aboriginal a ward of state and control every aspect of their lives. People were forcibly interned on reserves (1938:7525; 1968:8500).

From 1904 all employment, wages and savings were controlled by government under compulsory labour contracts. From 1904 workers' wages went direct to police protector apart from 'pocket money' retained by employer for distribution during work period. From 1910 government took levies from wages of people living on reserves. From 1919 government took levies from wages of those not living on reserves.

From 1919 government set pastoral wages at 66% of white wage. 'Every Aboriginal on a reserve must work for rations and shelter'. In 1943 government set up Aboriginal Welfare Fund to receive wages, levies and profits from reserve enterprises, to be used to develop enterprises on reserves. From 1950s government pays few shillings to a few key workers on reserves.

In 1968 government starts wage economy on reserves; workers paid 50% state minimum wage. From 1968 equal wages in pastoral industry; forced contracting ceases. From 1971 forced confinement on reserves ceases. 1972 forced control over wages and savings (bank books) ceases, although people have to request to be free from financial management.

From 1979 government knows underpaying reserve workers is illegal; wage 72% of state minimum. In 1986 government paying reserve workers only 75% of award. In 1985 seven Palm Island workers start action in Human Rights Commission for legal wages. From 1987 government hands control of communities to Aboriginal councils; budget insufficient to cover award rates.

In 1996 government loses Human Rights Commission case on under award wages; refuses to pay suggested compensation of $7000 to each of six workers. Workers commence federal court action; government capitulates in 1997.

*(http://www.reconciliation.qut.edu.au/issues/recweek/StolenWagesFactSheet.pdf.)*

The following excerpt from *No more yardin' us up like Cattle* illustrates that country continues to be at the heart of survival and meaning for Aboriginal Australians:

*In the south-west Gulf of Carpentaria in the Northern Territory there are five language groups, Mara, Gudanji, Yanyuwa, Garawa and Waanyi. We are all related through ceremony, culture, land and marriage. We lost control of our country, all of it, in the same way, when white people brought cattle into our country. Our people tried to protect their country, especially the wetlands; many of them were important sacred sites and places where there was always lots of food. When people speared the cattle to protect the sites and the water from being fouled, whole families were shot, men, women and children. Others were flogged and chained up and walked from places, like Wundigalla on Robinson River to Borroloola. Some of them died on the road.*

*We claimed some of our country back in the early days of Land Rights beginning in the late 1970s. We didn't win all our country back; we only managed to get a few of the pastoral stations where white people had failed to make a living and walked off or were looking for a quick sale. In 1984 we won the Nicholson (Waanyi/Garawa Aboriginal Land trust) through a land claim. We got Robinson River (Garawa Aboriginal Land Trust) in 1990 when we managed to get a grant to get the pastoral lease. Once we had the lease we can put a claim over it to change the title to Aboriginal freehold. The Commonwealth's Aboriginal Land Rights (Northern Territory) Act 1976 allows for such claims, but only for Aboriginal owned stations. That's why we could do it. We did it so we wouldn't ever lose it again, as under the Land Rights Act the land becomes inalienable, like it is under our law. These are the two places where the Garawa and Waanyi peoples have started caring for country projects.*

**(Green et al 2012:190)**

The protection policy continued to control the lives of Aboriginal peoples up until the 1970s. Poor health conditions resulting from change of lifestyles enabled health research to promote a 'doomed race theory'. Healthcare was provided to those who were considered infectious with conditions such as TB, leprosy and STDs by way of lock-up hospitals or incarceration. These lock-up hospitals were scattered across the country and those who went off to these hospitals did not come back home (Grant & Wronski 2008).

'High rates of morbidity and mortality mean that most Aboriginal and Torres Strait Islanders experience their own and others' illness and premature death on a painfully regular basis' (Saggers et al 2011:5).

Under the policy of protection and up until today, Aboriginal and Torres Strait Islander children were removed from their families. The government and its agencies argued that was for the children's own good and removed the children in order for them to 'be educated and civilised' (Ella et al 1998). This policy indentured children into labour camps called training homes where they became institutionalised. The impact of child removal on mothers, fathers and children was not considered harmful by government agencies. However, many national reports including *Bringing them Home* have demonstrated the significant damage that was caused and continues to be caused by this government policy and practice of child removal (HREOC 1997; 2007).

The legacy of the stolen generations has resulted in 'an intergenerational cycle of disadvantage, marginalisation and trauma' (Libesman 2014:76). Although the harm has been recorded and acknowledged by Prime Minister Kevin Rudd with a government apology to the stolen generations in 2008, the rate of Aboriginal and Torres Strait Islander child removal remains high. Terry Libesman argues that these high rates continue because of worldview differences held by child welfare agencies and Australian Indigenous communities, in that the agencies use a Western benchmark of effective parenting and neglect to respect or appreciate other parenting models. They also fail to consider poverty is not a form of

negligence but has in fact been constructed through historical experiences of ongoing marginalisation as a result of ongoing dispossession (Libesman 2014). Perhaps most problematic is the removing of children from a parent who was removed themselves, and possibly had a parent who had been removed. This is a cycle that has been established by this government policy and associated services. It ensures that parents do not gain the skills to be the parents they want to be, and prevents families growing. It also has a significant impact on the well-being of the entire community.

Government policies have had significant impacts on the health and wellbeing of Indigenous Australians and continue to do so. The Northern Territory Intervention—now called the Stronger Futures policy—is a bipartisan, agreed government policy with many laws that have once again been enforced on Aboriginal people living in the Northern Territory (see Clinical Interest Box 11.3). We were all told this was a policy to help Aboriginal people, and many believed this. However, the then United Nations Special Rapporteur on the Rights of Indigenous Peoples, Professor James Anya, was perceptive enough to ask the necessary questions of Indigenous and non-Indigenous Australians living in the Northern Territory to find that the Intervention 'overtly discriminates against Aboriginal peoples, infringing their right of self-determination and stigmatizes already stigmatized communities' (Sherwood 2013:36).

The Northern Territory now has the highest rate of youth suicide in the world.

History is a determinant of health. We need to stop repeating these policies that have been designed by those who don't know and don't work with Aboriginal and Torres Strait Islander peoples.

## CLINICAL INTEREST BOX 11.3

The Intervention has had a devastating impact on Aboriginal communities. At the core of this has been the destruction of employment opportunities and municipal and other community services with the closure of the Community Development Employment Projects (CDEP). A recent report by the Council of Australian Governments (COAG) Reform Council found that the NT had the highest level of Indigenous unemployment.

After 6 years of the Intervention, the NT Children's Commissioner Howard Bath says that, 'on the whole, the child well-being indicators in remote communities are getting worse'.

Most disturbing is the huge increase in the rate of suicide and self-harm. A recent Aboriginal and Torres Strait Islander Social Justice Commission report says that between 2001–2005 and 2006–2010, the incidence of Indigenous youth suicide in the NT increased by 160%. In contrast, non-Indigenous youth suicide had declined by one-third. The number of incidents of attempted suicide and self-harm being reported in remote communities has exploded by more than 500%.

The report noted: 'We know that feelings of hopelessness and disempowerment contribute to vulnerability to suicide. These types of feelings are well documented and widely acknowledged symptoms of the local government reforms and the Intervention.'

Aboriginal imprisonment has almost doubled since 2007, giving the NT one of the highest imprisonment rates in the world. The number of Aboriginal women being incarcerated is now more than three times pre-Intervention levels. Conditions in NT prisons resemble concentrations camps, with 15 people in a cell, thin mattresses on the floor and cells which flood when it rains.

(Solidarity.net.au, *Six years of shame: Aboriginal assimilation and the NT Intervention* (13 June 2013). http://www.solidarity.net.au/aboriginal/six-years-of-shame-aboriginal-assimilation-and-the-nt-intervention/.)

## SOME OF THE HARD DATA

Indigenous Australians' life expectancy if born in 2010–2012 was estimated to be 69.1 years for males and 79.7 years for females, around 10–11 years less than the estimates for non-Indigenous males and females.

- In 2008–2012, age-specific death rates were higher for Indigenous people than for non-Indigenous people across all age groups, and were much higher in the young and middle adult years
- For 2010–2012, the infant mortality rate was higher for Indigenous infants than for non-Indigenous infants; the rate for Indigenous infants was highest in the NT
- From 1991 to 2010, there were significant declines in infant mortality rates for Indigenous and non-Indigenous infants in WA, SA and the NT
- From 2006 to 2010, the leading causes of death among Indigenous people were cardiovascular disease, neoplasms (almost entirely cancers) and injury including suicide
- In 2003–2005, maternal mortality ratios were 2.7 times higher for Indigenous women than for non-Indigenous women (Australian Indigenous HealthInfoNet 2014:v)
- Circulatory disease continues to be the most prolific killer of Indigenous Australians and at younger years than in the mainstream population
- 68% of deaths from 2006 to 2010 were a result of chronic disease
- The gap in morbidity and mortality rates for Indigenous Australians is broadening in relation to cancer. Research has demonstrated that there are disparities in the 'stage of diagnosis and treatment (including lower rate of surgery, chemotherapy and radiotherapy)' for Indigenous Australians (AHMAC 2012:2)
- Kidney disease mortality rates have leapt by 89% between 2001 and 2010. This leap is at a faster rate than that of other Australians and, therefore, the gap has widened
- The occurrence of end-stage renal disease has grown by 96%, being 7 times the rate of other Australians (AHMAC 2012:2).

The following statistics on chronic disease are drawn from the 2011 report by the Steering Committee for the Review of Government Service Provision, which tracks federal

government progress in **Closing the Gap** (SCRGSP 2015). When compared to the non-Indigenous population, Aboriginal and Torres Strait Islander people experience the following burdens of disease:

- Deaths attributed to circulatory disease are over 2.5 times more frequent
- Deaths attributed to combined endocrine, nutritional and metabolic diseases are 3.5 times more frequent
- Deaths attributed to diabetes are over 8.5 times more frequent
- Deaths from respiratory illness such as asthma are over 3.5 times more frequent
- Deaths from renal disease are over 5.0 times more frequent.

The SCRGSP report suggests that the rates of diabetes, circulatory disease and renal disease are increasing among Aboriginal and Torres Strait Islander people (SCRGSP, cited in Hellsten 2014:225).

## Closing the gap

The health of Aboriginal and Torres Strait Islander people has continued to be observed within Australia as problematic. However, this view has had no impact in shifting the great disparities or gaps between Indigenous and non-Indigenous Australians' health morbidities and mortalities. These gaps in health and wellbeing within Indigenous populations across the world have required a broader plan of action than simply a health focus. They have required a human-rights-based approach. The United Nations Declaration on the Rights of Indigenous Peoples affirms that health is a right that all humans should enjoy:

*Article 24: Health*

*Indigenous people have the right to their traditional medicines and health practices. The plants, animals and minerals used in medicines shall be protected. Indigenous peoples shall have access to all social and health services without discrimination. Indigenous individuals have an equal right to the highest attainable standard of physical and mental health.*

**(Amnesty International 2009)**

Indigenous Australians' health was far worse than that of people in other English-speaking developed nations such as Canada, the US and New Zealand. The recognition that a different approach had to be made regarding Indigenous Australian health required pressure from the Social Justice Commissioner, who at that time was Tom Calma. Calma challenged the federal, state and territory governments to commit to achieving health equality in health status and life expectation for Indigenous Australians (Calma 2005; Sherwood & Geia 2014).

*The provision of Article 24 will only be realised when Aboriginal peoples and Torres Strait Islanders at the national, regional and local levels have the right to full participation in health service design, delivery, monitoring and evaluation. This is integral to closing the gap in life expectancy within a generation.*

*The network of Aboriginal and Torres Strait Islander Community Controlled Health Services provides frontline, culturally appropriate, primary health care in urban, regional and remote communities across Australia. It also gives Indigenous Australians the chance to set priorities to address needs at the local level.*

*The health sector needs to be properly resourced so we can reach our full potential and provide comprehensive care and improved health outcomes for people in our communities.*

**(Doctor Mick Adams in Amnesty International 2009:14)**

The Aboriginal and Torres Strait Islander Health Performance Framework was set up to measure the outcomes of the National Strategic Framework for Aboriginal and Torres Strait Islander Health (NSFATSIH). Since the National Strategic Framework was signed in 2003, the 17-year disparity in life expectancy between Indigenous and non-Indigenous Australians continues to be the most obvious indicator of overall Indigenous disadvantage. The unacceptable level of health disadvantage still being experienced by Indigenous Australians highlights that there is much still to be done, particularly using a whole-of-government approach, to increase life expectancy and quality of life for Aboriginal and Torres Strait Islander people.

Cuts in health resources by the federal and state governments made it very difficult for the primary health care sector to be able to deliver the changes necessary for closing the life expectancy gap. In 2007 Aboriginal and Torres Strait Islander health concerns were reported to be at alarming proportions, a situation that should not have occurred in a wealthy developed nation such as Australia. This claim was made by the National Aboriginal Community Controlled Health Organisation (NACCHO) and Oxfam, an international aid body that assists those who are living in poverty and injustice, in its report *Close the Gap: Solutions to Indigenous Health Crisis Facing Australia* (NACCHO and Oxfam 2007; Sherwood 2013).

In 2008, the new federal Labor government took up Social Justice Commissioner's challenge and NACCHO and Oxfam's plea to take action and assist in the closing of the gap (see Clinical Interest Box 11.4).

The **social justice** agenda and Closing the Gap form a story that is vital for you to know about and participate in. It is a question of **human rights**. According to the Social Justice Commissioner, Mick Gooda, '[t]he right to health is not to be understood as a right to be healthy. This cannot be guaranteed by governments. A human rights-based approach to health is about providing equal opportunities to be healthy, it's about participation and progressive realisation' (Australian Government 2013:10).

Improving the health status of Aboriginal and Torres Strait Islander people has been an ongoing trial for Australian governments. There have been some improvements over the past 50 years but they have not made Indigenous health commensurate with the non-Indigenous population, who are now enjoying longevity and wellbeing that is unprecedented (Sherwood et al 2014). The National Strategic Framework for Aboriginal and Torres Strait Islander Health has signalled that improving the health outcome for Indigenous Australians requires action beyond the tackling of targets set by COAG. It requires that socially constructed inequalities be addressed—these being the social determinants—and that strategies to

## CLINICAL INTEREST BOX 11.4

In 2008, COAG agreed to six ambitious targets to address the disadvantage faced by Indigenous Australians in life expectancy, child mortality, education and employment.

It aims to:

1. Close the gap in life expectancy within a generation (by 2031)
2. Halve the gap in mortality rates for Indigenous children under 5 by 2018
3. Ensure access to early childhood education for all Indigenous 4-year-olds in remote communities by 2013
4. Halve the gap in reading, writing and numeracy achievements for children by 2018
5. Halve the gap for attainment rates for Indigenous students in Year 12 (or equivalent) by 2020
6. Halve the gap between Indigenous and other Australians in employment outcomes by 2018.

*(Council of Australian Governments 2015:1)*

**Figure 11.6** Gough Whitlam pours soil into the hands of Vincent Lingiari, symbolically handing the Wave Hill station back to the Gurindji people in 1975

*(Fairfaxphotos/Merv Bishop)*

tackle racism in the health care sector be acted upon (Australian Government 2013:3).

## GOOD NEWS STORIES

The news is not all bad. There have been some positive movements to adjust how health services are delivered to Aboriginal and Torres Strait Islanders and to keep them connected to country. Below are some examples of how this is being done in areas across Australia for Aboriginal and Torres Strait Islander peoples. See Figure 11.6.

### The papunya and kintore renal dialysis good news and success story

The Western Desert of Australia is home to many Yanangu communities (Aboriginal peoples of the Western Desert) who are world-renowned Papunya Tula artists. They also have the highest rates of renal disease in Australia, being 30 times the national average.

*Dialysis is one downstream point along a pathway of chronic disease care. Upstream, when kidney function begins to deteriorate, its onset and duration is uncertain but can be delayed by primary health care interventions. Chronic kidney disease is usually symptomless, and reduced kidney function is often identified during routine clinical consultations for other common chronic conditions such as diabetes. End-stage kidney disease is defined when kidney function is reduced to 5 per cent of normal function, and renal replacement therapy, of which dialysis is the most common, is required to sustain life thereafter.*

**(Paul Rivalland, for Western Desert Nganampa Walytja Palyantjaku Tjutaku 2006:4)**

The lifesaving treatment of dialysis was only available for the Western Desert mob in Alice Springs at the renal dialysis unit. For many of those people with end-stage renal disease leaving home, country and family for treatment was very hard. It meant long times away and perhaps even dying in Alice. It was also very hard for family.

*The nurses don't realise why the renal Indigenous peoples die, because people worry for their family, for their Country, and to be there with the family close by. That's why they get worry and stress, they get a lot and they get sick because of thinking, you know.*

**(Smithy Zimran Tjampitjinpa, cited in Paul Rivalland, for Western Desert Nganampa Walytja Palyantjaku Tjutaku 2006:7)**

Many people could not bring themselves to leave country and family and so had to refuse dialysis treatment in Alice Springs, which could be 600 to 1200 km from home. The Yanangu knew that there was a different way that would work for the people and maintain life in a way that was respectful. Their communities are remote and have very little infrastructure to support end-stage treatment. The high rates of chronic and end-stage kidney disease are 'characterised by rapidly changing lifestyles, relative poverty and disadvantage' (Paul Rivalland, for Western Desert Nganampa Walytja Palyantjaku Tjutaku 2006:4).

*With limited infrastructure, which is also of significantly reduced quality, the regional population has extremely poor health, low levels of formal education and little or no employment. Although not all Indigenous groups are affected equally by end-stage kidney disease, Northern Territory rates are now some thirty times higher than the national figure, accelerating over the past few decades in conjunction with the co-existing conditions of type-2 diabetes and ischaemic heart disease.*

*The cause of end-stage kidney disease is not simple but certainly includes such diverse determinants as socio-economic disadvantage, low birth-weight and the institutional racism that has been operating in Australia since colonisation. Yanangu describe how processes that undermine individual and community coherence and wellbeing, including well-intentioned dialysis treatment services, exacerbate and cause ill-health.*

**(Paul Rivalland, for Western Desert Nganampa Walytja Palyantjaku Tjutaku 2006:4)**

Yanangu communities planned a number of ventures and took the initiative to raise money to set up their own renal service (Paul Rivalland, for Western Desert Nganampa Walytja Palyantjaku Tjutaku 2006:4). They were very successful and in their first venture were able to raise $1.1 million. This money was raised at the Art Gallery of New South Wales.

*They can't leave their Country. They think about their spirit and they think about their Dreaming, land and Country. They can't leave their families. Culture is the main one. They can't leave the place where they were born. They want to stay because they have grown up in that Country. Their land is what they think about, because if they go to another place they get sick and weak. Doing that they lose the spirit in their heart, and that is why they need to stay home.*

**(WDNWPT member, cited in Paul Rivalland, for Western Desert Nganampa Walytja Palyantjaku Tjutaku 2006: 4)**

**Figure 11.7** Purple House CEO Sarah Brown with Indigenous artist Patrick Tjungarryi

*(Photo by Justin Brierty)*

**Figure 11.8** The Purple House is the base of the Western Desert's nurses-led community health and renal care service

*(© Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation)*

In 2001 the Yanangu community set up the return to country services bringing people home from Alice Springs regularly so they did not worry too much about country and family. Additionally, they formed a kidney committee to do research on remote dialysis options, the Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation (WDNWPT). In 2003, the WDNWPT was officially incorporated.

In 2004, the WDNWPT started dialysis treatment at the Purple House in Alice—importantly out of the hospital grounds—and started home dialysis at Kintore. Figures 11.7 and 11.8 show Purple House CEO Sarah Brown and Indigenous artist Patrick Tjungarryi in front of his artwork on the Purple House.

WDNWPT continued to pursue services for the Western Desert and purchased the Purple Truck, which was funded by Medicines Australia in 2011 to provide dialysis. 2014 saw the celebration of 10 years of dialysis in Kintore (see Figures 11.9 and 11.10).

**Figure 11.9** Renal nurse Heather Smith, renal patient Hilary Tjapaltjari and his grandchildren, Chirstelda, Delphina and Luke

*(© Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation)*

**Figure 11.10** Western Desert Dialysis mobile renal unit, known affectionately as the Purple Truck

*(© Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation)*

## Summary

Aboriginal and Torres Strait Islander peoples have been significantly impacted by past and present government policies which specifically targeted Indigenous Australians in a negative and harmful manner. These policies and a universal lack of access to culturally safe and competent care have contributed to the high burden of morbidity and mortality. Most Australians have had the ability to be in control of their lives and make choices about their lives that ensured that they and their families enjoyed a life of freedom and wellness; this has not been the case for most Indigenous Australians. Governments and communities need to keep working with Aboriginal and Torres Strait Islander peoples to ensure the future health of Indigenous peoples is impacted in a positive way. There are some good examples of this in some areas as described in this chapter; however, much more work needs to be done.

## Review Questions

1. Why is it that Aboriginal and Torres Strait Islander peoples' current health is very different from that of most Australians?
2. Discuss the meaning of 'country' to Indigenous peoples.
3. What are the five (5) principles of cultural safety?
4. Name five (5) areas where burden of disease is greater in Indigenous populations than in non-Indigenous populations.
5. What were the six (6) targets set by COAG in relation to Indigenous disadvantage?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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Western Desert Nganampa Walytja Palyantjaku Tjutaku Aboriginal Corporation. *Sharing our story: making all our families well*. Online. Available: <http://www.westerndesertdialysis.com/>.

## Online Resources

Australian Indigenous Health*InfoNet*. Online. Available: http://www.healthinfonet.ecu.edu.au/ See especially http://www.healthinfonet.ecu.edu.au/cultural-ways-home, a web resource for people working, studying or interested in the health and cultural ways of Aboriginal and Torres Strait Islander peoples.

Lowitja Institute, *We All Have a Role to Play in Closing the Gap*. Online. Available: http://www.lowitja.org.au/lowitja-video

PAW Media, *Animations*. Online. Available: http://www.pawmedia.com.au/animations

Show the Gap. Online. Available: http://showthegap.org/

The National Aboriginal Community Controlled Health Organisation (NACCHO) website. Online. Available: http://www.naccho.org.au/

The National Aboriginal Community Controlled Health Organisation (NACCHO) App which contains a geo-locator to help you find your nearest Aboriginal Community Controlled Health Organisation, provides health information on a wide range of topics and contains information on where you can go to get assistance should you need urgent help. For iPhone or iPad: ios.giveeasy.org/naccho; for Android: android.giveeasy.org/naccho; or alternatively search for 'NACCHO' in the relevant App store.

UNIT
4

# Nursing care throughout the lifespan

CHAPTER 12
Nursing care across the lifespan: conception to late childhood

CHAPTER 13
Nursing care across the lifespan: late childhood to adolescence

CHAPTER 14
Nursing care across the lifespan: younger adulthood to middle adulthood

CHAPTER 15
Nursing care across the lifespan: older adult

CHAPTER
12

# Nursing care across the lifespan: conception to late childhood

*Andree Gamble*

## KEY TERMS

cognitive development
development
embryo
emotional development
extrauterine
fetus
growth
intellectual development
intrauterine
maturation
personality development
social development
social learning

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define key terms
- Describe the process of conception
- Discuss the growth and development of the placenta
- Explain intrauterine growth and development of the fetus
- Discuss the transition from intrauterine to extrauterine life
- Discuss the growth and development of neonates
- Examine growth and development from early to late childhood
- Compare and discuss the various theories of development
- Compare the theories of Erik Erikson and Jean Piaget
- Recognise the factors that influence growth and development
- Discuss the theories in relation to nursing a child
- State the factors that influence growth and development
- Describe the major physical and psychosocial changes that occur during each stage of development

## CHAPTER FOCUS

Nursing children is challenging at times as their understanding of life changes throughout their growth and development. This chapter looks at various developmental theories which view development as a continuous process. Growth and development are processes that begin at conception and continue through each stage of the life cycle. Human development involves biological and psychosocial components. Biological science is concerned mainly with structure and function, while the psychosocial sciences focus on the behavioural aspects of development. Nursing care of the infant and child is directed at promoting the optimal level of health for the individual and family. It is important for the nurse to understand that both infancy and childhood are unique phases of development and that these phases are accompanied by special needs. To understand these needs the nurse first requires knowledge of normal growth and development, beginning with conception.

## LIVED EXPERIENCE

The first time I cared for a child in hospital, I said, 'I'm going to take your vital signs now.' The child looked distressed and frightened and asked 'What does that mean and where are you taking it?' I realised that I needed to explain what I was going to do, and how and why I was going to do it in a way that a child would understand. It was a good lesson to learn.

**Madeline, Enrolled Nursing Student**

Nurses care for people in different stages of development. A basic understanding of growth and development enables the nurse to recognise individual needs, assess health status and thus provide appropriate care. Human **growth** and **development** are orderly processes that begin at conception and continue until death. Every person progresses through definite phases of growth and development, but the rate and behaviours of this progression vary with each individual.

Each person is a unique individual and, while growth and development are generally categorised into age stages or by using terms describing the features of an age group, categorisation does not take into account individual differences. It does, however, provide a means of describing the characteristics associated with most individuals at stages when comparative developmental changes appear. Growth and development affect the whole person and, although defined separately, overlap and are dependent on each other.

Physical growth results as cells repeatedly divide then synthesise new components, causing an increase in the number and size of cells and, consequently, an increase in the size and weight of the body or any of its parts. Growth can be measured in height and mass or by the changes in physical appearance and body functions that occur as a person grows older (Hockenberry & Wilson 2013).

Development refers to an increase in the complexity of function and skill progression that enables an individual to adapt to the environment.

**Maturation** is the process of attaining complete development and is the unfolding of full physical, emotional and intellectual capabilities. The term maturation is generally used to describe an increase in complexity that enables a person to function at a higher level (Hockenberry & Wilson 2013).

A person's development encompasses a range of dimensions besides the physical; for example, emotional and moral development. There are several theories, or approaches, regarding growth and development of these different dimensions. This chapter discusses these approaches and their implications for nursing practice.

## CONCEPTION

Fertilisation occurs when the chromosomes of a single egg and sperm (gametes) unite to form a fertilised egg (zygote), and is the benchmark of the beginning of a pregnancy. This event does not occur in isolation but as a result of a series of events, including ovulation (release of the egg), union of the gametes and implantation of the embryo into the uterus. Only after all these events are successfully completed can the process of embryonic and fetal development begin (Figure 12.1 and Table 12.1).

Fertilisation of the ovum occurs in the distal third of the uterine (fallopian) tube. The fertilised ovum (zygote) develops by simple cell division and as it travels to the uterus it forms a loose collection of cells called the morula. The morula separates into an outer (ectodermal) and an inner (endodermal) cell mass, fluid forms and fills the space between the two layers; the structure is then referred to as a blastocyst. The outer layer of the blastocyst becomes the trophoblast and will develop into the placenta and outer membrane, while the inner layer will develop into the embryo, cord and inner membrane. Between these two layers a third layer (mesoderm) will form (Marieb & Hoehn 2013).

Implantation (embedding in the endometrium) occurs about 6–7 days after fertilisation and normally occurs in the upper body of the uterus. After implantation, the lining of

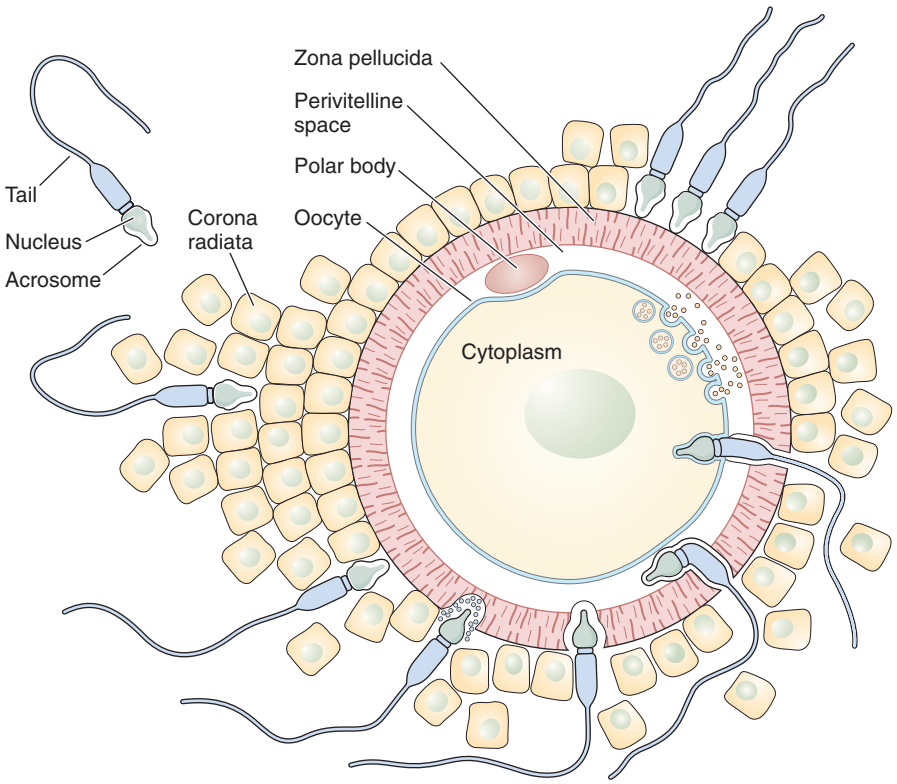


**Figure 12.1** Fertilisation
*(Falcone & Hurd 2007)*

**TABLE 12.1 | Fetal growth terms**

| Term | Time period in fetal development |
|---|---|
| Ovum | From ovulation to conception (fertilisation) |
| Zygote | From conception (fertilisation) to implantation |
| Embryo | From implantation to 8 weeks after conception |
| Fetus | From 8 weeks after conception until term |

the uterus grows over the blastocyst and pregnancy is established. From this stage onwards the lining of the uterus is termed the decidua (Marieb & Hoehn 2013) (Figure 12.2).

During week 3, the inner cell mass of the blastocyst differentiates into three distinct layers:

1. The outer layer (ectoderm), which develops to become the skin, hair, nails, brain and nervous system
2. The middle layer (mesoderm), which develops to become the circulatory, musculoskeletal and urinary systems, and most of the reproductive tract
3. The inner layer (endoderm), which develops to become the intestines, internal organs, respiratory system and the germ cells of the ovaries or testes.

(Marieb & Hoehn 2013)

As development continues, a cavity appears above the ectoderm. The lining of this amniotic cavity becomes the amniotic membrane, which secretes fluid that makes up part of the 'liquor' (the fluid that surrounds the embryo). The amniotic cavity enlarges so that eventually the embryo is suspended by the umbilical cord in a closed sac (membranes) of amniotic fluid.

## DEVELOPMENT OF THE PLACENTA, MEMBRANES, LIQUOR AND CORD

### The placenta

The outer cells of the trophoblast develop projections (villi), which project into the maternal capillaries to allow the exchange of oxygen, nutrients and waste products. The villi eventually join with an area of uterine tissue to form the placenta. The placenta continues to grow throughout the pregnancy, with one surface (maternal surface) attached to the lining of the uterus, and the other (fetal surface) with the umbilical cord arising from its centre. The fully formed placenta is disc-shaped, about 2.5 cm thick in the centre, and weighs about 500 g. The functions of the placenta are nutritional, respiratory, excretory and hormonal (Marieb & Hoehn 2013).

### The membranes

The two fetal membranes—the amnion and the chorion—are derived from part of the trophoblast and attached to the placenta. The inner membrane (amnion) encloses the **fetus**

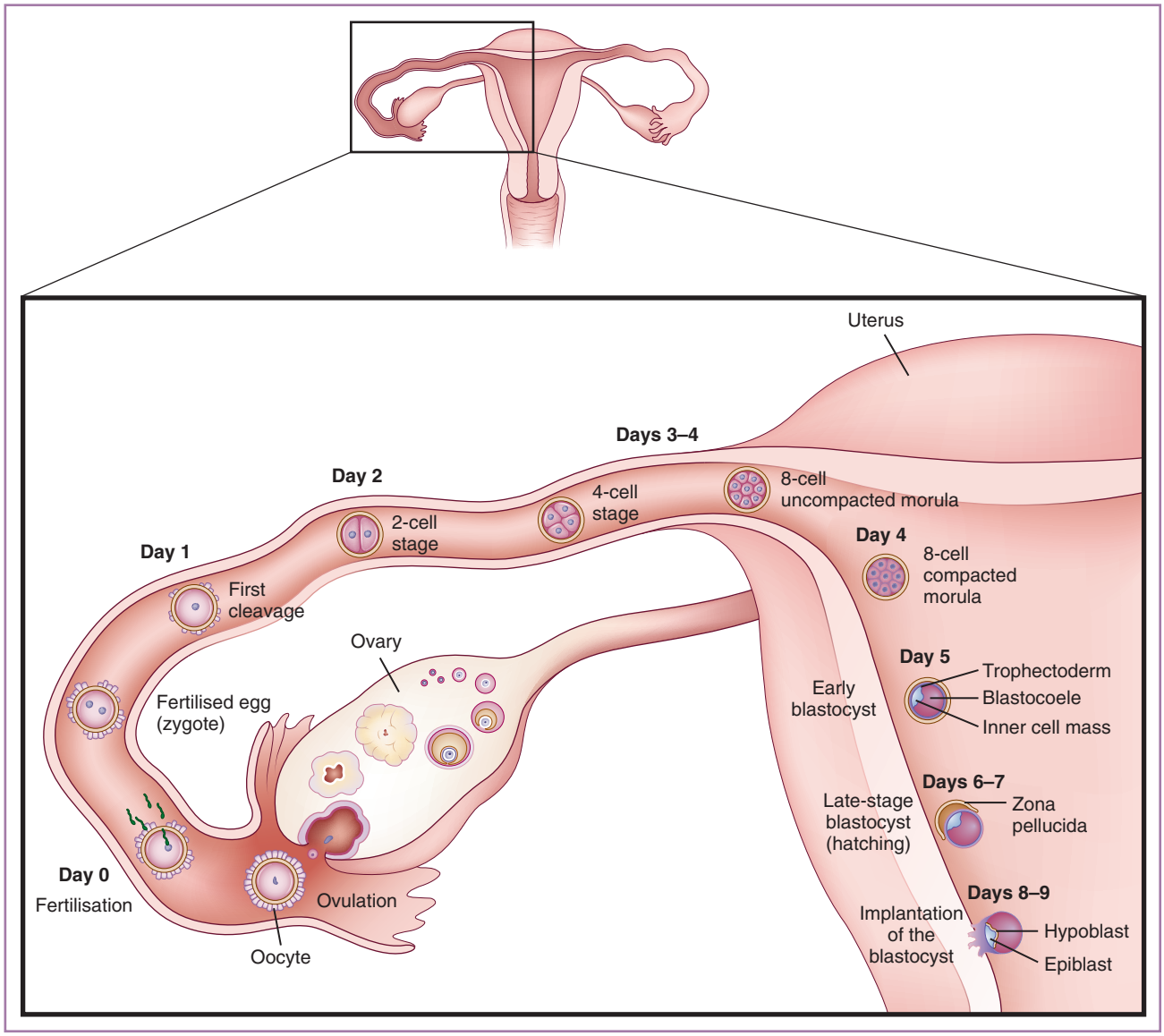


**Figure 12.2** Ovulation and implantation
*(Greene et al 2008)*

and liquor and covers the fetal surface of the placenta and the cord. The outer membrane (chorion) is continuous with the margin of the placenta and adheres to the wall of the uterus (Marieb & Hoehn 2013).

## Liquor

The liquor (amniotic fluid) is the pale straw-coloured liquid that surrounds the fetus in the amniotic sac. Initially derived mainly from maternal blood then combined with fetal urine, liquor is 99% water plus mineral salts. The functions of liquor include protection of the fetus, prevention of embryonic parts fusing together and maintenance of an even intrauterine temperature (Marieb & Hoehn 2013).

## The umbilical cord

The umbilical cord extends from the fetal umbilicus to the fetal surface of the placenta. It contains two umbilical arteries, which transport deoxygenated blood from the fetus, and one umbilical vein, which transports oxygenated and nutrient-rich blood from the placenta to the fetus. The vessels in the cord are embedded in a thick jelly-like substance and the cord is covered by amniotic membrane. At 40 weeks of pregnancy the cord can be up to 3 cm in diameter and 55 cm long (Beall 2014).

## Fetal circulation

The fetal circulation is designed so that the major blood flow bypasses the fetal lungs. The first blood cells arise in the yolk sac and, by the end of the third week, the embryo has a system of paired vessels which remain occluded until birth. Oxygen and nutrients move from the maternal blood into the fetal blood, and fetal wastes move in the opposite direction. As blood from the umbilical vein flows towards the fetal heart, most of it bypasses the fetal liver through the ductus venosus

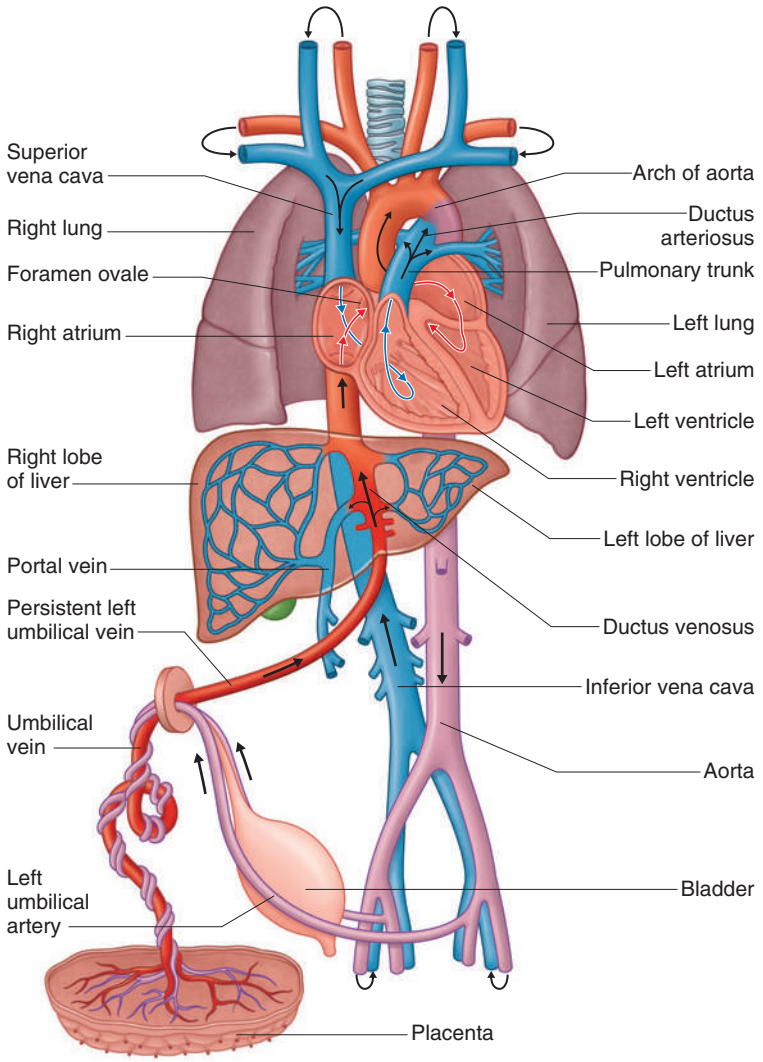


**Figure 12.3** Fetal circulation
*(Standring 2008)*

and enters the inferior vena cava. Some of the blood entering the right atrium is shunted into the left atrium through the foramen ovale, a temporary opening in the septum between the atria. Blood that enters the right ventricle is pumped out through the pulmonary artery, where it meets the ductus arteriosus, a short vessel connecting the pulmonary artery to the aorta. Because the fetal lungs are collapsed, blood enters the systemic circulation through the ductus arteriosus. The aorta transports blood to the fetal tissues and, ultimately, back to the placenta through the umbilical arteries (Marieb & Hoehn 2013) (Figure 12.3).

## INTRAUTERINE DEVELOPMENT AND GROWTH

The prenatal period is the stage of development from conception to birth, normally lasting 40 weeks. As the **embryo** grows, first in a cephalocaudal direction (head to tail), then in a proximodistal direction (from the centre of the body outwards), differentiation of cells gives rise to specific tissues and the shape of the embryo changes to gradually assume a human appearance (Figure 12.4).

The embryo continues to develop and by the end of the 8th week all organ systems are recognisable and the embryo is known as a fetus.

**Intrauterine** growth and development occurs in three main stages, each lasting 3 months (the first, second and third trimesters). Different tissues and regions of the body mature at different rates, while growth in length and mass proceeds at a predetermined rate.

Growth in length and mass depends on factors inherent in the fetus, placenta and mother. Growth and development of the fetus may be impeded by factors such as infectious agents (e.g. the rubella virus), chemical agents (e.g. ionising radiation or certain drugs), immunological factors (e.g. the Rh factor) or by nutritional factors (e.g. maternal mineral deficiency) (Norwitz & Schorge 2013).

The first trimester of intrauterine life is the most crucial for the developing fetus, as it is during this period that the fetal cells differentiate and develop into essential organ

systems. Any factors that cause interference with growth can result in extensive structural or functional alteration or congenital absence of an organ or system (Chiocca 2011). By the end of the second trimester, most organ systems are complete and capable of functioning, and the fetus is considered viable (capable of life outside the uterus). By 26 weeks, although the skin remains transparent, the fetus resembles a small baby. If a fetus is born at this stage, extensive environmental support is necessary to promote survival. From this stage onwards the major activities are growth and organ specialisation. During the third trimester, the fetus grows in length and mass and by the end of 40 weeks is about 50 cm long and weighs between 3.2 and 3.4 kg. When born, the infant is able to make the transition from intrauterine to **extrauterine** life without support (Figure 12.5 and Table 12.2).

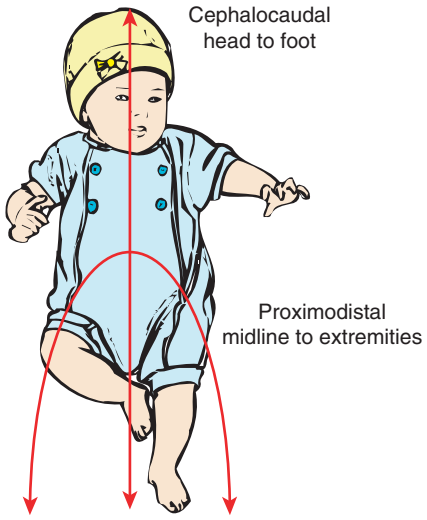


**Figure 12.4** Patterns of development

## TRANSITION TO EXTRAUTERINE LIFE

After the infant is born and begins to breathe, the shunting of blood from the pulmonary artery to the aorta via the ductus arteriosus is no longer needed and blood is circulated to the lungs. The pressure in the right side of the heart falls as the lungs become fully inflated and there is little resistance to blood flow. This causes the foramen ovale to close. The infant's blood oxygen level rises and the ductus arteriosus constricts and is converted to a fibrous ligament. The closure of these structures thus depends on the initiation of respiration. The cardiovascular system adapts so that blood circulation no longer bypasses the lungs, and the lungs are able to inflate, thereby enabling gaseous exchange (Figure 12.6). When blood stops flowing through the umbilical vessels, the circulatory pattern becomes that of an adult (Marieb & Hoehn 2013).

## THEORIES OF DEVELOPMENT

Some theories view development as a continuous process that moves from the simple to the complex, while other theories view development as a process characterised by alternating periods of equilibrium and change. The various developmental theories differ in how the human being is viewed. The following section provides the reader with an introduction to the major theories, or approaches, which are psychoanalytical, cognitive–developmental, maturational, **social learning** and moral. It is not the intent of this section to provide the reader with an in-depth analysis of these theories, rather to provide an overview of each approach.

### Erikson's theory

Using the psychoanalytical framework, Erik Erikson based his (1963) theory of psychosocial development on the process of socialisation. According to Erikson, a person spends their whole life constructing, shaping and reshaping their

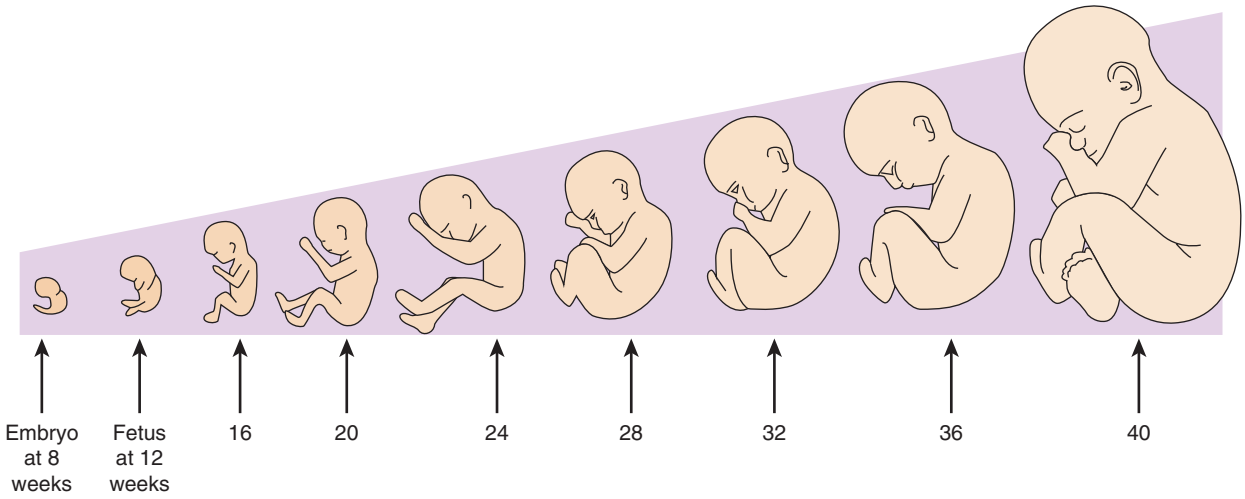


**Figure 12.5** Fetal growth

*(Reproduced from http://nursingcrib.com/wp-content/uploads/fetal-growth.jpg)*

## TABLE 12.2 | Developmental events of the fetal period

| Time | Changes and accomplishments |
|---|---|
| 8 weeks (end of embryonic period)<br> <br>8 weeks | Head nearly as large as body; all major brain regions present; first brain waves in brain stem<br>Liver disproportionately large and begins to form blood cells<br>Limbs present; digits are initially webbed, but fingers and toes are free by the end of this interval<br>Ossification just begun; weak, spontaneous muscle contractions occur<br>Cardiovascular system fully functional (heart has been pumping blood since the fourth week)<br>All body systems present in at least rudimentary form<br>Approximate crown-to-rump length: 22 mm; weight: 2 grams |
| 9–12 weeks (month 3)<br> <br>12 weeks | Head still dominant, but body elongating; brain continues to enlarge, shows its general structural features; cervical and lumbar enlargements apparent in spinal cord; retina of eye is present<br>Skin epidermis and dermis obvious; facial features present in crude form<br>Liver prominent and bile being secreted; palate is fusing; most glands of endodermal origin are developed; walls of hollow visceral organs gaining smooth muscle<br>Blood cell formation begins in bone marrow<br>Notochord degenerating and ossification accelerating; limbs well moulded<br>Sex readily detected from the genitals<br>Approximate crown-to-rump length at end of interval: 90 mm |
| 13–16 weeks (month 4)<br> <br>16 weeks | Cerebellum becoming prominent; general sensory organs differentiated; eyes and ears assume characteristic position and shape; blinking of eyes and sucking motions of lips occur<br>Face looks human and growth of the body beginning to outpace that of the head<br>Glands developed in GI tract; meconium is collecting<br>Kidneys attain typical structure<br>Most bones are now distinct and joint cavities are apparent<br>Approximate crown-to-rump length at end of interval: 140 mm |
| 17–20 weeks (month 5) | Vernix caseosa (fatty secretions of sebaceous glands) covers body; lanugo (silk-like hair) covers skin<br>Fetal position (body flexed anteriorly) assumed because of space restrictions<br>Limbs reach near-final proportions<br>Quickening occurs (mother feels spontaneous muscular activity of fetus)<br>Approximate crown-to-rump length at end of interval: 190 mm |
| 21–30 weeks (months 6 and 7) | Period of substantial increase in weight (may survive if born prematurely at 27–28 weeks, but hypothalamic temperature regulation and lung production of surfactant are still inadequate)<br>Myelination of spinal cord begins; eyes are open<br>Distal limb bones are beginning to ossify<br>Skin is wrinkled and red; fingernails and toenails are present; tooth enamel is forming on deciduous teeth<br>Body is lean and well proportioned<br>Bone marrow becomes sole site of blood cell formation<br>Testes reach scrotum in seventh month (in males)<br>Approximate crown-to-rump length at end of interval: 280 mm |
| 30–40 weeks (term) (months 8 and 9)<br> <br>At birth | Skin whitish pink; fat laid down in subcutaneous tissue (hypodermis)<br>Approximate crown-to-rump length at end of interval: 360 mm; weight: 3.2 kg |

*(Marieb & Hoehn 2013. © 2013, pp. 1087–1089. Reprinted by permission of Pearson Education, Inc., New York, New York)*

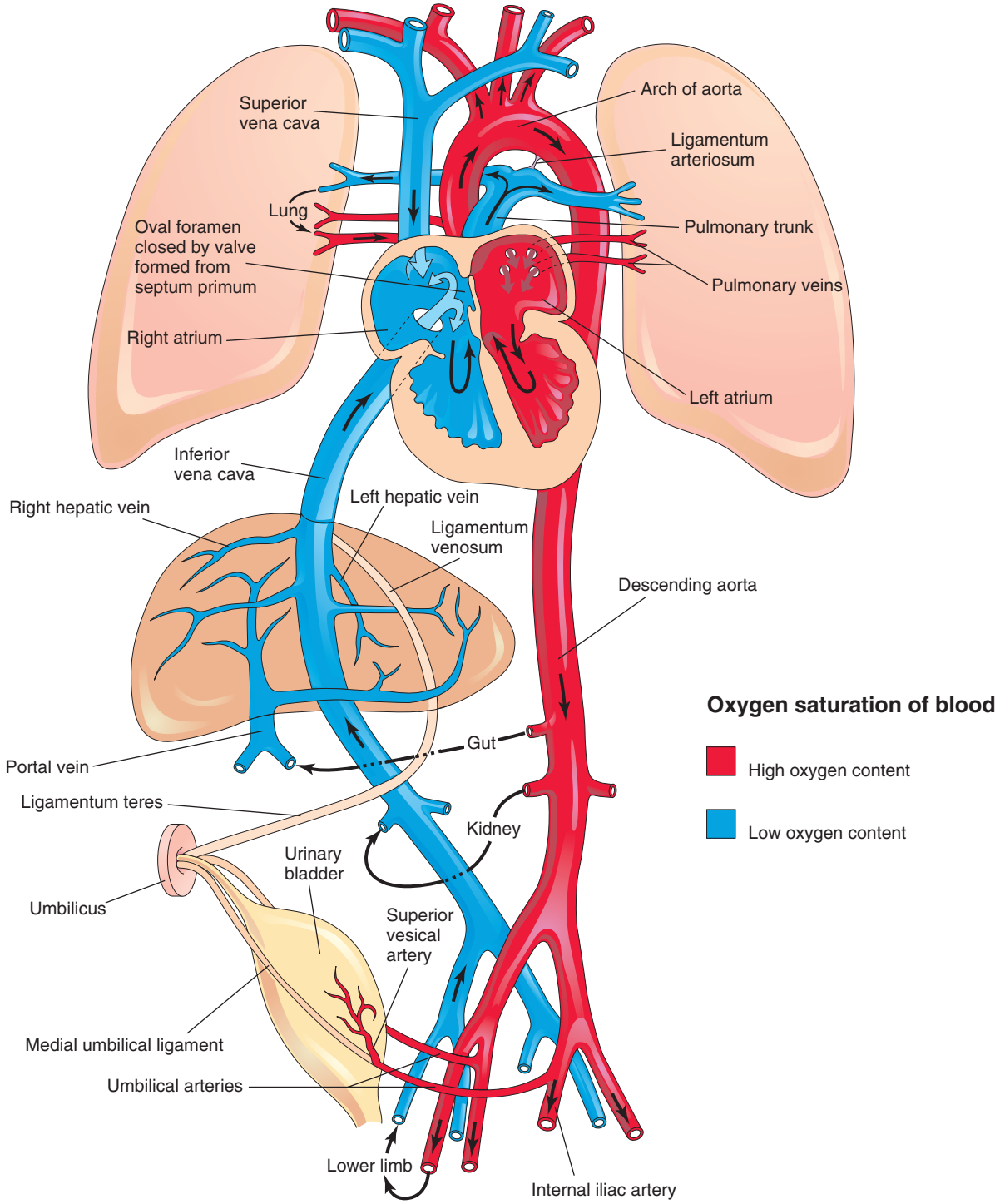


**Figure 12.6** Transition to extrauterine life
*(Moore et al 2012)*

personality, which is influenced by psychological, biological, social and environmental factors. Erikson described key conflicts or problems that the individual seeks to master during critical periods of **personality development**. Successful completion of each conflict is built on satisfactory completion of the previous stage. However, no core problem is ever entirely resolved, as each new situation will present a conflict in a new form (Chiocca 2011). Table 12.3 outlines the stages of development according to Erikson.

## Piaget's theory

The theory of **cognitive development** focuses on the gradual development of cognitive processes, such as problem solving, and intellectual growth. Cognitive development is the process

**TABLE 12.3 | Erikson's stages of development**

| Stage | Age | Conflict | Behaviours |
|---|---|---|---|
| I | 0–1 year | Trust versus mistrust | Develops basic trust in someone who consistently responds to needs. When needs are not met, may develop basic mistrust of others |
| II | 1–4 years | Autonomy versus shame and doubt | Develops a sense of self-control and independence. Feelings of shame and doubt may arise if made to feel self-conscious, or when expected to be independent in areas where not capable |
| III | 4–8 years | Initiative versus guilt | Plans and undertakes tasks and initiates a fantasy life whereby they can work out fears and conflicts. A sense of guilt may arise if a child is made to feel that their activities or imaginings are bad |
| IV | 8–12 years | Industry versus inferiority | Engages in tasks and activities that can be carried through to completion. Needs and wants real achievement. Feelings of inferiority or inadequacy may arise if a child believes that they cannot measure up to the standards set for them by others |
| V | 12–20 years | Identity versus role confusion | Establishes own identity and intimate relationships. Role confusion may result if unable to solve conflicts about role in society |
| VI | 20–30 years | Intimacy and solidarity versus isolation | Enters into intimate relationships by allowing others to share the psychosocial and physical aspects of their personality. May experience a sense of isolation if unable to become close to others |
| VII | 30–60 years | Generativity versus self-absorption and stagnation | Establishes and guides the next generation and strives to ensure the continuation of their work and lifestyle. If unable to assume responsibility for promoting the future, may experience a sense of stagnation. As a result, becomes self-absorbed and experiences difficulty in relating to the world |
| VIII | 60 years–death | Integrity versus despair | Strives to feel a sense of worth. A sense of integrity develops when an individual feels satisfied with past achievements. Despair arises when an individual is unable to recognise or accept their worth, or when they feel remorse for that which might have been |

*(Hockenberry & Wilson 2013)*

by which a child acquires knowledge and the ability to think, learn, reason and abstract.

Jean Piaget's (1969) theory of cognitive development deals with age-related changes in cognition and the way in which a child progressively learns about the world through the development of reasoning skills. It does not take into account all the psychosocial aspects of the personality. Piaget's views are that, for learning to occur, a variety of new experiences or stimuli must exist. He believed that there are four major stages in the development of logical thinking, and that each stage builds on the accomplishments of the previous stage. Table 12.4 outlines Piaget's stages of cognitive development (Chiocca 2011).

For further reading on theories of development, please refer to the Recommended Reading list.

## GROWTH AND DEVELOPMENT

Growth and development are interrelated processes that are influenced by a variety of factors, either modifiable or non-modifiable. The modifiable influences include nutrition, illness and provision of developmentally appropriate activities. Non-modifiable influences include culture and genetics (Chiocca 2011).

It is important for the nurse to understand that childhood incorporates unique phases of development, and that these phases are accompanied by special needs. To care for individuals from infancy to adolescence, the nurse first requires knowledge of normal growth and development. By understanding what is normal, the nurse is more able to recognise departures from normal and, therefore, to plan and implement appropriate nursing actions. Growth and development affect the total person and, although separately defined, growth and development overlap and are interdependent. Both occur from the moment of fertilisation until death. There is a predictable sequence, order and pattern to growth and development where certain developmental tasks must be accomplished during each stage. Although there is an orderly pattern to the processes, the rate of growth and development varies among individuals.

**TABLE 12.4 | Piaget's stages of cognitive development**

| Stage | Age | Intellectual development |
|---|---|---|
| Sensorimotor | Birth–2 years | This stage of intellectual development is governed by sensations in which simple learning takes place. Problem solving is primarily trial and error, as the child progresses from reflex activity, through repetitive behaviours, to imitative behaviour. The child gradually acquires a sense that external objects have a separate and independent existence and that they exist even when they are not visible to them |
| Preoperational | 2–7 years | During this stage the predominant characteristic is egocentricity, wherein the child considers their own viewpoint as the only one possible. Thinking is concrete and tangible and the child lacks the ability to make deductions or generalisations. Problem solving does not usually follow logical thought processes |
| Concrete operational | 7–11 years | Thought becomes increasingly logical and problems are solved in a systematic fashion. The child is able to consider points of view other than their own. Towards the end of this stage, the child demonstrates a greater reasoning ability |
| Formal operational | > 11 years | Thinking is characterised by logical reasoning. The adolescent is able to think in abstract terms, draw logical conclusions and solve problems |

*(Hockenberry & Wilson 2013)*

Development encompasses various aspects—motor, vision and hearing, speech and language, intellectual, emotional, personality, moral and social. A developmental task is a set of skills and competencies specific to each developmental stage, which children must accomplish to deal effectively with their environment. Each stage lays the foundation for the next stage of development (Hockenberry & Wilson 2013). The stages of development are:

- Prenatal (conception to birth)
- Neonatal (birth to 28 days)
- Infancy (1 month to 12 months)
- Early childhood:
  - Toddlerhood (12 months to 3 years)
  - Preschool (3 years to 6 years)
- Late childhood:
  - School age (6 years to 12 years)
- Adolescence (12 years to about 18–20 years)
- Adulthood (18–20 years onwards).

Growth in weight (mass) and height is variable and not uniform throughout life. The maximum rate of growth occurs before birth, in the 4th month of fetal life. Growth in height stops when maturation of the skeleton is complete. Standard growth charts are available on which measurements of growth may be periodically plotted and compared with the norm for that particular age group.

Growth and development occur in specific directions. Development is closely related to maturation of the nervous system, and occurs in the cephalocaudal direction (head to tail), which is logical; for example, an infant's head is disproportionately large. The second direction is from the centre of the body outwards (proximodistal); for example, infants can roll over before they can grasp an object with thumb and second finger (Chiocca 2011). The third pattern is differentiation (simple to complex development), where global patterns of behaviour become more specific and refined (Hockenberry & Wilson 2013).

## GROWTH AND DEVELOPMENT OF THE INFANT

Infancy is the stage of development from birth to 12 months. The first 28 days of extrauterine life are referred to as the neonatal period. (Refer to Table 12.5.)

### Physical development

At birth the spinal cord and lower brain centres are well developed and, while not capable of coordinated movement, the infant exhibits a range of reflexes. A **reflex** is an involuntary muscle reaction to specific stimulation (refer to Table 12.6). The Moro reflex is one example—a sudden loud noise or movement causes the infant to draw up their legs, fan out their arms and then bring them back together towards the midline in an embrace position. The presence and strength of a reflex is an important sign of neurological development and function. Many infant reflexes disappear as the child grows older, although some remain throughout adulthood. The presence of an infant reflex after the age at which the reflex normally disappears can be a sign of brain damage or damage to the nervous system (Hockenberry & Wilson 2013).

### Measurement

During the first 12 months the infant increases in length by more than one-third, and mass almost triples. (Refer to Table 12.7 for measurements at birth.)

As the infant grows in height and mass, internal organs also grow and develop to cope with the increasing demands made on them. Growth is influenced by hormones, especially thyroxine and growth hormone (Dempsey et al 2014).

**TABLE 12.5 | Growth and development—birth to 12 months**

| Age | Motor, communication, manipulative and social skills |
|---|---|
| Birth to 1 month | Primitive reflexes: can suck, grasp and respond to sudden sounds. Crying patterns and 'cooing' noises |
| 1–3 months | Holds head up when prone, holds head erect when held in a sitting position. Begins to vocalise. Smiles responsively. Distinguishes parents from others |
| 3–5 months | Turns head towards sounds. Rolls from prone to supine. Makes sounds when spoken to, may squeal with pleasure. Clasps hands together and can hold a rattle. Begins to watch own hands. Smiles and vocalises |
| 6–9 months | Sits with support and, later, alone. Sits up from a lying position. Crawls. Babbles and vocalises; says words like mum-mum, da-da. Picks objects up between finger and thumb. Reacts to strangers with anxiety |
| 10–12 months | Pulls self into a standing position, may walk with support. Says single words. Obeys simple instructions. Imitates adults (e.g. will scribble with a crayon). Expresses emotion. Can hold a cup to drink |

*(Hockenberry & Wilson 2013)*

**TABLE 12.6 | Development of reflexes**

| | |
|---|---|
| Eye reflex | When a bright light is directed towards the eyes, the pupils contract; blinking is elicited when objects are brought towards the eyes |
| Rooting reflex | Elicited when the infant's cheek contacts the mother's breast and in response to peri-oral touch. This reflex enables the infant to find a nipple in order to feed |
| Moro reflex | Elicited by a sudden loud noise or movement. If this occurs the infant draws the legs up and the arms fan out and then come together towards the midline in an embrace position |
| Grasp reflex | Elicited when the palm is stimulated so that the fingers flex and grip the object |
| Tonic neck reflex | A postural reflex that is sometimes assumed by sleeping infants. The head is turned to one side, the arm and leg of one side are extended, and the opposite arm and leg are flexed in a 'fencing' position |
| Sucking reflex | Sucks when area around mouth stimulated |
| Startle reflex | Legs and arms are pulled inwards after loud noise |
| Stepping reflex | Stepping motions when sole of foot touches hard surface |

*(Hockenberry & Wilson 2013)*

Children under 3 years of age should be weighed naked (ensuring maintenance of privacy), placed in the middle of the scale and must be still to ensure an accurate measurement is attained. Feeding should be considered when weighing an infant and, if possible, infants should be weighed at the same time each day. Length is measured in infants (rather than height), and should be undertaken using an appropriate measuring device if available (Hockenberry & Wilson 2015). (Refer to Figure 12.7 for standard growth charts.)

**TABLE 12.7 | General measurements at birth**

| Parameter | Birth |
|---|---|
| Length | 50–55 cm |
| Weight | 2.8–4 kg |
| Head circumference | 33–38.5 cm |

*(Hockenberry & Wilson 2015; Marieb & Hoehn 2013)*

## Sensory

At birth the infant can follow objects and pupils react to light; binocular vision begins at 6 weeks and is established by 4 months. At about 6 months the infant can move the head and eyes in every direction. By 12 months they are able to recognise familiar people and objects at a distance. Infants can hear at birth and by 1 month they are able to move their eyes towards a sound. The brain is not sufficiently developed initially for any meaning to be attached to sounds, but by 5 to 6 months the infant turns immediately to the sound of their mother's voice even when she is quite a distance away. Speech develops from vocalising at birth and crying as a means of communication. Crying allows the infant to signal displeasure (hunger) but also helps to develop infant–parent relationship. Infants cry between 1 and 4 hours per day until aged 6 weeks. Crying usually decreases by 12 weeks and by 12 months the infant is able to say three to five recognisable words but understand as many as 120. With time the number of words spoken increases and they become clearer. The rate of vocabulary gain varies and is related to factors such as the amount and type of speech the infant hears (Hockenberry & Wilson 2013).

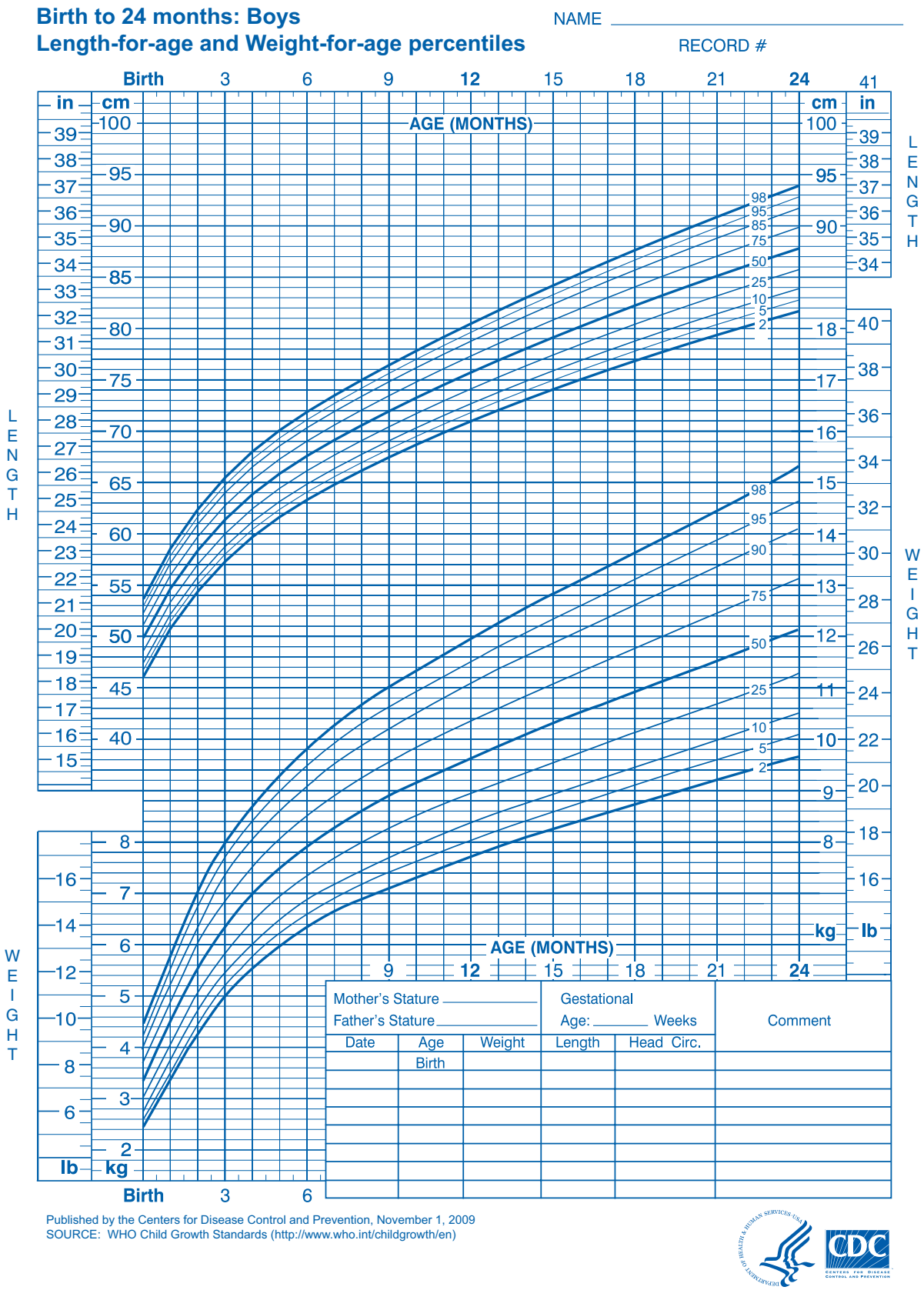


**Figure 12.7** Growth charts—newborn to infant

*(Centers for Disease Control and Prevention: www.cdc.gov/nchs—reproduced with permission from the National Center for Health Statistics)*

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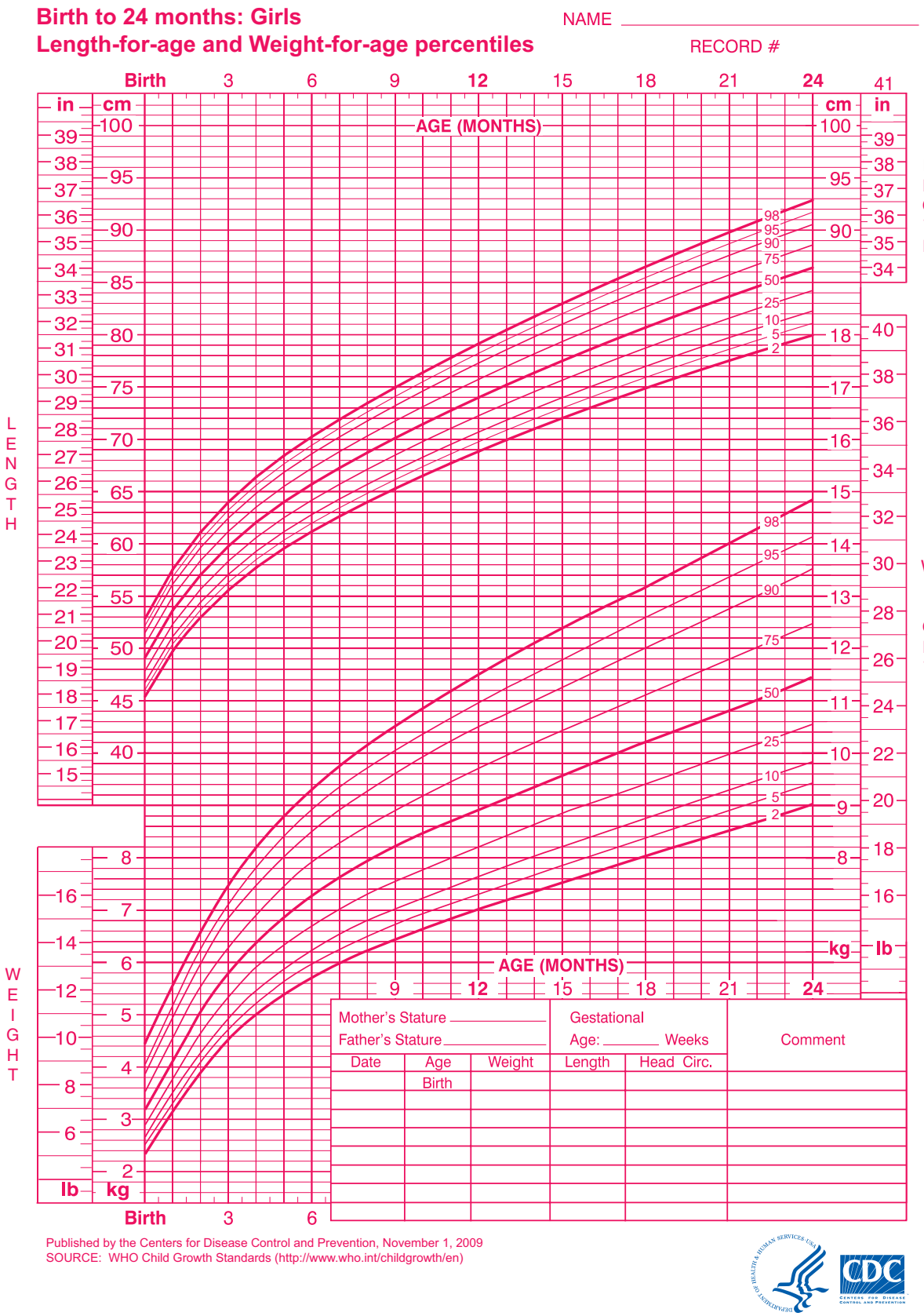


Figure 12.7, cont'd

## Motor

Locomotion proceeds in stages. First, the infant learns to position the head in space, then to crawl on hands and knees, later to move about while sitting upright and, finally, to stand, balance and walk. Thus, motor development occurs in the cephalocaudal direction.

## Psychosocial development

Psychosocial development refers to how a person learns to interact with others and begins early in an infant's life; smiling, for example, can be considered a social response. Initially a smile can be elicited in response to strangers but after about 6 months the infant's smile becomes more selective. As the infant begins to vocalise and later to speak, social interaction is increased.

The family is the first, and most important, social institution for the infant and they begin to develop trust as their parents meet their needs. Social roles such as brother or sister or playmate are gradually acquired during **social development** in infancy. Play provides the opportunity for social development, whereby the infant learns the social expectations that accompany relationships. Infants' play first revolves around their own body, but by age 3 to 6 months the infant exhibits more discriminate interest in stimuli and will play alone. Play becomes more vocal (laughing to demonstrate pleasure) and more sensorimotor between 6 months and 1 year of age and although solitary, infants choose with whom they will interact (Hockenberry & Wilson 2015).

The formation of personality, influenced by a combination of hereditary, psychological, environmental and social influences, includes those stable psychological characteristics that make each human being unique. An individual's personality traits form early in life and encompass many factors including intellectual abilities, motives, emotional reactivity, attitudes, beliefs and moral values. Infants are typically egocentric, or self-centred, and are primarily concerned with satisfying physical desires, such as hunger (Mitchell & Ziegler 2012).

Emotion is the term used to describe a feeling such as anger, fear, joy and sorrow. **Emotional development** depends on a variety of factors such as maturation, heredity, socialisation and the environment. Most emotional expressions appear to be learned, and emotional development is related to age. While some forms of emotional expression appear to be inborn or develop through maturation, learning is important in modifying emotional expression to conform to the patterns approved by a specific culture.

At birth infants are able to exhibit distress and pleasure; by 3 to 6 months they can express anger, distrust and fear; and by about 8 to 10 months they can exhibit anxiety, surprise, dis-satisfaction, obstinacy, anticipation and frustration (Mitchell & Ziegler 2012).

## Cognitive development

### Perception

The process of **intellectual development** skills such as reasoning, thinking and problem solving involves two main processes—perception and conceptualisation. Perception is the sensory process by which a person obtains information about themselves and their environment. Conceptualisation is the process of concept formation and is an intellectual activity that facilitates reasoning, thinking and problem solving. Concepts allow sense to be made of the information received through the senses (Mitchell & Ziegler 2012).

### Cognitive ability

Infants progress from reflexive behaviour to repetitive acts to imitation of activity. The crucial events of cognitive development during infancy include separation, where infants learn to separate from objects in the environment; object permanence, where infants begin to realise that objects outside of the visual field still exist; and mental representation, which is defined as the use of symbols to think about an experience without experiencing it (Hockenberry & Wilson 2015).

### Memory

Various studies have shown that infants as young as several days old are able to recognise significant figures in their life. Evidence has also shown that infants as young as 4 months of age can recall individual actions. It is not until 9 months of age, however, that infants are able to remember the order of actions after long delays. Research suggests that after a 3-minute delay, infants (12 months) can remember about 70% of the way they play with toys. After 1 week, more than 50% is remembered and, after 4 weeks, infants can recall about 50% of the way they initially learned to play with toys (raisingchildren.net.au).

### Learning

Learning starts at birth and is a continuous process; infants learn through imitation, exploration, discovery and play. Infants learn through a variety of mediums including observation, making sounds and stimulation of the senses—including putting things in their mouth. Infants can also remember what they see and copy it at a later time (Boyce 2013).

**CRITICAL THINKING EXERCISE 12.1**

Natalie is 24 and has attended the maternal–child health clinic with her baby for a routine 8-week checkup. Natalie is curious about the stages of infant development and asks, 'How is my baby doing? How long should she be and how much should she weigh now? When will she start smiling and trying to roll onto her back?'

What subjective and objective data do you need before you answer? What will you tell Natalie in response to her questions?

# HEALTH RISKS/PROBLEMS

## Colic

Colic occurs in approximately 15–40% of infants and is defined as abdominal pain that is manifested as loud crying for longer than 3 hours per day, more than 3 days per week

for more than 3 weeks. Infants with colic are also observed to draw their legs up to their abdomen. Episodes usually occur in the late afternoon (Hockenberry & Wilson 2011). There is no known definitive cause, but theories related to rapid or improper feeding, air swallowing and intestinal factors have been identified as potential causes. There is no specific treatment for colic, but infants are treated primarily with changes in formula, environmental or behavioural interventions (Hockenberry & Wilson 2015).

### Failure to thrive

Failure to thrive (FTT) is diagnosed when the infant isn't growing at the expected rate. FTT can be organic (resulting from an acute illness), non-organic (psychological problem such as failure to bond) or a mixture of both. FTT is considered when the infant fails to gain or loses weight, exhibits a decline in growth progress of length and then head circumference. Treatment is directed at the cause—either the underlying disease or the environment (Harari, as cited by Thomson et al 2015).

### Skin disorders

Skin disorders such as nappy rash are relatively common in infancy. Nappy rash is a form of contact dermatitis most prevalent in infants ranging from 9 to 12 months of age. The development of nappy rash is directly related to contact with irritants, such as urine and faeces, which permits constant exposure to moisture leading to breakdown of the skin and an increase in microbial count. Treatment is directed first towards prevention (frequent changes of nappy, ensure thorough drying occurs) followed by application of barrier creams (Hockenberry & Wilson 2015).

### Sudden infant death syndrome (SIDS)

Sudden infant death syndrome is defined as the sudden death of an infant younger than 1 year of age that remains unexplained. Although much research has been carried out over the past 20 years into the mechanism of SIDS, no definitive cause has been identified. The incidence of SIDS peaks between 2 and 4 months of age.

Risk factors may include premature birth, low birth weight, being one of a multiple pregnancy, being exposed to maternal smoking in utero, prone sleeping position, infant overheating or overcooling, or a brainstem abnormality in the control of cardiorespiratory function (Cutz 2014).

The most effective strategy in reducing the incidence of SIDS has been the 'safe sleeping' campaign which aims to educate parents about the importance of putting baby on their back to sleep, keeping their face uncovered, avoiding exposure to cigarette smoke and ensuring the baby sleeps at the end of an uncluttered cot (no toys or bumper) (www.sidsandkids.org).

Sleeping on the back reduces the risk of SIDS. Tummy or side sleeping increases the risk of SIDS. Healthy babies placed to sleep on the back are less likely to choke on vomit than tummy sleeping infants.

Research has shown that sleeping baby in the same room, but not in the same bed, with the parents in the first 6 to 12 months of life is protective. This is thought to be because parents can see the baby and easily check to see that baby is safe. This protective effect does not work if the baby is in the room with other children, probably because the children do not know if the baby is safe or not. Recent evidence from the UK indicates that sharing the same room during baby's daytime sleeps is also protective (Moon 2011).

## GROWTH AND DEVELOPMENT OF THE CHILD

Childhood may be divided into two stages of development: early childhood (from 12 months to about age 5–6), and late childhood (extending from age 6 to adolescence). (See Table 12.8.)

### Physical development

Physical growth slows and steadies during the toddler and preschool years. The average weight gain is 1.8 to 2.7 kg per year and by about 30 months the birth mass has quadrupled. Preschoolers have an increase in weight of 2 to 3 kg per year. The toddler grows approximately 7.5 cm per year which is mainly due to elongation of the legs rather than the trunk. In comparison, the preschool child has a height increase of 6.5 to 9 cm which results in a more slender body appearance (Hockenberry & Wilson 2015) (see Table 12.8).

The rate of increase in head circumference also slows and by 1 to 2 years of age, it is equal to chest circumference. After the second year the chest circumference exceeds the abdominal measurement, the lower extremities grow and the child assumes a taller, leaner appearance. However, the toddler maintains a 'pot-bellied' appearance because of less developed abdominal musculature and short legs. By the end of toddlerhood most of the body systems are relatively mature. The internal structures of the ear and throat continue to be short and straight, and the lymphoid tissue of the tonsils and adenoids remains large. These circumstances account for a high incidence of ear, throat and upper respiratory tract infections during this stage of development (Hockenberry & Wilson 2015).

**TABLE 12.8 | Average height and weight measurements**

| Age | Average weight | Average height |
|---|---|---|
| 2 years | 12 kg | 86.6 cm |
| 5 years | 18.7 kg | 110 cm |
| 12 years | 40 kg | 150 cm |

*(Hockenberry & Wilson 2015)*

Towards the end of childhood, height increases by an average 5 cm/year and mass by about 2 to 3 kg/year. There is little size difference between the genders, although boys tend to be slightly taller and heavier initially but by the end of the school-age years, although both genders increase in size, girls do tend to surpass boys in both height and weight. Body proportions take on a slimmer appearance, as fat gradually diminishes and its distribution patterns change. Development of all body systems continues during middle childhood to become more efficient and adult-like in function. Bones continue to ossify, but ossification of small and long bones is not completed during this stage of development. By about age 12, all temporary teeth have been shed and most permanent teeth have erupted. In later childhood most systems are mature and can adjust to moderate stress and change (Hockenberry & Wilson 2015).

## Measurement

Children until the age of 3 should be weighed naked if possible. Sitting or standing scales are appropriate, depending on the child's condition, ability to stand or willingness to participate in the procedure. If distressed, the child can be weighed with a caregiver, and their weight subtracted from the measurement. Height is measured in children, and can be gained through use of an accurate tool, such as a tape measure on the wall (Hockenberry & Wilson 2015).

## Sensory

Visual acuity of 20/40 exists during toddlerhood, but depth perception continues to develop. Children's vision continues to develop throughout their preschool years. The senses become well developed, coordinated and associated with experiences, and taste/texture preferences become evident as children progress through to late childhood (Hockenberry & Wilson 2015). Reading is important during the early childhood years as young children develop strong visualisation skills as they 'picture' the story in their minds. A child should have their first eye exam by age 3 (sooner if vision problems run in the family) so the optometrist can check if vision is developing normally and catch any problems early. Vision should be checked again when the child enters school (www.childrensvision.com).

## Motor

Motor development continues rapidly during early childhood with the major development being locomotion. By 12 to 13 months toddlers can walk alone and by 18 months they try to run but fall over. Between 2 and 3 years of age, children develop improved coordination and balance, allowing refinement of the upright walking position (Hockenberry & Wilson 2013). Fine motor skills also develop, allowing for increasing manual dexterity.

The school-age child gains increasing control over muscular skills and coordination, allowing for development of skill in games such as football and improved fine motor control for activities such as drawing (Berman et al 2012). (Refer to Table 12.9 for developmental progression.)

## Cognitive

Cognitive processes develop rapidly, and the major achievement of early childhood is the acquisition of language. Reasoning skills remain primitive (and should be considered when managing behaviour) but recognition of causal relationships becomes apparent. Preschool children tend to use words without comprehending meaning while children can use concepts correctly, but usually only in the circumstances in which they were learned. By the time children enter school, events and actions can be transferred into mental representations and expressed verbally (Hockenberry & Wilson 2015).

### Perception

Within the preconceptual phase (2 to 4 years), children become dependent on perception for problem solving (Hockenberry & Wilson 2015). In addition to object permanence, another perceptual milestone of toddlerhood is the capacity to sort objects into categories based on traits such as colour or type. By six years of age, kids can represent the things they perceive with symbols and words.

### Memory

Memory develops in children from as young as 7 months and is enhanced throughout development by acquisition of knowledge, familiarity and repetition. By early preschool years, children can plan and sequence activities based on retained memory (Sheridan 2014).

### Learning

During the ages from 6 to 12 years the ability to think abstractly and to solve problems develops and improves. Verbal language skills are further developed with an increased vocabulary and fluency of speech. The ability to read becomes a valuable means of increasing knowledge. By approximately 18 months, experimentation is used to achieve goals and skills become important for the function they serve. During this phase, there is differentiation of self from others which is reflected in the child's ability to tolerate longer periods of separation from parents. By the beginning of the second year, the child is able to think and reason and the concepts of time, space and causality (cause and effect) begin to have meaning. By about age five, egocentric thinking is replaced partially by intuitive thought. The child begins to acquire the ability to use thought processes to make sense of experiences, events and actions. Piaget describes this stage of development as concrete operational (Hockenberry & Wilson 2015).

## Psychosocial

As a child learns through interaction with others, they become more specific in the expression of emotions, and begin to learn the effects of their own behaviour on others. Behaviour is involved with meeting psychological needs such as security, acceptance, approval and feelings of self-worth. Emotions can activate and direct behaviour in the same way as biological drives.

Relationships with others play an important role in emotional and personality development. As the child interacts

**TABLE 12.9 | Growth chart—infant to younger child**

| Age | Motor, communication, manipulative and social skills |
|---|---|
| 12–15 months | Walks on own, can creep up stairs and climb onto chairs. Can kneel without support, runs clumsily and falls often. Says 4–6 words including names, asks for objects by pointing and understands simple commands. Tolerates separation from parents, begins to imitate parents, less likely to fear strangers |
| 18 months | Assumes standing position, walks up stairs with one hand held, jumps in place with both feet, seats self on chair, throws ball overhead without falling, builds tower of 3–4 cubes, says 10+ words and forms word combinations, expresses emotions and may have temper tantrums, imitates others, beginning awareness of ownership |
| 24 months | Able to run, climb, walk up and down stairs alone. Begins to put two or three words together, begins to use pronouns. Imitates adult activities, can dress themself but not do up buttons. Plays with other children |
| 3 years | Goes up and down steps alone with two feet on each step, runs confidently, jumps, can ride a tricycle. Can say own name and sex. Listens to stories. Vocabulary of 300 words. Thinks egocentrically. Plays constructively, has sustained attention span, increased independence from parents, interacts with peers |
| 4 years | Catches a ball, can hop on one foot. Can lace shoes but not always able to tie knot, uses scissors to cut out picture following outline. Vocabulary of 1500+ words, uses sentences of 4–5 words, knows many letters of the alphabet and can count up to 10. May rebel if parents ask too much and take out aggression on them or siblings |
| 5 years | Recites and sings. Asks lots of 'why' and 'how' questions. Vocabulary of 2100 words, sentences of 6–8 words. Can use scissors. Plays cooperatively with others. Can skip and hop. Can identify colours. Increased vocabulary, enjoys jokes and riddles. Ties shoelaces, does up buttons. More independent. Strongly identifies with parent of the same sex |

*(Hockenberry & Wilson 2013; Marieb & Hoehn 2013)*

with other people they learn to cope more effectively, and an ability to cooperate or compete with others involves a sense of accomplishment. Every small success increases the child's self-image, and a positive self-image makes the child feel likeable and worthwhile. If a child is incapable of, or unprepared for, assuming the responsibilities associated with a sense of accomplishment, they may develop a sense of inadequacy or inferiority. It is generally recognised that if a child's need for love and security is not met they may become insecure and unable to relate effectively to others in later life. Therefore, throughout childhood, emotional and personality development depend largely on having psychological needs met. Emotional deprivation results in developmental retardation. Young children especially do not thrive if their main carer is hostile or indifferent to them and their needs (Mitchell & Ziegler 2012).

With increasing age, social development becomes less family dominant and other people exert an influence on the growing child, which is essential to learning and to developing a healthy personality. Each group the child becomes involved with, such as school friends, provides a social relationship of varying strength and type. One of the most important socialising agents in a child's life is the peer group with whom they explore ideas and the physical environment. Through peer relationships children learn ways in which to relate and deal with others, and such relationships are important factors in gaining independence from parents.

As a child interacts with peers they become aware that there are views other than their own. As a result the child learns to persuade, bargain and cooperate to maintain friendships. The child becomes increasingly sensitive to the social norms and pressures of the peer group, and the need for peer approval becomes a powerful influence towards conformity. Peer relationships in which a child experiences love and closeness from a friend seem to be important as a foundation for close relationships in adulthood (Guan & Fuligni 2015).

Although increased independence is the goal of middle to late childhood, children still feel secure knowing that there is someone, such as the parents, to implement controls and restrictions. With a secure base in a loving family, a child is able to develop self-confidence and independence (Mitchell & Ziegler 2012).

## Moral development

Young children (2 to 4 years) have a limited understanding of moral judgment and judge actions depending on their result (reward or punishment). By 4 to 7 years, children begin to develop a sense of justice and fairness; however, their focus remains on satisfying their own needs rather than the needs of others. During school-age years, children begin to identify with the values and morals of their parents, develop awareness of acceptable behaviour and demonstrate guilt when these are violated. By age 6 to 7, although children are aware of rules and behaviours, they may not know the rationale behind

**TABLE 12.10 | Developmental stages according to Kohlberg**

| Stage | Age | Behaviours |
|---|---|---|
| Preconventional | Infant (birth–12 months) | Amoral stage<br>Punishment and obedience |
| Preconventional | Toddler (1–3 years) | Stage 1: Punishment and obedience<br>Children obey rules to avoid punishment and to obtain reward but they have no understanding of the reasons why they must obey rules<br>Stage 2: Instrumentalist relativist orientation<br>Behaviour fits the child's own needs, sharing and loyalty are not seen |
| Preconventional | Preschool (3–6 years) | Stages 1 and 2<br>Stage 3: 'Good girl or boy, nice girl or boy'<br>Conscience emerges, likes conforming to norms, seeks approval, behaviour is based on avoiding punishment or gaining rewards |
| Preconventional (<9 years) | School age (6–12 years) | Stage 4: Law and order<br>Obeys rules, respects authority |
| Conventional | 9–20 years | Stage 5: Social contract, utilitarian orientation<br>Behaviour and morals based on societal norms, increased desire to please others and 'be good' |

*(Hockenberry & Wilson 2013)*

them but by the older school-age period, an ability to judge behaviour based on intent rather than consequence is observed (Hockenberry & Wilson 2015) (refer to Table 12.10).

### Spiritual development

Spiritual development parallels cognitive development and is strongly influenced by the child's family and environment. Toddlers, unable to distinguish between make-believe and reality, learn about values and beliefs through the actions of those closest to them. By the preschool period, children have a more concrete perception of values and beliefs but remain unable to fully understand religious rituals (Hockenberry & Wilson 2015).

## HEALTH RISKS/PROBLEMS

### Injury

Once the infancy period has passed, deaths from injury emerge as the leading cause of mortality for children. In Australia the age group most likely to sustain injury is the 0–14 years age group, with a reported prevalence of 25% (Australian Bureau of Statistics 2012).

Injuries sustained in childhood include:

- Transport accidents where the child was either an occupant of a motor vehicle or a pedestrian
- Accidental drowning (children < 5 years of age are most vulnerable, more boys than girls)
- Suffocation or choking
- Burns
- Falls
- Poisoning.

The overall decline in injury deaths is partly due to injury prevention and safety promotion factors including speed limit initiatives, improved car safety including car seat installation, improved emergency and medical response and emphasis on safety in the home (childproofing cupboards, safety plugs in electrical outlets, supervision) (www.abs.gov.au).

**CRITICAL THINKING EXERCISE 12.2**

Annabelle is a 13-month-old toddler (see Clinical Interest Box 12.1) admitted to the paediatric ward following a fall sustained in the home. What developmental milestones and theories are related to Annabelle sustaining this injury? What impact could this fall have for Annabelle's family? What is the role of the paediatric nurse in this situation?

**CLINICAL INTEREST BOX 12.1**
**Childhood safety**

Annabelle is 14 months old and curious to explore the world. She is in the care of her grandmother when she attempts to crawl down a flight of stairs when unsupervised. As Annabelle's grandmother is not a regular carer for her granddaughter, the house is not 'toddler proof'.

Because locomotion is the major gross motor skill acquired during toddlerhood and Annabelle is striving to develop autonomy through experiences, safety becomes a high priority.

## Child maltreatment

Child maltreatment refers to any non-accidental behaviour by parents, caregivers, other adults or older adolescents that is outside the norms of conduct and entails a substantial risk of causing physical or emotional harm to a child or young person. Maltreatment may be intentional or unintentional and includes acts of omission (i.e. neglect, where a caregiver fails to provide the child's basic needs and an adequate level of care) or commission (i.e. physical, sexual or emotional abuse) (Hockenberry & Wilson 2015). Maltreatment can occur as a single incident, but usually takes place over time. Maltreatment can prevent children from reaching their growth and development milestones and can have long-lasting effects.

### Physical abuse

Physical abuse occurs when a child is physically hurt and it is *not* an accident. Bruises from being hit, burns, broken bones, babies being shaken and strangulation may be indicative of physical abuse.

### Emotional abuse

Wearing down the child's self-esteem and self-worth by putting the child down, criticising, shaming or rejecting the child, or never showing love or warmth are types of emotional abuse. Exposing a child to a negative environment (abuse between parents) can also affect a child's emotional state (Health Insite 2014).

### Sexual abuse

Sexual abuse is any sexual behaviour imposed on a child. Sexual abuse happens to both boys and girls and includes behaviour such as exhibitionism (purposely showing sexual organs), sexually suggestive comments and behaviour, fondling the child in a sexual way, making the child caress the abuser, oral sex or putting a finger, penis or anything else into the child's vagina or anus (Health Insite 2014).

### Effects of child abuse

Effects of child abuse are many and vary from child to child. A child who has been abused may have any or several of the following characteristics:

- Bruising, broken bones, burns
- Anxiety or low self-esteem
- Malnutrition or poor weight gain
- Poor school attendance
- Physical or intellectual developmental delay
- Dirty body, dirty clothes, unwashed hair
- Sad affect
- Self-destructive behaviour
- Abusive to the next generation of children
- Difficulty trusting others
- Feeling guilty even though it is not their fault
- Fear of having nappy changed or being bathed
- Sudden avoidance of familiar adults or places
- Difficulty dealing with emotions

In some cases they may die.

(Health Insite 2014)

The primary responsibility of the nurse is to identify abusive situations as early as possible and report concerns. All information gained during care of the child and family should be accurately documented in case of legal proceedings. For further information refer to Chapter 2. Care given to the child must be sensitive to their needs and they should be treated as any other child, rather than as a victim of abuse.

### Mandatory reporting

All suspected cases of child maltreatment must be reported under mandatory reporting laws. Reporting is the responsibility of any person who believes, on reasonable grounds, that a child is in need of protection and the child's parents are unable or unwilling to protect the child. In addition, anyone who suspects that a child is being abused and/or neglected or is at risk of being abused and/or neglected may make a report to child protection authorities (SECASA 2015).

### Legally mandated notification

Certain professionals must report to child protection services when, in the course of their duty, they 'form the belief on reasonable grounds that a child is in need of protection because the child has suffered, or is likely to suffer, significant harm as a result of physical injury and the child's parents have not protected or are unlikely to protect the child from harm' (Victorian Government 2015). Legally mandated professions include nursing. Reasonable grounds to report include when a child states they have been physically or sexually abused, a child states they know someone who has been abused, or a relative, friend or acquaintance or sibling of the child states that the child has been abused. Professional observations of the child's behaviour or development that led to the formation of a belief that the child has been abused, or if there are signs of physical or sexual abuse, must also be reported. Mandatory reporting takes precedence over maintenance of confidentiality and should be done without delay when grounds for the existence of abuse exist. A nurse does not have to prove the abuse has occurred (Victorian Government 2015).

## Obesity

The number of overweight children in Australia has doubled in recent years, with a quarter of children considered overweight or obese. Obesity not only causes health problems but can lead to social problems such as being teased by peers and the potential to develop low self-esteem and body image concerns. Being overweight and obese poses risks to the child's long- and short-term health as overweight children are very likely to become overweight adults (Better Health Channel 2015). Risk factors include:

- Poor food choices
- Lack of physical activity
- Increased levels of sedentary activity
- Overweight parents
- Genetics.

## Chronic illness

Improvements in healthcare services and technology, and reduced mortality rates, have led to an increased number of

children in the community living with chronic illness. The most common chronic illnesses experienced by children include cystic fibrosis, asthma, neurological impairment and cancers (Hockenberry & Wilson 2015).

The prevalence of asthma is increasing worldwide. Tobacco use is likely to be a key factor in higher rates of respiratory-related illnesses such as asthma. The principles of caring for children and families experiencing chronic illness include maintaining normalcy, supporting growth and development and promoting family-centred care in either the hospital or the home environment.

## FACTORS INFLUENCING GROWTH AND DEVELOPMENT

A person's development is influenced both by genetic factors and by the environment. Genetic factors are often referred to as the natural forces that influence development, while environmental factors are referred to as the nurturing forces. It is difficult to separate the effects of 'nature' and 'nurture', as individual development is affected by the interaction between these two forces. Another factor that influences development is maturation, which is a genetically programmed sequence of physical changes that is independent of environmental circumstances. Many behavioural changes that occur in the early months of life are related to maturation of the nervous system, muscles and glands. These changes represent a continuation of the growth processes that guide the development of the fetus within the uterus. Although maturation is not controlled by the environment, it can be accelerated or impeded by the quality of the environment and by life experiences.

### Genetic factors

Genetic factors influence many aspects of an individual's physical and psychosocial being. Research indicates that, as well as determining physical characteristics, genetic factors also influence parts of an individual's psychological makeup, such as temperament.

The central structure of a living cell is its complement of genes, which are located on the chromosomes within the cell nucleus. In humans, each cell normally contains 46 chromosomes and when fertilisation occurs the sperm and the ovum unite, each contributing 23 chromosomes to the zygote, which replicate in every cell of the body as the embryo develops (Figure 12.8).

Because of the high number of genes in each chromosome, 'shuffling' during replication and because during cell division each pair of chromosomes sorts randomly into the daughter cells, it is extremely unlikely that any two human beings would ever have identical genetic makeup, even with the same parents. One exception is identical (monozygotic) twins who, having developed from the same ovum, have exactly the same chromosomes and genes (Sigelman & Rider 2011). The single cell formed at fertilisation is capable of multiplying and developing into a fetus, with its sex and other characteristics, such as hair and eye colour, racial

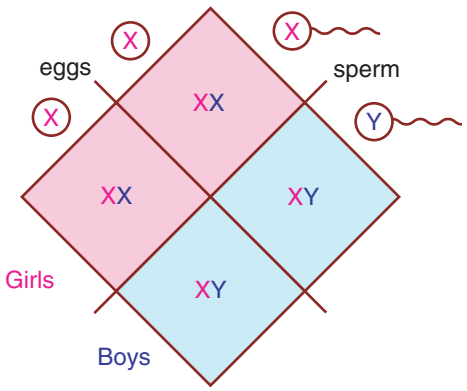


**Figure 12.8** Sex determination
*(Modified from Leifer 2010)*

characteristics and physical stature predetermined. Each person's genetic structure is unique and lifelong, so heredity affects all stages of development. While each person's capacities are inherited, the extent to which they are used in development is influenced by the environment (Marieb & Hoehn 2013).

### Environmental factors

The hereditary potential a person is born with is greatly influenced by the environment they encounter. Therefore, the environmental conditions to which an infant is exposed are a major influence on development. 'Environment' refers to the people with whom an individual has contact, the experiences they have throughout life and the physical surroundings they are exposed to.

Attachment and bonding are the processes by which the parents/carer and infant establish a relationship. Both parents/carer and the infant have a role to play in the attachment process, whereby each establishes emotional ties with the other. As the parent/carer responds to the infant, the infant responds to the parent/carer; for example by cooing or eye contact. Creating a situation in which the parent's/carer's and the infant's eyes meet in visual contact is significant in the formation of emotional ties. Research has suggested that this early social attachment provides the security necessary for infants to explore their environment and that it forms the basis for interpersonal relationships in later years (Hockenberry & Wilson 2015).

Early stimulation is important in providing the background necessary to cope with the environment at a later stage. Stimulation is provided by handling the infant, allowing them to move about freely and assume different positions, and by providing conditions whereby the infant receives visual and auditory stimuli, such as coloured objects, mobiles and the sounds of voices and music. Many studies indicate that a stimulating early environment is important for later intellectual development. Conversely, too much stimulation too soon could be upsetting for an infant, who may exhibit distress at being unable to respond to multiple stimuli (Smith & Hart 2010).

Through its various functions, the family exerts a major influence on development. It is through the family

environment that the individual first learns about self, the world and their place within a society. Initially the individual adopts the family's values and belief systems. Family functions include providing love and security, meeting the basic needs such as food and warmth, facilitating emotional and social development and helping the individual to learn about society, roles and behaviours (Hockenberry & Wilson 2013).

Factors within the everyday environment, such as nutrition, housing and socioeconomic status, have been found to influence development. For example, the adequacy of nutrients in the diet influences how physiological needs are met, and subsequent growth and development. When a diet is lacking in adequate nutrients, deficits in height, weight and developmental progression occur. In comparison, obesity results from a kilojoule intake greater than is required and can be attributed to hereditary, social, cultural or psychological factors. Obesity is rapidly becoming a significant health issue with children as young as 5 years affected. (Refer to Clinical Interest Box 12.2.)

## CLINICAL INTEREST BOX 12.2 Childhood obesity

### Facts about childhood obesity

- Results from the 2011–12 Australian Health Survey show that one-quarter (25%) of children aged 2–17 are overweight or obese, with 18% being overweight and 7% obese. The proportion of boys who are overweight or obese is not significantly different from girls (25% compared with 26%).
- Rates of overweight and obesity are similar across age groups, ranging from 23% for children aged 2–4 to 27% for adolescents aged 12–15. Boys aged 5–7 have the highest obesity rate (9%), and obesity among girls is most common at ages 5–7 and 16–17 (8%).
- The proportion of children and adolescents aged 5–17 who are overweight or obese increased between 1995 and 2007–08 (21% and 25%, respectively) but has remained stable to 2011–12 (26%).
- Obese children have a 25–50% chance of being obese as an adult and this might be as high as 78% in older obese adolescents.
- Children who are overweight or obese are at increased risk of developing certain health conditions, such as cardiovascular conditions and type 2 diabetes, compared with children of normal weight. They also have a higher risk of psychological and social problems, such as discrimination, victimisation and bullying. Obesity, in particular, may continue into adulthood and affect long-term health.

*(Australian Bureau of Statistics 2009; Ministry of Health 2009; AIHW 2012)*

## Demographic factors

Demographic characteristics include age, gender, race, socioeconomic status and education, all of which have the potential to affect health and health risks (Hockenberry & Wilson 2015). Age is considered the most influential factor when considering health promotion and disease prevention (e.g. children under 5 years of age and particularly infants are at higher risk than the rest of the population for respiratory syncytial virus).

## Socioeconomic factors

Socioeconomic status can exert significant impact on a child's growth, development and access to health services. Poverty can lead to inadequate nutrition and poor hygiene, and lack of education in combination with poverty can lead to limited access to healthcare. Lower levels of education can produce an inability to read information, and poor levels of involvement in health prevention (including immunisations and dental care).

### CRITICAL THINKING EXERCISE 12.3

Amy, aged 3, is admitted to your ward for elective surgery to remove her tonsils. Her weight is 25 kg and you notice on admission that she is very pale and doesn't attempt to communicate either verbally or physically with her mother or you. You ask her mother if she is normally very quiet and she tells you 'she never speaks, she just sits and watches television all day'. What physical and psychological factors may be affecting Amy's growth and development? According to developmental theory and milestone development, what would you expect to observe when assessing Amy? As a nurse, how would you educate Amy and her mother on the importance of diet and exercise?

# CULTURAL DIVERSITY

Beliefs related to health, causes of illness and treatments are strongly linked to culture. Nurses involved in the care of children and families from diverse cultures must recognise individual practices and respect family choices without displaying judgment. Examples of cultural practices seen in healthcare include 'coining' which is an Asian practice where a coin is repeatedly rubbed on the skin to rid the body of disease; coining results in welts which may appear as signs of abuse. Traditional herbal remedies can also be utilised by some cultures to treat various ailments; the role of the nurse is to elicit this information from the family and work with the medical team to identify any adverse interactions with prescribed treatment regimens (Hockenberry & Wilson 2015).

## Indigenous children

Indigenous children can have many health problems. Babies are more likely to be underweight, suffer from middle ear infections, malnutrition and exposure to cigarette smoke, all

of which have been linked to problems with mental development and disorders including anaemia and recurring infections. Indigenous people are nearly twice as likely to be admitted to hospital as non-Indigenous people. For children aged 15 years and under, the main reasons for hospitalisation include diseases of the chest and throat, injuries caused by accidents and middle ear infections (Better Health Channel 2015).

Hearing loss during childhood has a significant effect on speech and language development as well as emotional, social and educational development. Otitis media affects up to 40% of the Australian Indigenous population. The prevalence of otitis media can be directly linked to poor living conditions, poor nutrition, lack of hygiene and lack of access to appropriate health services. Primary prevention strategies are aimed at improving the environment and nutrition, increasing breastfeeding, reducing passive smoking and increasing access to health screening and treatments (Levi et al 2013). Perforation of the tympanic membrane occurs in up to 50% of otitis media cases and can result in permanent hearing loss.

**CRITICAL THINKING EXERCISE 12.4**

James is a 7-year-old Indigenous boy. His teacher has noted his poor school performance and apparent reduced hearing capacity and is concerned. She requests a referral to the school nurse. What could be causing James's poor school performance? What socioeconomic and cultural influences could exert an impact on James's situation? What is the role of the school nurse in providing care for James?

## HEALTH PROMOTION

Health promotion enables individuals to determine the influences on their health and identify strategies for how health can be improved. Many hospitals now produce fact sheets that outline potential hazards and strategies to prevent injuries from occurring (such as bicycle helmets). Health promotion must meet the needs of the child and family and be delivered using developmentally appropriate methods such as posters and storybooks for younger children and computer technology for the older population.

## PAEDIATRIC NURSING CARE

Nursing care of infants and children is directed towards promoting the optimal level of health for the individual and family. Knowledge regarding specific health problems and needs of each age/developmental phase is essential to the provision of individually appropriate care. The nursing role involves disease and injury prevention, health promotion, involvement of the family in care provision, health teaching, participating in a team approach to care and implementing measures to meet the physical, emotional, social and cultural needs of each individual in a developmentally appropriate manner. Because children are not 'little adults', their growth, development, reactions to illness, interventions, treatment and separation from family all influence care planning and delivery.

The role of a paediatric nurse can be described as that of carer, coordinator, educator and emotional support and resource person. The nurse involved in paediatric care, together with other members of the paediatric team, needs to adopt a holistic attitude towards caring for the child and parent(s)/carer(s) as a family unit. Many healthcare facilities recognise the need for family-centred care and adopt a philosophy to meet the needs of the family as a unit. Family-centred care recognises the family as the constant in the child's life and its pivotal role in shaping the hospital experience for their child. As such, supporting, respecting, involving and educating the family strengthens the partnership between health professionals and family.

### Nursing children in a hospital setting

Paediatric nursing recognises the role of the family as the constant in the child's life and their primary source of support and strength. As such, nurses should provide care based on principles of collaboration, partnership, sharing of knowledge, negotiation and respect (Hockenberry & Wilson 2015).

Hospitalisation is often the first stressful event in a child's life and they may lack the coping mechanisms to manage stressors. The causes of stress differ across the developmental continuum; however, the most common regardless of age/developmental stage are separation anxiety, loss of control, injury and pain. Responses to stress also differ according to their age, previous experience with illness/hospitalisation, innate or acquired coping skills, seriousness of the diagnosis and availability of support systems (Hockenberry & Wilson 2015). Although negative responses to hospitalisation can occur, there can also be beneficial outcomes such as developing resilience, coping skills, socialisation experiences and recovery from illness.

Practical approaches to caring for the hospitalised child include:

- Preparing the child and family for admission prior to hospitalisation using a pre-admission hospital orientation, multimedia or other developmentally appropriate strategies
- Encouraging family involvement in care delivery
- Minimising separation
- Minimising fear and anxiety through provision of developmentally appropriate explanations
- Allowing children to familiarise themselves with medical equipment if appropriate
- Encouraging involvement in medical play
- Assessing the child in a non-formal manner—during play is an optimal time for assessment
- Referring to developmental play therapists as necessary
- Offering some degree of choice (you have to have the medicine, but do you want the green or the red mixture?)
- Maintaining the child's routine (to the greatest possible extent)
- Encouraging independence.

## CASE STUDY 12.1

Amy is a 3-year-old girl admitted to the paediatric ward for removal of tonsils and adenoids (TandA). She was diagnosed with obstructive sleep apnoea (OSA) (confirmed by overnight oximetry), but has not been admitted to hospital previously. She is the eldest child of parents Michael and Jennifer who also have a baby aged 3 weeks. During admission, Jennifer indicates that Amy is a well child who is having her TandA removed for OSA which is manifested by loud snoring and an average of 10 episodes of apnoea (up to 20 seconds) per night. Jennifer states that Amy has no surgical history, her immunisations are up to date and she has been previously well apart from the 'normal childhood coughs and colds'. Jennifer indicates because of the new baby and keeping a close eye on Amy during the night, she is very tired. Michael works long hours as a bank manager and is rarely home before 8 pm, which means Jennifer is responsible for the majority of the children's care needs.

1. What is the relevant data in this clinical scenario?
2. Relate the significance of the data to the situation.
3. Develop a list of questions for inclusion in your nursing assessment.
4. Identify the rationale for these questions.
5. Discuss how your strategies would change when admitting a child rather than an adult to hospital.
6. What preoperative education would you provide to Amy and her family? How would you deliver this education?
7. How could you involve Jennifer in Amy's care during hospitalisation?
8. What support services/allied health referrals may be needed by this family? Justify your response.
9. What are the potential impacts of hospitalisation on Amy and on her family?

## DECISION-MAKING FRAMEWORK EXERCISE 12.1

Madeleine is a student Enrolled Nurse currently undertaking clinical placement on the paediatric ward of the local hospital. She is caring for 3-year-old Amy who is scheduled to undergo an elective tonsillectomy this afternoon. Amy has been reviewed by the anaesthetist who ordered a pre-medication to be given prior to surgery. Amy has not yet been reviewed by the surgeon and her mother has yet to sign the consent form.

Madeleine has completed the preoperative assessments and has been informed that the operating theatre is now ready for Amy to be transferred to preoperative hold. Madeleine knows that Amy has been ordered a pre-med; however, she also knows that pre-medication should not be given before the consent form is completed. Madeleine also knows that she is not permitted to give paediatric medications until she has achieved 100% in her medication calculations assessment.

1. Should Madeleine give the pre-medication? Consider the following:
   - What is the hospital policy regarding administration of pre-medications?
   - Have staff in preoperative hold been informed that the consent form has yet to be signed?
   - Has Madeleine or the RN informed the surgeon of the situation?
   - Is preparation and administration of medication without direct supervision within Madeleine's scope of practice?
   - Will administration of the pre-medication comply with accepted standards of nursing practice?
   - Have any potential risks of administering the medication been identified?
   - Is her preceptor adequately supporting Madeleine?
   - Does Madeleine have the required level of education and supervision available?

See Case Study 12.1 and Decision-making Framework Exercise 12.1 for exercises about nursing children in a hospital setting. The Progress Note Example 12.1 also shows a sample of an entry in nursing notes.

## PROGRESS NOTE EXAMPLE 12.1

| | |
|---|---|
| 12/01/2016<br>1430 hrs | Nursing: Amy is a 3-year-old girl admitted to the paediatric ward this morning. She has a history of obstructive sleep apnoea (OSA) and is scheduled for removal of tonsils and adenoids this afternoon. Assessment on admission: T: 37.2, HR: 106, RR: 24, weight 14.5 kg, no known allergies, immunisations are up to date. Amy has been fasting since an early breakfast at 0700 this morning. Prepared for theatre, two arm bands in situ, refusing theatre gown so remains in own pyjamas. Awaiting anaesthetist visit, mum yet to sign consent form. Amy and mum orientated to the ward and preoperative education completed.<br>***L. Adams* (Adams) EN** |

## Nursing care of the infant and child

Communication strategies should reflect the developmental stage with the use of appropriate verbal and non-verbal strategies. Developing language ability can cause problems when symptoms need to be described so the focus in the younger age groups should fall to non-verbal cues such as their activity levels and posture. Securing parental/carer involvement is imperative for the younger child; however, as children get older, they should be offered greater choices regarding level of involvement in procedures (where appropriate) and presence of parents/carers. Assessment should follow a least-to-most intervention format as the irritable infant or child can distort assessment findings. If possible, assessment should occur during normal interaction or play. When interacting with a child, the nurse must offer explanations as appropriate,

## CLINICAL INTEREST BOX 12.3 Play

- Children should be given choices regarding some elements of their care, and toys are an ideal way to give them both choice and control.
- Medical play is play with real medical equipment and often dolls, which allows children a non-threatening way to learn about and familiarise themselves with medical procedures, equipment, hospitals, medical officers and nurses.
- Through medical play, children can express fears about their hospital experience that they may be unable to express verbally.
- Infants will look at, handle, mouth and generally become familiar with medical equipment. Preschool children will re-enact medical events on dolls or stuffed animals while school-age children will explore medical equipment, allowing them to gain insight into the procedures and roles of staff and work through feelings within a controlled environment.

## CRITICAL THINKING EXERCISE 12.5

Thomas is a 7-year-old boy who presents to outpatient clinic with his parents for review of a painful left knee. Thomas has been complaining of pain and reduced mobility for approximately two weeks. On examination, his knee is red and swollen; he is unable to full weight bear on this leg. The orthopaedic surgeon diagnoses osteomyelitis which will require surgical incision and washout. He is scheduled for admission to hospital in 2 days.

Thomas has never been hospitalised before and is very anxious. His parents are unsure about how to prepare him for this experience. How should Thomas's parents prepare him for hospitalisation? What resources are available to help prepare Thomas for hospital? What information would you give to Thomas's mother, who would like to stay overnight with him in hospital? How can the concept of pain be explained to Thomas?

be truthful and gain the trust of both child and parent/carer. For further information on caring for the hospitalised child refer to Chapter 21.

Hospitals can be strange and scary places for children. Children are faced with unfamiliar people (the staff), separation from family and their home environment, painful or distressing procedures and different foods, smells and sounds. Negative hospital experiences can interfere with recovery and can inhibit normal growth and development. It is not unusual for a child to react to hospitalisation by crying or having tantrums and they may regress in their behaviour (e.g. revert back to bedwetting) or become withdrawn. Play is a way to help children cope with hospitalisation and reduce their stress levels. Play allows the child to participate in activities 'normal' to them, enables developmental progression and learning and offers a distraction from painful procedures or treatments (The Royal Children's Hospital Melbourne 2016) (refer to Clinical Interest Box 12.3).

Maintaining safety of the infant or child in hospital and promoting safety in the home is an important role for the paediatric nurse. Certain age groups, as their curiosity and mobility increases, are at increased risk of injury or illness. While the child is in hospital, the nurse should ensure they are free from exposure to dangerous situations such as boiling water, slippery floors, medication, chemicals or lack of cot sides which prevent falling from bed.

## CHILD HEALTH SERVICES

There are a variety of child health services whose broad aims are promoting the health of infants and children, providing parental/carer support and caring for the child who is ill. Many of the services are involved in preventing illness, health promotion and monitoring the health of children from birth. Preventative services include maternal–child health clinics and school health services.

Maternal–child health services support parents/carers and provide information on a variety of topics such as hygiene, nutrition, growth and development, and illness prevention strategies such as immunisation. These services play an important role in assessing growth and development and undertake screenings for various disorders (physical, metabolic, neurological). The maternal–child health nurse also consults with paediatricians on health problems, refers to other health professionals as required and offers parents the chance to meet other parents/carers to access information and support. The nurse also keeps comprehensive records that include information on the child's growth and development, immunisations and illnesses. These records are important tools for assessment and for detecting situations that require early intervention and preventive action. Refer to Table 12.11 for general trends in height and weight during childhood.

School health services are directed towards health promotion and early identification of and intervention for health concerns. School nurses provide specific health assessment activities for children at school entry and during school life. They undertake vision screening and hearing testing, immunisation, accident and injury prevention, nutrition assessment and guidance, positive parenting and asthma management, while maintaining regular contact with students, teachers and parents. Secondary school nurses have a key role in reducing negative health outcomes and risk-taking behaviours among young people. The role specifically encompasses individual health counselling, health promotion and planning, and is a resource and referral service to assist young people to make healthy lifestyle choices (www.education.vic.gov.au). (See Nursing Care Plan 12.1.)

Child guidance clinics staffed by educational psychologists, social workers and psychiatrists are available to assess

**TABLE 12.11 | A summary of general trends in height and weight during childhood**

| Age group | Weight | Height |
|---|---|---|
| Birth–6 months | 140–200 g/week<br>Birth weight doubles by 4–7 months | Monthly gain 2.5 cm |
| 6–12 months | 85–140 g/week<br>Birth weight triples by end of first year | Monthly gain 1.25 cm<br>Birth length increases by 50% by end of first year.<br>Height at 2 years is 50% of adult height |
| Toddler | Birth weight quadruples by 2½ years | Gain during second year 12 cm<br>Gain during third year 6–8 cm |
| Preschooler | Yearly gain 2–3 kg | Yearly gain 5–7.5 cm<br>Birth length doubles by age 4 years |
| School age | Yearly gain 2–3 kg | Yearly gain after age 7 is 5 cm<br>Birth length triples by age 13 |
| Females 10–14 years | Weight gain 7–25 kg<br>Average 17.5 kg | Gain is 5–25 cm<br>Average 20.5 cm |
| Males 10–14 years | Weight gain 7–30 kg<br>Average 23.7 kg | Gain is 10–30 cm<br>Average 27.5 cm |

*(Chiocca 2011)*

## NURSING CARE PLAN 12.1

**Assessment:** Suzie and her mother present to the community maternal–child health nurse (MCHN) for her 6-week health and development appointment. During discussion, Suzie's mother indicates that Suzie has not been feeding well, vomits small amounts of undigested milk after every feed and has lost weight since her birth. The MCHN weighs Suzie and finds that she is below the 50th percentile on the growth chart.
**Issue/s to be addressed:** Poor feeding
Weight below 50th percentile on growth chart
Failure to thrive
**Goal/s:** Suzie's mother will receive adequate education in both written and verbal forms to ensure adequate nutrition
Suzie will tolerate small frequent feeds with nil vomiting
Suzie will gain weight by next MCHN visit in 2 weeks

| Care/Actions | Rationale |
|---|---|
| Suzie to be fed with small frequent feeds | Increase caloric intake to assist weight gain |
| Thickener to be added to feeds | Identify change in condition or pattern of vomiting |
| Mother to record episodes of vomiting | To ensure Suzie does not become malnourished or dehydrated |
| Suzie to remain in upright position for feeding and for 20 minutes post feeds | To promptly identify and manage any concerns before condition deteriorates |
| Elevate head of bed | |
| Mother to receive education related to assessment of hydration and nutritional status | |
| Mother to notify MCHN/GP if nil improvement in condition | |

**Evaluation:** Suzie will gain weight before next MCHN visit.
Mother is able to identify correct feeding techniques and signs of malnourishment and dehydration.

children and provide services to help children overcome difficulties. The services assist children who show evidence of emotional instability or psychological disturbance to attain personal, social or educational readjustment. Children with mental or physical impairments are provided for by health, education and social services. Integration in ordinary schools is promoted so that all children can receive education, irrespective of the degree of their disability. In some instances this may not be possible and it may be necessary to provide education at home or in a special school. Every effort is made

to ensure that a mentally or physically impaired child can develop to their fullest potential (Department of Education and Early Childhood Development 2011).

## NEEDS OF INFANTS AND CHILDREN

The needs of children throughout the various stages of development are both physical and psychosocial. Physical needs include the need for food, water, oxygen, elimination, warmth, safety and protection. Meal times should be pleasant unhurried occasions and the environment should be one that enables children to enjoy meals. Psychosocial needs include the need for love and affection, security, dependence and independence and self-development. When physical or psychosocial needs are not met, children experience disruptions to their biological, emotional, social or educational growth and development. When needs are not met there are a variety of effects on the child, such as a greater incidence of disease and accidents, failure to thrive, behavioural problems, delayed language skills, antisocial behaviour such as conflicts with the law or substance use and abuse, learning difficulties and social inadequacy.

## Summary

Growth and development are processes that begin at conception and continue throughout each stage of the life cycle. Growth may be defined as the physical changes that occur in a steady and orderly manner, while development relates to changes in psychological and social functioning. The stages of growth and development are generally described as being prenatal, infancy, childhood, adolescence and adulthood. Characteristic changes occur at each stage, but the pace and behaviours of growth and development vary with each individual.

To care for individuals from infancy to late childhood the nurse first requires knowledge of normal growth and development. Infancy and childhood are unique phases of development accompanied by special needs. The paediatric nurse needs to develop certain skills to provide a high quality of individualised family-centred care to children and their families.

## Review Questions

1. Define fertilisation. Where does it normally occur?
2. Explain the importance of the placenta and umbilical cord to fetal growth.
3. Outline some of the major developmental changes during fetal development.
4. There are several theories about the various stages of growth and development, particularly in regard to infants and children. Name the stages according to Erikson and Piaget.
5. Identify the significant factors that influence growth and development during childhood.
6. List the developmental stages of early childhood and briefly outline the changes that occur during each phase. (Early childhood: toddler and preschool years (12 months–6 years of age).)
7. Identify the role of a children's nurse in various clinical settings.
8. Why are children aged less than 5 years most vulnerable to drowning?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australian Bureau of Statistics: www.abs.gov.au

Better Health Channel: www.betterhealth.vic.gov.au/

Children's Vision Information Network: www.childrensvision.com

Health Insite: www.healthinsite.gov.au

Maternal Child Health Service: http://www.education.vic.gov.au/childhood/parents/mch/Pages/about.aspx

http://www.education.vic.gov.au/school/parents/health/pages/nurses.aspx

http://www.secasa.com.au/sections/for-students/about-mandatory-reporting/so-when-do-you-report/

http://www.dhs.vic.gov.au/data/assets/pdf_file/0008/618983/CYF_responding-to-child-abuse.pdf

Raising Children Network: www.raisingchildren.net.au

Sids and Kids: www.sidsandkids.org

The Royal Children's Hospital Melbourne: www.rch.org.au

CHAPTER 13

# Nursing care across the lifespan: late childhood to adolescence

*Jean Elizabeth Ross*

## KEY TERMS

adolescence
anorexia nervosa
body image
bulimia nervosa
cognition
concrete operational stage
cultural differences
formal operations
health promotion
hormonal production
identity
menarche
morals and values
peer group
physical development
preadolescence
primary sex characteristics
psychosocial development
puberty
risk-taking behaviours
rite of passage
secondary sex characteristics
sexuality
social relationships
substance abuse
suicide

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Describe the physical changes that occur at puberty
- Discuss the changes that occur during adolescence
- Discuss factors influencing the growth and development of the adolescent
- Identify the role that 'others' have during adolescence (peers, family and friends)
- Plan health promotion activities for a group of adolescents

## CHAPTER FOCUS

Adolescence is the transitional stage between being a child and becoming an adult. For the child it is a time marked with many changes, from the most obvious physical ones to the more intrinsic cognitive, emotional and attitudinal changes. It is a time that is packed with milestones and incorporates many rites of passage. Although there are many guides to providing care for the adolescent, the rates of change for the child can vary considerably, so that each adolescent must be cared for individually and according to the stage that they are at. This chapter takes a holistic look at the preadolescent and the adolescent and helps guide the reader through the often complex route between being a child and developing into an adult. While this chapter discusses both the preadolescent and the adolescent experiences, the use of the term adolescent often encompasses all stages of adolescence.

An understanding of preadolescent and adolescent development is essential for nurses in their daily practice. This is the period in the lifespan where the individual, previously reliant on parents and carers for values and identity, becomes independent and, in this move towards independence, attempts to create a new and personal identity. It is a time when group identity is vital, often a time of experimentation with self-image, and a time to question family values and beliefs. It is a period of rapid and complex changes. This chapter highlights the growth and development of the adolescent and helps the nurse to understand how to use this knowledge to provide optimal nursing care for the adolescent when hospitalised or treated within the community.

## LIVED EXPERIENCE

I can't believe that my parents don't understand how busy I am and how annoying they are! With all the things I have to do they still expect me to drop everything when they need me to help out with my sisters. I hold down a part-time job, try to play netball and am expected to get over 80 in all my assessments if I want to get to uni next year. I'm trying to get my Ps and go to some of the gigs that the others seem to have no trouble fitting in. When I try to talk to the parents they end up telling me what I should do, but really I just want them to listen to me. When it suits I'm an adult and other times just a kid.

**Marnie, aged 17**

Having teenagers is much harder than childbirth! No matter what we say or do it's the wrong thing. Marnie is so busy with school, work and play, we hardly see her except to drop off or pick up. She never offers to help and gets annoyed when I ask her to do anything. When we do talk I try to offer advice but none of it is any use to her. I feel like I'm losing my daughter.

**Marnie's mum**

# PREADOLESCENCE

The transitional period between childhood and adolescence is referred to as **preadolescence**. However, it may also be referred to as late childhood, early adolescence or pubescence. Preadolescence is the period of about 2 years before **puberty** when the individual is developing preliminary physical changes that herald sexual maturity. Children during this period of time are often popularly referred to as tweenies or tweenagers—both newly coined terms that have only recently entered the English language. They are heavily targeted by advertisers as children of this age represent an important demographic. Often because they have their own purchasing power, they influence their parents'/carers' buying decisions and they are the adult consumers of the future.

# GROWTH AND DEVELOPMENT OF THE PREADOLESCENT

## Physical development

Preadolescence refers to the beginning of the second skeletal growth spurt, when physical changes such as the development of female breasts and pubic hair also begin. These physical changes occur about 2 years earlier in girls than boys (Tortora & Derricksen 2011). The bones begin to lengthen and broaden. More in-depth descriptions of these changes are included in this chapter under the heading 'Physical development' in the section on adolescence below.

## Cognitive development

**Cognition** is involved with thinking: perception, language, learning, memory and problem solving. According to the theories of the French psychologist Piaget, the preadolescent is in what is termed 'the **concrete operational stage**' of thinking (Atherton 2013). In this stage children think logically as long as they have the object of their thoughts physically present to manipulate. It is difficult for them to understand theories or abstract concepts.

## Emotional development

The preadolescent is better able to describe their feelings than the younger child, especially about developmental changes they are experiencing. They become better at problem solving and achieving their goals. Some experience mood swings,

which develop from the same hormones that contribute to physical changes. They may feel happy one minute and irritable or sad the next. Their feelings may be overpowering. The preadolescent may also give in to impulses, as the parts of the brain that are involved in impulse control have not yet developed fully.

### Psychosocial development

In the preadolescent stage children become more social and their behavioural patterns become much less predictable. Included in this stage are experimentation with make-up by girls and the interest in music and performers that are popular with older adolescents. Typically they have same-sex friends and tend to spend more time with their friends than with their families. Preadolescents often develop friendships with adults other than their parents and use these relationships to gather information about adults. They are no longer totally egocentric and begin to see the importance of others within their social environments.

### Sexual development

During this time most children experience some of the changes of puberty. As their bodies begin to change they tend to develop a natural modesty. They are frequently curious about sex and, provided that there is an environment where sex can be spoken about comfortably, they are likely to ask many questions. Sometimes when children are in hospital and curious about their bodies they ask questions of nurses they trust. This may be an indication that information relating to sexuality or sexual matters is wanted. It is advisable for the nurse to find out what knowledge the child already has to avoid giving inappropriate answers (Carpenito-Moyet 2010). (See Case Study 13.1.)

#### CASE STUDY 13.1

Hope is a 13-year-old girl with insulin-dependent diabetes who has been rushed to her local hospital in an unresponsive state while on holiday with her grandparents.

When recovered she discloses that she had not taken her medication or dietary requirements for the past 2 days.

When questioned about the incident Hope states she hates being a freak and that she doesn't want to be a diabetic anymore.

Hope has voiced her anger at the changes that puberty has brought and wishes to remain a child to escape this diagnosis. Hope states that it is not fair for this to happen to her and she will not inject herself again.

Both the grandparents and the parents are very distressed and are blaming each other for this event.

What could you do to help Hope?

## ADOLESCENCE

**Adolescence** is the period of development from age 12 to 20 and is the stage that marks the transition from childhood to adulthood (Mitchell & Ziegler 2013). Adolescence is a stage of development characterised by sudden physical changes and social and emotional maturing. It begins with the gradual appearance of secondary sex characteristics and ends with the cessation of body growth.

The term 'adolescent' usually refers to psychological maturation of the person, whereas puberty refers to the point at which sexual maturity is achieved and reproduction becomes possible. Puberty mainly refers to the maturational, hormonal and growth process that occurs when the reproductive organs begin to function and the secondary sex characteristics develop.

Adolescence is often described in three distinct subphases: early adolescence (11–14 years), middle adolescence (15–17 years) and late adolescence (18–20 years).

## GROWTH AND DEVELOPMENT OF THE ADOLESCENT

### Physical development

The **physical development** and changes of early adolescence (puberty) are primarily the result of hormonal activity, with the sequence of pubertal growth changes the same in most individuals (Sigelman & Rider 2015). (See Tables 13.1 and 13.2.)

Physical changes occur rapidly in both males and females. Physical distinctions between boys and girls are determined on the basis of distinguishing characteristics: **primary sex**

**TABLE 13.1 | Usual sequence of maturational changes in adolescence**

| Boys | Girls |
|---|---|
| Skeletal growth spurt | Skeletal growth spurt |
| Enlargement of testes and scrotal sac | Beginning of breast development |
| Appearance of pubic hair | Appearance of pubic hair |
| Changes in larynx and voice | Menarche |
| Enlargement of penis and prostate gland | Ovulation and completion of breast growth |
| Nocturnal emissions | Appearance of axillary hair |
| Growth of downy facial hair | Widening of pelvis, deposition of body fat |
| Appearance of axillary hair | Abrupt decrease of linear growth |
| Increase in shoulder width | |
| Deepening of voice, appearance of coarse facial hair | |
| Abrupt decrease of linear growth | |

*(Hockenberry & Wilson 2015)*

## TABLE 13.2 | Growth and development during adolescence

| Early adolescence (11–14 years) | Middle adolescence (14–17 years) | Late adolescence (17–20 years) |
|---|---|---|
| **Growth** | | |
| Rapidly accelerating growth<br>Reaches peak velocity<br>Secondary sex characteristics appear | Growth decelerating in girls<br>Stature reaches 95% of adult height<br>Secondary sex characteristics well advanced | Physically mature<br>Structure and reproductive growth almost complete |
| **Cognition** | | |
| Explores newfound ability for limited abstract thought<br>Clumsy groping for new values and energies<br>Comparison of 'normality' with peers of same sex | Developing capacity for abstract thinking<br>Enjoys intellectual powers, often in idealistic terms<br>Concern with philosophical, political and social problems | Established abstract thought<br>Can perceive and act on long-range operations<br>Able to view problems comprehensively<br>Intellectual and functional identity established |
| **Identity** | | |
| Preoccupied with rapid body changes<br>Trying out of various roles<br>Measurement of attractiveness by acceptance or rejection by peers<br>Conformity to group norms | Modifies body image<br>Very self-centred; increased narcissism<br>Tendency towards inner experience and self-discovery<br>Has a rich fantasy life<br>Idealistic<br>Able to perceive future implications of current behaviours and decisions; variable application | Body image and gender-role definition nearly secured<br>Mature sexual identity<br>Phase of consolidation of identity<br>Stability of self-esteem<br>Comfortable with physical growth<br>Social roles defined and articulated |
| **Relationships with parents** | | |
| Defining independence–dependence boundaries<br>Strong desire to remain dependent on parents while trying to detach<br>No major conflicts over parental control | Major conflicts over independence and control<br>Low point in parent–child relationship<br>Greatest push for emancipation; disengagement<br>Final and irreversible emotional detachment from parents; mourning | Emotional and physical separation from parents completed<br>Independence from family with less conflict<br>Emancipation nearly secured |
| **Relationships with peers** | | |
| Seeks peer affiliations to counter instability generated by rapid change<br>Upsurge in close idealised friendships with members of the same sex<br>Struggle for mastery takes place within peer group | Strong need for identity to affirm self-image<br>Behavioural standards set by peer group<br>Acceptance by peers extremely important—fear of rejection<br>Exploration of ability to attract opposite sex or same sex romantic partners | Peer group recedes in importance in favour of individual friendships<br>Testing of romantic relationships against possibility of permanent alliance<br>Relationships characterised by giving and sharing |
| **Sexuality** | | |
| Self-exploration and evaluation<br>Limited dating, usually group<br>Limited intimacy | Multiple plural relationships<br>Internal identification of heterosexual, homosexual or bisexual attractions<br>Exploration of 'self-appeal'<br>Feeling of 'being in love'<br>Tentative establishment of relationships | Forms stable relationship and attachment to another<br>Growing capacity for mutuality and reciprocity<br>Dating as a romantic pair<br>May publicly identify as gay, lesbian or bisexual<br>Intimacy involves commitment rather than exploration and romanticism |

*Continued*

**TABLE 13.2 | Growth and development during adolescence—cont'd**

| Early adolescence (11–14 years) | Middle adolescence (14–17 years) | Late adolescence (17–20 years) |
|---|---|---|
| **Psychological health** | | |
| Wide mood swings<br>Intense daydreaming<br>Anger outwardly expressed with moodiness, temper outbursts and verbal insults and name calling | Tendency towards inner experiences; more introspective<br>Tendency to withdraw when upset or feelings are hurt<br>Vacillation of emotions in time and range<br>Feelings of inadequacy common; difficulty in asking for help | More constancy of emotion<br>Anger more apt to be concealed |

*(Hockenberry & Wilson 2015)*

**characteristics** are the internal and external organs that carry out reproductive functions (ovaries, breasts, penis, uterus); **secondary sex characteristics** play no direct part in reproduction but are the changes that occur in the body as a result of the hormonal change (development of facial and pubic hair, changes in voice, fat deposits). Secondary sex characteristics externally differentiate males from females.

The main physical changes are:

- Increased growth rate of the skeleton and muscles
- Alteration in the distribution of muscle and fat
- Gender-specific changes, such as changes in shoulder and hip width
- Development of the reproductive system and secondary sex characteristics.

Height and weight usually increase during the prepubertal growth spurt. The final 20% to 25% of height is achieved during puberty, with most of this growth occurring in a 24–36 month period. For girls this usually begins between 8 and 14 years of age. Weight increases by 7–25 kg and height increases by 5–20 cm. Growth in height usually stops 2–2.5 years after menarche in girls. For males this growth spurt occurs between 10 and 16 years of age. Height increases by 10–30 cm and weight increases by 7–30 kg. Growth in length of the limbs and neck precedes growth in other areas. Increases in hip and chest width take place in a few months, followed by an increase in shoulder width several months later (Crisp et al 2013).

Growth in height usually stops at age 18–20 in boys. The individual often appears awkward and clumsy and the sequence of changes is responsible for the long-legged gawky appearance that is often seen. These changes require the adolescent to adjust their perception of their self in space as well as accepting a new body image. Fat becomes redistributed into adult proportions as height and mass increase, and the adolescent gradually assumes an adult appearance. Adolescents who are concerned about physical changes that make them different from their peers should be reassured by the nurse about normal growth curves and that their own growth patterns are normal.

**Figure 13.1** Acne on the cheek of 16-year-old girl
*(Clayton & Tom 2010. © 2010)*

An increase in the secretion of sebum occurs from the skin and frequently results in acne. This development can have significant effects on how the adolescent views their physical image. (See Figure 13.1.)

## Hormonal changes of puberty

**Hormonal production** is controlled by the anterior pituitary gland, which is in turn stimulated by the hypothalamus. The stimulation of the anterior pituitary results in the release of the gonadotrophic hormones that stimulate the gonads. As a result of this stimulation, testicular cells produce testosterone and ovarian cells produce oestrogen. These hormones contribute to the development of secondary sex characteristics and play an essential role in reproduction. The changing concentration of these hormones is also linked to problems of adolescence, such as body odour and acne.

### CRITICAL THINKING EXERCISE 13.1

You are working as an Enrolled Nurse on a ward with a 10-year-old girl admitted with a fractured right arm.

As you are assisting her in the shower she discloses that she doesn't like how her body is changing and asks if you can help her stop it. What might you say to her based on your understanding of changes that occur during puberty?

## Sexual maturation in girls

The initial indication of puberty in most girls is the appearance of breast buds. Breasts begin to develop from about age 10 (development continues until about age 17). (See Figure 13.2.) About 2–6 months later, growth of pubic hair on the mons pubis begins. (See Figure 13.3.) The initial appearance of menstruation (**menarche**) occurs about 2 years after the first pubescent changes. The normal age range of menarche is 10.5–15 years, with ovulation usually beginning 6–14 months after menarche.

Concerns about pubertal delay in girls should be considered if breasts have not started to develop by age 13 or if menarche has not occurred within 4 years of the onset of breast development (Sigelman & Rider 2015). It is important to remember that racial origin and environmental issues can contribute to when puberty begins. Girls from some genetic backgrounds will experience earlier menarche than girls from others. Similarly, girls with nutritional problems such as anorexia or those having to keep a minimal body weight for some activities such as dancing, modelling and gymnastics may also experience delayed menarche. The body requires a set level of fat deposits before menarche can be initiated.

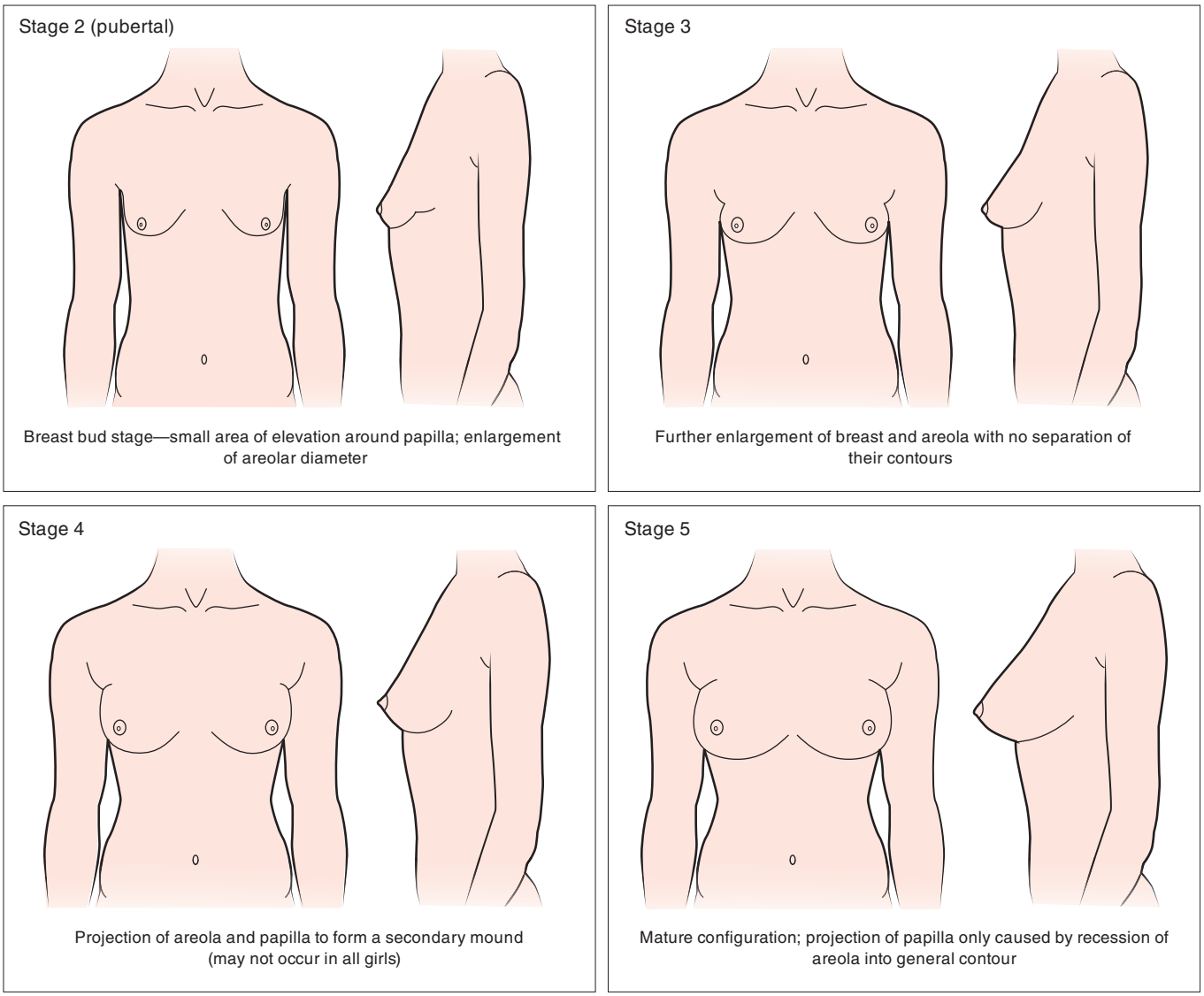


**Figure 13.2** Development of breasts in girls. Stage 1 (prepubertal elevation of papillae only) not shown
*(Adapted from Hockenberry 2005; Daniel et al 1979)*

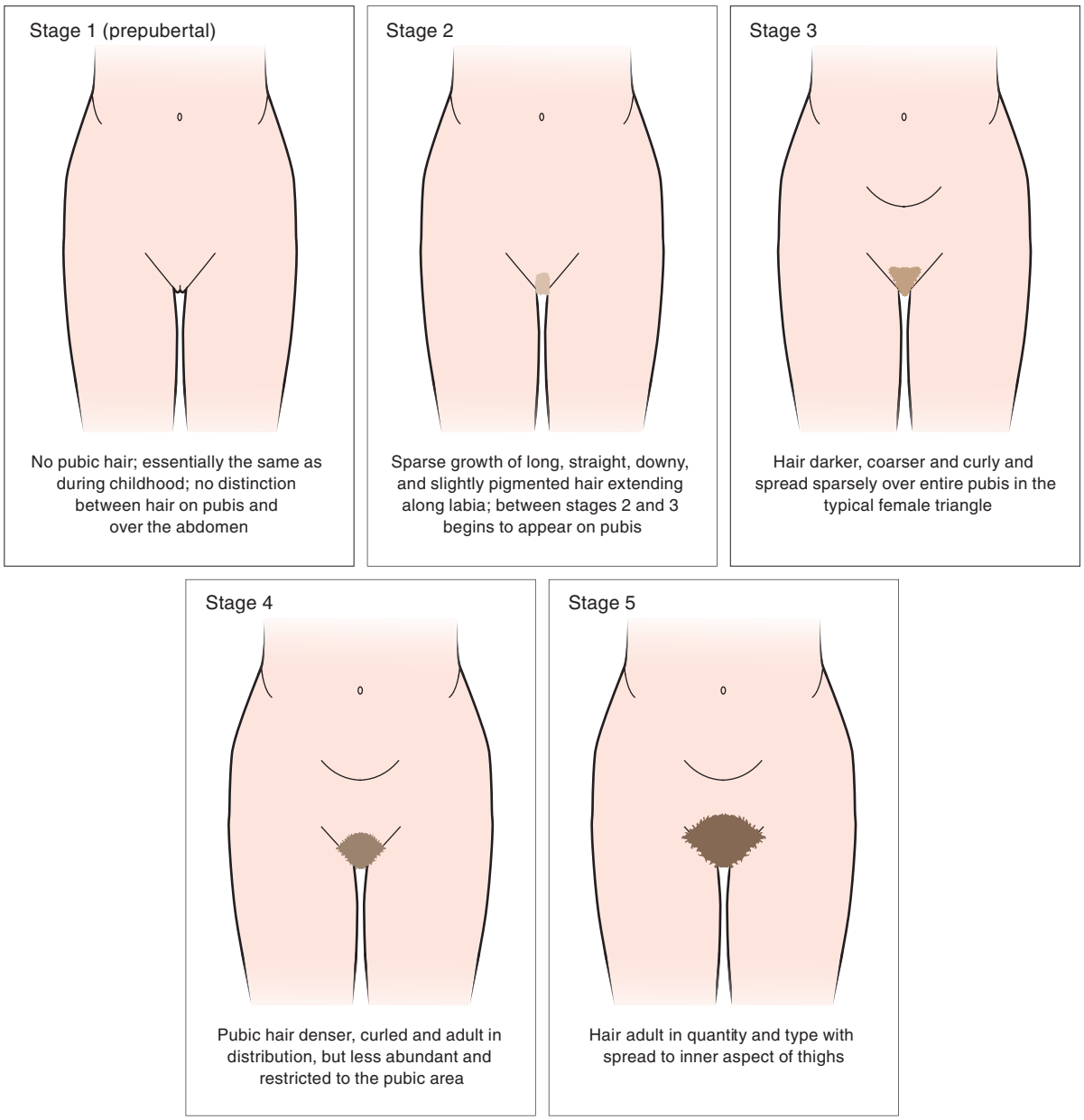


**Figure 13.3** Growth of pubic hair in girls
*(Adapted from Hockenberry 2005; Daniel et al 1979)*

The commencement of menstruation is often seen as a **rite of passage** in many cultures and is frequently heralded with celebrations. In mainstream Australasian and North American culture this time is not celebrated overtly. However, in other cultures it is celebrated by ritual bathing, specific ceremonies or the wearing of special clothing. In some Indigenous communities the practice of female circumcision is still undertaken to celebrate and mark this rite of passage.

## Sexual maturation in boys

Testicular enlargement, accompanied by thinning, reddening and increased looseness of the scrotum, is the first pubescent change in boys and usually occurs between ages 9.5 and 14. Penile enlargement begins, with continuing testicular enlargement and growth of pubic hair. (See Figure 13.4.) Facial hair may develop along with early voice changes. Temporary breast enlargement (gynaecomastia) and tenderness are common during mid-puberty. This breast enlargement usually disappears within 2 years. Height and weight growth occur towards the end of mid-puberty. Nocturnal emissions of seminal fluid are an indication of puberty in the male and occur spontaneously and periodically during sleep. In late puberty the testicles and penis enlarge, and the voice deepens. Axillary hair develops and facial hair extends to cover the

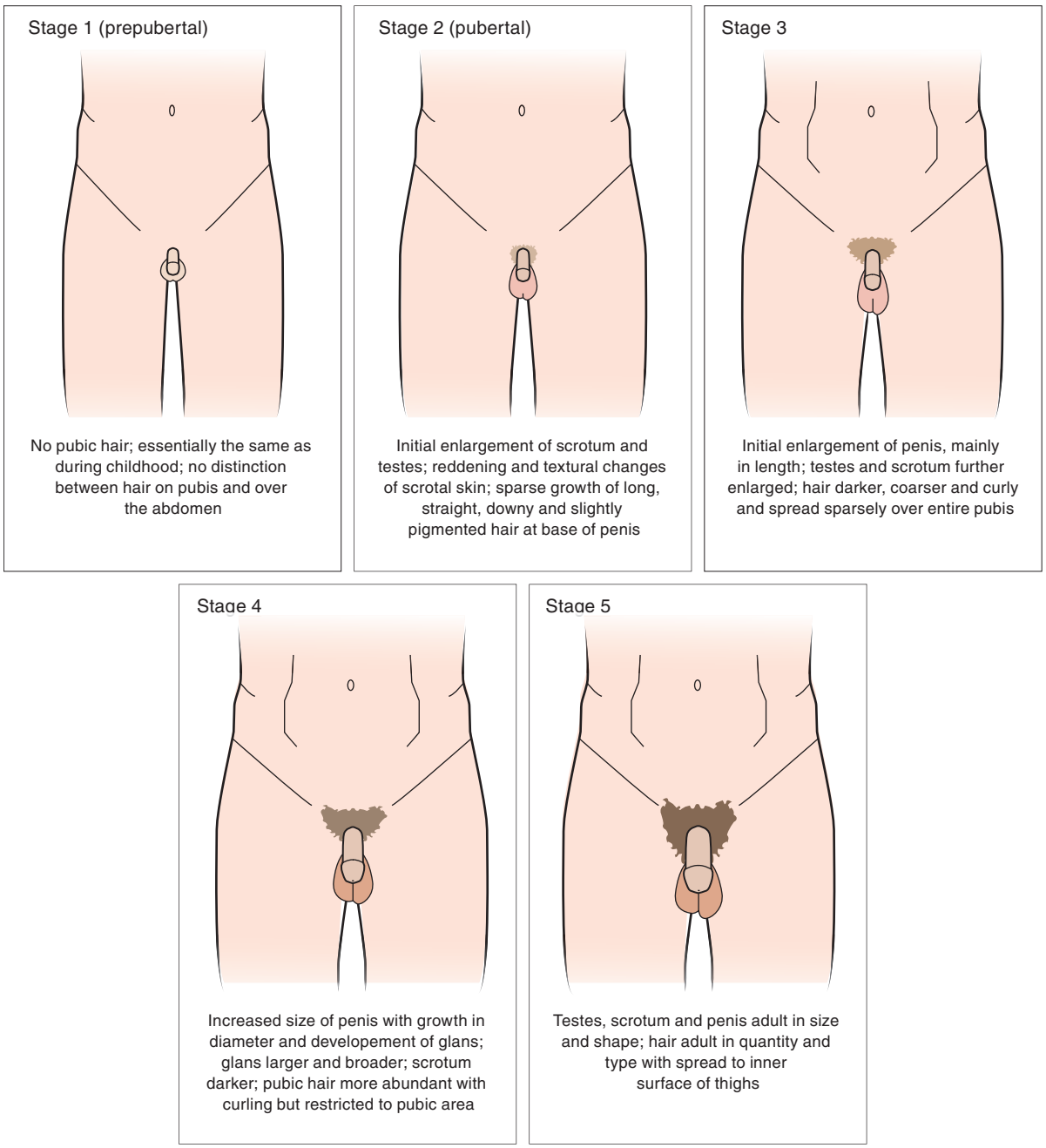


**Figure 13.4** Developmental stages of secondary sex characteristics and genital development in boys
*(Adapted from Hockenberry 2005; Daniel et al 1979)*

neck. During this time the opening of the foreskin in non-circumcised boys becomes larger and enables the foreskin to be retracted to below the head of the glans.

Boys may be considered to have pubertal delay if there is no enlargement of the testes or scrotal changes by age 13.5–14 or if genital growth is not complete 4 years after enlargement of the testicles.

In some cultures sexual maturation in boys is celebrated by routine circumcision or the undertaking of specific ceremonies. These ceremonies are aimed at initiating the boy into manhood. In mainstream Australasian and North American cultures no specific rite of passage is undertaken. Rites of passage for boys are more frequently celebrated at the attaining of a specific age rather than on the attaining of puberty. (See Clinical Interest Box 13.1.)

The physical changes that occur during adolescence are rapid and dramatic and play a significant role in **psychosocial development**. By understanding these changes you are better able to plan appropriate nursing care and to reassure and educate adolescents about their body care needs. The timing of these physical changes depends on factors such as heredity and nutrition and whether the adolescent is a boy or girl. The

## CLINICAL INTEREST BOX 13.1
## Rites of passage

Achieving sexual maturity is often celebrated as a rite of passage in some cultures. These ritual events mark the passage from child to adult. Some of these coming of age traditions include:

- Bar Mitzvah and Bat Mitzvah—Jewish (boys and girls)
- Ritual hair cutting—Cook Islands (boys)
- Quinceañera—parts of Latin America (girls)
- Upanayana—Hindu (boys)
- Debutante balls—western culture (girls)
- Land diving—Vanuatu (boys)
- Circumcision—some African tribes (boys and girls)

sequence of growth changes (Tables 13.1 and 13.2) is the same in most individuals (Sigelman & Rider 2015).

## Physiological needs

The strength and size of the heart and systolic blood pressure and blood volume increase during puberty. The pulse rate and basal heat production decrease. Boys have a higher blood volume than girls, which may be related to boys having a greater muscle mass. All formed elements of the body reach adult levels. Respiratory volume and vital capacity are increased, but respiratory rate and the basal metabolic rate decrease. As a result of increased strength and size of muscles and increased cardiac, respiratory and cardiac functioning, physiological responses to exercise change dramatically.

### Nutritional needs

During adolescence nutritional needs are significantly increased. As the person goes through this time of accelerated physical and emotional development, the body's metabolic rate increases, which intensifies the body's nutritional needs. There is no other time in life except during pregnancy and lactation that nutritional requirements are at this maximum. Both boys and girls are often constantly hungry and may have to eat frequently to meet their needs. Boys may even have to consume up to 16 000 kilojoules per day simply to avoid losing weight. Increased protein, fibre, calcium, iron and phosphorus especially are required to fuel the extra demands of the developing body. The adolescent who does not meet these needs is at high risk of compromising both psychomotor and cognitive development (Murray & Zentner 2014). Conditions such as malnutrition and anorexia are especially harmful at this stage. Chapter 30 of this text provides you with more information about meeting the nutritional needs of the individual.

## Cognitive development

Adolescents are capable of using deductive reasoning and abstract thinking and can consider the logic of a problem. According to Piaget, this stage, known as the period of **formal operations**, is the highest level of intellectual development. Being able to think logically about role behaviours enables adolescents to develop their own thoughts and means of expressing their identity. Intellectual development continues through formal education and the pursuit of personal interests (Atherton 2013). Without an appropriate educational environment, individuals may not reach this stage. The teenager can think abstractly and is no longer restricted to the real and actual, but can deal with the hypothetical. Adolescents are able to manipulate more than two different variables at one time. They think about what might be, whereas primary-school-age children only think about what is. This allows adolescents to have more skill and insight when playing board games or video games, for example.

By mid-adolescence, cognition develops an introspective quality. At this stage adolescents wonder about what others think of them and increasingly imagine the thoughts of others. They question society and its values and, although they have the ability to think as well as an adult, they do not have the experiences that an adult has on which to build. They can think about the consequences of their actions and can detect logical consistency or inconsistency in a set of statements or actions (Crisp et al 2013). For example, they will question a parent/carer who swears but tries to persuade the adolescent not to use bad language.

Language development is relatively complete by adolescence, although vocabulary continues to expand. The main focus becomes the development of communication skills that can be employed effectively in various situations. Adolescents need to share thoughts, facts and feelings to parents, teachers, peers and others. The skills needed are varied. The adolescent must decide whom they will communicate with, the message they wish to share and the way they will transmit the message. For example, the way a teenager tells peers about a new relationship is not the same as the way they tell their parents (Mitchell & Ziegler 2013).

## CRITICAL THINKING EXERCISE 13.2

While you are taking a nursing history of a teenager who is being admitted to the ward, his parent states that 'he eats like a horse and is lazy, sleeping in till 12 on the weekends'.

Understanding the physiological changes that occur in puberty, what could you ask to determine if the teenager's eating and sleeping habits were normal?

## Psychosocial development

Adolescence is a time when the young person is seeking and learning the skills to become independent. It is often a period of emotional turmoil and insecurity, caused by the conflict between the need and desire for independence and the need to retain dependence on others. It is a time when **identity** is consolidated and a time when choices about vocation and lifestyle must be made. Relationships with parents undergo change and the adolescent begins to assert individuality and

a desire for independence, often by resisting adult authority and advice. The adolescent usually displays mood swings and experiences confused emotions. In later adolescence, emotions are better controlled and more mature. However, an older adolescent is still subject to heightened emotion and their expressive behaviour reflects feelings of insecurity and indecision (Crisp et al 2013). As adolescents move into adulthood they normally become less reliant on positive reinforcement from others as their main source of self-esteem-enhancing experiences.

For those working with adolescents, knowledge of the theories of adolescent development is essential to obtain an understanding of the adolescent stage and the ability to recognise the tasks of adolescence. One such theory is Erikson's theory of human development (1963) which encompasses the whole of the lifespan in eight stages, each of which involves opposing crises which must be negotiated to be able to go on to the next stage. This theory recognises the period of adolescence as a time spent searching for identity. Erikson sees identity (or role) confusion as the main danger of this stage. The adolescent's search for identity involves the quest for individual, sex-role, moral and group identity (Mitchell & Ziegler 2013).

### Group identity

The adolescent's need to develop a personal sense of self is strong and an adolescent will often identify with a **peer group** that provides an identity. Adolescents seek to belong to a group to feel that they belong and have status. The pressure to belong to a group intensifies and, as the adolescent moves away from the family, the values of the peer group and their appraisal of them become increasingly important. Peer groups provide a sense of belonging, approval and the opportunity to learn acceptable behaviour. By developing close bonds with peers, adolescents are able to develop a frame of reference for their own identity (Crisp et al 2013).

### Individual identity

A sense of identity is the individual's concept of who they are and where they are going in life. To find out who they are, adolescents must formulate standards of conduct and know what they value as important and worth doing. This fulfils their need for a sense of their own worth and importance. Adolescents need to develop their own ethical systems based on personal values. When parental views and values differ greatly from those of peers and other important figures, the possibility for conflict is great. As a result, the adolescent may experience role diffusion as they try out one role after another and they may have difficulty in synthesising the different roles into a single identity. A positive identity eventually emerges after periods of confusion and adjustment, as the adolescent makes choices about the future.

### Moral development (identity)

Moral development is consolidated in adolescence as the teenager moves from accepting the decisions of adults to gaining their own set of **morals and values**. Kohlberg (1964) explains moral development in terms of stages and, according to his theory of moral development, adolescents begin to question existing moral values and learn to make choices. The development of moral judgment depends on communication, cognitive skills and peer interaction. Not all adolescents reach the same level of moral development. Boys may have more justice-oriented responses to moral problems, while girls have been found to have more caring responses. Table 13.3 summarises the developmental behaviours of adolescents.

## Social development

Social development involves an expansion of the network of **social relationships** and social activities. For many adolescents the peer group remains the most important social group, serving as a strong support providing a sense of belonging. It provides a link between independence and autonomy. Adolescents may move away from family domination and define their identity independently of parental authority. Adolescents may want to separate from parental restraints but at the same time may be fearful of the consequences associated with independence. This process of achieving independence often involves turmoil and ambiguity as both adolescent and parent learn new roles. Conflicts can arise from almost any situation or subject. Adolescents may find themselves argumentative, critical and remote with both parents as they attempt to achieve independence from parental controls. This rejection is usually not consistent and varies with mood changes. Some research shows that parents who provide a more cooperative style of parenting rather than an authoritative style improve the adolescent's ability to be independent and make appropriate decisions (Peterson 2014). Social relationships that develop outside the family help the adolescent identify their role in society.

## Sexual development

Adolescence is a time of acute awareness and sensitivity to emerging **sexuality** and body image, when appearance, personal and sexual attractiveness and peer acceptance are of crucial importance to self-esteem and a sense of belonging (Varcarolis et al 2014; Videbeck 2014).

A positive self-concept and sense of emotional security depends significantly on the support the adolescent receives while coping with the physical and emotional changes experienced during the difficult and sometimes tumultuous transition to adulthood. Support includes allowing for privacy, the freedom to develop personal interests and new relationships and understanding the frequent changes of mood and behaviour that commonly occur.

Particular sensitivity is needed when nursing the ill or hospitalised adolescent, because changes or threats to appearance or functioning can have a profound impact, resulting in anxiety, feelings of vulnerability and a negative impact on self-image. The nurse can help the adolescent, as any other individual, by demonstrating respect, which reinforces self-worth. The nurse can show this in many ways, including by being non-judgmental, reinforcing the belief that the individual is doing their best to cope, to adapt or to change and

## TABLE 13.3 | Developmental behaviours of adolescents

| |
|---|
| **Relationships with parents** |
| Adolescents' desires for increasing independence and autonomy and continuing need for some dependence and limit setting by parents place strain on their relationship. Effective communication and democratic parenting are best tools for meeting this challenge. |
| **Relationships with siblings** |
| Younger siblings rarely understand their adolescent sibling's need for privacy to think, dream and talk with peers. Adolescents often enjoy interacting with and guiding younger brothers and sisters when timing is convenient for them and they can remain in control. |
| **Relationships with peers** |
| Peer group is a factor of critical influence to adolescents, who have increasing need for recognition and acceptance. Companionship offered by peer groups provides a secure environment for individuals to try out new ideas and share similar feelings and attitudes. Adolescents often form cliques with peers from the same socioeconomic group with similar interests. Cliques, which are highly exclusive, help their members, who have strong emotional bonds, develop their identities. The crowd, which is more impersonal than the clique, offers opportunities for heterosexual interaction and social activities. The crowd also maintains rigid membership requirements; clique membership is usually a prerequisite for crowd membership. |
| **Self-concept** |
| Formal and informal peer groups are a primary force in shaping self-concept of group members. Popularity and recognition within the peer group enhance self-esteem and reinforce self-concept. Total immersion in peer group may make it appear that adolescents have no original thoughts and are incapable of making decisions. Adolescents who withdraw from peers into isolation struggle with developing identity. |
| **Fears** |
| Fears in this age group centre on peer group acceptance, body changes, loss of self-control and emerging sexual urges. Adolescents constantly examine their bodies for changes and signs of imperfection. Any defect, real or imagined, is the cause of endless worry. Adolescents' developing awareness of economic and political problems may result in fear of going to war, with its resulting death and destruction. |
| **Coping patterns** |
| Repertoire of coping behaviours has expanded with experiences adolescents have gained from life and from developing cognitive maturity. By age 15, most use full range of defence mechanisms, including rationalisation and intellectualisation. Adolescents' problem-solving abilities have matured, and they can reason through philosophical discussions and complex situations that require abstract thinking and proposition of hypotheses. Some adolescents use avoidance coping strategies in which the problem is denied or repressed and an attempt is made to reduce tension by engaging in chemical abuse or avoiding people. |
| **Morals** |
| According to Kohlberg (1964), as youths approach adolescence they reach conventional level, where internalisation of expectations of their family and society begins. Initially there is considerable conformity to rules to win praise or approval from others and to avoid social disapproval or rejection; later, they seek to avoid criticism from persons of authority in institutions. |
| **Diversional activity** |
| Many adolescents develop special interests in certain sports and concentrate on developing maximal skills therein. Recreational activities are often determined by what is popular with peers and what can provide independence from parents (e.g. computers, cars). |
| **Nutrition** |
| Total nutritional needs become greater during adolescence. Girls' energy needs decrease and their need for protein increases slightly. Iron needed by adolescent boys is almost twice that of adult men, and growth spurts increase calcium demand. |

*(Modified from Crisp et al 2013)*

by demonstrating acceptance of the adolescent individual's own perspective and feelings (Stein-Parbury 2014).

During adolescence there may be a great deal of experimentation in the expression of sexuality. Heterosexual and homosexual liaisons are common and sexual behaviour usually includes masturbation (Makadon 2011). Assurance about what is generally accepted as normal in physical and emotional development is helpful, as is open, honest and accurate information on topics such as body changes, sexual orientation, sexual practices, emotional responses within intimate relationships, sexually transmitted infections (STIs) and contraception. (Information about contraception and reproductive health is provided in Chapter 37.)

There are times when the nurse may feel it appropriate to explore sexuality issues with an adolescent; for example, when working in sexual health clinics, adolescent mental health units and in drug and alcohol clinics.

Experts generally agree that sexual orientation is probably the outcome of complex interactions between biological, cognitive and environmental factors and that it is established at an early age but commonly emerges in adolescence. It is accepted that genetic and hormonal factors play a part in shaping a person's sexuality to the extent that the person has no conscious choice in the matter, but also that there are probably many combining reasons for a person's sexual orientation, which may be different for different people (Makadon 2011; Rathus et al 2013). Often it is difficult for the adolescent to discuss with their family and friends their thoughts in relation to their own sexuality or sexual orientation. Always be aware that the adolescent who is developing their sexual identity may not be ready or willing to discuss this issue with health practitioners either. Huffaker and Calvert (2005) suggested that the use of social media and virtual reality may be one area in which adolescents may feel more comfortable expressing their sexual orientation and exploring their sexual identity beyond social prescriptions. This is mainly due to the anonymity that can be gained by communicating online.

Healthcare professionals should be aware that a recent Australian study identified that mental health problems, particularly depression and anxiety, are experienced in high levels in people who identify as transgender/transsexual (Hyde et al 2014).

Many healthcare providers including nurses feel uncomfortable and unskilled in discussing sexuality with adolescent individuals. It is essential, therefore, that you first examine your own attitudes about sexuality, particularly those that relate to adolescents, and reflect on how these attitudes affect your work with teenagers.

## Issues in adolescence

This is a good question rather than a statement. We need to acknowledge that the issues of adolescence change from year to year as our communities and societies change, ensuring that Australian young people will require healthcare professionals and systems to constantly adjust to respond. The following are some prevalent issues with research that has been captured. There are potentially many others that due to the age group and rapid changes may not be identified or researched but impact on caring for this group.

## Social media

The adolescent of today has always had exposure to electronic media. The computer, the internet and mobile phones have been part of their lives since early childhood. Their use as a tool for communication is an important aspect of the adolescent's life. There is significant discussion about the effects of the use of social media, with some researchers suggesting that heavy use can have negative effects, and others observing the positive influences that social media can have on adolescent development (Valkenburg & Peter 2007). Networking sites like Twitter and Facebook are often used by the adolescent to keep in touch with their friends and can be seen as positive tools in maintaining relationships. However, heavy usage of these sites may have risks for susceptible persons. Cyber bullying, stalking and predatory behaviour are just a few of the issues that can affect the adolescent user. Unfortunately the cyber bully can remain anonymous to the victim, making it difficult to track and/or halt the behaviour. It is suggested that the cyber bully can be motivated to use not only SMS phone text messages but to also use chat rooms and emails as tools of bullying. While research in this area is still fairly limited, it has been suggested that such bullying is widespread. The management of cyber bullying can be difficult due to its covert nature and the difficulty of tracing the offender (Cross et al 2009).

### CRITICAL THINKING EXERCISE 13.3

The mother of a teenager in your care complains that she is worried her daughter has a speech problem. On further discussion she indicates that her daughter rarely talks but is constantly texting on her phone. How would you investigate this issue?

## Body image

How the adolescent responds to the physical changes of puberty depends on their stage of development. In early adolescence some adolescents are preoccupied with the changes in their body and **body image**. Girls find body changes difficult to adjust to and are often concerned with weight increase and associated fat deposits. This may lead them to think they are obese and lead to fad dieting. Frequently they will compare their body with images in the media and their peers. With the increased use of 'photoshopping' of photographs of celebrities to remove evidence of imperfections and fat deposits, and the increasingly slimmer bodies of those portrayed in the media, the adolescent is often using an invalid measure to compare their bodies with. As the average model is 23% thinner than the average person and with the media praising and celebrating this fact, it can be very difficult for the adolescent to be satisfied with their body shape (Derenne & Beresin 2006). The nurse must be

## NURSING CARE PLAN 13.1

**Assessment:** Katie is a 15-year-old girl admitted to your ward with anorexia nervosa. Her weight has dropped to 45 kg, she exercises excessively, takes laxatives and will only eat small amounts of vegetables and fruit. She has recently broken up with her boyfriend and believes this is because she is 'fat'.
**Issue/s to be addressed:** Nutrition less than body requirements
Sensitivity to cold
**Goal/s:** Katie will consume nourishment adequate for weight gain and will reduce energy expenditure
Maintain normal temperature

| Care/Actions | Rationale |
|---|---|
| Start high-calorie diet and explain diet plan | To encourage gradual weight gain and commence healthy dietary education |
| Monitor physical activity | To participate in quiet and planned activities and reduce basic metabolic rate (BMR) |
| Ensure dressed appropriately and environment is warm | Reduce energy expended to maintain temperature |
| Promote a positive sense of self-regard | Encourage positive health behaviours |

**Evaluation**

Katie has been involved in her own care making decisions involving food choices and activity levels.
She has commenced education and understanding of a healthy diet plan and has stated she is less cold.

## PROGRESS NOTE EXAMPLE 13.1

| | |
|---|---|
| 24/07/2015<br>2030 hrs | Nursing: Katie's mother spoke with the dietitian and Katie at 1600 hrs today. Katie has refused all nutrition this afternoon and this evening is sitting quietly with her mother. Attempts from staff to engage with Katie have been declined. Temperature at 1800 was 36.4 with offers of warm blankets declined.<br>***J. Mackenzie* (Mackenzie) EN** |

extremely cautious when working with the adolescent with body image distortions. Always refer to the care plan or seek advice from the RN when you are unsure how to approach an adolescent in your care who has body image issues.

Overeating or under-eating during adolescence is of concern particularly for girls who, when they experience the normal increase in fat deposition and weight associated with the growth spurt, are more likely to resort to dieting.

**Anorexia nervosa** is a clinical syndrome with physical and psychosocial components. People with anorexia nervosa have an intense fear of gaining weight and refuse to maintain their weight at the normal minimal weight for their age and height.

**Bulimia nervosa** involves binge eating followed by behaviours such as induced vomiting, use of laxatives and excessive exercise to prevent weight gain. It is important to take a thorough dietary history when working with these adolescents. Good and appropriate nursing care can make a significant difference in the recovery process of individuals with anorexia nervosa (Ommen et al 2009). Review Nursing Care Plan 13.1 and Progress Note Example 13.1 for samples of documentation in this area.

Obesity is becoming more prevalent in adolescence. American studies refer to 'the childhood obesity crisis' with research identifying that almost one-third of children in the US over the age of 2 years are already overweight or obese (Wojcicki & Heyman 2010). Australian research also identifies similar findings, with up to 25% of all children between the ages of 5 and 17 years identified as being either overweight or obese. There are now more severely obese children than ever before. Poor nutrition and decreased physical activity have been identified as two major risk factors for individuals who are overweight and obese. In the adolescent the most immediate consequence of obesity is social discrimination associated with poor self-esteem and depression. They are also more likely to develop other comorbidities such as diabetes than children within normal weight ranges (Queensland Health 2008). This problem has serious ongoing effects across the health continuum.

## CULTURAL DIVERSITY

With Australia rapidly becoming more multicultural it is important for the nurse to be aware of some of the cultural issues surrounding the development of the adolescent. Not all cultures have the same attitudes or beliefs about adolescence and it is extremely important that the normalised western theories of adolescence are not measured against all adolescent behaviours. While these theories are a sound template, **cultural differences** must always be considered. If you are caring for an adolescent from a culturally diverse background, ensure that the advice and care that you give are culturally appropriate.

Adolescents from diverse cultures and migrant families may have stressors that affect the way they behave. Immigration has its own inherent problems such as dealing with a new life pattern and issues of loss. And at times individuals face discrimination as they adjust to life within a new country. Conflict often occurs between the adolescent and their family in relation to social and gender differences between Australia

and their country of origin (Murray & Zentner 2014). Chapter 10 of this text provides more insight into the cultural issues of Australia.

### Indigenous adolescents

Australian Indigenous adolescents have not only the concerns of all adolescents, but also their own specific set of problems. They may feel alienated from both their traditional cultures and mainstream society. Without a thorough understanding of both the contemporary and the historical issues no appropriate understanding of the health and developmental issues of these adolescents can be gained. Readers are advised to research texts and articles specifically written for these groups to obtain further information.

As a nurse you are also urged to discover more about social determinants and their effects on the Australian Indigenous adolescent before attempting to make assumptions on the health status of the adolescents you are caring for. When developing health promotion and other tools to address these issues, care must be taken to ensure that the literature is culturally sensitive and in the appropriate language. It is essential to adopt a culturally appropriate approach to provide effective individual education. Chapter 11 of this text provides you with a greater insight into Indigenous health in Australia.

## HEALTH RISKS

The major causes of morbidity and mortality in adolescents are not diseases but health-damaging behaviours related to depression, injury, violence and sexually transmitted infections (STIs).

### Risk taking

Adolescents are risk takers. While there are a number of theories that attempt to determine why the adolescent engages in **risk-taking behaviour**, it is often seen as a normal part of the adolescent process. Teenagers are good at weighing up the pros and cons of their decisions but take risks because they enjoy the thrill of a risky situation more than other age groups, especially when they have a 'lucky escape'. Teenagers take risks, not because they do not foresee the consequences, but because they choose to take those risks (Burnett et al 2010). Research with adolescents has revealed that risk-taking behaviour is more prevalent among males, early school leavers and youths with less parental supervision and peers who also actively engage in risk-taking behaviour, have negative attitudes to authority and high alcohol use. Unfortunately, a tendency for risk-taking behaviour together with feelings of indestructibility makes adolescents particularly prone to accidents, especially those involving motor vehicles and sports. Risk behaviours in adolescents are reported to be the primary source of death in adolescents (Fredrickson & Levin 2007). (See Case Study 13.2.)

### Suicide

**Suicide** is a prominent public health concern with 2522 deaths occurring in 2013, or 6.9 deaths by suicide per day in Australia. For young Australians, when considering all deaths, the statistics for suicides in 2013 for those aged 15–19 years old were males 21.9% and females 32.6%.

Data from hospitalisation for self-harm indicates that teens to middle age are the most common group (Australian Bureau of Statistics 2015). This is consistent with the data that between 22% and 38% of adolescents have had thoughts about suicide at some point in their lives and 6–7% have self-harmed in any 12-month period. Understanding self-harm can be challenging but there are some common triggers:

- Disputes with family or friends
- School or workplace issues (i.e. bullying)
- Relationship and or sexual/gender issues
- Physical or mental health (i.e. depression)
- Drug and or alcohol abuse.

(Headspace 2009)

Suicide usually results from a combination of factors. In adolescence it is often used to escape from a situation that adolescents do not feel they can manage and it can be associated with depression. The following warning signs may occur for at least a month before a suicide attempt:

- Withdrawal
- Loss of initiative
- Decreased performance at school
- Crying, sadness and loneliness
- Disturbance in sleep and appetite
- Verbalisation of suicidal thoughts
- Giving away possessions.

Prevention of suicide always involves education. This can be done in major health promotional campaigns or in smaller campaigns run by school and community nurses or even one-on-one sessions with susceptible individuals. As a nurse, you need to be able to identify precipitating events and adolescent suicide risk factors. If assessment suggests that the adolescent is at risk of suicide you need to facilitate referral to mental health professionals while helping the adolescent to focus on the positive aspects of life and develop coping skills such as

### CASE STUDY 13.2

James is a 12-year-old who is admitted for removal of skin lesions on his face and body.

While preparing him for operating theatre (OT) he discloses that he will be ugly after this surgery and that he has grown his hair to cover the scars.

After returning from OT he covers his face with the sheet and turns away from the door.

His 10-year-old brother comes to visit and calls James 'Frankie'—short for Frankenstein. James is furious and grabs his brother, threatening to hurt him. The parents are not concerned at this behaviour and state, 'Boys will be boys!'

Consider if this is a cultural/social phenomenon. How could you assist James and this family?

problem solving, anger management, conflict resolution and assertive communication.

## Substance abuse

**Substance abuse** involves the use of mood-altering substances in an attempt to create a sense of wellbeing or improve levels of performance. The adolescent's peer group can have a significant affect upon the individual's use of illicit or other substances. All adolescents are at risk of substance abuse and have a higher risk of becoming addicted than an adult if abuse continues. The adolescent will use illegal/recreational substances for a number of reasons; these include perceived risk, social approval and availability (Crisp et al 2013). Drug-related health problems vary according to the type of drug, how much is used and the duration of use.

Alcohol is one of the main substances that the adolescent is liable to abuse and although only a small percentage (2.6%) of all adolescents claim to have undertaken risky drinking, the percentage is increasing. Not only is alcohol use by the young person proven to be linked to dependence later in life, it also can have a detrimental effect on the maturing brain (AIHW 2009).

It is important to note that if the adolescent has a substance abuse problem it is not just an individual problem. Their network of family and friends will also be affected in some way.

## Sexual experimentation

Sexual experimentation during adolescence is often seen as behaviour to confirm sexual orientation. Current awareness of issues such as marriage equality has also raised awareness of sexuality and gender identity (e.g. lesbian, gay, bisexual, transgender or intersex (LGBTI) (Headspace 2009)) that many young people can experience.

Some consequences of sexual activity during adolescence are sexually transmitted infections (STIs) and unplanned pregnancy. At least 1 in 4 sexually active teenage American girls has a sexually transmitted disease (Centers for Disease Control and Prevention 2008). While these are American statistics it is reasonable to assume that the figures would be similar in Australasia.

A thorough sexual history should be included in any screening of adolescent health. The nurse can use the interview process to identify risk factors.

Education about the ways STIs are transmitted is recommended, as most adolescents believe they are not at risk. (See Clinical Interest Box 13.2.) The rate of adolescent pregnancy has fallen in Australia. This is a result of education and the availability of contraception and, in most states and territories, access to abortion.

### CLINICAL INTEREST BOX 13.2 Teaching individuals about transmission of sexually transmitted infections

**Objective**

- Individual will identify how sexually transmitted infections are transmitted

**Teaching strategies**

- Provide information on the transmission of sexually transmitted infections (STIs)
- Educate about the symptoms and names of STIs
- Encourage the use of condoms if sexually active
- Inform the adolescent about the consequences of sexual activity

**Evaluation**

- The adolescent is able to identify the common STIs, how they are transmitted and their consequences

# HEALTH PROMOTION

**Health promotion** for adolescents consists mainly of education and guidance to avoid health-damaging behaviours and risk-taking activities. Health professionals who work with adolescents should acknowledge their increasing independence and responsibility, and try to maintain privacy and confidentiality. Health promotion during adolescence is directed towards:

- Establishing healthy habits of daily living in relation to personal care, such as vision, hearing, posture, body piercing and sun tanning
- Education in stress-reducing techniques
- Providing information on nutritional requirements and eating habits and behaviours
- Accident prevention in relation to vehicle-related injuries and sport injuries
- Immunisation
- Exercise and activity
- Education about sexuality and guidance on avoiding STIs and unplanned pregnancies
- Substance abuse.

(See also Table 13.4.)

Nurses need to be aware of the prevalence of adolescent problems affecting healthy habits of daily living and must make assessments accordingly. Community and school-based health programs focus on illness prevention and health promotion. Nurses can play an important role in preventing injuries and deaths related to accidents and substance abuse. You will find more information about health promotion in Chapter 6.

# NURSING IMPLICATIONS

All nurses caring for the adolescent need to understand that this is a lengthy transition period. During this transition from childhood to adulthood, the adolescent undergoes a significant number of changes and these changes are both diverse and complex.

**TABLE 13.4 | Health promotion during the adolescent period**

| Adolescent health concern | Health promotion |
|---|---|
| Accidents | Provide information on proper use of sports equipment<br>Emphasise proper pedestrian behaviour<br>Promote proper behaviour while a passenger in a vehicle<br>Reinforce use of seatbelts<br>Encourage attendance at driver education course, reinforce dangers of drugs when driving<br>Teach basic rules of water safety<br>Promote use of safe sports and recreational facilities<br>Instruct in safe use and respect for firearms |
| Suicide | Be alert for signs of depression<br>Offer suicide prevention education<br>Teach methods to cope with a suicidal peer<br>Promote alternatives to suicide |
| Substance abuse | Educate about the risks of tobacco, alcohol and drug use<br>Screen for substance abuse |
| Sexually transmitted infections | Provide information about mode of transmission and symptoms<br>Encourage use of condoms, abstinence from sexual activity<br>Educate about the consequences of sexual activity |
| Nutrition | Provide information about nutritional requirements during adolescence<br>Educate about the risks of snacking and irregular mealtimes<br>Promote regular consumption of breakfast and a balanced diet |

*(Modified from Crisp et al 2013)*

These changes can cause considerable emotional stress for the adolescent which can manifest in many ways. The adolescent will often rebel against rules and regulations, criticise treatment and be uncooperative. This may be due to a combination of an instinctive negative reaction against authority and hidden anxieties and fears. Much of the behaviour observed in the adolescent is related to the struggle for independence and the external constraints that are placed on this maturation process. It is essential that the nurse has a strong understanding of the issues of adolescence and provides an empathetic and understanding approach to care. More information on care of the hospitalised adolescent can be found in Chapter 21.

### DECISION-MAKING FRAMEWORK EXERCISE 13.1

You are an EN student undertaking placement in a busy surgical ward. The RN asks you to speak to the parents of a child with a concussion prior to discharge about signs and symptoms to be alert for at home.

You have not as yet had the theoretical or practical education about this condition during your course.

Use the decision-making framework to assist you with this issue by asking three questions:

1. Am I educated to complete this task?
2. Am I authorised to complete this task?
3. Am I competent to complete this task?

## Summary

Adolescent behaviour patterns highlight the need for the nurse to understand the expected process through which an adolescent passes. Adolescents cannot be cared for wholly as adults, as they often lack the emotional maturity to cope with independence and still require the emotional support of parents or adult carers. Nurses with an understanding of adolescent phases will be able to develop an environment that provides privacy and protects independence, which will enable the adolescent to feel supported in unfamiliar surroundings.

## Review Questions

1. Under each of the headings list the changes that can occur in puberty.

| Physical | Cognitive | Emotional | Psychosocial | Sexual |
|---|---|---|---|---|
| | | | | |

2. What nursing action would you take if when taking a nursing history you observed the following behaviours in an individual?
   - Withdrawal
   - Loss of initiative
   - Decreased performance at school
   - Crying, sadness and loneliness
   - Disturbance in sleep and appetite
   - Verbalisation of suicidal thoughts.
3. What health promotions are directed at adolescents?
4. True or False quiz

   Select True (T) or False (F) for each of these statements:

| | |
|---|---|
| Changes in puberty are brought about by the effect of hormonal activity. | T/F |
| Puberty decreases metabolic rate. | T/F |
| Sensitivity to emerging sexuality and body image is normal in adolescence. | T/F |
| Growth in height usually stops at age 18–20 in boys. | T/F |
| Depression and suicide are uncommon in adolescence. | T/F |
| Education about STIs is not recommended for adolescence. | T/F |
| Alcohol is the most commonly abused substance in the age group. | T/F |
| Up to 25% of 5–17-year-olds are obese. | T/F |
| Racial origin and environmental issues can contribute to when puberty begins. | T/F |
| Rite of passage is when you first have sex. | T/F |

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australian Bureau of Statistics: www.abs.gov.au

Better Health Channel: www.betterhealth.vic.gov.au

Black Dog Institute: www.blackdoginstitute.org.au

Headspace (National Youth Mental Health Foundation): www.headspace.org.au

Mental Health Foundation of Australia: www.mentalhealthvic.org.au

Queensland Health: www.health.qld.gov.au

Raising Children Network: www.raisingchildren.net.au

Suicide Prevention (Australia): www.suicideprevention.com.au

The Royal Children's Hospital Melbourne: www.rch.org.au

United States National Library of Medicine: www.nlm.nih.gov (links to Medline)

Youth/Teenage Health—Department of Health WA: www.health.wa.gov.au

CHAPTER
14

# Nursing care across the lifespan: younger adulthood to middle adulthood

*Vivienne Therese Decleva*

## KEY TERMS

emerging adulthood
emotional development
menopause
sexual dysfunction
sexual identity
sexual orientation

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define relevant key terms and concepts
- Identify the factors that influence growth and development
- Describe the major physical and psychological developmental changes that occur during early and middle adulthood
- Discuss the issues related to emerging adulthood
- Discuss the key concepts of sexual development and sexuality
- Discuss nursing interventions to promote sexual health through the lifespan
- Identify relevant nursing management and health promotion requirements
- Apply critical thinking and problem-solving approaches to management of individuals

## CHAPTER FOCUS

The chapter looks at growth and development of the body as it transitions through young adulthood (20 to 40 years) and middle adulthood (40 to 65 years). Adulthood is the period of time spanning from adolescence to death and encompasses three main phases: early adulthood, middle adulthood and older adulthood. This chapter focuses specifically on the first two phases. Early adulthood, which is the period of development from 19–20 years, is the period when a person transitions to maturity, independence and considerable social change. This is followed by middle adulthood occurring between the ages of 40 and 65 years. This phase is a time of stabilisation and physical change. Not only natural growth and development but also environment, social and life choices influence health issues that arise in adult life.

## LIVED EXPERIENCE

Doing a course in health services is something that I had been thinking about for a long time. But because of my age, I thought that no one would want me. Just think, starting my career in my forties. The years of staying home and looking after the kids are behind me. Now I am working towards doing something for myself. I feel good doing the course because I will be contributing to the community, and in turn I am sure that I will get a lot back.

**Trish Boyer, approximately 40 years old. Health services student**

The age spans of early adulthood, middle adulthood and older adulthood feature three very different generations commonly described as: Baby boomers (born between 1945 and 1964), generation X (born between 1965 and 1978) and generation Y (born between 1979 and 2000). Baby boomers are often described as workaholics with an optimistic, driven and team-orientated outlook to their work. In the majority of cases people of generation X have been raised in a two-parent family unit; they strive for a balance between work and personal time and have a slightly sceptical outlook on life. People of generation Y have shown themselves to be ambitious, technologically savvy and enjoy public recognition of their efforts (Berman et al 2015).

## EMERGING ADULTHOOD

**Emerging adulthood** is described as the period of time when an individual is an adolescent but not yet fully adult (Arnett 2014) where the transition to adult roles is delayed until the late teens to mid twenties. This phase is primarily observed in industrialised societies, as the majority of individuals in non-Western countries, because they have fewer economic resources, often live in rural regions and have limited education and typically enter marriage, parenthood and lifelong work earlier than their Western counterparts.

Arnett (2014) identified five main features of emerging adulthood:

1. It is the age of identity exploration, of trying out various possibilities, especially in love and work.
2. It is the age of instability.
3. It is the most self-focused age of life.
4. It is the age of feeling in-between, in transition, neither adolescent nor adult.
5. It is the age of possibilities, when hopes flourish, when people have an unparalleled opportunity to transform their lives.

## GROWTH AND DEVELOPMENT IN EARLY ADULTHOOD

### Physical development

With the exception of the major physical changes that accompany a pregnancy, physical changes are minimal during this stage of development. Females have generally reached their maximum height by the age of 18 years, with males reaching maximum height at approximately 20 years. Muscle continues to develop during the earlier phase in this age span, particularly in males, and both males and females will add body fat with an average weight gain of 6.5 kg (Crisp et al 2013). The main growth and developmental changes occurring in early adulthood are summarised in Table 14.1.

During early adulthood an individual is usually 'at their prime'. It is often a peak time for athletic performance and ability to perform strenuous activity, trouble-free reproduction and childbearing, as well as maximum health status with fewer illness-related deaths reported. The emerging adult may expose their body to extreme risk and serious injury (Nelson & Barry 2005) as they become more interested in extreme sports and activities such as base jumping, abseiling and bungee jumping.

### Cognitive development

Brain growth often continues to develop into the early twenties with changes in the frontal lobe and cerebral cortex. Maximum memory and cognitive speed occur at this stage. Decision-making processes need to be flexible, as the young adult is constantly adjusting to changes in their home, workplace and personal life. Formal and informal educational experiences and life experiences together with occupational opportunities increase the young adult's conceptual and problem-solving skills.

**TABLE 14.1 | Summary of developmental stages in early adulthood**

| | |
|---|---|
| Physical development | Maximum height achieved for both males and females<br>Physical strength peaks<br>Peak physical performance occurs between 25 and 30, then declines 1% per year<br>Male pattern baldness in males occurs<br>Short-sightedness develops during 20 and 30s<br>Peak bone densities reached by 30 years<br>Sexual responsiveness at its peak<br>Testosterone levels begin to drop 1% per year after 30 |
| Cognitive development | Brain development completed between 22 and 25<br>Able to comprehend and balance arguments<br>Creativity tends to peak |
| Psychosocial development | Seek meaningful relationships<br>Women more likely to consider relationships integral to sense of self<br>According to Erikson, enter stage of intimacy versus isolation<br>Exploration of self and separation from parents<br>Undertake high-risk behaviours |

*(Adapted from Levinson 1978; Erikson 1982)*

The young adult is more capable of assimilating a number of complex and sometimes contradictory situations and arguments during this stage. While this could also be said of adolescents, the difference is that the young adult does not tend to focus as critically on the absolute answer and is more comfortable with finding a balance they can be happy with. Most young adult thinking will also reflect strongly on the values and norms of their social group and their behaviours will be consistent with these (Pfaffenberger 2005). Research has also shown that the influence of peer groups can contribute to the either positive or negative choices the young adult makes (Young et al 2015).

## Psychosocial development

**Emotional development** concerns adjustment to independent adult life and centres on the formation of adult relationships. Erik Erikson (1963) described this stage of development as that between 'intimacy and solidarity' and 'isolation'. The young adult often becomes conflicted by the choices between occupation, education, relationships, living arrangements and independence. As they strive to establish life goals and work towards financial and emotional independence they may also need to choose between intimacy and isolation (Crisp et al 2013). Choices may need to be made between entering into close relationships (which may involve marriage and a family and the need to redefine goals and beliefs to accommodate those of a partner) or choosing a successful career or travel. Ultimately, the young adult wants to be able to do all of these things but often at least one 'dream' will need to be sacrificed.

The success of relationships is believed to be linked to the type of relationships the young adult has observed or had in their childhood. Events such as divorce, domestic violence and single-parent relationships impact on the young adult's ability to maintain their relationships (Crisp et al 2013).

## Moral development

As the young adult moves into adulthood, moral development enters what is described as the post-conventional stage whereby they recognise that everyone has a right to their own opinion and this may be based upon age, social group, culture and their life experiences to date. Decisions during this stage in moral development are based on the ability to determine what is right and wrong and may vary depending on the circumstances surrounding the situation.

## Spiritual development

The spirituality of the young adult will be dependent on their experience as a child. Where there has been some exposure to religion or some form of faith, the adult will rationalise the experience and make a decision to either accept or redefine these beliefs. This does not mean that an adult will not seek and develop spiritual beliefs in the absence of similar experiences. Heischman (2010) identifies this stage in development as a time where the young adult often 'struggles to find meaning'.

## Sexual development

In early adulthood many people begin to think of relationships having long-term implications. With the formation of sexual relationships the young adult becomes concerned about what is a 'normal' sexual response and this may involve sexual experimentation. The quality of sexual relations during this time is just as significant as that experienced during puberty and may lead to feelings of inadequacy and confusion. Unless positive outcomes can be achieved, the insecurities established at this point in sexual development can lead to a **sexual dysfunction** which may impact significantly on future relationships, and possibly **sexual orientation**.

### CLINICAL INTEREST BOX 14.1 Boomerang kids

According to the ABS, in 2006–2007, of males and females aged 18–24 years, 49% of males and 45% of females had never left the parental home. This is a slight fall from the 25–34 years age group in which 13% of males and 15% of females had never left home (ABS 2008). In 2009, McCrindle Research found that 8% of Australians between the ages of 30 and 34 years have retuned to live in their parental home—many have returned with their children (McCrindle Research 2009).

During early adulthood the search for **sexual identity** and meaning continues. In the past the trend has been for many young adults to enter into marriage and start a family. This has changed in recent years, with many young adults preferring to cohabit with a partner. Many young adults are also choosing to remain single, be celibate or enter into casual relationships. The availability and variety of contraception also provides more options for young adults to engage in sexual activities and to choose when they will start a family.

## Socioeconomic development

During this stage young adults generally give more attention to occupational and social pursuits and attempt to improve their socioeconomic status. Their network of relationships provides opportunities for fulfilling a variety of social roles and entering a range of different social systems. This stage in adulthood was once marked by lifestyle choices such as marriage, getting a mortgage and starting a family. In the past, most young adults would leave home to establish independence. Today it is not uncommon for children to still live at home into their thirties or to return home for a period after completing tertiary schooling, or even in the first years of marriage. This subset of young adults is referred to as 'Boomerang kids' (Berman et al 2015) (Clinical Interest Box 14.1).

Career is strongly influenced by the educational choices made during early adulthood. The early stages of adulthood may be spent gaining the qualifications that will secure employment stability in later years. Many women are delaying getting married and having a family, preferring to remain in the workforce. Women are also choosing to return to work after childbirth rather than remain at home and raise their children, which was the trend in past years. Young adults are technologically savvy and information empowered and expect diversity, variety and freedom in their jobs. They are likely to change jobs if clear job progression and career pathways are not available.

# HEALTH RISKS/PROBLEMS IN EARLY ADULTHOOD

In the period 2010 to 2012, life expectancy at the age of 25 years for Australian males was 79.7 years and for females was 84.2 years (Australian Bureau of Statistics (ABS) 2013a). (See Clinical Interest Box 14.2.) According to the ABS (2013b), statistics for 2010–12 showed the life expectancy at birth for Indigenous males was 69.1 years and for females 73.7 years, some 10 years less than for non-Indigenous people.

### CLINICAL INTEREST BOX 14.2 Life expectancy

Over the past 120 years in Australia, life expectancy at birth has improved. In 2011–13, life expectancy at birth was 33–34 years longer than it was in the late 1890s (AIHW 2016c). Based on current mortality rates, a boy born from 2011 to 2013 can expect to live 80.1 years, while a girl can expect to live 84.3 years (AIHW 2016c).

According to United Nations estimates for 2005–10, Australia's life expectancy at birth is ranked among the highest in the world.

Over the past 20 years, death rates have declined for both males and females for all age groups (ABS 2013b).

Australian males had the joint fourth-highest life expectancy in the world (along with Switzerland) over the period 2005–10. Only Iceland, Japan and Hong Kong have higher male life expectancy than Australia. Australian females have the joint third-highest female life expectancy.

(AIHW 2010)

While this stage is commonly the healthiest time of life, health problems do occur and are generally related to lifestyle choices. The National Health Survey of 2014–15 estimated that 63.8% of 25- to 34-year-olds rated their health as excellent or very good, with females rating their health as excellent more often than males (ABS 2015a). The ten most common long-term health conditions for 25- to 44-year-olds in Australia are shown in Table 14.2.

A number of factors put the young adult's health at risk. These include lifestyle factors, family history, poor personal hygiene and habits, psychosocial situation, environmental and occupational factors and culture. According to ABS (2015b), in 2013 the main cause of death for adults between ages of 25 and 44 years was suicide, with accidental poisoning being second and land transport accident third. Ischaemic heart disease was the leading cause of death for men and women between the ages of 45 and 64, with lung cancer being the second and breast cancer the third (ABS 2015b). (See Table 14.3.) In 2013 ischaemic heart disease remained the leading cause of death for both males and females.

## Injuries

Injuries associated with lifestyle and the workplace have a significant impact during this period of development. Causes of mortality in young adults include motor vehicle accidents, drowning and workplace injuries (Crisp et al 2013), as well as drug overdose, suicide and injuries due to physical attacks.

## Chronic illness

Hypertension is becoming a significant problem in young adults. While the reason for the increased diagnosis of hypertension in young adults is not well understood, it is thought to be due to lifestyle factors and obesity. Hereditary as well as lifestyle factors such as smoking, obesity and stress are all thought to be contributory factors (Berman et al 2015).

**TABLE 14.2 | Ten most common long-term health conditions, people aged 25–44 years, 2011–2012**

| Age group | Condition | Percentage |
|---|---|---|
| 25–34 | Short-sightedness | 25.1 |
| | Hayfever and allergic rhinitis | 21.9 |
| | Back pain and disc problems | 11.9 |
| | Mood (affective) problems | 10.2 |
| | Chronic sinusitis | 8.2 |
| | Asthma | 11.1 |
| | Long-sightedness | 8.5 |
| | Migraine | 8.4 |
| | Astigmatism | 8.3 |
| | Other mental and behavioural problems | 0.6 |
| 35–44 | Short-sightedness | 25.6 |
| | Hayfever and allergic rhinitis | 22.5 |
| | Back pain and disc problems | 17.6 |
| | Long-sightedness | 14.6 |
| | Chronic sinusitis | 11.2 |
| | Asthma | 9.8 |
| | Migraine | 9.4 |
| | Mood (affective) problems | 12.8 |
| | Arthritis (all types) | 7.6 |
| | Deafness | 7.2 |

*(Adapted from ABS 2012)*

## Cancers

The most common malignancies diagnosed in males during this stage in development include testicular and prostate cancer. The most common malignancies for females include breast and cervical cancer. Breast cancer is the most common cause of cancer deaths among women in Australia (Crisp et al 2013). In addition, individuals may be diagnosed with lung cancer, bowel cancer and skin cancers.

Early diagnosis of cancer is the main method of reducing the incidence of cancer and this involves education of the community and maintenance of national databases and health promotion strategies such as the National Cervical Screening Program. The Australian Cancer Council notes that the improvement in statistics related to the incidence of cancer can be attributed to better diagnosis methods, earlier detection and improved treatment.

## Mental illness

According to ABS, one in nine (11.7%) Australians aged 18 years and over had experienced very high or high level of psychological distress (ABS 2015a). Women between the ages of 18 and 24 years experienced the highest rate (13.0% and 20.0% respectively) of psychological distress than any other group (ABS 2015a). Women between the ages of 45 and 54 years experienced the second highest level (15.4%) (ABS 2015a). For males the incidence of psychological distress was higher between the ages of 18 and 24 years (11.1%) and it decreased between the ages of 45 and 54 years (9.2%) (ABS 2015a). Depression is one of the major concerns in individuals in their twenties to mid-thirties, with a majority of the individuals who are diagnosed with major depression diagnosed in this life stage. In a study completed by Welch et al (2009) a link was found between mild adolescent depression and depression in early and later adulthood. The study followed teenagers with mood, anxiety and eating disorders, disruptive behaviours and substance abuse problems into their twenties and thirties and found they had significant depressive illness with an increased risk of anxiety and eating disorders as adults.

**TABLE 14.3 | Leading causes of death by sex and age group, Australia, 2013**

| | Males | | | Females | | |
|---|---|---|---|---|---|---|
| Age group | Cause of death | Deaths | % of deaths | Cause of death | Deaths | % of deaths |
| 25–34 | Suicide | 300 | 22.3 | Suicide | 73 | 12.5 |
| | Land transport accidents | 206 | 15.3 | Land transport accidents | 45 | 7.7 |
| | Accidental poisoning | 128 | 9.5 | Accidental poisoning | 27 | 4.6 |
| 35–44 | Suicide | 319 | 15.0 | Breast cancer | 167 | 13.6 |
| | Coronary heart disease | 204 | 9.6 | Suicide | 85 | 6.9 |
| | Land transport accidents | 148 | 7.0 | Lung cancer | 47 | 3.8 |

*(AIHW 2016b)*

Depression during this stage is thought to be due to feelings of being trapped in a cycle of dysfunctional thoughts and feelings of powerlessness related to a conflict between intimacy and isolation. Onset may be due to a failure to succeed in relationships, career and lifestyle choices which leads to feelings of despair, inadequacy and eventually depression. The individual often has feelings of helplessness, loss of control, hopelessness and worthlessness, insomnia, fatigue, weight gain, suicidal thoughts, lack of concentration and persistent crying.

Young people from culturally and linguistically diverse (CALD) backgrounds are believed to have an increased risk of developing a depressive illness as their backgrounds may result in young adults experiencing additional challenges with feelings of being torn between cultures, communication difficulties and intergenerational conflict.

Being alert to the symptoms of depression and having an understanding of the disease can ensure the young adult is referred to appropriate health professional support and provided with the resources that will enable the condition to be managed effectively.

Case Study 14.1 explores a scenario involving mental illness.

## Suicide

Over the past decade there has been a decline in the reported incidence of suicide in Australia. Suicide in males continues to be significantly higher than in females and the incidence across different age groups tends to be relatively consistent. Suicide by hanging remains the most common method of suicide, with only a slight decline in its use over the past decade.

Through identification of behaviours and risk factors such as depression, sleep disturbances, weight loss, altered gastrointestinal function, social isolation, mood swings and increased use of alcohol and drugs, the nurse is able to refer their concerns on to the appropriate health professional or support such as a general practitioner (GP) (Berman et al 2015).

## Substance abuse

Substance abuse is another health concern for young adults. The prolonged use of alcohol, marijuana, amphetamines, cocaine and nicotine can lead to ongoing health issues in later life and, depending on the time of use, such as during pregnancy or when driving, it can significantly affect the lives of other individuals. The long-term use of cigarettes can lead to deteriorating health due to chronic respiratory diseases, cardiovascular disease and malignancies affecting the lungs.

The role of the nurse in relation to substance abuse will in some cases be about support and education to help individuals make life choices which do not include the use of these substances and to ensure they have the counselling and help needed to make a change (Berman et al 2015).

### CASE STUDY 14.1

A 21-year-old woman arrives with her mother and older sister to the outpatient clinic where you work. The young woman chooses to be interviewed alone. As you are gathering her history she states that she:

- Lives at home with her mum and dad and two sisters
- Loves her sisters and parents
- Has a few friends and does not socialise much as she spends most of her time studying
- Is doing second year law at university
- Would rather be a primary school teacher than a lawyer and feels that she is not clever enough to be lawyer
- Has just completed her mid-year exams. She has been repeating some modules from last year and feels she has not done well this semester
- Feels very nervous about the results and does not want to bring shame to her family again.

When you ask why she is doing law, she explains that her parents want her to be a lawyer and she feels that it is very important to respect their wishes.

She states that she is experiencing the following symptoms:

- Constant headaches
- Lacking energy and feeling tired
- Sleeping a lot
- Feeling very sad and bad about herself
- Having a very 'grey' down feeling since finishing her exams 2 weeks ago
- Feeling irritable and aggressive one minute and lethargic the next
- Crying often in the last weeks
- Not feeling hungry, but snacking on junk foods
- Drinking a lot of soft drinks, fruit juices and home-made smoothies for energy
- Experiencing constipation
- Had the flu 3 weeks ago and is still not feeling 100%.

1. Discuss how you would approach the care of this person.
2. What referral if any would you make?
3. Would you involve the mother and sister in the care?

## Eating disorders

Eating disorders such as obesity, anorexia and bulimia are an issue for many young adults. It is believed the eating disorders occurring during this stage in development are due to an attempt to manage emotional conflicts through the control of weight and food intake. As the young adult continues to seek their identity as an individual in the community, they can be adversely influenced by media, peer-group pressure and expectations which can result in feelings of inadequacy and a desire to conform to perceived expectations.

The nurse needs to observe and assess the nutritional needs of individuals affected by an eating disorder to ensure

### CLINICAL INTEREST BOX 14.3 Incidence of diabetes in early adulthood

According to the National Diabetes Register (NDR), the incidence rate of type 1 diabetes during 2007 was 15.1 cases per 100 000 population for people aged 15–24 with a further 10.9 cases per 100 000 and 4.6 cases per 100 000 accumulative, for people aged 25–39 years and 40 years and over respectively.

*(AIHW 2010)*

nutritional needs are met. This may involve monitoring dietary intake and education about appropriate dietary choices (Berman et al 2015).

## Diabetes

The recorded incidence of diabetes in Australia is increasing (AIHW 2016a). This increase is believed to be due to the increase in obesity (Colagiuri et al 2015). Of the three main types of diabetes, type 1 diabetes and gestational diabetes affect the young adult. New cases of gestational diabetes in women between the ages of 15 and 49 increased by 15% between 2000–2001 and 2008–2009 (AIHW 2010). (See Clinical Interest Box 14.3.)

Diabetes is the sixth leading cause of disease and injury in Australia, putting a significant burden on healthcare and funding. The role of the health professional in the management of this complex, chronic disease is therefore important and needs to be focused on promoting prevention strategies, self-management and treatment options. Key factors in self-management include making decisions about diet, exercise and treatment which promote a healthier lifestyle.

To be successful in the education of the person with diabetes the nurse must be familiar with the most current methods of screening and diagnosing the disease as well as the treatments and management strategies available (Berman et al 2015).

## Sexually transmitted infections

Common sexually transmitted infections (STIs) affecting the young adult include *Chlamydia*, genital herpes, syphilis, gonorrhoea and AIDS. Chlamydial infections are the most frequently reported sexually transmitted infection in Australia, with 60 000 cases notified in 2008 (Department of Health & Ageing 2010). Genital herpes caused by the herpes simplex virus type 2 (HSV2) affects 12% of Australian adults. The significance of these two conditions is that they often go untreated due to non-specific symptoms. In the case of *Chlamydia*, untreated infection is the main cause of infertility in later life.

There is an opportunity for the nurse when the younger adult is in a healthcare facility to provide educational advice on safe sex techniques and the reduction of the transmission of causative microorganisms. As the management of most STIs involves the use of multiple antibiotics it may also include education on the appropriate use of medications, as well as knowledge on the symptoms associated with each infection.

### CRITICAL THINKING EXERCISE 14.1

Marc Diaz is 24 years old. Four months ago he was involved in a car accident that left him paralysed from the waist down. He is now recovering in the rehabilitation unit. Discuss the tasks of an early adult and how the nurse may assist Marc to carry out some of these tasks.

# GROWTH AND DEVELOPMENT IN MIDDLE-AGED ADULTS

The stage identified as middle age begins at about 40 years and extends to the age of 65 years. This stage is usually considered to be the time of continuity and consolidation. Children are often older or fully grown and may move away from home, which can lead to what is called the empty-nest syndrome. This stage is often also associated with the term midlife crisis which describes a phenomenon that occurs when individuals reflect back on what has been achieved or not achieved. It may also be a time to contemplate stability in life or significant change (Orshan 2006).

## Physical development

Major physiological changes occur between the ages of 40 and 65 years. By the age of 65 years visible signs of ageing are obvious, regardless of race, ethnicity, culture or socioeconomic status. Hair becomes thinner and may be grey, wrinkles develop on the skin's surface, most people need to wear glasses, there may be a level of hearing loss and internally major organ function is reduced. Physical growth is replaced by physical degeneration, bringing about changes such as:

- Skin turgor decreases
- Muscle mass decreases
- Range of joint motion decreases
- Declining oestrogen and progesterone production occurs preceding menopause
- Level of androgen decreases, leading to male and female menopause
- Possible diminished acuity of the senses (Ebersole et al 2008).

Secondary ageing due to a lifetime of unhealthy behaviours—smoking, poor diet, substance abuse, lack of exercise and obesity—also become apparent. The leading causes of death during this stage in development are heart disease and cancer.

## Psychosocial development

Erik Erikson (1963) described middle adulthood as the stage characterised by 'generativity' versus self-absorption. During this stage in development a chosen lifestyle has been

established. For some this will have involved raising a family, and for others this may have involved achieving career goals and travel. For the person who has raised a family, the focus shifts from their children to retirement. This is regarded as the stage when a person is interested in establishing and guiding the next generation, and one in which people strive to ensure continuation of their work and lifestyle.

During middle adulthood most individuals, including those who have divorced and remarried, describe their relationships as meaningful and intimate. Married couples start to have more time for each other and recreational pursuits such as bowling, golf or volunteer work. Relationships with children and parents also tend to improve as the focus shifts from needing to provide for the family.

In middle adulthood there are likely to be many changes in a person's life, such as children moving away from home, change in career and assuming responsibility for the care of ageing parents. Loss of a spouse or partner by divorce or death is not uncommon. Retirement will be a reality for most adults towards the end of this stage, so it is necessary to plan for the future well before the event.

The nurse should be aware of possible life changes that may impact on the individual's health and should include assessment of coping mechanisms and social support (Crisp et al 2013).

Review Nursing Care Plan 14.1 and Progress Note Example 14.1 to see how a presentation in this area might be documented.

## Cognitive development

Changes in intellectual capacity are relatively uncommon, except in the presence of disease or trauma, and the middle-aged adult is able to continue learning. Some people may experience increased difficulty with concentration and retention of information.

While younger generations tend to perform better in IQ tests than older generations, this does not mean that older people have diminished capacity. Recent research suggests

### NURSING CARE PLAN 14.1

John, a 55-year-old male, is admitted to the ward. On arrival he was confused, felt hot and sweaty and complained of headache and leg cramps. Before arriving on the ward John had experienced palpitations and shortness of breath. An ECG done in ER showed no abnormalities.
**Assessment:** During the data gathering you find out that John had just completed a marathon in 35°C heat. Immediately after the run he started to vomit, had cramps to both lower legs and felt dizzy. He also temporarily experienced heaviness and palpitations in his chest. John has type 2 diabetes which is well controlled by diet and exercise. On arrival John's glucose level was 4.4 mmol/L, his vital signs were T 38.5°C, HR 94 (weak), R 32 (shallow), B/P 110/75.
**Issue/s to be addressed:** Dehydration
Confusion and dizziness
Cramps to lower legs
Palpitations and shortness of breath
**Goal/s:** John's hydration will be restored by taking small sips of fluid if tolerated and/or administration of isotonic saline (0.9%) as per IV therapy as prescribed by medical officer
John will rest in bed until headache and dizziness have subsided
John will be kept cool to reduce temperature
Symptoms of hypokalaemia will subside

| Care/Actions | Rationale |
|---|---|
| Measure for signs of dehydration | Poor skin turgor, dry mucous membranes, presence of thirst are all signs of dehydration |
| Assess skin turgor, mucous membrane, thirst | Vomiting may aggravate dehydration |
| Assess nausea or/and vomiting | Compensatory peripheral vasoconstriction will result in a weak pulse and low blood pressure. A reduced heart rate and an increase in blood pressure will indicate decrease in peripheral vasoconstriction. |
| Measure vital signs, first after 30 minutes and then if improving every 60 minutes | Normal depth of level of respiration will indicate hypokalaemia |
| Monitor discomfort, cramps in lower legs, palpitations, headaches | Decrease in severity of cramps, palpitations and headaches will indicate a return to normal potassium level |
| Monitor level of consciousness | Alterations in mental status can be the result of volume depletion and altered sodium levels |
| Monitor IV therapy | Volume replacement is required to restore vital circulation |
| Maintain a fluid balance chart | To measure fluid input and output |

**Evaluation**
Hydration will be restored.
John will become alert and aware, no dizziness will be present.
Cramps to lower legs, palpitations and headache would have completely subsided.

## PROGRESS NOTE EXAMPLE 14.1

| | |
|---|---|
| 25/06/2016<br>1530 hrs | Nursing: John, a 55-year-old man, has been admitted to the ward this afternoon. John ran a marathon earlier in the day. On admission John was confused, appeared very hot, was sweaty, confused and complained of cramp to both lower legs. Prior to arriving on the ward he had also experienced palpitations and shortness of breath. An ECG performed in emergency room showed no cardiac abnormalities. Assessment on admission: glucose level 4.4 mmol/L, T 38.5°C, HR 94 (weak), R 32 (shallow), B/P 110/75. IV therapy 1 L isotonic saline (0.9%) was commenced at 1500 hrs. John able to tolerate small sips of water.<br>***F. Moodie* (Moodie) EN** |

### CRITICAL THINKING EXERCISE 14.2

Emily Jackson is 45 years old. Emily has worked for 20 years as a primary school teacher. At present she is recovering after having a right mastectomy. You are the visiting nurse and see Emily twice a week to check her dressing, vital signs and general wellbeing. During one of your visits you notice that Emily is feeling down. In conversation she conveys that she would like to go back to work, but is not able to do so for a few months. At the moment she feels that she is being unproductive and useless.

Discuss how you as the nurse may be able to assist Emily to have a constructive attitude.

that cognitive performance may be enhanced or maintained in people who regularly stimulate their brain.

Table 14.4 summarises the common physical, cognitive and psychosocial changes of middle adulthood.

## Socioeconomic development

A major lifestyle issue in middle adulthood is the impact of what is referred to as the sandwich generation—when baby boomers and generation X have become sandwiched between the responsibility of caring for their dependent children as well as having to care for their older parents (Crisp et al 2013). This is compounded by the combination of trends such as delayed childbearing, delayed financial independence of children and an increased life expectancy for older adults.

The relationship of middle-aged adults with their children may also be at risk, with alterations to expected roles. Some adults will become grandparents and may still fulfil the traditional role of passing on traditions and stories, helping with the care of grandchildren and providing support to their adult children. Others may have limited involvement, perhaps as a result of distance, which provides the greatest obstacle to relationships between grandparents and grandchildren. Fractured families can leave grandparents without the opportunity to maintain a relationship with the grandchildren. When a marriage breaks down visitation rights of grandparents can be an issue if the relationship between the daughter-in-law or son-in-law is not maintained. Health problems may occur as a result of individuals stretching themselves across two carer roles for their children and for their elderly parents. As the role of the carer becomes more complex there may be implications for health professionals and the healthcare system (Ebersole et al 2008).

**TABLE 14.4 | Summary of developmental stages in middle adulthood**

| | |
|---|---|
| Physical development | Lens of the eye becomes dense and inflexible leading to increased loss of visual acuity<br>Hearing generally remains good<br>Less air intake during strenuous activity<br>Body less efficient at clearing byproducts of metabolism<br>Osteoporosis may develop in women due to decline in oestrogen levels<br>Sexual responsiveness may decline<br>Enter into menopause at approximately 50 years |
| Cognitive development | Reaction time generally remains the same<br>Problem solving and memory remain unchanged<br>Adaptation to stress improves |
| Psychosocial development | Relationships improve with children and each other<br>According to Erikson, enter stage of generativity versus self-absorption<br>Preparing to retire from workforce<br>Feel more comfortable in 'self'<br>Focus shifts from work to social and recreational activities |

*(Adapted from Levinson 1978; Erikson 1982)*

## Sexual development

Middle age is associated with many changes, and people in their middle years may experience doubt or anxiety about their sexual attractiveness or adequacy. The major developmental change influencing sexuality for women is the onset of **menopause**. Some women perceive this in a negative way and view it as a time when maternal potential, feminine

characteristics and sexual attractiveness disappear. Others perceive it as a time of freedom and new challenges (Orshan 2006). The term 'male menopause' is sometimes used to describe the changes that occur in men during this stage of the life cycle. It is not widely accepted as an issue in males.

In these middle years, self-image is less likely to suffer if the person has previously established a positive self-concept in relation to personal appearance and relationships with other people and is generally satisfied with their life achievements (Shives 2007; Varcarolis et al 2006; Videbeck 2007).

The middle-aged person who already has a low self-image is likely to have that esteem further reduced when the physical changes of middle age begin, such as greying hair, wrinkles and alterations to genitalia. Societal and cultural attitudes that value youth and beauty above age and experience may be a cause for anxiety in people approaching older age. If people perceive a loss of attractiveness during these years it may impact negatively on their ability to express their sexuality.

Frequency of sexual activity and the number of sexual partners often decline during middle adulthood. In some cases this may be due to lack of opportunity as individuals continue to juggle balancing a career, relationship pressures and financial burden, often leaving little time or energy for sex. Medications used may also affect sexuality as side effects reduce sexual function (Crisp et al 2013). Sexual activity may also decline due to the effects of disease processes, particularly chronic conditions where long-term effects, treatment and management can limit ability and/or inclination.

## HEALTH RISKS/PROBLEMS IN MIDDLE-AGED ADULTS

According to AIHW (2016c), the life expectancy at 64 years is 84.2 years for males and 87.1 years for females. While the majority of middle-aged adults remain healthy throughout this stage, health issues that were present in early adulthood continue to have an effect and may become more significant. The Australian Health Survey of 2011–12 indicated that most Australians between the ages of 24 and 64 reported their health to be very good or excellent (ABS 2015a). Table 14.5 lists the ten most common health conditions for people aged 45–64 years. Lifestyle, the ageing process, family history and emotional and situational stressors are usually the cause of developing health problems (Berman et al 2015).

The leading causes of death for people over the ages of 45 are ischaemic heart disease followed by cerebrovascular disease, cancers and suicide (AIHW 2016b). Table 14.6 lists the leading cause of death for people aged 45–64 years.

**TABLE 14.5 | Ten most common long-term health conditions, people aged 45–64 years, 2011–2012**

| Age group | Condition | Percentage |
|---|---|---|
| 45–54 | Long-sightedness | 53.0 |
| | Short-sightedness | 30.1 |
| | Back pain and disc problems | 18.6 |
| | Arthritis (all types) | 18.7 |
| | Hayfever and allergic rhinitis | 19.1 |
| | Chronic sinusitis | 11.5 |
| | Deafness | 10.7 |
| | High blood pressure | 11.6 |
| | Mood (affective) problems | 14.0 |
| | Asthma | 9.7 |
| 55–64 | Long-sightedness | 62.3 |
| | Short-sightedness | 35.9 |
| | Arthritis (all types) | 35.5 |
| | High blood pressure | 22.8 |
| | Back pain and disc problems | 19.9 |
| | Deafness | 17.7 |
| | High cholesterol | 22.8 |
| | Hayfever and allergic rhinitis | 14.1 |
| | Chronic sinusitis | 12.3 |
| | Other diseases of circulatory system | 34.5 |

*(Adapted from ABS 2012)*

**TABLE 14.6 | Leading causes of death by sex and age group, 2011–13**

| | MALES | | | FEMALES | | |
|---|---|---|---|---|---|---|
| Age group | Cause of death | Deaths | % of deaths | Cause of death | Deaths | % of deaths |
| 45–54 | Coronary heart disease | 644 | 15.1 | Breast cancer | 376 | 14.3 |
| | Lung cancer | 271 | 6.4 | Lung cancer | 222 | 8.5 |
| | Suicide | 270 | 6.3 | Coronary heart disease | 123 | 4.7 |
| | | | | Colorectal cancer | 123 | 4.7 |
| 55–64 | Coronary heart disease | 1296 | 16.2 | Breast cancer | 581 | 12.0 |
| | Lung cancer | 858 | 10.7 | Lung cancer | 538 | 11.1 |
| | Suicide | 388 | 4.9 | Coronary heart disease | 308 | 6.4 |

*(AIHW 2016b)*

## Chronic conditions

The chronic conditions that may be present in this age group are diabetes, asthma and hypertension. The most common form of diabetes at this stage is type 2, accounting for 85–90% of all cases. Depending on the time of onset, diagnosis and level of control, complications may be minimal or advanced in the person with diabetes.

The prevalence of cardiovascular disease increases markedly with age. Between 2011 and 2012, 10.2% of males and 7.5% of females aged 50–64 years suffered from a cardiovascular disease (ABS 2013c). It was reported that approximately 6.8% of Australians aged 55–64 years had long-term coronary heart disease. Hypertension, stroke, atherosclerosis and myocardial infarction may develop as the result of hyperlipidaemia, obesity, sedentary lifestyle, familial history and diabetes mellitus. Table 14.7 summarises lifestyle issues causing disease in middle adulthood.

**TABLE 14.7 | Lifestyle issues causing disease in middle adulthood**

| Disease | Lifestyle issues |
|---|---|
| Cardiovascular (CHD, stroke) | Dietary intake—high fat, carbohydrates and salt intake<br>Sedentary lifestyle<br>Obesity<br>Stress<br>Long-term alcohol intake |
| Skeletal (osteoporosis) | Dietary intake—inadequate calcium, phosphorus, magnesium, vitamin D<br>Immobility<br>Decreased oestrogen levels in females<br>Lack of exercise |
| Respiratory (emphysema, asthma) | Chronic asthma<br>Long-term nicotine use<br>Air pollution<br>Occupational exposure to chemicals |
| Psychological (depression, dementia) | Long-term diagnosis of disease<br>Loss of spouse, family member<br>Loss of occupation<br>Social isolation |
| Cancer | Familial history<br>Occupational exposure<br>Long-term cigarette and alcohol use<br>Radiation<br>Environmental carcinogens |
| Sexual dysfunction | Loss of partner<br>Long-term abstinence<br>Effects of medications used to treat health issues |

*(Adapted from AIHW 2010)*

The onset of chronic illness and disability and death occurs approximately 20 years earlier in Indigenous Australians than in non-Indigenous Australians. These rates are most significant in Aboriginal and Torres Strait Islander adults living in rural and remote areas.

The burden of chronic disease states and their associated complications has a significant impact on the economy and is the focus of the work of many healthcare providers. The role of the nurse is to provide ongoing education and support by identifying deficits in knowledge and ensuring resources are provided to promote health and ongoing stabilisation of conditions.

### CRITICAL THINKING EXERCISE 14.3

Eric Jones, a 56-year-old train driver, has been admitted to the ward with chest pain. He states he has been experiencing pains for a week and decided he would see his GP only on the advice of his wife. Mr Jones is overweight and admits not exercising as much as he did when he was younger.

1. What questions would you ask Mr Jones to gather a complete history?
2. What health issues may be attributed to Mr Jones's chest pains?
3. How would you phrase questions related to Mr Jones's sexuality?
4. What health promotion education might Mr Jones require?

## Cancer

The National Health Policy Area identifies the common cancers affecting individuals during this stage of the lifespan as colorectal cancer, lung cancer, melanoma of the skin, non-melanoma skin cancer (NMSC), breast and cancer of the cervix in females, prostate cancer in males and non-Hodgkin lymphoma (AIHW 2010). Lifestyle and hereditary factors are thought to be the main cause of their development. The current risk of dying from cancer before the age of 75 years is estimated to be one in eight for males and one in twelve for females.

## Depression

In this mid-life stage many people may be at a crossroad in their life and become depressed because of a perception that goals and dreams identified throughout early adulthood have not been achieved and because of feelings of failure. Depression diagnosed in early adulthood will need continued management and treatment. Lifestyle and psychosocial changes such as loss of job, end of a long-term relationship, onset of menopause, ageing or death of a spouse may trigger the onset of depression during this stage in the lifespan.

# CULTURAL DIVERSITY

Australia's population consists of a diverse range of migrant cultures with a rich combination of values, beliefs, traditions

and languages. According to ABS (2011), in 2010 5.3% of Australia's population was born in the United Kingdom, with 2.4% born in New Zealand, 1.7% born in China, 1.5% born in India and 1.0% born in Italy.

Indigenous Australians make up an increasing percentage of the population with the 2006 census showing an increase of 11% in the number of Indigenous Australians. This increase is believed to be due not only to a higher birth rate but also to better recording of numbers.

For many Indigenous Australians the accumulative effects of poor health during infancy, unstable family and community influences, poor socioeconomic conditions and engagement in antisocial behaviours have led to what is described as 'prejudicial entry into adulthood' (Eckermann et al 2010).

For health professionals the rich tapestry of cultures that makes up Australia's population means they must have a degree of cultural competence that will allow them to develop awareness and positive attitudes in conjunction with the knowledge and skills to live and work effectively in a culturally diverse environment (Thackrah & Scott 2011). (See Clinical Interest Box 14.4.)

**CRITICAL THINKING EXERCISE** 14.4

Refer to Clinical Interest Box 14.4.

What does the ceremony initiating Indigenous males into adulthood involve? Discuss the cultural conflict in this clinical scenario.

## HEALTH PROMOTION

Young adults generally have a minimum of major health problems and are interested in meeting their health needs. However, because of the many changes that occur and the stresses in their lifestyle, they may be at risk of illness. Young adults may also be genetically susceptible to certain chronic diseases such as diabetes. Physiological concerns for the middle-aged adult include stress, level of wellness and the formation of positive health habits. The nurse may wish to discuss some or all of the health promotion topics outlined in Table 14.8.

### CLINICAL INTEREST BOX 14.4
### A young man's cultural dilemma

Mark is a 24-year-old male. His father is a white Australian cattle station owner in remote Australia and his mother is a full-blood Aboriginal woman from a local Aboriginal community. Mark completed most of his secondary schooling at a boarding school in Darwin and wishes to return to Darwin to complete tertiary studies but is feeling conflicted by the need to connect with his Aboriginal heritage and to work on the cattle station with his father.

Mark recalls visits to the community where his mother grew up and being intrigued by the stories and ceremonies. On his last visit Mark overheard one of the elders talking about the fact that it was time for him to prove his courage and transition into 'manhood'. However, Mark is unsure whether taking part in a ceremony would mean he would have to live in the community and give up his dream of studying.

## IMPLEMENTING THE NURSING PROCESS

Assessment and care planning which focuses on the physical, cognitive, psychosocial and cultural elements of care is important if holistic care needs are to be addressed. As a nurse it can sometimes be uncomfortable asking questions about a person's sexuality. It is good to remember that the person may also feel uncomfortable talking about these issues.

### History taking

When nurses take a nursing history, it helps if they ask questions in a matter-of-fact manner and that they are clear about the purpose of those questions. For example, a non-threatening approach to specific issues such as sexuality might be, 'Sometimes people who have this illness experience some changes; have you noticed any changes happening to you?' It is important in such situations for the nurse to establish a relationship and an environment where the person feels safe in talking about their concerns. At the same time the nurse needs to be aware that the person may not reveal the most concerning or personal issues during the initial interview. These may be revealed later, when the person feels that they can trust the nurse (Stein-Parbury 2009).

For trust to develop the nurse must be non-judgmental, put personal values and beliefs aside and be open to the world of the person as construed through their words, feelings and values.

### Care planning

Whenever possible, care planning is a collaborative activity that follows identification of nursing issues. The nurse and person together develop a care plan that responds to individual needs. If appropriate, the person's partner/carer may be included in the planning. This is particularly relevant when the identified individual is in an established relationship, or has alterations to bodily functions or appearance; for example, the individual who has an ostomy (ileostomy or colostomy) as a result of colorectal cancer may respond negatively to the stoma and have concerns about maintaining a physical relationship with their partner.

One aim of care is to facilitate open communication between the nurse and other health professionals as well as the person concerned. It is this open and honest communication which will promote discussion of concerns. The nurse with excellent interpersonal skills such as listening, asking open-ended questions, using silence and summarising the discussion will help individuals to share feelings, concerns and information more openly, which will ensure all care needs are met.

**TABLE 14.8 | Health promotion in adulthood**

| | Early adulthood | Middle adulthood |
|---|---|---|
| Safety | Workplace measures<br>Sun-safe measures<br>Motor vehicle safety | Workplace measures<br>Motor vehicle, especially driving at night<br>Home safety measures (e.g. handrails, non-slip mats, lighting) |
| Routine health screening | Breast screening<br>Vision and hearing<br>Testicular examination<br>Immunisation<br>Dental<br>Smoking<br>Physical examination | Breast screening<br>Vision and hearing, particularly glaucoma, macular degeneration<br>Testicular examination<br>Screening for cardiovascular disease<br>Screening for cancers (e.g. breast, colorectal, prostate)<br>Smoking |
| Nutrition and exercise | Need for regular exercise—assess joint mobility, muscle tone, musculoskeletal<br>Nutrition assessment of risk factors for heart disease (e.g. obesity, cholesterol and fat intake) | Dietary assessment, including fat, calcium, vitamin D<br>Exercise assessment, need for regular exercise<br>Screen for nutritional and exercise risk factors for cardiovascular disease |
| Psychosocial | Assess for job or family stress<br>Encourage setting of short- and long-term goals | Screen for anxiety associated with physiological and psychosocial changes<br>Depression<br>Retirement planning |

*(Berman et al 2015; Crisp et al 2013)*

## Summary

Growth and development are processes that begin at conception and continue throughout each stage of the life cycle. Growth may be defined as the physical changes that occur in a steady and orderly manner, while development relates to the adjustment to the changes in psychological and social functioning. The stages of adult growth and development are: early adulthood, middle adulthood and older adulthood. Characteristic changes occur at each stage, but the pace and behaviours of growth and development vary with each individual. In each stage in the lifespan, disease and injury can impact on continued health and wellbeing.

### DECISION-MAKING FRAMEWORK EXERCISE 14.1

Mary is a student nurse on clinical placement. She has not yet completed her medications and IV therapy education. This afternoon Mary will be caring for John (refer to Nursing Care Plan 14.1).

Using the decision-making framework:

1. Should Mary accept delegation to care for John?
2. What observations would Mary make during the evening shift?
3. What observations would she refer to the RN?
4. If John continues to tolerate fluids, how could hydration be maintained?
5. What changes in John's condition would indicate that he is improving?
6. If John asks the reason for the palpitations and shortness of breath what explanation could Mary give?
7. What other factors may be considered regarding the care of John?
8. What questions regarding John's condition could Mary ask her preceptor?

## Evaluation

Current models of care relate to maintaining a 'person-centred' approach to care which requires the health professional to be responsive to the needs of the individual. This involves consideration of cultural and linguistic backgrounds, lifespan issues, socioeconomic and educational issues, as well as the healthcare setting in which care is provided. To determine if nursing goals have been achieved the nurse has to be observant on how the person responds to the interventions implemented as part of nursing care. If nursing goals are not achieved, the nurse is to modify the care to ensure the person's specific needs are met.

## Review Questions

1. What is meant by the term 'early adulthood'?
2. Under the heading 'early adulthood', identify the main health issues.
3. Discuss the meaning of the phrase 'intimacy and isolation' when applied to early adulthood.
4. Under the heading 'middle adulthood', briefly outline the growth and developmental phases.
5. Under the heading 'middle adulthood', identify the main health issues.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Recommended Reading


Couzos, S., & Murray, R. (2007). *Aboriginal primary health care: an evidence-based approach* (3rd ed.). Australia and New Zealand: Oxford.

## Online Resources

American Federation for Aging Research: www.infoaging.org
Cancer Council Australia: www.cancer.org.au
Closing the Gap: www.indigenous.gov.au
Congress of Aboriginal and Torres Strait Islander Nurses: www.indiginet.com.au/catsin
E-Geriatric.Net: www.e-geriatric.net
Health Insite: www.healthinsite.gov.au
Māori Health: www.maorihealth.govt.nz

# Nursing care across the lifespan: older adult

*Margaret Webb*

CHAPTER 15

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Discuss the key concepts of older adulthood
- Explain the terms ageism, ageing process, age-related adjustments, dementia
- Understand how cultural factors impact on the ageing process
- Outline psychological, physical and social impacts of ageing on older adults
- Understand the impact of disability on lifestyle choices in older adults
- Identify and describe nursing interventions to promote person-centred care in residential care environments
- State primary functions of nurses in promoting quality nursing care in older individuals

## KEY TERMS

ability
abuse
ageing
ageism
age-related changes
dementia
disability
falls
restraint
theories of ageing

## CHAPTER FOCUS

Ageing is an inevitable part of life. Ageing begins as soon as life begins and ceases only when life is terminated; it is dynamic and extends across the lifespan. Ageing is a process that accumulates changes in organisms or objects over time and involves multidimensional changes on physical, psychological, cultural and social levels. Physiologically, it cannot be avoided or delayed. The physical appearance of an older adult offers only a superficial view of ageing. Although ageing is an inevitability for all, it does not always happen without some health compromises. Nurses, because of their unique work practices and relationships with individuals, are in an ideal situation to recognise age-related health compromise, promote healthy ageing and recognise and reinforce wellness as a desired state of ageing.

## LIVED EXPERIENCE

Some people are born old ... others feel young for their whole lives. It is a state of mind ... you're only as old as you feel and I feel like I did when I was 20!

**Charles, 78 years young**

I do not ask to be young again; all I want is to go on getting older.

**Konrad Adenauer (First Chancellor of West Germany after World War II. Lived to be 91)**

I do not remember becoming old. All of a sudden I was there.

**Elaine M. Brody MSW.DSc(Hons). DOB 1922**

You can't help getting older, but you can help yourself from becoming old and infirm. In mind as well as body.

**Joan Collins**

For the purposes of this chapter we will view ageing from the point in people's lives at which they reach maturity during adulthood and at which **ageing** and development in later adulthood becomes apparent. This occurs around the seventh decade, when people are thinking of, or are actually, retiring from the paid workforce. This is, of course, a generalisation as some people retire in their fifties whereas others are still fully employed or work part time well into their late sixties or seventies. Chronological age for many is not indicative of when and how they enter the later stage of life (see Clinical Interest Box 15.1).

Theories of development in the twentieth century focused predominantly on children, adolescents and young adulthood. However, in recent decades, far more attention has become focused on the older population, using geriatrics (the study of disease process in older adults) and gerontology (the study of healthy ageing) (Crisp et al 2013).

### CLINICAL INTEREST BOX 15.1 Categories of older adulthood

Older adulthood is divided into the following categories:

| | |
|---|---|
| Young Old (Stage I) | 65–74 years |
| Old Old (Stage II) | 75–84 years |
| Oldest Old (Stage III) | 85 years+ |
| Centenarians (Stage IV) | older adults of 100 years or more |

*(Adapted from Crisp & Taylor 2009; AIHW 2007)*

## THE STATE OF AGEING IN AUSTRALIA

The population of Australia is ageing and is considered to be mainly middle aged in terms of the average age of the population (37.3 years) (Thornton 2010). Between 1994 and 2014 the proportion of people aged 65 years and over increased from 11.8% to 14.7%. The Australian Bureau of Statistics (ABS) (2014) has predicted that over the next decade, this increase will be significantly steeper. In 2014, the number of people who were over the age of 85 years was 456 500 and 4080 were over the age of 100 years (ABS 2014).

## AGEISM

**Ageism** refers to a set of ideas and beliefs that are associated with discriminatory attitudes directed towards older adults (Quadagno 2011). It implies negative beliefs and stereotypes about older people collectively. These negative beliefs, attitudes, norms and values are used to justify stereotypical views of the older person (Johnson & Chang 2014).

Ageism is seen in all the categories of ageing, from limitations in employment to life-changing decisions that must be made in regard to living or lifestyle choices. At no time should age be a factor in not empowering an older person to be involved in decision making. With the increasing number

of older people in developed countries, ageism may face some opposition (Crisp et al 2013). Discrimination based on age is deemed to be unlawful by Commonwealth law as outlined in the *Age Discrimination Act 2004* (Australian Government 2014c).

## GROWTH AND DEVELOPMENT

The process of ageing can be viewed from the perspective of physical, social, psychological, functional and emotional ageing. There is no one theory of ageing, but a number of theories have been developed to explain the ageing process. Biological theories look at the physiological and anatomical changes that occur, while psychological theories seek to explain the thought processes and behaviours of older people (Crisp et al 2013).

### Physical changes

The body's organs and systems undergo changes as they age. These changes alter susceptibility to various diseases and will frequently alter the efficiency of the functioning of the organ/organ systems. Changes are often difficult to identify in just one individual system because of the inter-relatedness of the body organs, systems and functions. Understanding these processes is important for nurses because many of the adverse effects of ageing are first noticed in body function.

#### Neurological and sensory systems

The nervous system has some distinctive **age-related changes**, but the origin of these changes may be attributed to other body system variations, such as reduced cerebral circulation attributed to cardiovascular weakening (Eliopoulos 2010). (See Clinical Interest Box 15.2.) What is evident is that there is a decline in brain weight and circulation; however, there is little evidence that thinking and behaviour are affected early in later adulthood. Neurons, nerve fibres and cerebral circulation will decrease. Efficiency of function of the hypothalamus is altered. Lens, pupil size and corneal and retinal changes will affect visual acuity, and atrophy and sclerosis in the tympanic membrane and inner ear structures will impact on hearing.

#### Integumentary system

Ageing affects all aspects of the integumentary system. Flattening of the dermal–epidermal junction, reduced thickness and vascularity of the dermis and loss of collagen and uniformity of fibres make skin less elastic. Skin becomes thinner, and the change in lean-muscle-to-fat ratio means that skin is more at risk from bony prominences underneath it (Berman et al 2015). Skin becomes drier. There is a reduction of melanocytes, the skin's immune system diminishes, sweat glands atrophy and heat receptors that have typically been spread through the dermis are less receptive, resulting in delayed recognition of heat on the skin. Growth rate of hair declines (head, pubis, axillary), but facial, eyebrow, ear and nasal hair becomes more prominent in men (refer to Clinical Interest Box 15.3).

### CLINICAL INTEREST BOX 15.2 Neurological and sensory systems

Vision: inability to focus or accommodate properly (presbyopia), changes in clarity and density to the lens (cataracts), narrowing of visual field (decreased peripheral vision), decreased ability to adjust to dim light, alteration to blood supply to retina (can cause macular degeneration)

Hearing: presbycusis develops (progressive hearing loss, especially high-frequency sounds, progressing to low and mid-range sounds), accumulation of cerumen (ear wax)

Taste/smell: approximately 50% of all older adults experience some loss of their ability to smell. Taste acuity is dependent on smell; decreased saliva production and effects of medication may cause loss of sensitivity to taste and perception of food may be altered

Slower reflexes: delayed responses to multiple stimuli, alterations to balance and coordination may increase the risk of falls

Body temperature: regulation is less effective because of decreased function of hypothalamus, with delayed thirst, atrophy of sweat glands, decreased muscle:fat ratio

Quality of sleep (especially in stages III and IV): sleep is altered due to circadian and homeostatic factors

Tactile sensation: sensation and response to pressure and pain are reduced

*(Crisp et al 2013; Eliopoulos 2010)*

### CLINICAL INTEREST BOX 15.3 Integumentary system

- As the skin becomes less elastic, it becomes drier and more fragile, increasing the risk of tearing
- As subcutaneous tissue is lost, skin sags, wrinkles and becomes more irritated and more at risk of infection
- Nails become brittle and growth decreases
- Thinning and baldness of hair in men, greying of hair due to loss of pigment
- Skin pigmentation due to clumping of melanocytes
- Increased risk of benign and malignant skin lesions

*(Crisp et al 2013; Eliopoulos 2010)*

#### Cardiovascular system

The heart muscles decrease in efficiency and contractile strength with age. Left ventricular hypertrophy is slight, but the aorta thickens and dilates, as do the atrioventricular valves, causing sclerosis and fibrosis. Cardiac output is reduced. Valve closure may become incomplete, causing systolic and diastolic murmurs (Eliopoulos 2010). Arteries

## CLINICAL INTEREST BOX 15.4
## Cardiovascular system

- Blood pressure increases to compensate for increased peripheral resistance and decreased cardiac output (particularly systolic)
- Hypertension predisposes older adults to heart failure and coronary disease, renal disease, peripheral vascular disease, stroke
- Less efficient utilisation of oxygen results in less available energy, especially with strenuous exercise
- Increased heart rate occurs when body is affected by anxiety, excitement, illness or strenuous activity, and there is a longer period until baseline heart rate returns
- Peripheral pulses are weaker and lower extremities may be cooler

*(Crisp et al 2013)*

## CRITICAL THINKING EXERCISE 15.1

George Minnow is a 92-year-old man admitted to an acute care facility following a fall in the residential aged care facility in which he lives. It is expected that he has a fractured right neck of femur (RNOF). You have concerns for his skin integrity while he is on bed rest. What factors could compromise his skin integrity?

stiffen with age, decreasing their properties of stretch and contractility, creating more resistance for the heart to pump blood through them. Veins, conversely, become less rigid and are less resistant; therefore bulging and pooling is experienced. (See Clinical Interest Box 15.4.)

### Respiratory system

As a result of age-related structural changes in the chest (see also 'Musculoskeletal system' below), there is a reduction in respiratory activity and efficiency. Costal cartilage calcification makes the rib cage and trachea more rigid. The anterior and posterior diameter of the chest cavity increases and, with osteoporotic changes, the appearance of kyphosis (sometimes referred to as a dowager's hump) may be seen, particularly in women (Crisp et al 2013). The inspiratory/expiratory muscles are weaker, causing a decrease in lung expansion and vital capacity and there is a decrease in strength of cough and laryngeal reflexes. In the lungs, cilia are reduced in number and effectiveness, and less elastic alveoli result in increased difficulty in clearing secretions. The maximum capacity of the lungs may decrease as much as 40% between the ages of 20 and 70 years. Spontaneous alveoli destruction increases in rate. Available energy is decreased (in conjunction with the cardiovascular system) and exercise/activity tolerance is decreased. There is increased risk of infection because of decreased efficiency in clearing secretions and expelling accumulated material. There is also increased prevalence of shortness of breath because of decreased vital capacity (Crisp et al 2013).

## CLINICAL INTEREST BOX 15.5
## Gastrointestinal system

- Teeth enamel becomes harder and more brittle
- Increasing numbers of cavities; the bones supporting teeth decrease in height and density
- Flattening of chewing cusps occurs
- Taste sensation becomes less acute
- Increased risk of aspiration due to altered gag response
- Risk of pernicious anaemia due to diminished or absent intrinsic factor
- Increased risk of constipation

*(Crisp et al 2013, Eliopoulos 2010)*

### Gastrointestinal system

Changes in the gastrointestinal system are identifiable at most levels and they may create a greater need for adaptation than do some of the other body systems. Changes can be noticed in the mouth. These changes affect the condition and effectiveness of teeth and may cause the tongue to atrophy, a decrease in production of saliva by up to two-thirds and changes to cheek musculature, which can impact on the mechanical breakdown of food and swallowing (Eliopoulos 2010). Gag reflex and oesophageal motility are diminished; in addition there are changes to gastric mucus and production of bicarbonate, which will impact on the pH of the stomach. Abdominal muscles become weaker and there is a decreased tone and peristalsis in the smooth muscle of the intestines. This results in an increased tendency for constipation (Scott et al 2015). The effects of medication may change because of changes in the metabolism capacity of the liver. (Refer to Clinical Interest Box 15.5.)

### Musculoskeletal system

Muscle tissue atrophies and muscle strength and tone diminish in proportion to the decline in muscle mass. Joints become less elastic and flexible with the loss and calcification of cartilage. There is an alteration to the equilibrium between bone deposition and resorption, and in postmenopausal women decreased oestrogen increases bone resorption and decreases calcium deposition (Scott et al 2015). The loss of bone density particularly affects long bones and vertebrae. The curve of the lower back changes, resulting in a change to the centre of gravity (Crisp et al 2013). There is a loss of lean muscle tissue which is converted to fat. Basal metabolic rate (BMR) can decrease during mid to later adulthood; therefore an increase in body weight may be experienced early in later

## CLINICAL INTEREST BOX 15.6 Musculoskeletal system

- Fibrous tissue gradually replaces muscle
- Arm and leg muscles become particularly flabby and weak when the person becomes less active
- Muscle cramps are more prevalent
- Increased brittleness of bones, bone loss and decreased bone density, increasing the risk of fractures and damage from only minor trauma
- Increased risk and prevalence of osteoporosis
- Reduction in height and appearance of kyphosis
- Limitation to joint mobility, appearance of spurs and points on bone ends, limiting motion and activity and increasing joint pain
- Gait changes due to structural and postural changes

*(Crisp et al 2013, Eliopoulos 2010)*

adulthood. Body fat moves deeper in the body with ageing. Body heat is less effectively retained. Muscle activity associated with shivering to increase body temperature is less efficient (Eliopoulos 2010). Thermoregulation is compromised (by the age-related changes in the cardiovascular, integumentary, neurological and musculoskeletal systems). Age-related changes may affect mobility and safety. The older adult is at increased risk of falls and fractures. (Refer to Clinical Interest Box 15.6.)

### Urinary system

Overall, kidney function decreases with age, although even with a 50% reduction the body can function adequately in the absence of disease. Atherosclerosis of the renal vessels may promote atrophy of the kidney, and renal tissue growth decreases (Miller 2008). The total capacity of the bladder declines and tissues may atrophy, causing both functional and structural incontinence. Detrusor overactivity, which is more commonly known as an 'overactive bladder', is also frequently seen as a cause of incontinence occurring in older people. (DeMaagd & Davenport 2012). It is suggested that 68% of older people living in nursing homes require some urinary continence care. Urinary incontinence can be directly attributed to reduced social wellbeing, reduced quality of life and an increase in urinary tract infections and falls (Yu et al 2015).

### Reproductive system

Changes in structure and function are the result of hormone alterations. In men, there is no definite cessation of fertility, but refractory periods may increase. Prostatic hypertrophy can cause incontinence, frequency and nocturia in men. Female breasts become smaller, sag and become more pendulous due to loss of breast tissue mass, elasticity and tone. Incidences of breast cancer will increase for individuals aged over 80 (AIHW 2014a). Lubricating vaginal secretions are reduced (Berman et al 2015). Reduced libido is not usually related to hormonal changes, but decreased sexual activity may be the result of illness, death of sexual partner or decreased socialisation (Elias & Ryan 2011).

### Immune system

T-cell activity declines and T-cells take longer to replenish in older people. More immature T-cells are present in the thymus and are less able to proliferate in response to pathogens; therefore, the immune response to invading antigens is slowed. The immune system is not ineffective; it is just slower and less responsive to invasion. Responses to vaccines (influenza, tetanus) are decreased (Berman et al 2015). Inflammatory response declines; therefore, in the presence of inflammation or infection clinical manifestations such as fever and pain may not be present. Immune system changes may precipitate insulin resistance (Berman et al 2015).

### Endocrine system

The thyroid gland fibroses and becomes more nodular. Despite changes, thyroid activity remains adequate in the absence of disease. Parathyroid activity remains within normal limits. The adrenal cortex, regulated by the pituitary gland, decreases production of adrenocorticotrophic hormone, and there is also a noted decrease in the production of oestrogen, testosterone and androgens (Crisp et al 2013). There is delayed and insufficient release of insulin by the beta cells, and a decreased sensitivity in tissues to insulin. The ability to metabolise glucose due to the reduction in insulin production is reduced, causing increased blood glucose concentrations (Scott et al 2015).

## Psychosocial changes

There are a number of psychosocial **theories of ageing** which are currently used to frame our understanding of the psychosocial ageing process. Where once disengagement theory was seen as a preferred model to shape nursing practice, it is now not so widely accepted. Disengagement theory sees ageing as a process in which the person begins to withdraw from their active roles and activities and becomes increasingly self-occupied. It is assumed that withdrawal from society is a natural aspect of ageing (Johnson & Chang 2014). Within this model the nurse assists the older person to withdraw from aspects of active life.

Conversely, activity theory and continuity theory both propose that the continuation of active involvement in social activities, roles and relationships is essential for successful ageing. It is suggested that the older person is happiest when they can stay active and maintain social interactions (Johnson & Chang 2014). Whereas activity theory proposes the maintenance of regular roles and activities, continuity theory suggests that personality, attitudes and behaviours remain constant across the lifespan. Within these models the nurse assists the older person to not only maintain existing activities and roles but also to help develop them.

Personality development continues even in late adulthood. Late adulthood is the developmental stage during which people clarify and use what they have learned over the years. Older adults can continue to grow and adapt when they are flexible and realistic. Older adults can use their skills to conserve their strength, adjust to change and loss and use these years productively. For some older people there is a new awareness of time and older persons may want to use the time they have left to leave a legacy to their children or to the world, pass on their knowledge and experiences and validate their lives as having been meaningful.

### Older adulthood and the experience of grief

The experience of grief is not limited to the losses experienced when someone close to us dies. For an older adult, there can be many losses that will be grieved:

- Retirement from the paid workforce
- Change of living arrangements
- Change in physical health and wellness
- Loss (of function) of body parts
- Changes to abilities (such as being independent in activities of daily living [ADLs])
- Loss of sensory acuity (failing sight, hearing)
- Loss of mobility (e.g. driving a car)
- Regret at recognition of stage of life (i.e. later adulthood)
- Lack of fulfilment or achievements in life
- Lack of longevity expected in rest of life (own mortality) (Jeffreys 2010).

It is anticipated that those in older adulthood will encounter loss through death of siblings, parents, partners and friends. Some older people become more accepting of death as they age, whereas others grieve for the loss of longevity in their lives in the process of adapting to the ageing process. (See Clinical Interest Box 15.7 for strategies to assist an older person who is grieving.)

**CRITICAL THINKING EXERCISE 15.2**

You are undertaking a home visit to Martha Wells. Martha recently had a major cerebrovascular accident (CVA) and has a significant right-sided paresis. You arrive at her home at 11 am to find her crying and still in her night attire. When you ask her what the problem is she cries more and tells you that she is helpless and feeling sad. What do you do? What might be her problem?

## Cognitive changes

Cognitive changes that impact on everyday life are not a part of normal ageing (Berman et al 2015). Such changes should be considered abnormal. The risk of dementia does increase with age (Clinical Interest Box 15.8) but is not an inevitable condition of ageing.

**CLINICAL INTEREST BOX 15.7**
**Strategies for nurses to assist older people to grieve**

Nurses should be aware of their own attitudes towards dying, death, grief and loss. Death is a taboo topic in many cultures and many people do not think about it or discuss it with others.

Many people are very uncomfortable talking about loss or listening to someone else talk about it. Grieving people often feel alone in their experience and do not want to burden others with discussion of their feelings. Giving a grieving person an opportunity to share personal feelings can be a very powerful experience.

Encourage the expression of feelings, needs and beliefs, and listen closely to what is being expressed. Whether an individual is experiencing denial, anger, confusion, fear or guilt, the nurse should remain calm, even when the emotions of the grieving person are intense.

Do not take anger or irrational outbursts personally. Remember that the individual is grieving. Reacting to anger with anger will only escalate the situation.

Because each person experiences grief very differently, nurses should not tell a grieving person that they know what they are feeling or understand what they are going through. What should be communicated is that they are sorry for their loss and offer sympathy and support.

Do not try to talk individuals out of their feelings. People experience intense emotions following a loss and need a safe place to express them. Use active listening skills, like responding to statements without agreeing, challenging or disputing the other person's perspective. Listen carefully and acknowledge what the person has said.

Allow an individual time to think about the loss. This is especially true for older adults who may be processing information more slowly.

If grief is interfering with daily functioning for more than 2 months after the loss, referral to a grief counsellor may be beneficial.

*(Adapted from Christensen & Kockrow 2011)*

**CLINICAL INTEREST BOX 15.8**
**Dementia**

The incidence of dementia in Australia is projected to rise from the current figure of 257 275 in 2010 to 1 130 700 by 2050 (Access Economics 2009). Its prevalence in older adulthood increases with age:

- 65–69 years: 1 in 100
- 85 years: 25 in 100.

**Dementia** is the term used to describe the symptoms of a group of illnesses that cause a progressive decline in a person's cognition, to a degree that it interferes with intellectual, social and occupational function. Dementia is discussed in more depth later in the chapter.

### Socioeconomic changes

The majority of older adults in Australia continue to make valuable contributions to their families and their community. A substantial proportion of volunteering, both in the community and in the care of younger and older family members, is undertaken by people aged 55 years and over (ABS 2011; Thornton 2010). Formal, paid employment may decrease for many older adults in the population, but immeasurable economic, cultural and social contributions are made to the community through informal care and participation by older adults, often for other older adults and those who are disadvantaged or have disabilities that impact on their **ability** to function independently. The contribution of older adults is often not measurable until it is discontinued as a result of illness or a change in circumstance. The value of volunteering and informal care arrangements impacts on the recipient, but also on the older adult, who is active, engaged and continues to find worth and identifiable roles in the later stages of their life (Crisp et al 2013).

### Sexuality and the older adult

Sexuality is a part of self, regardless of age or disability. As a person ages, the ways in which their sexuality is expressed, and the way they see themselves as sexual beings, may change (Crisp et al 2013). The expression of sexuality and self extends from basic human needs such as the ability to give and receive tactile stimulation (touching, stroking and massage), to the way we present ourselves to the world. If it was important for a woman to always wear a skirt with stockings as a part of how she saw and expressed herself, her choices and expression should be continued for as long as is practicable to ensure that the maintenance of personhood (self) is preserved. Sexuality is not only about sexual intercourse or sexual activity, although both may be part of how a person—older or younger—expresses themselves. Sexual health and/or wellbeing will have a different meaning for individuals. For some it may be in the way they present themselves or feel, but for others it may be the fulfilment of intimate sexual expression.

## HEALTH RISKS/PROBLEMS

Australians' life expectancy at birth continues to rise and is among the highest in the world. For older people, the main causes of death are heart disease, stroke and cancer. At age 65, Australian males can now expect to live a further 19 years to almost 84 years of age, and females a further 22 years to almost 87. Life expectancy, however, is not uniform across all groups of society in Australia. Compared with those who have social and economic advantages, disadvantaged Indigenous populations are more likely to have shorter lives. Indigenous people are recognised as being generally less healthy compared with other cohorts in the community, die at much younger ages and have more disability and a lower quality of life. People living in rural and remote areas tend to have higher levels of disease risk factors and illness than those in major cities (AIHW 2010; Cotter et al 2012).

In taking into account age-related changes, the most common specific health problems of later adulthood are usually related to degenerative changes in body systems. It is often thought that most older people with degenerative changes will experience some loss of function in a body system; therefore, comorbidities increase the complexity of disease processes, treatment and the nursing care that is required.

### Chronic conditions

Although the majority of older people are in good health, chronic medical conditions do become more frequent with age and may cause **disability**. Older people have at least one chronic condition: the most common conditions are arthritis (48%), complete or partial deafness (33%), cardiovascular disease (24%), osteoporosis (16%) and type 2 diabetes (13%) (ABS 2010). Another common problem of late adulthood is dental problems, especially tooth decay. This affects digestion and leads to many other problems. Older people may suffer from a wide variety of functional disorders related to ageing and chronic diseases. With a slowing down in immune system functional ability, the older person is also more susceptible to viral and/or contagious diseases which could further compromise existing chronic conditions (Scott et al 2015).

### Impaired cognition

The three most common conditions affecting cognition in the older adult are dementia, delirium and depression. These three conditions are colloquially referred to as 'The 3Ds' in ageing individuals. The nurse should be able to distinguish between the three in order to select appropriate nursing interventions (Crisp et al 2013). Failure to be able to differentiate between them will result in not only highly inappropriate nursing care being given, but may also further compromise the person's health and wellbeing.

**CRITICAL THINKING EXERCISE 15.3**

Mary Avery is a 78-year-old woman with Alzheimer's disease. She lives at home with her daughter in central Queensland. Recently she has started having conversations with her husband who has been dead for 20 years and her urinary incontinence has worsened. What should initially be done?

#### Dementia

Dementia is not a single disease but a term that is associated with many different diseases. It is a disease process and is progressive in nature. It is not a normal part of ageing, but the incidence and prevalence of this condition increases proportionately with chronological ageing. Dementia interferes with cognitive functioning to the degree that it impacts on

normal social and occupational activity. Dementia is the single greatest cause of disability in older Australians (Alzheimer's Australia 2015b). The areas of function that may be affected in a person living with dementia are:

- Memory
- Insight
- Ability to plan and make decisions
- Ability to reason or learn new ideas
- Language skills
- Filtering systems
- Control mechanisms including emotions
- Tolerance to stress
- Information processing
- Orientation and spatial awareness (Alzheimer's Australia 2015a).

A person living with dementia will not necessarily have disturbance to all intellectual function, but will experience difficulties with abstract thinking and decision making (Christensen & Kockrow 2011).

Risk factors for dementia include hypertension, high cholesterol levels, poor diet, obesity, age (65+), smoking, excessive alcohol consumption, heredity (5–10%) and head injury.

There are more than 160 different types of dementia:

- *Alzheimer's disease*: the most common form of dementia accounting for between 50% and 70% of all dementias. Alzheimer's disease is a physical disease which attacks the brain, resulting in impaired memory, thinking and behaviour. As brain cells die, the substance of the brain shrinks. Abnormal material builds up as 'tangles' in the centre of the brain cells and 'plaques' outside the brain cells, disrupting messages within the brain and damaging connections between brain cells. This leads to the eventual death of the brain cells and prevents the recall of information (Alzheimer's Australia 2015a).
- *Vascular dementia*: the broad term for dementia associated with problems of circulation of blood to the brain. There are a number of different types of vascular dementia, the most common being multi-infarct dementia. Multi-infarct dementia is caused by a number of small strokes called transient ischaemic attacks (TIAs). The strokes cause damage to the cortex of the brain, the area associated with learning, memory and language (Alzheimer's Australia 2015a).
- *Dementia with Lewy bodies*: this is caused by the degeneration and death of nerve cells in the brain. The name comes from the presence of abnormal spherical structures, called Lewy bodies, which develop inside nerve cells. It is thought that these may contribute to the death of the brain cells. People living with dementia with Lewy bodies may experience difficulty with concentration and attention, extreme confusion, difficulties judging distances (often resulting in falls), visual hallucinations, parkinsonism and fluctuations in mental state from lucidity to extreme confusion (Alzheimer's Australia 2015a).
- *Fronto-temporal lobar degeneration*: the name given to dementia when there is degeneration in one or both of the frontal or temporal lobes of the brain. There is considerable difference in symptoms, depending on which parts of the frontal and temporal lobes are affected. The right and left frontal lobes govern mood, behaviour, judgment and self-control. Damage leads to alterations in personality and behaviour, changes in the way a person feels and expresses emotion and loss of judgment. The right and left temporal lobes are involved in the organisation of sensory input such as what is heard or seen. Damage may lead to difficulty placing words or pictures into categories (Alzheimer's Australia 2015a).
- *Parkinson's disease*: dementia with Lewy bodies sometimes co-occurs with Alzheimer's disease and/or vascular dementia. It may also be hard to distinguish dementia with Lewy bodies from Parkinson's disease, which is also associated with Lewy bodies, and some people who have Parkinson's disease develop a similar dementia (Alzheimer's Australia 2015a).

Clinical Interest Box 15.9 discusses the issue of sexuality and dementia.

## Delirium

Delirium is an acute, transient confusional state that often has a reversible physiological cause. It is characterised by impaired cognitive function and reduced ability to focus, sustain or shift attention (Gross et al 2012). The disturbance manifests in a very short time, and fluctuates throughout the day. It may last only a few days or may persist for weeks, depending on the ability to identify and manage the cause of the confusion. Delirium in older people is often overlooked or misdiagnosed. Delirium is usually precipitated by an underlying acute health condition, which in most cases can be identified with careful assessment and investigation. This can include an alteration in sodium or infections such as urinary tract infections. Increasing old age, dementia, visual impairment and severe medical illness are important risk factors for delirium (Paulson et al 2014). It is estimated that significant numbers of older adults admitted to acute health facilities will experience delirium during their admission and about 40% of older adults in residential aged care facilities may be found to be in delirium state. Nurses should place importance on environmental and physiological changes that may impact on the psychosocial presentation of older adults.

## Depression

Depression is not a normal part of ageing. It is under-recognised and inadequately treated in many older people. Misdiagnosis of depression delays treatment, increases the risk of functional decline and slows the rate of recovery. Depression in older adulthood is a serious condition and can be associated with a loss of independent function, cognitive impairment, poor response to rehabilitation and diminished recovery. It also can lead to an increased risk of death. Major depression occurs in 1–3% of the general older population, with a further 8–16% having clinically significant depressive symptoms. The incidence of depression in long-term care

## CLINICAL INTEREST BOX 15.9
## Sexuality and dementia

If behaviour is sexually motivated and inappropriate (e.g. if it is being conducted publicly), the matter may be resolved and the person's dignity maintained by gently discouraging the behaviour or by redirecting the person with dementia to another activity. Some people who are living with dementia may behave in a sexually inappropriate manner that is totally different to behaviour before the onset of their dementia. The underlying cause is the invisible damage to the brain caused by the illness. It can be helpful to remember that the person with dementia does not intentionally seek to embarrass or annoy others (Alzheimer's Australia 2015a). Nurses need to recognise that the desires and needs of older people are not unlike their own. There is no reason to prevent older people, even those who are very old, from forming relationships. This may mean that they simply wish to spend time together, hold hands, hug or kiss. Or it may mean that a couple wish to sit, lie down together or become more intimate. This can be reassuring and comforting for both but can also cause problems in different ways.

Specific problems may arise if:

- One or both has a wife or husband but are no longer aware of their marital status because of memory impairment in dementia
- One or the other is at risk of harm or injury as a result of the relationship
- The new relationship distresses a spouse or other family members
- One individual is exerting power over the other, or in any way coercing the other
- Staff are in conflict about the 'rights and wrongs' of the situation and cannot agree on how it should be managed.

In such cases it is advisable for the healthcare facility to have a clearly formulated policy concerning residents and sexual behaviour. This should guide responses and can be shown to family members in case of conflict about what should happen. A policy may indicate that if there is no evidence of overt sexual activity the rights of the residents to have a relationship will be respected; alternatively, the policy may indicate that such relationships will be discouraged by close monitoring or by moving one individual to another facility.

Ideally, relatives should be alerted to how the pathophysiology of dementia can lead to the possibility of such relationships developing and be made aware of relevant policies before the loved one is admitted to the facility.

settings is three to four times higher than in the general population (Victorian Government Health Information 2010). Sleep disturbances can result in cognitive impairment and depression. Depression can be effectively treated in older people resulting in improved mood, improved function and an increased quality of life.

With the projection of the numbers of people who will be living with dementia in the 21st century, and the assumption that we will live longer in adulthood, nurses must have the knowledge and skills to communicate effectively and provide appropriate care that celebrates the person who is living with a dementing illness. See Table 15.1 for a comparison of dementia, delirium and depression.

## Polypharmacy

As the incidence of disease and chronic ill health increases in the older body, there is an increase in the number of medications that are prescribed. Multiple-drug use is referred to as polypharmacy. For the older person this can be especially hazardous as there can be a slower metabolism rate for the drugs. Drugs that need to be excreted via the kidneys have the potential for developing toxicity due to the slower excretion rate for older persons. (Refer to Chapter 24 for more details.)

## Falls

The World Health Organization defines a **fall** as 'an event which results in a person coming to rest inadvertently on the ground or floor or other lower level'. An *injurious fall* is a fall that causes a fracture to the limbs, hip or shoulders (Australian Commission on Safety and Quality in Health Care 2009). It is recognised that older adults are more at risk of falls related to both physiological (e.g. osteoporosis, decreased exercise, vision impairment) and environmental factors. See Clinical Interest Box 15.10 for general safety measures to prevent falls. These safety measures can be utilised for all hospitalised individuals. See Chapter 19 for falls risk assessment.

In some circumstances even the most careful nursing interventions are unable to avoid the risk of injury or harm to individuals. In such cases, as a last resort, it becomes necessary to consider the use of restraining devices to protect individuals.

### Restraints

**Restraints**, sometimes called protective devices, are used to limit the freedom of movement of an individual of any age, to varying degrees. Restraints may be physical or chemical. Protective or restraining devices are used to prevent individuals from harm or from harming others.

The Department of Health and Ageing (2012) has produced guidelines for the use of restraints in all health and aged care settings. These guidelines state that:

- The least restrictive form of restraint must be used
- A full, documented assessment must be completed prior to using a restraint
- The person must be monitored and observed closely for signs of distress or harm
- A medical officer's order for restraint must state the reason for the restraint, the time period and the type of restraint to be used
- Restraints should only be used after all other possible ways of ensuring safety have been tried and documented as unsuccessful
- Restraints cannot be used for staff convenience.

**TABLE 15.1 | Differentiating the 3Ds—dementia, delirium and depression**

| Feature | Dementia | Delirium | Depression |
|---|---|---|---|
| Onset | Slow and insidious—deterioration over months or years | Sudden—over hours or days | Often abrupt—may coincide with life changes |
| Course | Symptoms are progressive over a long period of time; not reversible | Short and fluctuating—often worse at night and on waking<br>Usually reversible with treatment of the underlying condition | Typically worse in the morning. Usually reversible with treatment |
| Duration | Months to years | Hours to less than 1 month—not often longer | At least 2 weeks—can last for months or years |
| Psychomotor activity | Wandering/exit seeking or agitated or withdrawn (may be related to coexisting depression) | Hyperactive delirium: agitation, restlessness, hallucinations<br>Hypoactive delirium: sleepy, slow moving | Usually withdrawn, apathy |
| Alertness | Generally normal | Fluctuates—may be hypervigilant through to very lethargic | Normal |
| Attention | Generally normal | Impaired—difficulty following conversation, fluctuates | Normal |
| Mood | Depression may be present in early dementia | Fluctuating emotions (e.g. anger, tearful outbursts, fear) | Depressed mood<br>Lack of interest or pleasure in usual activities<br>Change in appetite (increase or decrease) |
| Thinking | Difficulty with word finding and abstraction | Disorganised, distorted, fragmented | Intact—themes of helplessness and hopelessness present |
| Perception | Misperceptions usually absent (can be present in Lewy body dementia) | Distorted—illusions, hallucinations, delusions; difficulty distinguishing between reality and misperceptions | Usually intact (hallucinations and delusions only present in severe cases) |

*(Adapted from Scott et al 2015; Clinical Epidemiology and Health Service Evaluation Unit 2006)*

Protective devices include the use of:

- Side rails on an individual's bed
- Security or safety belt on trolleys or wheelchairs
- Soft material ties (extremity immobilisers) that prevent movement of the hands and feet
- Padded coverings for the hands; for example, hand mitts
- Vest or jacket chest restraint that secures an individual in an upright position in a wheelchair.

***Selecting a restraint*** When selecting a restraint the nurse must consider the following:

- It is the least restrictive possible
- It does not interfere with treatment
- It can be changed easily
- It is the safest restraint for the individual
- It is the least obvious to others.

The use of restraint is always deemed to be the last option for managing challenging behaviours. Challenging behaviours can at times be triggered by an event or sequence of events. The nurse should always try to identify these triggers and amend/remove them where possible. Alternative measures must always be considered before physically or chemically restraining a person. These measures include environmental changes, introduction of or changes to activities and alteration to nursing care (Department of Health and Ageing 2012).

Some suggestions for alternatives to the use of a restraint are identified in Clinical Interest Box 15.11.

## Mistreatment of the older adult

Mistreatment or **abuse** may be directed towards an older person or carer and may involve physical, psychological, financial or sexual neglect (Berman et al 2015).

Physical neglect/mistreatment may involve failure to provide food, fluid, personal care and hygiene. Overmedication may be used to cause sedation. Hitting, slapping and pushing may also occur.

Psychological mistreatment may involve name calling, swearing, threats, humiliation or bullying. Abuse may also

## CLINICAL INTEREST BOX 15.10 Safety measures to prevent falls

General safety measures to prevent falls include:

- Ensuring that floors are free of clutter, slippery substances and loose rugs. Spills should be wiped up immediately, floor coverings should be maintained in good repair and rugs should have a non-slip backing or be removed from the area. Large, clearly worded warning signs should be displayed when floors are wet or slippery
- Installing handrails in corridors, stairways, bathrooms and toilets. These provide support for individuals who are weak or unsteady when walking and also provide support when a individual is sitting down or getting up; for example, sitting on the toilet or getting out of the bath
- Placing a non-slip mat on the floor at the base of the bath or just outside the shower cubicle. A chair should be available in the bathroom for individuals to sit on; for example, during a shower or while dressing or undressing. Floor tiles in any area should be of the non-slip variety
- The nurse remaining with and supporting at-risk individuals during hygiene and toileting procedures and whenever there is a risk of the individual falling
- The nurse frequently checking more independent individuals during hygiene and toileting procedures and ensuring that every individual is aware of the position of the call button in the shower or toilet area
- Adjusting the height of the bed to meet the needs of the individual enabling them to get into and out of the bed safely and independently whenever possible
- Placing any items that the individual might need within easy reach; for example, when the individual is in bed or sitting on a chair. Items required should be on the locker or over-bed table that is positioned close to the individual. This avoids the risk of a fall from the bed caused by the individual stretching while attempting to reach for a needed item
- Ensuring that all walking aids, for example crutches and frames, are fitted with non-slip tips to prevent them skidding on the floor. Individuals who are using walking aids should be supported adequately and supervised until they are able to use the aids safely. All walking aids should be positioned at the correct height for the individual
- Ensuring that clear lighting is available in all areas and that a nightlight is provided in the individual's room
- Placing the signal device within the individual's easy reach so that assistance can be summoned if necessary; for example, to get out of bed
- Keeping all areas free of items that could cause a person to fall; for example, electrical cords, cleaning equipment, linen, dressing or medication trolleys
- Ensuring that ambulant individuals wear shoes or slippers that are well fitting and have non-slip soles. The cord from a dressing gown should not be allowed to trail, as it could cause the person to trip
- Doors should remain fully open or closed, as people are more likely to bump into a door that is ajar.

*(Crisp et al 2013)*

include isolation or confinement. Misappropriation of money or valuables or denying the right to money may also occur (Crisp et al 2013).

The older adult may be mistreated in their own home, an aged care facility or hospital. Abusers may be family members/carers, other relatives and in some cases healthcare providers. Older adults are usually afraid to report abuse or neglect because they are ashamed or fear retaliation. Nurses should be familiar with the laws under which they work in regard to the reporting of suspected or known cases of neglect (Berman et al 2015).

## CULTURAL ASPECTS OF AGEING

In Australia the population of older people from culturally and linguistically diverse populations is increasing (Crisp et al 2013). Based on the 2011 Australian census figures, 30.22% of all Australians were born overseas. As culture includes aspects of life such as language, values, beliefs and customs, an environment that does not support these characteristics can create challenges for the older person, their family and friends, and for the nurses who provide their care. Isolation and feelings of alienation created by a lack of cultural interaction can be compounded by difficulties with communication and acceptance of care strategies. In Australia the introduction of culturally specific residential care services is attempting to address this challenge; however, unless these services are accessible for the older adults requiring them, many culturally diverse older adults will be accommodated within mainstream care services.

For many family members of these culturally diverse older people guilt at not being able to provide care at home for their relative may increase the difficulties experienced by the older adult and the care staff.

To care for the culturally diverse older individual competently, nurses must develop appropriate strategies. These may include:

- Appreciating that all people have diversity in their backgrounds
- Considering own beliefs, attitudes and values
- Refraining from assumptions relating to the thoughts and feelings of the older adults and their families in regard to difficulties experienced. Listening and communication are paramount

## CLINICAL INTEREST BOX 15.11 Suggestions to promote restraint minimisation

- Bed, chair or wrist alarms
- Exit door alarm
- Electronic movement sensors (see Figure 15.1)
- Planned night-time activities for those who wander at night
- Daytime recreational and social activities, provide auditory and visual stimuli such as soothing music, television or radio
- Activity areas at the end of each corridor
- Easy access to safe outdoor areas
- Structural design of units modified to enhance visibility of residents. Assign confused or disoriented individuals to rooms with high visibility
- Rocker and recliner chairs
- Outlets for industrious or anxious behaviour; for example, physical, occupational and recreational therapies
- Ensure regular toileting
- Review medication to ensure it is having the desired therapeutic effect
- Allocate staff to ensure familiarity with individual
- Change position frequently.

*(Adapted from Department of Health and Ageing 2012; Joanna Briggs Institute 2002)*

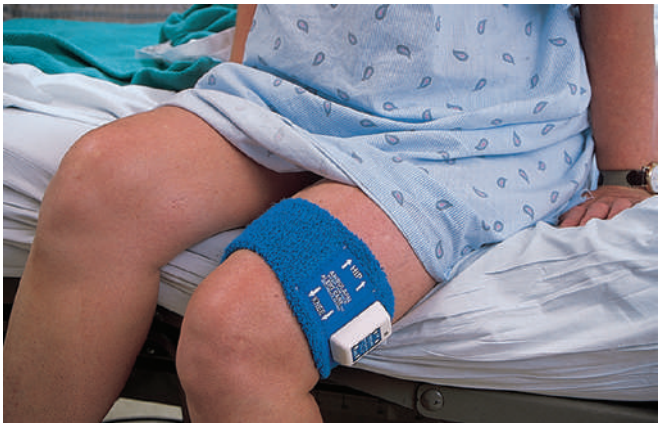

**Figure 15.1** Individual wearing an Ambualarm
*(Fig 27.9 Crisp et al 2013, see Tabbner's 6e Fig 13.2)*

## CLINICAL INTEREST BOX 15.12 Attitudes to ageing

Which of these statements of negative and positive views of ageing do you agree with?

**Negative**

- People have a poor view of turning 60 or 70 and fear getting older
- The older you get the worse your health will become
- Older people will end up in an old age home. Families will put them in a home when they become a burden
- Older people will experience age discrimination (employment, healthcare, etc)
- Women aren't as beautiful as they age
- Older people become more cranky and have wrinkled skin and grey hair
- Many older people are sick, disabled, demented
- Older people have no sexual desire or the thought of them having sex is repulsive
- Older people are a drain on the healthcare system
- Old workers are not as effective as younger workers
- Older people live in poverty or cannot afford their medications
- Older people are a burden to society

**Positive**

- People look forward to the 'golden years'
- Society has different standards that older people are held to in comparison to younger people
- Older people have more free time to spend with friends and family
- Older people have the freedom to do the things that they couldn't do before
- Older people are nice, warm, friendly people
- Older people have lots of knowledge and wisdom and have the time to help others
- Older people are well off financially and don't have career and childcare issues to worry about
- Old age is peaceful and fun
- Older people look forward to the future

- Appreciating the diversity that exists within cultures, language and values (different dialects, religions, practices within an ethnicity)
- Clarifying with the older adult and their family the importance of cultural behaviours and events
- Seeking education and familiarising self and workplace with the specific needs of people from culturally and linguistically diverse backgrounds (Crisp et al 2013)
- Realising that non-verbal cues and indicators can at times be more important than verbal language within cross-cultural communication (Kirov & Webb 2014).

There are times when nurses hold stereotypical views and attitudes towards ageing which will significantly impact upon their own practice. While some of these may be linked to cultural misconceptions, others may be attributed directly to the nurses' own lived experiences. To understand the needs of another person, nurses must look past their own beliefs and values and consider the world view of those in their care (Hofstede 2011).

See also Clinical Interest Box 15.12.

**CRITICAL THINKING EXERCISE 15.4**

Mabel Grainger is a 70-year-old woman who has been admitted to hospital following a fall at home. She has a haematoma on her right arm and on her face, but has not sustained any major injuries. What issues do you think may have led to her fall at home? What aspects of care will you consider in planning her discharge?

## HEALTH ASSESSMENT AND PROMOTION

Assessments and health screening that are undertaken in wellness will assist in identifying adjustments or treatments that are required to manage age-related changes to ensure that function and quality of life are maintained. With an accumulation of age-related changes, disease processes may begin to impact on the person's quality of life and functional ability. This impact may be identified through assessments by healthcare professionals.

The Australian government funds some programs through Medicare and other national health strategies. These may include:

- Vision and hearing tests
- Breast screening (for women over 40 years)
- Prostate checks (for men of all ages)
- Bowel screening (for those over 50 years)
- Medication review
- Older person's health assessment
- Podiatry
- Physiotherapy assessments for falls risk.

The Aged Care Assessment Program is a federally funded program that comprehensively assesses the frail older person in order to identify their care needs and help gain access to appropriate care services (Australian Government 2014b).

## CARE SETTINGS

### Continuum of care—assessment as the basis for care

With the ageing of the baby boomers in Australia (those born after the end of World War II and up to 1964), the number of people within the population who are moving towards the 'young old' category of older adulthood is increasing markedly. With this rise expected to continue over the next decade, changes in care provision will continue to be refined by successive governments. What is becoming clearer is that older adulthood is no longer accepted as a time of only frailty and chronic illness, but that older adults enjoy 'good health and wellness' as they age, and actively pursue their own choice with regard to their finances, health and occupation. Their considerable influence (and power related to numbers) means that political parties are listening more carefully to the needs and wants of older adults. The time of assumptions of knowing what is best for older people has passed.

For nurses to assist older adults in planning effective care, a familiarity with current forms and access to services is necessary.

### Community care

When older people are required to make adjustments in their lives to accommodate assistance with their functionality, community services may provide this assistance. This may be in response to assistance required after an illness, surgery, hospitalisation or as a result of an assessment prompted by a general practitioner (GP) or a relative to identify areas in the ADLs that the older person may not be able to manage independently.

Community care services may assist older people to live independently with informal care for extended or short periods of time. When the decision is made, either willingly or as a necessity for more formalised, continual care, an Aged Care Assessment Team (ACAT) referral will be required.

### Aged Care/Needs Assessment Teams (ACAT)

A formal assessment is required for most government-funded care services (federal, state or local government funded). The multidisciplinary ACAT team operates as a single point of entry to community Home Care Packages and residential aged care services. An ACAT assessment is not required for Home and Community care services. A referral for ACAT assessment may be by self-referral or it may come via family or friends, healthcare practitioners or community services known to the person. Assessment of a person's care needs takes into account physical, medical, psychological and social factors, and facilitates access to appropriate care services.

Care needs will be determined, and an assessment will be made regarding the requirement for care needs. High-level care indicates that the older adult requires frequent care interventions of a complex nature. This care can be delivered in the community or in a residential aged care facility (RACF). Low-level care indicates that the degree and frequency of care is less, and care can also be delivered in the community or in an RACF.

### Community aged care support

Community aged care support allows older adults to receive the care they require without relocating; that is, they are able to remain in their own homes and communities. The services provided vary according to the needs of the individual.

Community care services may include meals, cleaning, transport, home and garden maintenance and assistance with personal care. For older adults with greater needs, home nursing (district nursing), counselling and therapy may also be provided.

There are two main streams of support available:

1. Home Care Packages
2. Home and Community Care Packages.

### Home Care Packages

To be eligible for a Home Care Package the person must have a home care agreement with a service provider following an ACAT assessment. As these packages are consumer directed the person and the home care provider decide together what services the person wishes to receive. Reforms in funding indicate that from 1 July 2015 all applications for a Home Care Package will be means tested and a co-payment required (AIHW 2014b).

There are four levels of Home Care Packages.

1. Level 1 supports people with basis care needs
2. Level 2 supports people with low-level care needs (formerly Community Aged Care Packages)
3. Level 3 supports people with intermediate care needs
4. Level 4 supports people with high-level care needs (formerly Extended Aged Care at Home and Extended Aged Care at Home Dementia Packages).

These packages are consumer directed and aimed at supporting the lifestyle of the person, not aimed at solely providing personal support (AIHW 2014b).

### Home and Community Care Packages (HACC)

HACC is a basic Commonwealth/state-funded home care service and is aimed at supporting the older person who only requires help with daily tasks or basic care to stay within their own home. Assessment for these services is undertaken by the service provider (AIHW 2014b).

This support may include:

- domestic assistance—household jobs like cleaning, clothes washing and ironing
- personal care—help with bathing or showering, dressing, hair care and toileting
- home maintenance—minor general repair and care of the house or yard; for example, changing light bulbs and replacing tap washers or lawn mowing
- home modification—installing safety aids such as alarms, ramps and support rails
- nursing care—for example, wound care, continence advice (Australian Government 2014c).

In 2013, there were over 56 515 older adults using community aged care packages in Australia, with most requiring a relatively low level of care (AIHW 2014b). The aim is to provide options and alternatives for older adults who require assistance to continue to live in their own homes. (See Case Study 15.1.)

## Acute settings

On occasions, assessment, treatment and rehabilitation of a new or existing chronic illness or a surgical or medical intervention may require admission to an acute care setting. Older people are typically more at risk in this setting than those in younger age groups. Nurses will benefit from an awareness of age-related changes to older adults and how risk is increased for this cohort. See Clinical Interest Box 15.13 for a list of risk factors for hospitalised older people.

Discharge planning for older adults in acute settings is imperative to ensure that the older person has the required support for ADLs, as well as service provision for nursing and home care to optimise the highest level of function and independence possible. Refer to the resources in the References and Recommended Reading section at the end of this chapter.

### CASE STUDY 15.1

Alan Porter is 75 years old and has lived alone for the past 10 years. He enjoys living in his neighbourhood and plays cards every Thursday night with some friends up the road. He also lives a suburb away from his niece and goes to church with her and her family on Sundays. His pride and joy is his modest-sized garden, in which he has a variety of fruit trees and a vegetable patch.

Recently, Alan has had trouble with his vision and, as a result, has decided to give up driving. He has also noticed that while he still loves his garden, the work needed to maintain it seems to take twice as much effort. Alan's niece has noticed that the state of his appearance has been deteriorating, as his clothes are often dirty. She also recently visited him at home and found that, while Alan spent a lot of time working on his garden, his house was quite dirty and his cupboards were bare except for some tins of soup and baked beans. Alan feels very connected to his community and wants to stay there, but he has realised that in order to do this he may need help. He is trying to decide what options might be available to him. Alan's neighbour suggested that he should contact his GP and ask for help.

1. What help could the GP offer?
2. Who would assess Alan?
3. What help could Alan potentially receive?
4. Can Alan's niece seek help on Alan's behalf?
5. Will Alan have to pay for any help?

### CLINICAL INTEREST BOX 15.13 Risk factors for hospitalised older people

- Effects of immobility (loss of strength, constipation, stasis)
- Adverse reaction to anaesthetics
- Adverse reaction to medications
- Increased risk of nosocomial infection
- Loss of independence, autonomy
- Response to unfamiliar environment
- Increased risk of falls
- Slower recovery rate due to reduced energy reserve and response
- Slower adaptation and coping mechanisms (physical/emotional)

*(Crisp et al 2013; Eliopoulos 2010)*

## Rehabilitation

To assist an older person to reach and maintain their optimum level of function, a phase or period of rehabilitation may be

necessary. The site for rehabilitation may be in the acute care setting, as an outpatient in the community, in a specific rehabilitation unit or in the residential care setting. Nurses are an important part of the multidisciplinary rehabilitation team, often taking a role in assisting the older person in their ADLs and facilitating adjustment to their independence and ability (Berman et al 2015). See Chapter 40 for more information on rehabilitation nursing.

**CRITICAL THINKING EXERCISE 15.5**

Joseph King is a resident in a RACF. He is not his usual self when you inform him he has a visitor awaiting him in the lounge room, and he says he does not want to leave his room today. What might be your actions to address this change in Joseph?

## Residential aged care facilities (RACF)

When older adults can no longer remain in their own homes, they may decide, or a decision may be made for them, to move into residential aged care facilities where their care needs can be more holistically met. Aged care facilities provide suitable accommodation, as well as services such as meals, laundry and cleaning, personal care, medication assistance and complex nursing care, as assessed by nursing staff once the older adult has taken up residence.

In Australia in 2011, there were 169 000 people (usually referred to as 'residents') in mainstream residential aged care. Seventy-seven per cent of all residents were aged 80 or over and 57% were aged 85 or over. Seventy per cent of all residents were women and 1127 (0.7%) identified as Indigenous (AIHW 2012).

The admission to an RACF has the potential to affect an older person in physical, psychological and emotional ways. Nurses must be aware of this period and the ability of the older person to adjust to this major change in their circumstances and way that they live. Issues of privacy, dignity, self-esteem and maintenance of personhood are all factors that require the older person to undertake a period of adjustment and adaptation. Some older adults find the move to residential care comforting, while others feel isolated and alienated.

### Quality of care in residential aged care

The monitoring of the standards of care is managed by a process called Aged Care Accreditation This process ensures care facilities provide a high quality of care. The Australian Aged Care Quality Agency has the responsibility for the accreditation of all RACFs (Australian Government 2014a).

The standards cover all aspects of residents' needs from health and personal care and safety to a range of lifestyle matters including independence, privacy and dignity. Care facilities (service providers) that meet these standards are accredited/certified. Service providers that do not meet these standards may be subject to sanctions. There are four Standards and 44 expected outcomes that must be met. The Standards are:

1. Standard 1: management systems, staffing and organisational development
2. Standard 2: health and personal care
3. Standard 3: care recipient lifestyle
4. Standard 4: physical environment and safe systems.

The Accreditation Standards are detailed in the Quality of Care Principles 2014 (Australian Government 2014a).

**CLINICAL INTEREST BOX 15.14**
**Adjustments and adaptations to ageing required of older people**

- Retirement/end of paid employment
- Housing/living arrangements
- Health status/changes to capacity
- Loss of partner/friends
- Financial capacity/position
- Changes to self-image/self-esteem
- Accepting self as ageing
- Finding ways to maintain quality of life

*(Adapted from AIHW 2007; Crisp et al 2013)*

# NURSING CARE OF THE AGEING PERSON

Older Australians face challenges and adjustments as they move into later adulthood. (See Clinical Interest Box 15.14.) They contend with the end of employment at whatever age they retire; changes in health status; changes in relationships with family, children and friends; and adjustments to losses. Nurses must listen to older individuals, rather than making assumptions about what they value and aim for in their lives.

As age-related changes and chronic illnesses affect the functioning of older adults, the assistance that they require becomes more complex. This is not to say that all older people will require full assistance with all of their care needs. It is frequently shown that with assistance to meet needs in certain areas (such as mobility or positioning), other ADLs such as nutrition or toileting can be better maintained by the older person themselves. This type of care is called person-centred care—care that is specific and individualised to that unique person. However, within the community the framework of care as discussed earlier is frequently that of consumer-directed care (CDC). CDC gives the person more choices and control over the types of care and services that they choose to receive. (See Progress Note Example 15.1.)

# IMPLEMENTING THE NURSING PROCESS

Nurses must recognise that holistic care needs do not disappear or become inappropriate due to changes in health circumstances. No matter what the illness, injury or disability, care delivery needs to be assessed in conjunction with the

individual's previous attitudes, beliefs, knowledge, experiences and behaviours relating to their expression of self. Assessment and care planning need to incorporate physical, psychological, social and cultural elements. (See Chapter 17 for discussion of these components of the nursing process.)

## Specific nursing assessments for older adults

*Nutrition*: Mini Nutritional Assessments (MNAs) have been developed to allow for a holistic assessment of factors that may impact on nutritional status. Refer to Clinical Interest Box 15.15 for these factors in older adulthood.

*Falls*: falls are the most common cause of injury for older adults in an acute care facility (deWit 2015) but every individual in every care setting should be assessed for the risk of having a fall. Falls risk is a recognised priority in Australian healthcare. There are many different falls risk assessment tools (see Clinical Interest Box 15.16).

*Skin assessment*: relative to the level of dependence and disability in an older adult, the risk of interruptions to skin integrity and the development of pressure ulcers is a risk factor that must be managed. Refer to Table 15.2 for an example of the Norton Scale which is used to assess risk of pressure ulcers.

*Continence*: although incontinence can affect all age groups, assessment of urinary and faecal continence is an important component of the assessment process for the older adult.

*MMSE*: the Mini-Mental State Examination (MMSE) and the Abbreviated Mental Test Score (AMTS) provide quick measures of cognitive impairment (Molloy 2014).

### PROGRESS NOTE EXAMPLE 15.1

| | |
|---|---|
| 18/02/2015<br>1500 hrs | Mrs Jones stated that she had pain over her right knee and that it was causing some difficulties when mobilising. On inspection the area appeared to be slightly swollen. She was observed to be limping slightly. RN advised. RN Mallard completed an assessment of Mrs Jones and administered pain relief as per medication chart at 1330 hrs. At 1430 hrs Mrs Jones stated that her pain was significantly less and she was able to walk better.<br>***M. Myers* (Myers) Student Enrolled Nurse** |

### CRITICAL THINKING EXERCISE 15.6

Barry Whiteley has always been a keen bowls player, but is becoming frustrated with his form and says he is not going to continue with his three-times-a-week sport. When you go to visit him with the district nursing service, he is dishevelled and non-communicative. What might be your actions in addressing Barry's situation?

### CLINICAL INTEREST BOX 15.15 Non-physiological causes of under-nutrition in older people

**Social factors**

- Poverty
- Inability to shop
- Inability to prepare and cook meals
- Inability to feed themself
- Living alone, social isolation or lack of social support network
- Failure to cater to ethnic food preferences

**Psychological factors**

- Alcoholism
- Bereavement
- Depression
- Dementia or Alzheimer's disease

**Medical factors**

Mediated through anorexia, early satiation, malabsorption, increased metabolism and impaired functional status

- Medications

*(Adapted from Ahmed & Haboubi 2010)*

### DECISION-MAKING FRAMEWORK EXERCISE 15.1

You have just commenced working within a unit at the Sunray Residential Aged Care Facility as an Enrolled Nurse. Within this unit there are 25 residents, all with dementia. On this shift apart from you there are two care workers who both hold the Certificate III in Aged Care qualification, a diversional therapist and a volunteer. The aged care workers advise you that they will do the medications administration, and that you only need to do the dressings and assess any of the residents in case they exhibit challenging behaviours. The volunteer advises you that she is great with the residents when they become restless and will let you know so that you can give them their 'calming down' pills. You call your supervisor who advises you that this was the normal practice and task allocation.

Using the decision-making framework address the following:

1. Do you accept this allocation of duties?
2. What (if any) are the issues that could potentially result in you working outside your scope of practice?
3. Identify the potential and/or actual flaws within this scenario.

These tests are useful to assess and document severity of cognitive impairment and to measure changes in cognitive function. Alzheimer's Association Australia provides further explanations of the implications of these tests (refer to Clinical Interest Box 15.17 and References and Recommended Reading).

## CLINICAL INTEREST BOX 15.16 Falls risk-assessment tool

Place a tick in front of the items that apply to the individual.

General information
- Age over 70
- History of falls*
- Confusion at times
- Confused most of the time*
- Impaired memory or judgment
- Unable to follow directions*
- Needs assistance with elimination
- Visual impairment
- Feels physically weak*

Medications
- Receiving central nervous system suppressants (narcotic, sedative, tranquilliser, hypnotic, antidepressant, psychotropic, anticonvulsant)
- Receiving medication that causes orthostatic hypotension (antihypertensive, diuretic)*
- Medication that may cause diarrhoea (cathartic)
- Medication that may alter blood glucose levels (insulin, hypoglycaemics)

Gait and balance
- Poor balance when standing*
- Balance problems when walking*
- Swaying, lurching or slapping gait*
- Unstable when making turns*
- Needs assistive device (walker, cane, holds onto furniture)*

*(deWit 2015)*

**Note: A tick on any starred item indicates a risk for falls. A combination of four or more of the unstarred items indicates a risk for falls.*

## Care planning

The nurse and individual together (or the older person's representative) develop a care plan that responds to individual needs (see Nursing Care Plan 15.1). This is particularly relevant when the older person's partner, family or significant other has been involved in the primary care of the person. The information that the older person and their primary carer can provide will ensure, where appropriate, that this care and preference can be continued, further supporting the value of person-centred care planning and delivery. Honest communication about concerns, wants and needs will assist the older adult to feel positive about their ability to maintain some degree of decision making and independence, even when faced with serious impairment. Refer to Clinical Interest Box 15.18 for strategies to help the older adult face the challenges of ageing.

The nurse with excellent interpersonal skills such as listening, asking open-ended questions, using silence and summarising the discussion will help individuals to share feelings, concerns and information about themselves (Stein-Parbury 2013). See Chapter 8 for more information on communication.

## CLINICAL INTEREST BOX 15.17 Mini-Mental State Exam

The MMSE tests:
- Orientation to time and place
- Short-term memory, registration, retention and recall
- Attention and concentration
- Language
- Information processing
- Word-finding abilities
- Ability to follow three-stage command
- Planning, constructional and spatial abilities.

*(Adapted from Molloy 2014. © Commonwealth of Australia 2014)*

**TABLE 15.2 | Norton scale**

| Physical condition | Mental condition | Activity | Mobility | Incontinence |
|---|---|---|---|---|
| Good 4 | Alert 4 | Ambulant 4 | Full 4 | Not 4 |
| Fair 3 | Apathetic 3 | Walk help 3 | Slightly limited 3 | Occasional 3 |
| Poor 2 | Confused 2 | Chair bound 2 | Very limited 2 | Usually/urine 2 |
| Very bad 1 | Stupor 1 | Bed 1 | Immobile 1 | Doubly 1 |

Each of the five items in the scale is scored from 1 to 4, with a maximum total score of 20. Scores of 14 or less rate the individual as at risk of developing pressure sores; the lower the score, the greater the risk.

*(Kroshinsky & Strazula 2013 adapted from Norton 1989)*

## NURSING CARE PLAN 15.1

Morris Fisher has returned home following a period of time within the Rehabilitation Unit at a local hospital. He confides to you (his community nurse) that his biggest fear is falling as it was a fall that resulted in his recent admission to hospital. He walks with a walker both inside and outside his house. He is waiting for an assessment to be completed by the occupational therapist on his home. You are the first healthcare worker to visit him.
**Assessment:** Potential for falls due to decreased functional mobility and fear of falling
**Goal/s:** To minimise the risk of falls
To improve his confidence in mobilising

| Care/Actions | Rationale |
|---|---|
| Remove all loose mats | Loose mats are a hazard for tripping |
| Endure that all passageways are free from clutter | Clutter from furniture or other areas is a potential trip hazard |
| Instruct Morris on how to get in and out of his bed without falling | Getting out of bed in the morning is potentially hazardous if not undertaken slowly and appropriately |
| Instruct Morris on how to get onto and off the toilet safely | Changing position from standing to sitting and the reverse can result in a fall |
| Encourage Morris to use his walker at all times | Continuous use of a mobility device such as a walker will considerably decrease the risk of falling, plus increase his confidence in mobilising |

**Evaluation**

Morris expresses greater confidence in mobilising.
Morris does not experience any falls until his home has been reviewed and amendments made by the occupational therapist.

## CLINICAL INTEREST BOX 15.18
## Helping older people face the challenge of ageing

- Help older adults maintain roles and relationships
- Offer maximum support to facilitate older people to do or be involved in personal decision making
- Discover and celebrate the uniqueness of older adults' interest, skills and knowledge. Encourage discussion on past accomplishments and experiences to support the maintenance of personhood
- Listen to the concerns of your individual, regardless of their age or ability
- Reminisce with older adults—their experiences can be valuable in promoting and maintaining relationships and self-esteem.

*(Adapted from Crisp et al 2013; Eliopoulos 2010)*

Nurses involved in planning care also require the following:

- Knowledge about ageing, age-related changes and the needs of older adults across this period of their life cycle
- Ability to be non-judgmental and not make assumptions about preferences
- Awareness of their own limitations and knowing when to refer the individual to another healthcare professional.

## Summary

The older adult may access healthcare services in a variety of settings and for a number of reasons. The nurse needs to have an understanding of the ageing process and the physiological and psychological aspects of ageing. It is also important that nurses be aware of their own and others' attitudes towards ageing and how these affect their approach to giving care to the older person. Nursing an older person requires a thorough understanding of all aspects of healthcare in order to ensure that the person receives appropriate holistic care.

## Review Questions

1. What are the main changes that occur to the neurological and sensory systems with ageing?
2. What are the differences between dementia, delirium and depression?
3. What are the risk factors for the hospitalised adult?
4. What strategies can be used to reduce the use of restraints?
5. Define consumer-directed care.
6. What is the difference between the disengagement theory of ageing and the activity theory of ageing?
7. Identify four (4) types of elder abuse.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Aged Care Standards Agency (Australia): www.accreditation.org.au

Alzheimer's Australia: www.alzheimers.org.au http://www.alzheimers.org.au/victoria.aspx

Delirium: www.health.vic.gov.au/acute-agedcare/delirium-cpg.pdf

Nutrition assessment in older adults: www.fallssa.com.au/cms/documents/hp/Nutritional_Risk_in_Older_People-EPC_plan_flow_chart.pdf

Older adults in hospital: www.health.vic.gov.au/older/toolkit/06Cognition/index.htm

Sexuality and dementia: www.alzheimers.org.au/common/files/NAT/20101001_Nat_QDC_6DemSexuality.pdf

UNIT
5

# Critical thinking and reflective practice

CHAPTER 16
Critical thinking, problem-based learning and reflective practice in nursing care

CHAPTER 17
Nursing process: framework

CHAPTER 18
Health information: nursing documentation and clinical handover

CHAPTER 16

# Critical thinking, problem-based learning and reflective practice in nursing care

*Jennifer Marshall*

## KEY TERMS

clinical reasoning
critical thinking
problem-based learning
professional practice reflective journal
reflection on practice
reflective practice
reflective practitioner

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Outline how critical thinking differs from 'thinking'
- Understand the relevance of clinical reasoning to the continued development of practice
- Recognise the role of problem-based learning in practitioner development
- Outline the three phases of reflective practice
- Apply their understanding of 'reflection on practice' in a professional practice reflective journal

## CHAPTER FOCUS

To enhance professional practice in an ever-changing, complex healthcare setting, nurses must have the knowledge and skills to appropriately process a vast amount of information in a timely fashion, ensuring the results reflect contemporary nursing practice. Critical thinking, problem-based learning and reflective practice are learned conceptual processes and practices that assist nurses to process information that will influence the provision of nursing care and enhance professional development. By demystifying these concepts and processes we hope to stimulate nurses' interest in becoming lifelong learners.

## LIVED EXPERIENCE

The first time I walked into a dementia unit, I felt anxious about the behaviour of a couple of residents. I considered them unpredictable, my heart was racing and I avoided them. At the time I had very little knowledge of dementia. Since then, I have gained more knowledge, participated in learning-based role plays in class and engaged in critical thinking under the guidance of my workplace preceptor. I am now more aware of my behaviour and communication approach and consequently more comfortable in supporting people with dementia. I am more skilled at interpreting a person's behaviour as a form of communication.

**Bronwen, Enrolled Nursing Student**

# INTRODUCTION

This chapter introduces students to the conceptual processes of critical thinking, problem-based learning and reflective practice, with the expectation that they will be stimulated to learn and practise these skills in their everyday nursing practice.

# CRITICAL THINKING

## It's more than just 'thinking'

**Critical thinking** is a cognitive skill that with practice in the classroom—using questioning, small group activity, role play, case studies and problem-based learning strategies, along with exposure to the clinical setting—will enable the nurse to incorporate this process into their nursing practice. Critical thinking requires that the nurse exhibits or develops the attributes of habit of mind, confidence, contextual perspective, creativity, flexibility, inquisitiveness, intellectual integrity, intuition, open-mindedness, perseverance and reflection (Niemer et al 2010). (See Clinical Interest Box 16.1.)

The importance in the development and application of critical thinking to nursing practice cannot be overstated. The Australian Nursing and Midwifery Accreditation Council (ANMAC) mandates it as a curriculum requirement and it forms part of the competency standards for the Enrolled Nurse (Industry Skills Council 2012). Critical thinking in nursing is an essential component of professional accountability and quality nursing care (Romeo 2010; Hunter et al 2014). The complex health environment, caring for individuals with high acuity needs and the increasing number of comorbidity presentations demand that nurses deliver competent and appropriate nursing care. Castledine (2010) cautions that failure to develop the skills of a critical thinker 'are not only letting their clients down but also their colleagues in the professional healthcare team'.

### CLINICAL INTEREST BOX 16.1 Critical thinking attributes

- Habit of mind
- Confidence
- Contextual perspective
- Creativity
- Flexibility
- Inquisitiveness
- Intellectual integrity
- Intuition
- Open-mindedness
- Perseverance
- Reflection

*(Asselin 2011; Kim et al 2010)*

The literature contains many definitions for critical thinking, including critical reasoning, critical analysis and critical decision making as elements of the critical thinking process. Peter Facione (Facione et al 1994), internationally known for his work on the definition and measurement of critical thinking for over 40 years, described critical thinking as the process of purposeful, self-regulatory judgment. This process gives reasoned consideration to evidence, context, conceptualisation, methods and criteria. Thus, this definition describes critical thinking as not 'mindless' thinking or 'day dreaming' but as a focused cognitive process of continually assessing information derived from multiple databases, then questioning and sorting that knowledge to initiate sound contemporary nursing practice and learning from the experience. 'Critical thinking is an attribute that enhances one's skills in problem solving and decision making' (Romeo 2010). One element of critical thinking is clinical reasoning. It will be necessary to rehearse this cognitive skill in order for a nurse to apply critical thinking to their everyday nursing practice.

## Clinical reasoning, clinical judgments and clinical decisions

### Clinical reasoning

**Clinical reasoning** can be considered to consist of both 'formal and informal processes involved in making sound professional judgments' (Koharchik et al 2015). Clinical reasoning is the process by which nurses collect cues, process the information, come to an understanding of the individual's problem or situation, plan and implement interventions, evaluate outcomes and reflect and learn from the process.

'Effective clinical reasoning depends upon the nurse's ability to collect the right cues and to take the right action for the right patient at the right time and for the right reason' (Levett-Jones et al 2010). Clinical reasoning often includes 'if–then' statements, such as; if a nurse learns the signs and symptoms (cues) of a disease then they can choose the appropriate action.

### Clinical judgments and decisions

Clinical judgments and decisions are interrelated as both these elements form part of the critical thinking process which can contribute to the appropriateness of a nurse's eventual actions. Using clinical judgment the nurse evaluates alternative courses of action in order to reach an appropriate decision suited to the specific needs of the person (Thompson & Stapley 2011). For example, a nurse who does not apply clinical judgment observes 'the diabetic person is pale, cold and clammy' then chooses an inappropriate action of 'providing extra blankets'. For nurses to make appropriate decisions, exposure to health education practices and professional nursing practice that support the development of clinical reasoning skills is essential. Some methods of health education that may assist the student to develop clinical reasoning and critical thinking skills include utilisation of the nursing process, problem-based learning, role playing, reflective learning, the critical incidence conference, preceptorship, case studies and concept mapping (Rochmawati & Wiechula 2010; Kong et al 2014). (See Clinical Interest Box 16.2.)

**CLINICAL INTEREST BOX 16.2**
**Clinical reasoning and critical thinking learning methods**

- The nursing process
- Problem-based learning
- Role playing
- Reflective practice
- Critical incidence conference
- Videotaped vignettes
- Preceptorship
- Case studies
- Concept mapping

*(Asselin 2011; Kim et al 2010)*

**CRITICAL THINKING EXERCISE 16.1**

Review the attributes required for critical thinking. Which attributes do you think you possess and which attributes require further development?

**CRITICAL THINKING EXERCISE 16.2**

Consider realistic opportunities outside of the classroom where you might practise your critical thinking skills. Who will you collaborate with in these exercises?

# PROBLEM-BASED LEARNING

## Relationship to the nursing process

**Problem-based learning** is a student-centred health education method which is thought to contribute to the development of critical thinking skills. Problem-based learning encourages use of skills that correspond to those used in application of the nursing process such as organising and appraising available data, team-based reasoning and reporting decisions (Martyn et al 2014). As a process, problem-based learning starts by applying currently held knowledge to an identified clinical problem, then building understanding through the attainment of new knowledge (Kong et al 2014). Therefore, problem-based learning can be seen as an inductive process whereas the nursing process is associated with a deductive reasoning approach.

It is important to reaffirm that the nursing process, as discussed in Chapter 17, is an integral element of the critical thinking, problem-solving and decision-making process. Similar to the nursing process, problem solving involves the elements of assessment, planning, implementing and evaluating; the best course of action in a given situation for the best possible outcome.

In the clinical practice setting nurses are continually confronted with complex individualised care problems to solve. Problem-based learning is a teaching method which allows students to practise and develop these skills in the classroom prior to entering the clinical practice setting, so as to be better prepared to solve real-life clinical problems.

## A health education method

Problem-based learning is described as an active educative strategy, providing a framework for the development of self-directed learning, self-evaluation, interpersonal communication, critical thinking and access to and retrieval of information (Chunta & Katrancha 2010). It is a classroom teaching strategy that requires the student to participate actively in the learning process. The instructor facilitates the learning, as a co-learner, to provide clarity, encouragement, feedback and guidance, until the problem is solved.

Often problem-based learning is in the form of a case study simulating a real-life problem which can be conducted in small groups. Collectively, students must actively seek out information, draw from their knowledge base and use clinical practice experience and/or further research to accurately solve the simulated clinical case study. Together students initiate discussions by asking 'what do we know' and 'what do we not know', further analysing the problem by brainstorming ideas from the group members.

As self-directed learners the students seek out the gaps in their knowledge base, form a hypothesis and seek instructor guidance as required, until they solve the presented problem. During this process, the students are productively building on their knowledge base through collective and individual clinical reasoning and critical thinking skills. A study conducted by Vittrup and Davey (2010) found that a group-based learning approach promoted critical thinking, clinical judgment and knowledge-acquisition skills.

Successful implementation of problem-based learning entails designing a learning environment that stimulates constructive, self-directed, collaborative and contextual learning. It should also foster the ability to work as a member of a group and collaborate effectively with others (Kong et al 2014). It is important that students are exposed to, and provided with, many opportunities to develop and practise their clinical reasoning and problem-solving skills in the classroom setting. The problem-solving scenarios should reflect the students' level of theoretical knowledge and clinical exposure and develop from non-complex to more complex case studies.

## CRITICAL THINKING EXERCISE 16.3 A non-complex problem-based learning scenario

Students were given these instructions during class.

In groups of four, read each step carefully. Before moving on, consult with your facilitator at the end of each step.

Step 1: Acute cerebrovascular accident (CVA) assessment

Miss Maureen Smith, a 65-year-old, is admitted to the medical ward at 0700 following an acute right CVA. She has a history of arthritic pain in her knees and both feet. She also lives with myopia. She wears corrective lenses.

1. Explain your understanding of the medical terms.
2. Name four aspects of monitoring that may be required in the acute phase and provide a rationale.
3. Describe why a CVA occurs and list possible complications of a CVA.
4. Formulate a list of questions that you would need to ask Maureen Smith or her family.

Step 2: Rehabilitative assessment

Maureen Smith has remained stable for 72 hours. She has been assessed by the rehabilitation team as stable and therefore will now commence rehabilitation. Maureen has a right-sided hemiparesis with neglect, and is currently prescribed a texture-modified diet for a dysphagia.

1. What are the three standard levels of texture-modified diets and corresponding thickened fluid regimens?
2. What are some of the neurocognitive deficits commonly associated with right-sided CVAs?

Step 3: Nursing care plans

Review Nursing Care Plan 16.1 which provides an example of a nursing diagnosis relevant to the rehabilitative phase. For the nursing diagnosis, planned interventions are listed with rationales. Develop additional nursing care plans for other nursing diagnoses, then list appropriate interventions, rationales and means of evaluation for the following assessments:

1. Assessment: Left-sided hemiparesis with neglect secondary to R CVA, history of myopia.
2. Issues/s to be addressed: Difficulty negotiating environment safely due to stroke-related deficits of hemiparesis and neglect and long-standing myopia.

   Goal/s: Enable Maureen to negotiate immediate environment safely.

1. Assessment: Dysphagia with hemiparesis.
2. Issue/s to be addressed: Risk of aspiration due to impaired swallow reflex and hemiparesis.

   Goal/s: To minimise risk of aspiration while maintaining optimal nutritional and hydration status.

3. Assessment: Hemiparesis, arthritis in knees, feet. Decreased strength and exercise intolerance due to deconditioning associated with period of acute illness.

Goal/s: To improve from current level of strength and deconditioning which will be evident in functional level.

Step 4: Report

Prepare your case study to present to the class for further discussion.

Problem-based learning provides a safe way for students to learn how to make high-risk decisions and teaches them to use and fine tune their critical thinking skills in the new context of clinical reasoning (Russell et al 2011).

The nursing care plan and related progress note entry below provide examples of a care plan developed in the rehabilitative phase following an individual's cerebrovascular accident (CVA). The individual has a right-sided hemiparesis with neglect and they are currently prescribed a texture-modified diet for a dysphagia. The nursing care plan provides a practical example of critical analysis, reasoning, judgment and decision making in action. These skills are applied to the health problems identified following assessment of the individual's needs (see Nursing Care Plan 16.1 and Progress Note Example 16.1).

## NURSING CARE PLAN 16.1

**Assessment:** Arthritis in knees and feet, left-sided hemiparesis with neglect.
**Issue/s to be addressed:** Difficulty mobilising due to painful lower limb joints and muscle weakness of left limbs.
**Goal/s:** Maureen will be able to mobilise with less difficulty.

| Care/Actions | Rationale |
|---|---|
| To implement regular pain charting and report to medical officer in order to optimise current regular analgesia | Analgesic requirements will have changed from usual management regimen due to current immobility of joints. Pain charting supports objective assessment of analgesic need |
| Provide two-person assistance with mobility at all times. Increase occasions of mobility from two to three times per day | Supported mobility will maintain Maureen's safety given current level of dependence. Increase in mobility level will assist to regain previous range of movement in joints and strengthen muscles |
| Assist Maureen with active assisted lower limb exercises as prescribed by physio, while lying down or sitting out | Maintaining movement in the limbs can help prevent muscle contractures and stiffness |

**Evaluation**

Maureen reports more ease in mobilising. Pain charting demonstrates more consistent pain control.

## PROGRESS NOTE EXAMPLE 16.1

| | |
|---|---|
| 25/11/2015<br>1400 hrs | Nursing: Maureen continues to tire quickly after hygiene and assisted walk of 50 metres, refusing opportunity for assisted walk after lunch. Maureen tearful as knocked water jug off bedside table at lunchtime, as a result of neglect. Pain chart indicates pain management regimen is effective at present. Maureen informed me her usual pattern prior to stroke was to always have an afternoon walk. Agreement with Maureen that we shall assist her with her exercises in the morning, then shorter walk after lunch, leaving the longer walk for the afternoon as is her usual pattern. Await physio feedback on goal of moving to three walks per day. Prior to each meal, prompt Maureen to scan the environment in order to: establish routine practice which will reduce risk of accidents, enable movement of required items to the left and aid her independent functioning.<br>***B. Mawhill*** **(Mawhill) RN** |

### CRITICAL THINKING EXERCISE 16.4

Recall recent problem-based learning exercises in class that you have participated in. Have you challenged the assumptions of others in the group? Have you offered alternative perspectives or contradicting knowledge? Consider your level of active participation in the exercises and reflect on the reasons influencing your level of engagement.

# REFLECTIVE PRACTICE

## Becoming a reflective practitioner

There are many occurrences in a person's life that provide potential sources for reflection. **Reflective practice** is a systematic and thoughtful activity that enables individuals to make sense of experiences and phenomena then make changes, if appropriate, for future situations. An integral component of reflection in nursing practice is that it will involve some kind of clinical reasoning to arrive at an outcome or resolution. Reflection is a conscious, dynamic process of thinking about, analysing and learning from a clinical experience, enabling the nurse to gain insight into self and practice (Asselin 2011).

Cognitively, a **reflective practitioner** starts with a 'clean slate' to critically examine the 'when', why', 'what' and 'how' of themself, a situation or clinical problem, which may lead to other questioning styles to elicit further information or understanding. In reflecting on a clinical problem the nurse would consider: 'What was the nature of the problem?', 'When did the problem happen?', 'Who was involved?' and 'Why did the problem occur?'

For self-reflection, the nurse recalls from a personal perspective, asking questions such as: 'What was my reaction to the situation?', 'Why did I react this way?', 'How do I feel about the situation?', 'What do I think about it now?' and 'What can I do to change these feelings?' Reflective practice enhances the nurse's ability to identify their knowledge deficit, generate knowledge from the experience and systematically arrive at new insights, with the potential for improvement and change. Reflective practice is the process of drawing pertinent information from past experiences, then using that knowledge to guide the current practice and related decisions (Walton 2014).

## Barriers to reflection

For beginning practitioners, it is worth acknowledging the barriers to reflection so as to minimise the impact on your

learning. The use of writing to record the account of practice upon which to base the reflection is considered 'gold standard'. Varying written formats have been used, ranging from a narrative account through to mind mapping in conjunction with care plans. There are also several models of reflective practice that can be used. Using a model can assist the practitioner to engage in the practice. The selection of model should be based on individual preference. Individuals may feel drawn more to one than another that assists them to learn. Making time, especially time that is not too disconnected from the event as to interfere with recall, is recognised as important to the usefulness of the activity.

Incorporating the habit of reflective practice into your professional behaviour from an early stage is advantageous. Clinical reasoning skills are also important to the process. Therefore, it is often useful for the practice to be reinforced through supervision, professional development forums and persistence in mastering the practice (Olarerin 2013).

## Types or phases in reflection

Nursing curriculums expose students to a vast array of theoretical knowledge which they must be able to apply to clinical practice if they are to be truly professional nurses. There are different types of knowledge which in turn influence the approach or phases in the reflection process. An understanding of knowledge is taken from Habermas's (1972) critical social theory, which describes knowledge in terms of empirical, interpretive and critical models.

Empirical knowledge, as the name suggests, has been scientifically tested or researched and claims to be predictive or not happening by chance. Interpretive knowledge is the human or personal experiences, values and judgments about how we feel and think and is said to be a true account from that person's lived experience. Critical knowledge is also referred to as emancipatory as it is seen to free individuals or groups from oppressive conditions and give them the consciousness to view the world from a different perspective or understanding.

The phases in reflection are closely aligned to these domains of knowledge and are focused on reflecting on professional practice situations in three phases: descriptive phase, reflective phase and critical (emancipatory) phase. (See Clinical Interest Box 16.3.)

In nursing the first descriptive reflection phase provides an account of actions, thoughts and feelings of the clinical situation. The second reflective phase is analysed at three levels: reflection against standards, reflection on the situation and reflection of intentions. The third and final stage of reflection is the critical phase which is focused on identifying changes that need to be made to correct any gaps in knowledge or competency (Asselin 2011; Kim et al 2010).

## Professional practice reflective journal

A **professional practice reflective journal** is a narrative account of the nurse's experiences and feelings towards those experiences, and is often referred to as a log or a diary. Other methods of recording experiences may be through the media of audio recording, or drawings or other forms of creative expression.

### CLINICAL INTEREST BOX 16.3 Phases of reflection

- Descriptive phase: setting the scene
- Reflective phase: against standards, on situations and intentions
- Critical phase: focused on identifying changes to practice, gaps in knowledge and competency.

*(Asselin 2011; Kim et al 2010)*

Most nursing education programs prescribe the use of recording experiences in the written form and these are used as an educational tool to review students' progress and identify problems they may have in meeting educational requirements. For the individual, the written record provides an opportunity for review at a later date to learn more about themselves and their skills, values, beliefs and attitudes.

The written word, like a camera, captures the 'moment' and yields snapshots which the nurse can interpret and learn from when reviewing what has been written. It is important that the recordings be made as soon as possible and at least daily and that they tell a story of events, situations and feelings.

It is important to encourage nurses to look at both positive and negative feelings, situations and/or outcomes. Reflection on both can promote professional growth, problem solving and development of knowledge from practice, and can potentially improve practice through changed behaviours (Asselin 2011). (See Case Study 16.1.)

The recording of experiences and feelings provides the nurse with an opportunity to be continually asking probing questions and to be prepared to move out of their comfort zone. The questions a nurse asks themself about a clinical practice situation are constructed around the phases in reflection: that is, descriptive, reflective and critical phases which are individually or collectively **reflection on practice**.

The more exposure a nurse has to educative methods of critical thinking, problem-based learning, reflection and clinical practice, the better their skills in reflective writing will become. The nurse should be encouraged to view reflective practice as a journey of discovery until they have gained as much insight as they can from the situation or experience.

In preparing for reflective writing the student commences with the descriptive phase of reflection, a pure description of an event that sets the scene. Some questions that may facilitate reflection include: 'How do you feel about the situation?', 'How do your feelings relate to any action?', 'If you "step back" from this, does it look different?' (Kowalski 2010).

For the reflective and critical phases of reflection Kim and colleagues (2010) provided examples of questions that will assist in the writing of reflection on practice in the professional practice reflective journal. Examples of questions in reflective phase are set out in Clinical Interest Box 16.4 and questions for the critical phase in Clinical Interest Box 16.5.

## CASE STUDY 16.1 Professional practice reflective journal entry

Emma was excited to be working in the cardiac ward. She expected she would be caring for people who were acutely unwell and assisting and learning about the monitoring of cardiac issues.

Saturday entry

For the past week I have been working in the cardiac ward. The individuals there range in age, I have seen some really interesting presentations and have been working closely with the Registered Nurse caring for people who are acutely unwell. Today, we had a busy morning, with one person quite unstable which had been taking a lot of the Registered Nurse's time, another person was recovering from a valve repair surgery earlier in the week and I had been discharging another post angiogram. At the same time, we had admitted another lady on transfer from the oncology unit, she was elderly. Apparently she had experienced some atrial fibrillation over the past 24 hours. When she arrived on the ward she had quite a lot of family in tow as well as the admitting doctor. The RN and I set the lady up on the monitor, raced through the admission paper work and settled her in her room. She seemed anxious and wanted the commode and assistance to use it. Thinking back now, maybe I looked rushed or impatient, because when the lady was finished she apologised to me for being a nuisance. Then the family said to me that she has been experiencing urgency associated with her bowels and she is anxious about being incontinent. They reinforced with me that she can't help this need. I do remember feeling frustrated when the lady had asked for assistance with her personal hygiene. At the time, I was pre-occupied with the other issues and work that had to be done, and I was probably making judgments in my head about the lady being older while we had younger people in need. Also, this is a cardiac ward, so I felt we had more important care to be attending then helping people with their toileting all shift, why was she in the cardiac ward if she has more pressing medical needs? I think I shall speak to my preceptor about this, we are due to touch base on Monday.

Monday entry

Wow, spoke to my preceptor today about the lady and toileting issues on the weekend. We reviewed the lady's file and I realise I wasn't really focusing on the whole picture. Although she had acute cardiac issues, she also had been receiving treatment for a bowel obstruction secondary to her cancer which was also being treated! I now see that I can't really separate one health issue from the whole person! Furthermore, each of those conditions would be impacting on the other. Secondly, I have been reflecting on what attitudes are leading me to think the younger peoples' needs should take priority over older peoples. In future I intend to maintain focus on the rights of each person—if I don't maintain awareness, I could potentially be influenced by other discriminating judgments as well as ageism. Such mindlessness would not support me to be there for those I am caring for. That is what I shall now practise, truly 'being present' with each person at the time I am attending them.

**Emma, Enrolled Nursing Student**

Describe how using a reflective practice journal can enhance individual care.

## CLINICAL INTEREST BOX 16.4 Professional practice reflective journalling

Examples of questions in the reflective phase:

- What did I believe guided my actions (or inactions)?
- What do I think guided my actions as I think back now?
- What knowledge informed my actions?
- Did I possess the knowledge required in this situation?
- What sorts of values or ethical standards guided my actions?
- Were my actions harmonious with the situation? How so?
- What aspects of the situation influenced my actions?
- Were my intentions in agreement with the person's goals?
- Why did I carry out the actions in the way I did?
- Did I get the outcomes I wanted in this situation?

*(Asselin 2011; Kim et al 2010)*

The intended outcomes of reflection are not only that the nurse gains an understanding of gaps in their knowledge but also that they examine their nursing practices to ensure provision of competent contemporary nursing and that they learn from the experience. An example of how a nurse may document reflection on practice is provided in Table 16.1.

## CLINICAL INTEREST BOX 16.5 Professional practice reflective journalling

Examples of questions in the critical phase:

- Did I use this knowledge appropriately?
- Do I need to revise my knowledge base?
- What were the critical factors that got in the way of doing a better job, and why?
- Do I need to rethink my values and attitudes?
- What have I learned from the situation?
- How could I change my practice in the future?

*(Asselin 2011; Kim et al 2010)*

**TABLE 16.1 | The phases of the clinical reasoning process with examples**

| Process | Description | Example |
|---|---|---|
| Consider the person's situation | *Describe* or list facts, context, objects or people | This 60-year-old gentleman is in ICU because he had an abdominal aortic aneurysm (AAA) surgery yesterday |
| Collect cues/ information | *Review* current information (e.g. handover reports, history, charts, results of investigations and nursing/medical assessments previously undertaken) | He has a history of hypertension and he takes beta-blockers<br>His BP was 140/80 an hour ago |
| | Gather new information (e.g. undertake assessment) | I've checked his BP and it is now 110/60, Pulse 110, Temp 38°. Epidural running @ 10 mL/hour |
| | *Recall* knowledge (e.g. physiology, pathophysiology, pharmacology, epidemiology, therapeutics, culture, context of care, ethics, law etc) | BP is related to fluid status<br>Epidurals can drop the BP because they cause vasodilation. In ICU we have standing orders for epidural management |
| Process information | *Interpret*: analyse data to come to an understanding of signs or symptoms. Compare normal vs abnormal | His BP is low, especially for a person who is normally hypertensive |
| | *Discriminate*: distinguish relevant from irrelevant information; recognise inconsistencies, narrow down the information to what is most important and recognise gaps in cues collected | His temp is up a bit but I'm not too worried about it—I'm more concerned about his BP and pulse<br>I'd better check his urine output and his $O_2$ saturation |
| | *Relate*: discover new relationships or patterns; cluster cues together to identify relationships between them | His hypotension, tachycardia and oliguria could be signs of impending shock<br>His BP went down after we increased the epidural |
| | *Infer*: make deductions or form opinions that follow logically by interpreting subjective and objective cues; consider alternatives and consequences | His BP could be low because of blood loss during surgery or because of the epidural |
| | *Match*: current situation to past situations or current experiences to past experiences (usually an expert thought process) | AAAs often have hypotension post op |
| | *Predict*: an outcome (usually an expert thought process) | If I don't give him more fluids he could go into shock |
| Identify problem/ issue | *Synthesise* facts and inferences to make a definitive diagnosis of the person's problem | He is hypovolaemic and the epidural has worsened the BP by causing vasodilation |
| Establish goals | *Describe* what you want to happen—a desired outcome, a time frame | I want to improve his haemodynamic status—get his BP up and urine output back to normal over the next hour |
| Take action | *Select* a course of action between different alternatives available | I will ring the doctor to get an order to increase his IV rate and to give aramine if needed |
| Evaluate | *Evaluate* the effectiveness of outcomes and actions. Ask: 'Has the situation improved now?' | His BP is up for now but we will need to keep an eye on it as he may still need aramine a bit later.<br>His urine output is averaging >30 mL/hour now |
| Reflect on process and new learning | *Contemplate* what you have learnt from this process and what you could have done differently | Next time I would ...<br>I should have ...<br>If I had ...<br>I now understand ... |

*(School of Nursing and Midwifery University of Newcastle 2009)*

### CRITICAL THINKING EXERCISE 16.5

Think about what reflection means to you. How would you define reflection and to what extent do you consider reflection has enhanced your practice?

### CRITICAL THINKING EXERCISE 16.6

Think about any incident that happened while caring for a person, or interacting with a work colleague. Work through the descriptive, reflective and critical phases of reflection of the incident and provide the answers to these questions:

1. What was the nature of the problem?
2. Where did it happen?
3. What were your thoughts, perceptions and feelings?
4. What aspects of the situation influenced your actions?
5. What do you think guided your actions as you think back now?
6. What would you do differently if the problem occurred again, and why?

## Summary

This chapter has introduced the concepts and processes of critical thinking, problem-based learning and reflective practice. The student should now be aware of, and stimulated to pursue, these forms of inquiry in all aspects of everyday learning and nursing practice. The nursing profession and people accessing healthcare deserve and demand excellence in nursing care and healthcare delivery that is critical in its approach and contemporary by nature. This critical and contemporary approach cannot be provided unless the nurse has the attributes, skills and knowledge to reflect on their practice and be prepared to take steps for change to occur.

## Review Questions

1. Discuss your understanding of critical thinking and how it differs from 'thinking'.
2. Outline your understanding of clinical reasoning.
3. Describe the relationship between the nursing process and critical thinking.
4. Provide an example of questions that may be used in the three (3) phases of reflection.
5. List some health education methods that assist in developing critical thinking skills.
6. Discuss your understanding of problem-based learning.
7. Describe the process taken by students during problem-based learning in the class setting.
8. Discuss your understanding of the relevance of critical thinking, problem-based learning and reflection to your nursing practice.
9. Explain what a professional practice reflective journal is.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resource

The Critical Thinking Community: www.criticalthinking.org

CHAPTER 17

# Nursing process: framework

*Gillianne Meek*

## KEY TERMS

assessment
clinical judgment
clinical reasoning
critical thinking
evidence-based practices
interventions
nursing care plan
nursing interview
nursing process
objective data
SMART goals
subjective data

## LEARNING OUTCOMES

At completion of this chapter and with further reading, students should be able to:

- Define key terms
- Discuss the five steps used in the nursing process
- Explain the principles of care planning using the nursing process as a framework
- Explain the benefits of involving the individual in planning their care
- Describe the process for carrying out a nursing interview
- Differentiate between subjective data and objective data
- Identify how critical thinking and clinical reasoning are used to identify actual and potential issues
- Use clinical judgment skills to develop and implement care plans that use Specific, Measurable, Achievable, Realistic, Time-bound (SMART) goals
- Incorporate evidence-based practice into nursing interventions

## CHAPTER FOCUS

The nursing process is an organised step-by-step approach that creates a framework for nurses to use as the basis for a person's care plan. It is universally adaptable and can be used in a range of clinical settings such as acute care, long-term care and in the community. Through a process of using critical thinking skills, nurses are able to identify actual or potential issues and to develop a nursing care plan utilising the five dynamic and interrelated components of the nursing process. The use of clinical reasoning skills supports nurses with the process of collecting objective and subjective data about the person, while the use of evidence-based clinical judgment informs the nursing actions and care nurses should implement and evaluate. The components of the nursing process are assessment, identification, planning, implementation and evaluation. This chapter examines the five components of the nursing process and uses real-life examples to illustrate how nurses can use the framework in a systematic and methodical manner.

## LIVED EXPERIENCE

I was really excited when I found out my next practicum placement would be on the surgical admissions unit (SAU). I knew that the SAU admitted people on the day of their surgery. Some people would return post theatre to the SAU if it was minor surgery and would be discharged from there later that day, while others would be transferred to a main ward after their surgery. When I went to the SAU to collect my roster, I met Louise, the RN who I would be working with. She told me that many of the admissions we would be nursing would be for the endoscopy unit and that it would be a good idea to read up on those procedures.

**Una, Enrolled Nurse Student**

## AN OVERVIEW OF THE NURSING PROCESS

The **nursing process** (an organised step-by-step approach that creates a framework for nurses to use as the basis for a person's care plan) provides a structured framework of nursing actions. It is comprised of five interrelated components that follow on in a step-by-step cyclic manner. Each of the components requires the nurse to use **critical thinking** skills (a process-driven way of thinking which uses problem solving techniques and reflective practice to make reasoned judgments that support clinical decision making) to collect, review and validate the amassed data. By using **clinical reasoning** skills (a dynamic process used by nurses to collect the right information to allow them to understand the clinical situation and plan effective nursing actions) and **clinical judgment** (the ability to make an informed decision about nursing actions based on observations, analysis of data, reviewing alternatives and reflection) nurses are able to plan, implement and then evaluate the effectiveness of their nursing interventions. The data collected through the nursing process is used to formulate a nursing care plan. The **nursing care plan** is a legal document which records all pertinent interactions the nurse has with the person and follows the five steps of the nursing process: assessment, identification, planning, implementation and evaluation. Significantly, the care plan is developed, negotiated and evaluated in collaboration with the individual who is receiving the nursing care. This person-centred care approach considers the individual as a whole person and promotes individual autonomy, control and decision making (Fawcett & Rhynas 2012).

The nursing process is both continuous and cyclic, with each step reliant on the step preceding and the step following. At the centre of the process is the person. Figure 17.1 is a diagrammatic representation of the nursing process.

### CRITICAL THINKING EXERCISE 17.1

If you were Una from the Lived Experience feature, how would you research about endoscopic procedures? What different types of endoscopic procedures are there? What is the nursing care required for individuals after undergoing an endoscopic investigation? For a person coming for day surgery, what specific assessment questions related to the admission would you ask?

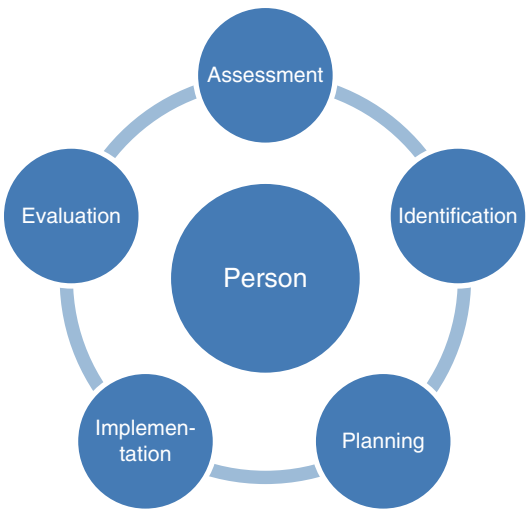


**Figure 17.1** Components of the nursing process

## ASSESSMENT

**Assessment** is the first component of the nursing process and the first step in developing a care plan. Assessment is the process of obtaining data about an individual with the purpose being to:

- create a baseline set of data about the individual
- better understand the condition and circumstances of the individual
- identify actual and potential issues
- identify required nursing interventions
- develop a therapeutic relationship with the individual.

The data may be obtained directly from the person, from others of significance to them, from other members of the health team and from the person's past or present medical and nursing records. This data needs to be actual, factual, complete and relevant in nature. It may be either subjective or objective.

**Subjective data** includes the person's unique perceptions, ideas, experiences and sensations about an issue that they share with the nurse. For example, a person may supply information about their sensations of pain in their lower abdomen; they may say it feels as if it is gripping or burning and that it is increasing in intensity.

**Objective data** consists of information that can be observed or measured directly by the nurse. For example, while a person may report the location and intensity of abdominal pain (subjective data) an increase in blood pressure, pulse and respirations recorded by the nurse provides measurable objective data.

Several different methods can be used to obtain both subjective and objective data, including interviewing the individual, carrying out a physical examination and observations and reviewing laboratory and diagnostic tests. However, the process usually commences with the nurse initiating an interview with the person. A **nursing interview** is the process used by nurses to obtain physical data, along with health and social information from a person in a structured and comprehensive manner. It includes aspects of physical assessment and a health history. If the nurse is able to, they should make themselves as familiar as possible with the person's past and current nursing, social and medical history. The nurse should review the latest laboratory and diagnostic results, as these could help guide the assessment interview and can provide additional prompts for the nurse when talking with the person.

Most importantly, the nurse should work towards establishing an effective therapeutic relationship with the person, which enables them to build trust in the nurse and the healthcare organisation. By adopting a person-centred approach, the nurse works with the person as a partner. This partnership approach is based on mutual respect and a sharing of power. It is underpinned by the person being actively empowered and supported to make informed decisions about their healthcare. Chapter 19 provides further reading on general health assessment.

### CRITICAL THINKING EXERCISE 17.2

Robert is 55 years old and has had a productive cough for several months. An x-ray showed a suspicious area in his left lung that requires a biopsy. In preparing Robert for being admitted to the SAU for a bronchoscopy the following day, Una printed off the latest set of blood test results for him. She notices one of the tests was for an $HbA_{1c}$ test. What does this blood test tell us? How can this information be used by Una as part of carrying out her nursing interview with Robert? What additional factors should Una be considering in nursing Robert?

### The nursing interview

The aim of a nursing interview is to talk with the person and/or their significant other(s) in a structured manner so that a comprehensive nursing history can be obtained. Nurses must obtain consent from the individual for the interview to go ahead and the person must be informed why and how the information is to be gathered and used. Ensuring patient confidentiality is essential, along with their rights to privacy when the interview is taking place and to withhold information they do not wish to share. The nurse must ensure the person gives consent to having a third person present during the interview, as there may be questions of an intimate nature that the person does not want discussed or disclosed in their presence.

The information gained through undertaking a nursing interview enables the nurse to initiate a plan of care, one that can be developed to meet the unique needs of the person. The information gained is documented and used as part of the data collection. Good quality nursing documentation has both legal and practical implications for nurses. The ability to write in a succinct, clear and legible manner reduces the risk of adverse outcomes due to misinterpretation and poor communication (Blair & Smith 2012).

How this data/information is recorded is determined by the individual healthcare facility. For example, it could be through pro forma documentation or direct input into a computer-based patient management system (PMS) or electronic medical record (EMR). (See Chapter 5.)

Through the use of effective interviewing skills, the nurse is able to obtain information about the person's current and past health problems, their lifestyle, activities of living and their psychosocial history. A nursing history centres on the person's description and interpretation of their physical, psychological and emotional reactions to their healthcare needs and on the resultant actual and potential changes to their lifestyle. The answers a person gives may prompt the nurse to ask further exploratory questions so that a complete picture of the person may be obtained. The answers a person provides may also direct the nurse to provide health education information or to make a referral to another health professional (McKenna et al 2011).

A nursing history:

- Requires the nurse to use critical thinking and problem solving skills to ask the right questions to the person
- Requires the nurse to listen closely to the person's responses and to use clinical reasoning skills to guide how the information gained is then used to probe and ask additional questions
- Establishes baseline data from which the nurse can identify actual and potential issues as the foundation for the care plan
- Forms the basis for a therapeutic person-centred relationship with the person
- Allows the nurse to make a holistic assessment of the person that utilises verbal and non-verbal communication perspectives (e.g. the use of the sense of smell or touch)
- Gives individuals an opportunity to talk about any health issues
- Assists the person in revealing any past, present and family issues that may require nursing intervention
- Forms a collection of data and information about the person's physical, functional, social, psychological, spiritual and emotional state
- Identifies environmental and lifestyle factors which influence the person's wellbeing.

A nursing history should be obtained as soon as possible after the person is admitted to the healthcare agency and should be conducted, when feasible, by the nurse with primary responsibility for planning the person's care. A culturally sensitive approach needs to be taken and the nurse should reflect on any cultural considerations; for instance, the person may want to be accompanied by their partner or other family members and have them remain with them throughout their healthcare journey. Chapter 21 of this book covers admission, discharge and transfer processes.

Before beginning the interview the nurse must explain its purpose so the person can understand why certain questions will be asked. The interview setting should be quiet and private for the person to feel comfortable about discussing personal details. If a person is unable to communicate effectively an appropriate aid must be utilised. This may include the use of an interpreter or communication aids such as visual cues and writing pads. If an interpreter is required, this must be arranged prior to the nursing history being obtained; it is not acceptable practice to rely on family or friends to do the interpreting as this may breach confidentiality. It is valuable to record on the nursing assessment form what aids were utilised to obtain the assessment information so that other staff are aware of the need to utilise these in future interviews. It is important to take the time to accurately and comprehensively document all aspects of the nursing history/assessment as this helps to meet legal and professional standards, demonstrates nursing accountability and facilitates quality nursing care (Blair & Smith 2012).

The process of history taking will vary depending on the age of the person. It is usual for a parent or other adult to provide information for a young child, but older children may be able to give their own factual account. It is essential for the nurse to use terminology that the child can easily understand. Additionally, questions about reaching milestones and immunisations should be included. The nurse needs to be mindful of the needs of older people who may have sensory deficits such as loss of hearing or vision. The seating arrangements during the interview should allow the nurse to position themself so that the person can both hear and see clearly what is happening.

It is essential that any information obtained during the interview is documented accurately and concisely, as the nursing assessment form is a legal document that needs to be retained for future reference together with other documentation. The basic information, which should be obtained in a nursing history, includes:

- Personal demographics, age, gender, marital status, next of kin or significant other(s), preferred name of address
- Reason for requiring medical/nursing intervention and the person's understanding of why they are there
- Past and current medical history, including any age-appropriate questions such as immunisation status for children
- Cultural considerations such as dietary requirements, the use of traditional healing practices and specific religious practices
- Current medications and treatments including any allergies
- The use of any aids or prosthetics
- Baseline information regarding their normal level of ability to carry out the physical activities of daily living (breathing, eating and drinking, maintaining a safe environment, communicating, eliminating, personal hygiene and dressing, controlling body temperature, mobilising, expressing sexuality, working and playing, sleeping and concerns about death and dying)
- Social data including accommodation and home circumstances, education, occupation, religion
- Psychological, emotional and spiritual wellbeing
- Personal habits including alcohol usage, smoking or the use of illegal drugs.

## Open and closed questions

Effective communication skills are particularly important in taking a nursing history and consideration must be given to the type of questions being asked (Thornbory 2013). Table 17.1 gives some examples of open and closed questions. Open questions invite the person to divulge a wide range of information and to describe how the person is feeling, why they are there and what happened. They promote the development of a therapeutic relationship. While it is not a direct question, starting a question with the phrase 'Tell me about . . .' is a good way to prompt open discussion. Closed questions often require a single word reply or brief answer. They do not encourage the person to disclose information but can be useful when you need specific information. See Chapter 8 for further reading on communication.

**TABLE 17.1 | Open and closed questions**

| Questions | Expected responses | Open/closed |
|---|---|---|
| Are you in pain? | Yes, I am in pain | Closed |
| | No, I am not in pain | Closed |
| **What** do you mean when you say you are in pain? | I mean I have a dull ache that I can feel in my left shoulder and across my upper back. It has been there for more than a week | Open |
| **How** are you feeling about having your surgery today? | I'm anxious; I just wish it was over with | Open |
| Are you prepared for your surgery? | Yes | Closed |
| | No | Closed |
| Do you take aspirin? | Yes | Closed |
| | No | Closed |
| **What** medications do you take? | I take aspirin every morning when I have my breakfast and medications for my blood pressure. I have a list of my tablets here with me | Open |
| Are you concerned about your health? | Yes | Closed |
| | No | Closed |
| **Why** have you come to the clinic today? | I've been having pain in my knee for several weeks and I am concerned as it is appears to now be swollen | Open |
| **Tell me** about your previous hospital admission | I was admitted last year with abdominal pain and had surgery for appendicitis. This was in July | Open |

## Physical examination and observation

Traditionally medical officers have been the profession who would perform the initial assessment and physical examination of individuals. They would use this information to make a medical diagnosis and to determine the most appropriate course of treatment (Fawcett & Rhynas 2012). As the profession of nursing and nursing practice has evolved, increasingly this is being carried out by nurses (Anderson et al 2013) as part of a holistic person-centred approach to healthcare delivery.

A physical examination uses the techniques of inspection, palpation, percussion and auscultation to detect any abnormalities that may provide information about the person's current or past health history. This information is recorded in the person's nursing notes and may be used in conjunction with the evidence gained in the nursing interview, as the foundation for identifying health issues, developing SMART goals and the planning and implementation of nursing care (see section Creating SMART goals later in this chapter).

As part of the physical assessment of the person, a set of baseline observations or vital signs need to be recorded. Nurses have traditionally carried out observations which include blood pressure, pulse, temperature, respiratory rate and oxygen saturation to assess their patients (Elliot & Coventry 2012); however, depending on the reason for the assessment, the nurse may also record the person's height and weight, test and record urinalysis results and measure blood sugar levels. Having an accurate weight recorded for a baby or young child is especially important as many drug doses are calculated based on body weight. Body weight is also an important factor when a person is having a general anaesthetic, or to achieve a therapeutic dose of some medications.

Observation of the person is performed by the nurse during the interview and requires a head-to-toe assessment. This relies on the nurse using all their senses to pick up information about the person. This could include the sense of smell picking up evidence of urinary incontinence or an infected wound or the sense of touch if a person feels hot, cold or clammy.

### Clinical pathways and standardised care plans

Some healthcare agencies use clinical pathways or standardised care plans as a communication tool between healthcare clinicians. A clinical or care pathway is a document which outlines a standardised, evidence-based multidisciplinary management plan. A standardised care plan is used in much the same way and can be used with people with the same diagnosis, similar treatments or similar nursing issues; however, it can be individualised to meet specific needs (Jakobsson & Wann-Hansson 2013). The purposes of using

standardised documentation are to reduce discrepancies, enhance the quality of care provision, promote safety and user satisfaction, support interdisciplinary integrated care, improve health outcomes and optimise resource utilisation (Beaulieu 2013; Schrijvers et al 2012). A clinical pathway identifies the appropriate sequence of clinical interventions, timeframes, milestones and expected outcomes for people. As there will always be exceptions, the pathway should be followed in accordance with the clinician's assessment of each individual case. A process for charting by exception should be in place. Charting by exception involves the nurse only charting significant findings or exceptions to the standards or norms of the predicted care pathway for the person. See Chapter 42 for further reading.

## Cultural considerations care planning

With an increasingly diverse cultural population for nurses to care for, the ability to deliver care in a culturally safe and appropriate manner becomes vital if successful healthcare engagement is to be achieved. Culture influences all aspects of health and wellness behaviour so that having an understanding and awareness of our own cultural beliefs is vital for every nurse to ensure the best possible healthcare outcomes (Nardi et al 2012). Culture can be defined as the shared values, beliefs, customs and social norms that characterise the everyday structure of a socially defined group. This may be significantly different from the cultural norms of the nurse; however, for nurses to be able to carry out culturally safe nursing care, they need to acknowledge the potential impact of their own culture on their interactions with people from other cultures.

A cultural assessment allows the nurse to ask the person how they would like to be cared for based on their individual cultural beliefs. By doing this, it provides the basis for power sharing between the person and the nurse and acknowledges the value of diversity within the population. Nurses should have an awareness of a wide range of different cultures, but it is equally import that the nurse does not stereotype the person as part of the cultural assessment. For more information on cultural diversity see Chapter 10.

## Laboratory and diagnostic tests

Laboratory and diagnostic tests, which are the most objective forms of assessment data, provide another source of information about the person. Both subjective and objective data are required to create a comprehensive assessment. For example, during the nursing interview the person may reveal that they feel constantly tired (subjective data). The nurse visually observes that the person looks extremely pale (objective data) and the laboratory test results indicate that their haemoglobin level is below normal (objective data). In this situation, the laboratory results (low haemoglobin level) verified the personal feelings of the person (feeling tired) and the visual observations of the nurse (the person looks pale).

While it is usually the role of a medical officer to order laboratory and diagnostic tests, increasingly this is becoming part of advanced practice nursing roles, such as the nurse practitioner. A nursing role is to ensure that the person understands why they are having the test and to prepare and support them for the test. This may be by providing education or preparing them by keeping them nil by mouth for tests such as fasting blood sugar tests or some abdominal ultrasound scans.

Now that you have read through the documentation part of the chapter, review Case Study 17.1 that explores an admission scenario.

### CASE STUDY 17.1

Emma is an Enrolled Nurse working in an aged care facility. She has been asked to prepare for an unexpected admission. Mrs Taylor has had a fall and has fractured her right shoulder. She lives alone and can't manage, especially since she is right handed. She will be admitted for one week until her daughter can come and stay with her. She will be arriving later that morning. Emma has prepared her work plan for that morning and has a very busy morning. When Mrs Taylor arrives she is taken to her room and put into a chair. She is unsure of her surroundings and a little nervous. The room looks messy and the bed is not made. No one orientates her to the facility or the room.

When she arrives it is lunch time and she has not eaten since breakfast; unfortunately there is no lunch prepared for Mrs Taylor and although she is quite hungry she feels too intimidated to alert anyone. Later that afternoon her daughter arrives to find her mother in tears; she has not had any of her medications, she is very hungry and very distressed as she has wet her pants, being unable to find a toilet. Her daughter demands to speak with the manager and arranges transfer to another home the next day. She also lodges a written letter of complaint.

How could this admission have been' handled better to avoid this poor outcome for Mrs Taylor?

# IDENTIFICATION

The second component of the nursing process is the identification of issues related to the health situation. This involves using all the information gained at the assessment stage to identify actual or potential issues. These issues are from the person's perspective and are identified, discussed and constructed in collaboration with the person and the nurse.

Actual issues are those that the person is currently experiencing, whereas a potential issue is one that the person does not currently have but that may occur. By taking preventative actions, nursing staff can reduce the risk of potential problems developing into actual problems. This is especially important when people are unable to make those decisions themselves. This could be due to lack of knowledge about the risks or because the person is dependent on nursing staff. Once actual and potential issues are identified the nurse and the person can work together to plan the care that needs to be implemented.

### CRITICAL THINKING EXERCISE 17.3

Fred is 72 years old. Prior to being in a motor vehicle accident he was fully independent in all activities of daily living. Following orthopaedic surgery to his pelvis and legs he is non-weight-bearing and is being nursed supine in bed. What potential issues should nursing staff observe Fred for, given that Fred is immobile? What nursing action should be implemented to reduce the risk of any potential issues occurring for Fred?

### CLINICAL INTEREST BOX 17.1 SMART framework

One of the frameworks for setting goals is to use the acronym SMART, which stands for:
**S**pecific
**M**easurable
**A**ttainable/Achievable
**R**ealistic/Relevant
**T**ime-bound

## PLANNING

The third component of the nursing process is planning. After the actual and potential issues have been identified, the nurse needs to plan the care that is required to be implemented to achieve the desired outcomes. This is accomplished by setting person-centred goals, prioritising those goals, determining what nursing interventions are required to meet those goals and updating the care plan within a given timeframe.

### Creating SMART goals

Goal setting is a collaborative process in which nurses and the people to whom they are providing care work together to establish a desired outcome and create a workable plan so that this can be achieved in a timely and realistic manner. Goals establish the framework for a nursing care plan and are the stages that need to be met to reach the desired outcome (see Clinical Interest Box 17.1). Hence, for each identified issue the nurse, in conjunction with the person, sets the goals to be achieved. A short-term goal may be one that is expected to be achieved in a relatively short timeframe such as hours or days, while a long-term goal is one to be achieved in the future, perhaps in several weeks or months. Before a person is able to return to their normal state, short-term goals may need to be set to measure their progress towards returning to their normal level of functioning.

**SMART goals** are used to express behaviours that are observable and measurable: in that way it is easy to determine if the goal has been met or not within the given timeframe. By using SMART goals it is easy to establish when these goals are achieved. In a similar way, when goals are not being achieved they can be re-established between the person and the nurse. Goals are not achieved for a number of reasons, which may include the development of complications or unforeseen events.

### CRITICAL THINKING EXERCISE 17.4

After several weeks of being nursed in bed, Fred has been re-assessed by the medical staff and the physiotherapist. Fred can now begin the process of rehabilitation and regaining his mobility. What would be short-term and long-term SMART goals appropriate to Fred and his mobility issues?

### Prioritising goals

Priorities are established after specific goals have been set by grading them in order of importance. Basic physiological needs, such as the need for oxygen, nutrition or water, are given priority over the other needs. However, in using a person-centred approach to prioritising the goals, the nurse works with the person to establish which goals the person perceives as being of most importance and value to them after these most basic of needs. From this discussion, high-priority goals that require immediate attention take precedence over low-priority goals that may not need to be attained as quickly.

In working with people, nurses should always think that managing pain should be considered high priority. Setting a SMART goal to reduce pain to a tolerable level within a given timeframe is very important. This is because pain can have such a profound effect on many other of the activities of daily living, such as impacting on mobility, impairing psychological wellbeing, reducing appetite/nutritional wellbeing and reducing the ability to sleep and rest. Nurses should not underestimate the effect that being in pain has for an individual and should suggest a range of options to manage the pain.

### Determining nursing interventions

This step involves selecting the activities or **interventions** that are expected to help the person achieve the set goals, which in turn create the expected or desired outcomes. All possible options need to be discussed in consultation with the person, and time given for them to be able to make informed decisions about their healthcare needs. Sometimes at the request of the person these discussions need to be made in consultation with family members or significant others, so that they too are involved in the person's care. Critical thinking and good decision-making skills assist the nurse to select the most appropriate nursing activities or interventions to discuss with the people involved. Appropriate nursing interventions must be based on sound clinical judgment using an evidence-based practice approach to problem solving. **Evidence-based practices** are those that have been researched and shown to provide the best possible outcome for people. After a decision has been made by the person, in consultation with the nurse and sometimes with other members of the multidisciplinary team, the proposed actions or interventions to be implemented are formulated into statements and written in the nursing care plan. For example, one selected nursing activity may be for the nurse to assist the person to shower each morning.

All proposed nursing interventions must be written specifically and in adequate detail to enable all nursing personnel to carry them out correctly. Interventions may consist of activities that the nurse will perform or actions to be taken by the person with or without assistance from the nurse; however, all actions should be person- and outcome-focused.

### Nursing care plans

A nursing care plan is a document developed by the healthcare agency to record all aspects of the care the person requires. The structure of the care plan may vary between health agencies. Some agencies use paper records while others have computerised care plans, electronic medical records and patient management systems (PMS). Nurses need to be familiar with the nursing care plan and all other documentation used within the healthcare agency in which they are working. Nursing care plans form part of the person's healthcare records and can be requested and used in legal situations. Nurses need to adhere to the legal and ethical guidelines for documenting and remember that the clinical progress notes and care plan may be the only record of what care was given by the healthcare providers and can be the main source of evidence used in the investigation of complaints (Blair & Smith 2012). (For more information see Chapter 18.)

Nursing care plans may vary in structure but the basic principles remain the same. The nurse should be able to clearly identify:

- The issues relevant to the person
- The goals and expected outcomes
- The specific nursing interventions for each goal
- If the goals are being achieved (evaluation).

Some forms of nursing care plans use the headings of the nursing process and are set out in a table using columns. As mentioned previously, some health agencies are using clinical or care pathways which outline predetermined care plans, interventions and goals for specific plans of treatment and nursing care.

While the structure of a nursing care plan may vary between healthcare settings, the principles of care planning remain the same. A correctly formulated nursing care plan facilitates the coordination and continuity of care for the person. See Nursing Care Plan 17.1.

## IMPLEMENTATION

The fourth component of the nursing process is implementation. Implementation means putting the nursing care plan into operation by using nursing actions and interventions. This is the performance of selected nursing actions/interventions to help the person achieve the goals that have been set. These actions can include providing health education, wound care, catheter management, assisting the person with activities of daily living in which they are not independent, carrying on the work of other health professionals such as physiotherapists and the recording of specific observations (e.g. vital signs, pain score, blood glucose levels). All actions and interventions should utilise the most current evidence-based practices and be based on sound clinical judgment. Nurses need to ensure their clinical practice is up to date with any innovations in nursing care and that it incorporates policies, procedures and guidelines published by the healthcare provider they are employed by. Nurses are accountable for their decision making and clinical actions. They need to ensure that they are able to carry out any actions and interventions in a competent manner so that they do not place the person at risk or work beyond their capabilities or limitations. Quality nursing care is provided by nurses when they intentionally deliver evidence-based nursing care which is person-centred, based on sound clinical judgment and incorporates caring, patient advocacy and respect, while taking responsibility and being accountable for their actions.

The person's needs are reassessed continuously during the implementation stage so that any new needs can be identified and the nursing care plan modified or adapted to take these into account. As the person's condition changes, the nursing actions and interventions need to be reassessed and the care plan reviewed. This may mean that new goals and interventions are added to the nursing care plan and those that are ineffective may need to be modified. The process of implementation is closely linked with the final stage of the nursing process, evaluation.

## EVALUATION

The fifth component of the nursing process is evaluation of care. Once the planned nursing interventions have been implemented, the nurse must evaluate the results to determine whether the interventions were effective or not. Evaluation is the process of determining the extent to which the set goals have been achieved and the desired outcome obtained. It enables the nurse to monitor the effectiveness of the nursing actions, as documented in the care plan, and to determine if the care plan was a success or not. The success of the care plan can be determined by comparing the initial desired outcomes with those outcomes that were eventually achieved.

Evaluation requires an examination of the results of the interventions, assessing the person for possible side effects and adverse reactions to the nursing interventions and analysing the results. Analysis involves determining whether the person has improved, deteriorated or shows no change.

Based on the data obtained from the evaluation of the care plan, nurses use their clinical judgment to determine what actions or interventions are required next. Evaluation allows the nurse to revise and, if necessary, modify or change the plan at any stage. If the set goals have been achieved, the plan is deemed to be successful and the nursing interventions can usually be discontinued. If the goals have not been achieved, the person's needs must be reassessed, new nursing goals formulated and the care plan changed and re-implemented.

While evaluation is proposed as the fifth and final component, it is actually performed continuously throughout the nursing process. It is the most important method of determining the effectiveness of a nursing care plan. The effectiveness of a nursing care plan can also be determined by another

## NURSING CARE PLAN 17.1

**Assessment:** Nancy has commenced compression bandaging on her right leg as treatment for a venous ulcer on her shin. The bandaging will be managed by the Wound Nurse Specialist. It will be changed weekly at the local hospital.
**Issue/s to be addressed:** Potential issues with having compression bandaging can include the dressing becoming loose due to swelling subsiding, pinching caused by increased swelling, loss of sensation in any part of the leg, toes going pale or dusky and increased pain; however, increased pain can be common in the first week.
**Goal/s:** To provide education to Nancy on admission about the potential issues from compression bandaging and ensure that there are no issues arising between her weekly visits to the Wound Nurse Specialist.

| Care/Actions | Rationale |
|---|---|
| Provide education session with Nancy on admission and follow up as required, so that she is aware of any potential issues that can develop and the benefits of compression bandaging (Yarwood-Ross & Haigh 2012) | Providing education to Nancy means she will know what is important to report to the nurse if there are any issues with her bandages |
| Check compression twice daily for signs of slippage/ pinching or excessive exudate and document (Wounds International 2013) | Checking her toes daily for colour, warmth, movement and sensation allows the nurse to have an objective measure of how the circulation is for her foot/leg |
| Document twice daily colour, warmth, movement sensation (CWMS) in Nancy's toes | It is a legal requirement to document nursing actions and care and any changes can be an indicator that problems are developing |
| Encourage a high-protein diet to support wound healing | A high-protein diet encourages wound healing |
| Report any concerns directly to the Wound Nurse Specialist (Todd 2011) | |

**Evaluation**

On third day of admission the bandage was noticeably looser. The Wound Nurse Specialist was contacted and arranged to have the bandaging re-done later that day. The looseness was due to a significant reduction in swelling. By the end of the first week, Nancy thought her leg was much less painful and this was verified with her decreasing pain scores.

Nancy continued to have weekly visits to the Wound Nurse Specialist for the 6 weeks she remained in the care home. The wound documentation showed a decrease in the dimensions of the wound; however, it was anticipated the treatment would need to continue for at least 12 weeks. Nancy was discharged home to her unit after 6 weeks. There had been no further issues with the compression bandaging.

**Assessment:** Nancy states she has pain in her right leg caused by the wound on her right shin and the compression bandaging. Nancy says the pain is worse when sitting and improved when she has her leg elevated.
**Issue/s to be addressed:** Pain in right leg caused by the wound on her right shin, the compression bandaging. The pain is worse when sitting and improved when she has her leg elevated.
**Goal/s:** To reduce pain to a tolerable level within 24 hours of admission.

| Care/Actions | Rationale |
|---|---|
| Give prescribed regular analgesia and monitor the effectiveness (Anderson & Knight 2011) | Giving regular analgesia to Nancy prevents any peaks of pain caused by having no medication, and is a better approach to pain management. Using a pain scale is an objective measure of how much pain Nancy says she is in. It allows the nurse to know how effective the care and the analgesics have been |
| Observe for potential side effects including constipation | Some analgesia can cause constipation and as Nancy is not as mobile this could also add to the problem |
| Use a pain scale to evaluate the effectiveness of the analgesia (Wood 2004) | |
| Encourage Nancy to ask for her PRN medication (as required medication) to keep breakthrough pain to a minimum | |
| Provide Nancy with a recliner chair and encourage her to sit with her legs elevated to promote venous return and to reduce swelling (Anderson & Knight 2011) | Having Nancy sit with her feet elevated helps reduce the swelling in her legs; however, by also encouraging her to gently mobilise it prevents her joints becoming stiff |
| Encourage gentle mobilisation at least four times daily (Wounds International 2013) | Mobilising may also encourage Nancy to socialise which prevents boredom and the risk of depression |
| Encourage Nancy to becoming involved in recreational activities she enjoys (e.g. reading, listening to the radio) so as to be distracted from the pain | |

**Evaluation**

After the first week of admission, Nancy reported a decrease in the pain in her leg. This was evidenced with the pain scale scores. Nancy said she has been reluctant to ask for her PRN medication while in hospital as she did not want to disturb the staff; however, Nancy said she now used the opportunity to exercise by walking along to the nurses' office to ask for her medication. On discharge Nancy was only taking PRN analgesia.

method of evaluation, a nursing audit. A nursing audit is a thorough review of a person's journey to evaluate the overall nursing care received by a person in relation to outcomes achieved. An audit is generally performed by an experienced nurse who is external to the unit carrying out the nursing care, or an external committee. Each healthcare agency develops its own nursing audit form. Another type of audit identifies a specific standard which needs to be attained and a list of criteria which need to be met as part of reaching the required standard. Many healthcare providers carry out monthly scheduled audits which can document patterns of improvement and deterioration in audit results. Ensuring nurses meet these standards is a way of demonstrating quality nursing practices.

## Summary

The nursing process forms the basis for all nursing practice. It is a cyclic process that relies on the five interrelated components of assessment, identification, planning, implementation and evaluation. The nursing process provides nurses with a systematic method of problem solving, which requires the nurse to use critical thinking and clinical reasoning skills to develop a plan of nursing care and interventions based on sound clinical judgment and evidence-based nursing practice.

## Review Questions

1. Explain the benefits of involving the person in planning their care and developing a care plan.
2. Name the five (5) components of the nursing process and give a single sentence definition for each component.
3. Give three (3) examples of open questions you could ask a person at admission about their medication.
4. What are SMART goals?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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Yarwood-Ross, L., & Haigh, C. (2012). Managing a venous leg ulcer in the 21st century, by improving self-care. *British Journal of Community Nursing*, *17*(10), 460–465.

## Recommended Reading

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## Online Resources

Care Giver Guides http://www.waitematadhb.govt.nz/Health-professionals/Aged-care/Caregiver-guides

Care Guides for Aged Residential Care http://www.waitematadhb.govt.nz/Health-professionals/Aged-care/Care-guides

Smith and Nephew Wound Care http://www.globalwoundacademy.com/

CHAPTER
18

# Health information: nursing documentation and clinical handover

*Leisa Bishop*

## KEY TERMS

care pathway
clinical handover
computer-assisted documentation
computerised documentation
documentation
incident reports
ISBAR
narrative report
SOAPIE

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Define the purpose of nurse documentation and reporting
- Discuss the legal and ethical considerations associated with documentation
- Describe guidelines for documenting individual information
- Identify the types of documentation formats in use
- Review case management and critical pathway systems
- Define the term ‘clinical handover’
- Determine the principles for reporting individual information
- Develop and practise the skills of verbal and written reporting and recording in the delivery of individual care

## CHAPTER FOCUS

The term *documentation* refers to any written or electronically generated information that describes the care or service provided to an individual or group. Health records include paper documents or electronic documents such as faxes, emails, audio or images (including video or digital images).

As defined within the National Safety and Quality Health Service (NSQHS) Standards (2012:5) developed by the Australian Commission on Safety and Quality in Health Care (ACSQHC), clinical handover is defined as 'the transfer of professional responsibility and accountability for some or all aspects of care for an individual, or a group of individuals, to another person or professional group on a temporary or permanent basis'.

Several types of records may be used to communicate information about the individual. These include, but are not limited to:

- Integrated progress notes
- Nursing, medical and allied health admission and discharge formats
- Observation charts
- Incident reports
- Fluid balance charts
- Medication charts and care pathways.

## LIVED EXPERIENCE

I have been a witness in a medical court case in Sydney in 2008 involving a surgeon. The alleged incident occurred in 2002. From this experience, I cannot stress strongly enough the importance of accurate documentation in nursing or midwifery practice. My clinical area was the perioperative environment; however, documentation in any arena is important.

When giving every statement on each of the six patients to detectives who were gathering evidence, I was presented with the relevant patient's history and shown the specific pages, count sheet and perioperative patient care plan involving my documentation. I was then questioned on these notes, being asked what I had written and if it was my writing and signature. In this you are required to answer honestly and are relying on your documentation as your evidence.

In the courtroom I was frequently shown photocopies of schedules from the patient history, being the count sheet and perioperative care plan I had signed. I was questioned and requisitioned from different angles at length on these by barristers for the Office of the Department of Public Prosecutions and the judge. I was also extensively cross-questioned by the defence barrister on these documents.

At the conclusion of my time in the witness stand, the judge commended me on the accuracy and neatness of the writing on these schedules and the importance of this in the legal system.

Following my first appearance to give evidence, the Office of the Department of Public Prosecutions' barrister spoke with me outside the courtroom regarding my documentation. She stressed the importance of the accurateness of documentation, that Nil or N/A had been written and that no space had a line through it, which could have been written by anybody or a mistaken slip of the pen, leaving no opening for misinterpretation.

Due to the duration of this case, from 2002 when the procedure took place until giving evidence in 2008, recollections of the events throughout the operation were non-existent. I had to rely on what I had documented in the notes to provide an accurate statement to detectives.

The intensity of the court case has impacted on my health and it has been a cruel educator; however, I have gained valuable insight into the legal/medical system. Six years is a long timeframe for the memory on a specific perioperative patient. Thankfully my documentation was accurate, concise and complete. The bottom line is your registration is involved, so take the time to provide accurate and legible documentation every day in your clinical practice. Every time you document in a patient's notes you could become a witness in a lawsuit.

**Penny Arnold, Perioperative Nurse**

*(Arnold 2012:28)*

# PURPOSE OF DOCUMENTATION

The primary purpose of **documentation** is to communicate information between the healthcare team members caring for the individual. Nurses provide 24-hour care; therefore, information exchange, whether verbal (clinical handover) or documented, is a significant part of nurse activity and must be reliable (Joanna Briggs Institute 2011). Through documentation nurses communicate to other nurses and the healthcare team their assessment of the status of individuals, nursing interventions that are carried out and the outcome of these interventions. This allows for continuity of care and follow-up from previous care provided.

As noted by Forrester (2011), healthcare records of individuals are not legal documents in their own right; however, they assist with several important functions including:

- An account of care and individual treatment and procedures
- A way of communicating between health professionals
- A source for gaining data for research
- Evidence if required in the event of legal action in the future.

There are a number of other purposes of nursing documentation; these include professional accountability, legislative requirements, quality improvement, research and resource management and funding (Crisp et al 2013).

## Professional accountability

In discussing the importance of nursing documentation, Jefferies and colleagues (2010:113) stated that 'not only is nursing documentation a repository of knowledge about the individual, it is also verifiable evidence showing how decisions are made and records the results of those decisions'. Documentation demonstrates nurse accountability and records professional practice. It may be used to determine responsibility of care providers and to resolve questions or concerns in relation to care required. The nurse's documentation may be used in relation to performance management, internal organisational inquiries and/or legal proceedings (such as civil lawsuits or coronial inquests).

## Legislative requirements

Nurses are required to document in accordance with standards of practice of their profession and local organisational policy and procedure which in Australia are the National Safety and Quality Health Service Standards (2012). The *Enrolled Nurse Standards for Practice* (NMBA 2016) reflect the minimum standard for documentation and reporting. These standards are used to assess the performance of students to determine if the student has met the standard required to gain a licence to practise. These standards are also used to assess the ongoing performance of an Enrolled Nurse in professional practice, specifically in complaint investigation of a professional practice matter.

The *Code of Ethics for Nurses in Australia* and the *Code of Professional Conduct for Nurses in Australia* outline the minimum requirements of documentation which nurses and midwives are to maintain within individual records. Value statement 7 'Nurses value ethical management of information' of the *Code of Ethics for Nurses* (ANMC 2008:5–6) states 'the information being recorded to be accurate, non-judgemental and relevant to the health, care and treatment of a person. All health documentation is a record that cannot be changed or altered other than by the addition of further information'.

Legislation may further identify and require specific information and content to be recorded and maintained. Acts such as failure to keep and maintain certain documentation records as required, falsifying documentation, incomplete or inaccurate documentation, signing or issuing a document that the person knows or suspects to be false or misleading, may be found to constitute unprofessional conduct by a regulatory authority. For an outline of the NMBA *Enrolled Nurse Standards for Practice* that relate to documentation and communication see Clinical Interest Box 18.1.

### CLINICAL INTEREST BOX 18.1 *NMBA Enrolled Nurse Standards for Practice* provision of care domain

Standard 7: Communicates and uses documentation to inform and report care

Indicators:

7.1 Collects data, reviews and documents the health and functional status of the person receiving care accurately and clearly.

7.2 Interprets and reports the health and functional status of people receiving care to the RN and appropriate members of the multidisciplinary healthcare team as soon as practicable.

7.3 Uses a variety of communication methods to engage appropriately with others and documents accordingly.

7.4 Prepares and delivers written and verbal care reports such as clinical handover, as a part of the multidisciplinary healthcare team.

7.5 Provides accurate and appropriate information to enable informed decision making by others.

*(NMBA 2016)*

## Quality improvement and research

Documentation is used by organisations to evaluate professional practice as part of quality improvement processes, including performance reviews, audits, organisational accreditation processes and incident investigations. In addition, health records provide valuable information for medical research in relation to clinical interventions, evaluation of individual outcomes and individual care.

The Australian Council on Healthcare Standards (ACHS) requires hospitals to establish quality improvement programs and imposes standards for information to be included in the healthcare record. The Standards require information be accurate, complete, timely, confidential and specific to the individual (ACHS 2010).

## Resource management and funding

Governments are progressively moving towards systems of activity-based funding, which means that health services are funded on the basis of their expected activity. In residential care, the activity is counted per day and resources are allocated as per the Aged Care Funding Instrument (ACFI) assessment. There are three areas by which funding is allocated: activities of daily living, behaviour supplement and complex health supplement. It is the Registered and Enrolled Nurses' responsibility to conduct clinical assessments and complete accurate documentation so the correct funding can be allocated. Table 18.1 shows the ACFI at a glance.

## TABLE 18.1 | Aged Care Funding Instrument (ACFI) at a glance

| | Question | ACFI appraisal evidence |
|---|---|---|
| Note: the resident's ACCR must be included in the ACFI Appraisal Pack | | |
| | **Mental and Behavioural Diagnosis**<br>**Medical Diagnosis** | • Disorders/diagnosis checklists<br>• Source materials checklists<br>• Copies of source materials e.g. ACCR, GP comprehensive medical assessment, other medical practitioner assessments or notes |
| 1 | **Nutrition**<br>Care need: readiness to eat / eating<br>Assistance level—independent OR supervision OR physical assistance | • Assessment<br>• Nutrition Checklist |
| 2 | **Mobility**<br>Care need: transfers / locomotion<br>Assistance level—independent OR supervision physical assistance OR mechanical lifting equipment | • Assessment<br>• Mobility Checklist |
| 3 | **Personal Hygiene**<br>Care need: dressing / washing / grooming<br>Assistance level—independent OR supervision OR physical assistance | • Assessment<br>• Personal Hygiene Checklist |
| 4 | **Tolleting**<br>Care need: use of tollet / tollet completion<br>Assistance level—independent OR supervision OR physical assistance | • Assessment<br>• Tolleting Checklist |
| 5 | **Continence**<br>Urinary continence and faecal continence<br>Measurement—frequency | • Continence Assessment Summary<br>• Continence Record<br>• Continence Checklist<br>• Documentary evidence of Incontinence prior to the implementation of a scheduled tolleting program<br>(Note: Other types of logs or diaries may be used to complete the continence record providing they contain all the required information.) |
| 6 | **Cognitive Skills**<br>Care need: needs arising from cognitive impairment<br>Measurement—none, mild, moderate, severe | • Cognitive Skills Assessment Summary<br>• PAS—CIS if appropriate<br>• Cognitive Checklist<br>(Note: A clinical report may be attached to provide supporting evidence) |
| 7 | **Wandering**<br>Care need: absconding or interfering whilst wandering<br>Measurement—frequency | • Wandering/ verbal/ physical behaviour assessment summary<br>• Wandering verbal/ physical behaviour records<br>• Behaviour checklist<br>(Note: Other types of logs or diaries may be used to complete the behaviour records providing they contain the same information as in the supplied record) |
| 8 | **Verbal**<br>Care need: verbal behaviour<br>Measurement—frequency | |
| 9 | **Physical**<br>Care need: physical behaviour<br>Measurement—frequency | |

*Continued*

**TABLE 18.1 | Aged Care Funding Instrument (ACFI) at a glance—cont'd**

| | Question | ACFI appraisal evidence |
|---|---|---|
| 10 | **Depression**<br>Care need: depressive symptoms<br>Measurement—none, mild, moderate, severe | • Depression Assessment Summary<br>• Cornell Scale for Depression<br>• Depression Checklist<br>• Diagnosis<br>(Note: A clinical report may be attached to provide supporting evidence) |
| 11 | **Medication**<br>Care need: assistance with medications<br>Measurement—complexity, frequency and assistance time | • Source materials table<br>• Medication Checklist<br>• Medication chart |
| 12 | **Complex Health Care**<br>Care need: complex health care procedures<br>Measurement—complexity and frequency | • Complex Health Care Checklist<br>• Diagnoses, assessments and directives as specified<br>• If requested at validation–records of treatments |

*(Australian Government Department of Social Services 2013. © Commonwealth of Australia)*

In most hospital models, activity is counted by 'episode of care', which refers to the whole time an individual is in hospital from admission to discharge. The healthcare record must contain the correct diagnosis-related grouping (DRG) for the facility to receive payment through Medicare. The DRG is obtained from the documentation in the healthcare record. Nursing documentation contributes to the codable diagnoses. If the individual's length of stay exceeds that allowed, thorough documentation assists in justifying the additional care, treatment or length of stay (Berman et al 2015; Crisp et al 2013). The Royal College of Nursing Australia (2011) raised concerns that 'current models of activity-based funding do not capture the unit price and characteristics of nursing services, and case mix classifications that are predominantly medically based fail to reflect nursing sensitive information'. With this said, nursing documentation is of growing importance to assist determining the most appropriate level of service delivery for the provision of care. Nurses must document all elements of a quality assessment, monitor findings and respond in an appropriate and timely manner.

## LEGAL AND ETHICAL CONSIDERATIONS

The promise of confidentiality encourages open communication between the individual and healthcare team. The nurse has a legislative, professional and ethical obligation to protect individual confidentiality. Legal and ethical considerations relating to documentation and reporting were introduced in Chapter 2. There are Australian legislative provisions to protect individual privacy and confidentiality. The nurse needs to understand the application of the law in the jurisdiction they practise in. The 13 Australian Privacy Principles are listed in Clinical Interest Box 18.2.

### CLINICAL INTEREST BOX 18.2 Australian Privacy Principles January 2014

Australian Privacy Principle 1—open and transparent management of personal information
Australian Privacy Principle 2—anonymity and pseudonymity
Australian Privacy Principle 3—collection of solicited personal information
Australian Privacy Principle 4—dealing with unsolicited personal information
Australian Privacy Principle 5—notification of the collection of personal information
Australian Privacy Principle 6—use or disclosure of personal information
Australian Privacy Principle 7—direct marketing
Australian Privacy Principle 8—cross-border disclosure of personal information
Australian Privacy Principle 9—adoption, use or disclosure of government-related identifiers
Australian Privacy Principle 10—quality of personal information
Australian Privacy Principle 11—security of personal information
Australian Privacy Principle 12—access to personal information
Australian Privacy Principle 13—correction of personal information

*(Australian Government 1988. For the latest information on Australian Government law please go to https://www.legislation.gov.au)*

Legislation also protects individual privacy and confidentiality of individual records that are stored electronically. Health services and departments of health install systems to monitor, protect and recover data that is stored electronically. The nurse assists in this process by using personal passwords

to enter and sign off from electronic records, not sharing passwords with others, never leaving computers unattended when logged on, ensuring that screens displaying individual information are not visible to the public and knowing the health service policy for protecting and reporting potential breaches of confidentiality.

To summarise, the nurse needs to be aware that the healthcare agency owns the healthcare record and the law includes provisions for the individual to access their healthcare record and also provisions for the restriction of access to the individual in specific circumstances.

Matters of privacy, confidentiality and consent must be considered by nurses, students and organisations when using exemplars of practice and journalling of practice experience. With the use of social media and the internet, the world's ability to connect is at an all-time high. This may result in contextual descriptions along with the location of the author(s) enabling identification of person(s) involved in the exemplar.

It is recommended that the nurse obtain consent from those involved in the situation described when using exemplars or journals. This means talking with the individual and staff involved, sharing the story with them and informing them on how it would be used.

### CASE STUDY 18.1

Coroner's investigation into the death of Keiran Daragah Watmore, Albany 2009

'At about 2 am his oxygen saturation rate was 88% on room air. As this was low, I put him on oxygen through nasal prongs and later mentioned I had done so to one of the Registered Nurses. About half an hour after I had connected up the oxygen, I checked his oxygen saturation level and it was up to 98%'.

In evidence Nurse F was asked to which of the Registered Nurses she had mentioned the low oxygen saturation level. She stated that she could not recall which one it was and that it might have been both of them. Nurse F was asked whether or not the nurse she spoke to had said anything to her in response, to which she said, 'I can't recall them saying anything, no.' She stated that she did not make any entry in the notes recording this conversation or recording the observations which she claimed indicated that the oxygen saturation level had gone up to 98%. Coroner Hope stated that, 'In my view Nurse F's account in respect of this matter was inconsistent and unconvincing.'

Provide an example of an appropriate entry into the progress notes that may have been made by Nurse F at the time the initial observations were taken at 0200.

## DOCUMENTATION GUIDELINES AND PRINCIPLES

Forrester (2011) described nursing documentation as a 'fundamental skill that underpins high quality patient care'. Each Australian state health department has policies detailing the standards required for nursing documentation and clinical handover and it is essential that you refer to these state policies as well as your local employer's policy to ensure compliance. Chapter 2 lists the important points to ensure quality documentation is provided while Case Study 18.1 further highlights the importance of accurate documentation within the clinical setting.

### Effective nursing documentation

Jefferies and colleagues (2010) identified seven critical themes for effective nursing documentation:

#### Theme 1

Nursing documentation should be centred on the individual. This means that the individual's own perception of their condition and their response to care should be the basis of nursing documentation.

#### Theme 2

Nursing documentation must contain the actual work of nurses, including education and psychosocial support; for example, the nurse 'supervised performing blood sugar level check. Continues to require instruction to clean finger prior to finger stick'.

#### Theme 3

Nursing documentation is written to reflect the objective clinical judgment of the nurse; for example, do not write 'appears to be asleep', write 'when observed was asleep'. Nurses working within rehabilitation, aged and home care also have the responsibility of documenting activities of daily living as well as the burden of care as legislated by the Australian Aged Care Quality Agency within the Quality of Care Principles 2014. (See Clinical Interest Box 18.3.) The nurse should accurately describe how nursing care has contributed to the outcome for the individual; use of the following words can aid in demonstrating the relevance of nursing care:

- *Assist* can be used when the person is unable to perform a task independently
- *Instruct* can be used when a person is able, but not knowledgeable and needs to be taught how to do something
- *Monitor/supervise* can be used for a person who is impulsive in undertaking a task that is not safe for them to undertake independently.

Phrasing personal cares in this manner also validates Commonwealth government funding as well as the facility's compliance for accreditation from the Aged Care Standards and Accreditation Agency.

## CLINICAL INTEREST BOX 18.3 Examples of documentation of delivery of care in rehabilitation practice

'Nurse provided instruction to ambulate in room to increase activity tolerance.'
'Instructed to call for assistance if feels weak/unbalanced.'
'As recommended by physiotherapist, nurse instructed and supervised Mr Smith in using walker to facilitate and promote independence.'
'Nurse instructed Mr Smith to place feet flat on the ground before attempting transfer.'
'To maintain skin integrity, the individual/family require assistance with turning for pressure relief.'
'Reports fatigue after therapy and has difficulty removing pants independently. Instructed to use the electric bed to sit up and the reacher device to facilitate reaching lower legs. With these instructions, Mr Smith can remove clothing, but it takes him a little longer than normal.'

### Theme 4

Nursing documentation must be presented in a logical and sequential manner.

### Theme 5

Nursing documentation should be written as events occur; this is described as contemporaneous documentation. Documenting events as they occur guarantees that important information about the individual's condition and care is not forgotten as subsequent events take place. In the event of a deposition or trial, your testimony should be based primarily on the information provided in the individual's health record (see Case Study 18.1). You may testify regarding undocumented care provided, but your credibility can be compromised if what you did or said you did is not accurately documented in the healthcare record.

Figure 18.1 illustrates the 24-hour clock.

### Theme 6

Nursing documentation should record variances of care.

### Theme 7

Nursing documentation should fulfil legal requirements. Documentation demonstrates that the nurse has applied nursing knowledge, skills and judgment in their care of the individual or group. The nurse's documentation may be used in evidence in coroners' investigations, disciplinary hearings and lawsuits. A summary of the legal requirements that are necessary for nursing documentation is outlined in Clinical Interest Box 18.4 and Clinical Skill 18.1, with additional explanation within Chapter 2.

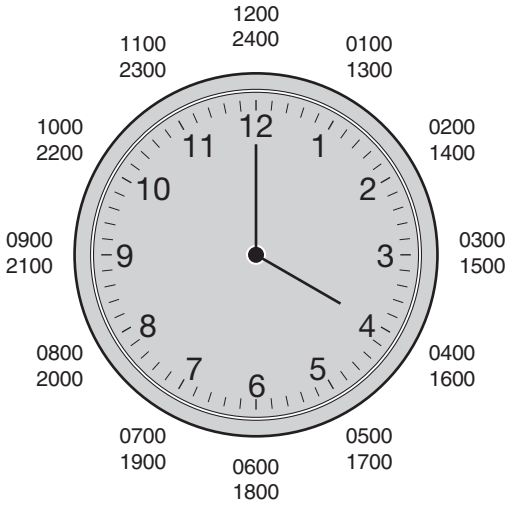


**Figure 18.1** 24-hour clock

## DOCUMENTATION FORMATS AND APPROACHES

The healthcare record includes many documents that are designed to demonstrate the nursing care given. Many of these are discussed in other chapters throughout the text.

The various types of records that may be used by a healthcare agency include:

- Nursing and medical admission histories
- Individual interview forms
- Nursing care plans
- Flow charts
- Progress notes/integrated notes
- Laboratory/diagnostic test reports
- Consent forms
- Incident reports
- Pre-operative anaesthetic records and postoperative surgical reports
- Therapeutic order sheets
- Medication records
- Medication charts
- Discharge summaries
- Medical orders for life-sustaining therapy.

The nurse is most likely to be regularly involved in recording information on individual interview forms, nursing care plans, various flow charts and progress notes. See Table 18.2.

### Types of documentation

Most documentation falls into one of two categories: documentation by inclusion or documentation by exception. Documentation by exception is a system in which only abnormal or significant findings to norms are recorded. When charting by exception it is assumed that all standards are met unless documented otherwise (Guido 2013; CRNBC 2013). When documenting it is important to identify information which is *subjective* and that which is *objective*.

## CRITICAL THINKING EXERCISE 18.1

Mrs A is an 81-year-old female admitted with a diagnosis of a fractured right radius post syncope. Vital signs are as follows: blood pressure 85/60 mmHg, pulse rate 110–145 beats per minute, respirations 24 breaths per minute and temperature 38°C.

During your initial assessment she complains of feeling breathless with only a small amount of exertion and feeling dizzy. Mrs A states that she has fainted a couple of times over the past 2 weeks but this was the worst fall that she has had in weeks. Mrs A is speaking in single words and short sentences, you note that her shoulders rise as she inspires, her lungs have crackles in both bases and she has peripheral oedema. There is no audible wheeze. Mrs A has a history of hypertension, ischaemic heart disease (medically managed) and COPD. Mrs A's right arm is in a cast. Differentiate between objective and subjective data.

## CLINICAL INTEREST BOX 18.4 Standards of documentation

Documentation in healthcare records must comply with the following:

1. Be clear and accurate.
2. Legible and in English.
3. Use approved abbreviations and symbols.
4. Written in dark ink that is readily reproducible, legible and difficult to erase and write over for paper-based records.
5. Time of entry (using a 24-hour clock—hhmm).
6. Date of entry (using dd/mm/yy or dd/mm/yyyy).
7. Signed by the author, and include their printed name and designation. In a computerised system, this will require the use of an appropriate identification system (e.g. electronic signature).
8. Entries by students involved in the care and treatment of an individual must be co-signed by the student's supervising clinician.
9. Entries by different professional groups are integrated (i.e. there are not separate sections for each professional group).
10. Be accurate statements of clinical interactions between the individual and their significant others, and the health service relating to assessment, diagnosis, care planning, management/care/treatment/services provided and response/outcomes, professional advice sought and provided, observation/s taken and results.
11. Be sufficiently clear, structured and detailed to enable other members of the healthcare team to assume care of the individual or to provide ongoing service at any time.
12. Distinguish between what was observed or performed, what was reported by others as happening and/or professional opinion.
13. Made at the time of an event or as soon as possible afterwards. The time of writing must be distinguished from the time of an incident, event or observation being reported.
14. Sequential—where lines are left between entries they must be ruled across to indicate they are not left for later entries and to reflect the sequential and contemporaneous nature of all entries.
15. Be relevant to that individual.
16. Only include personal information about other people when relevant and necessary for the care and treatment of the individual.
17. Addendum—if an entry omits details any additional details must be documented next to the heading 'Addendum', including the date and time of the omitted event and the date and time of the addendum. For hardcopy records, addendums must be appropriately integrated within the record and not documented on additional papers and/or attached to existing forms.
18. Written in error—all errors must be appropriately corrected. No alteration and correction of records is to render information in the records illegible. An original incorrect entry must remain readable (i.e. do not overwrite incorrect entries, do not use correction fluid). An accepted method of correction is to draw a line through the incorrect entry or 'strikethrough' text in electronic records; document 'written in error', followed by the author's printed name, signature, designation and date/time of correction. For electronic records the history of audited changes must be retained and the replacement note linked to the note flagged as 'written in error'. This provides the viewer with both the erroneous record and the corrected record.

*(NSW Health 2012:5–6)*

## CLINICAL SKILL 18.1 Documentation

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Individual care profile/individual history<br>Progress note<br>Pen (blue or black)<br>Computer (If electronic health record) |

| **Skill activity** | **Rationale** |
|---|---|
| **Documenting in progress notes** | |
| Review standard steps for all nursing procedures and interventions | These steps must be performed consistently with each individual to ensure safe nursing care is provided |
| Review individual's assessment data and problems identified (e.g. nursing diagnosis, goals, expected outcomes, interventions and individual's responses during each contact) | Makes it easier to document in an organised manner and decreases errors |
| After contact with the individual identify information that needs to be documented. Consider abnormal findings, changes in individual's status and any new problem identification | Ensures quality; accurate, timely and continuity of information; and completion of documentation in a timely manner; therefore the record is contemporaneous |
| Obtain necessary forms or access appropriate computer for documentation depending on hospital protocol | In accordance with legal requirements for documentation. Charting on the correct form ensures the information can be accessed efficiently by other health professionals |
| Ensure the documentation is correctly identifiable with the individual's details: full name, date of birth and gender. Generally this will be with an identification label attached to the healthcare record | In accordance with legal requirements for documentation and to reduce the risk of errors in documentation |
| Use a blue or black pen. Ensure your writing is legible, free of blank areas, comprehensible and contemporaneous | In accordance with legal requirements for documentation. Makes the reporting more legible and ensures the correct sequence of events and that correct treatment is provided to the individual. Blank spaces should be eliminated to ensure no incorrect information is added into the space. |
| Record date and time using the dd/mm/yy system and 24-hour clock for each entry | In accordance with legal requirements for documentation. This ensures the correct sequence of events is recorded |
| In conjunction with facility/organisation policy and recommended format, document in chronological order the following:<br>• Pertinent, factual, objective data<br>• Selected subjective data that validates and clarifies (avoid subjective statements)<br>• Nursing actions taken<br>• Evaluation of the individual's responses to nursing actions<br>• Any additional nursing actions needed<br>• To whom information has been reported, including name and status | Ensures high-quality documentation is used in order to enhance efficient and individualised care and that documentation is completed to professional standards as for legal requirements |
| Depending on the facility/organisation procedure, make a progress note entry using the SOAP format. The SOAP format consists of subjective data, objective data, assessment and plan and is usually based on a numbered list of problems or nursing diagnoses | Written plans are developed to deal with each problem the individual has. As more problems develop more plans are made, and additionally as more problems are resolved the plans are completed and no longer addressed in the documentation |

| CLINICAL SKILL 18.1 Documentation—cont'd | |
|---|---|
| Depending on the facility/organisation procedure, make a progress note using the PIE format. The PIE format consists of problem, intervention and evaluation. It is a problem-orientated system in which documentation is based on individual problems | This format is used to address problems identified during baseline assessment and monitor during care. This tends to be more nursing focused and flexible with specific information easier to find |
| Depending on the facility/organisation procedure, make a progress note using a basic narrative note format. This is not using a problem list but tells a story on the individual's problem, interventions and outcomes in a chronological order | Narrative documentation can tend to be repetitive, especially in long-term care |
| Depending on facility/organisation procedure, make a progress note using a CBE (charting by exception) format. This progress note will describe any deviations from the individual's normal assessment findings and can sometimes be described as a variance. This is usually completed in addition to care pathways | Reduces the amount of time and documentation required. It relies on the nurses using the established flow sheets, graphic records, standard protocols and care plans or pathways which are already in place to ensure continuous appropriate care is provided |
| Ensure your writing is error free or if you make an error it is crossed out with a single line through it and 'error' plus your initials written above | In accordance with legal requirements for documentation. Chart may become illegible and it can appear you were attempting to hide information. It is important that errors are corrected promptly to ensure no errors in treatment |
| Only care that has been personally delivered is documented, with the exception being in an emergency situation, in which case a designated scribe is in control of all recording of information | In accordance with legal requirements for documentation |
| Record the individual's response to treatment | Allows for ineffective treatment to be ceased and effective interventions to continue |
| Ensure appropriate medical terminology and approved abbreviations and acronyms are used | In accordance with legal requirements for documentation. Reduces the chance of errors and ineffective communication, therefore improving individual safety |
| Sign the progress note with full name or first initial and last name and status according to healthcare organisation policy. If you are a student, you need to indicate your school affiliation and level of education | In accordance with legal requirements for documentation. Documents who is accountable for the information written |
| If documenting a late entry, this must follow the last entry and be noted as such: either 'addit' or 'late entry' written beside the time you actually wrote the notation. The time of the original occurrence must also be documented within the note | In accordance with legal requirements for documentation |
| Review previously documented entries with those that you enter, identifying if there is any significant change in the individual's health status or care and report as needed | Changes in medical, physical, emotional or psychological condition are documented to report and alert other healthcare professionals to potential complications |
| **Use of electronic health records (EHRs)** | |
| Sign on to EHR using your password; never share passwords and keep your password private | For accountability purposes, your user name and password become your signature and therefore you are accepting accountability for your documentation |
| Do not leave individual's information on the monitor where others can view it | The individual's privacy and confidentiality must be maintained |

*Continued*

| CLINICAL SKILL 18.1 Documentation—cont'd | |
|---|---|
| Review assessment data, problems identified (e.g. nursing diagnosis, goals, expected outcomes, interventions and individual's responses during each contact) | Makes it easier to document in an organised manner and decreases errors |
| Follow procedures for entering information in all appropriate program functions | Some programs will not let you enter pages until you have completed other forms or procedures to ensure documentation is complete |
| Review previously documented entries with those that you enter, identifying if there is any significant change in the individual's health status or care and report as needed | Changes in medical, physical, emotional or psychological condition are documented to report and alert other healthcare professionals to potential complications |
| Know and implement procedures to correct documentation errors | This may be different in different computer programs and is important to be done promptly to ensure errors in the individual's treatment do not occur |
| Save information as you complete documentation | Information may be lost if you do not save your documentation |
| Log off when you leave the computer | In accordance with legal requirements for documentation. Ensures no one uses your user name to change data or review individual's health conditions and also ensures individual's privacy and confidentiality are maintained |

Note: Documentation must be completed according to the facility/organisation's guidelines and policy. Therefore, it is important to become familiar with different formats of documentation and their best indications of use.

You need not document information that is already charted on flow charts, unless that information is relevant to other pertinent information you are recording (Tollefson 2016). Content of documentation will depend on the individual and their condition. But whatever the individual's condition there should always be nursing interventions documented and the individual's response to these (Tollefson et al 2016).

When documenting, remember the guidelines for quality documentation:

- Factual
- Accurate
- Complete
- Concise
- Current
- Organised (Perry et al 2012).

*(Rebeiro et al 2013; Perry et al 2012; Tollefson 2016; Tollefson et al 2016)*

## Narrative documentation: SOAPIE, APIE, PIE

For a **narrative report** the nurse charts in chronological order the events that occur, including the gathering of information. The format is generally story-like, and is often repetitive and long.

There are a number of other methodologies that the nurse may apply to construct a logical order to documentation.

## Subjective data, objective data, assessment and plan

SOAP is an acronym for **S**ubjective data, **O**bjective data, **A**ssessment and **P**lan; however, some nurses use an amended format of **SOAPIE** in which **I**mplementation and **E**valuation have been added.

## Assessment, plan, implementation and evaluation (APIE)

APIE is a method in which the nurse will document **A**ssessment, **P**lan, **I**mplementation and **E**valuation. The subjective and objective data have been combined in assessment, while combining what nurses do with the expected outcomes of individual care forms the plan component.

## Problems, intervention and evaluation (PIE)

PIE is an acronym for **P**roblems, **I**ntervention and **E**valuation of nursing care. When the nursing assessment is undertaken, an individual problem list is developed with each individual problem being allocated a number. The charting is documented using the numbering system, by individual

**TABLE 18.2 | Example organisation of traditional source record**

| Sections | Contents |
|---|---|
| Admission sheet | Specific demographic data about client: legal name, identification number, sex, age, birth date, marital status, occupation and employer, health insurance, nearest relative to notify in an emergency, religious preference, name of attending doctor, date and time of admission |
| Doctor's order sheet | Record of doctor's orders for treatment and medications, with date, time and doctor's signature |
| Nurse's admission assessment | Summary of nursing history and physical examination |
| Graphic sheet and flow sheet | Record of repeated observations and measurements such as vital signs, daily weights, and intake and output |
| Medical history and examination | Results of initial examination performed by doctor, including findings, family history, confirmed diagnoses and medical plan of care |
| Nurses' notes | Narrative record of nursing process: assessment, nursing diagnosis, planning, implementation and evaluation of care |
| Medication records | Accurate documentation of all medications administered to client: date, time, dose route and nurse's signature |
| Doctor's progress notes | Ongoing record of client's progress and response to medical therapy and review of disease process |
| Healthcare discipline's records | Entries made into record by all health-related disciplines: radiology, social work and laboratories |
| Discharge summary | Summary of client's condition, progress, prognosis, rehabilitation and teaching needs at time of dismissal from hospital or healthcare agency |

*(Crisp et al 2013:422)*

problem, followed by the nursing intervention that is delivered in relation to the identified problem and the evaluation of nursing care to resolve or improve the individual problem.

## Focus charting: DAR

Focus charting is used when an individual-centred problem is identified. The identified problem will be commented on during each shift until incorporated into routine management. The method of organising the narrative in focus charting is the principle: **D**ata, **A**ction and **R**esponse (DAR). Data reflects a combination of subjective (what the individual states) and objective (what the nurse observes), action is the documentation reflecting what nursing actions were taken to address the problem and response is the individual's response to the nursing action (see Clinical Interest Box 18.5).

## Computerised documentation and charting

In 2005 the National E-Health Transition Authority (NEHTA) was formed. It 'is the lead organisation supporting a national vision for eHealth for Australia' (NEHTA 2015). Its purpose is to lead, support and direct Australian e-health while enhancing healthcare by increasing accessibility 'to the right information, for the right person, at the right time and place' (NEHTA 2015) for individuals and healthcare providers. NEHTA is jointly funded by the Australian Commonwealth and state and territory governments and engages with the ACSQHC and the University

### CRITICAL THINKING EXERCISE 18.2

Mr Q returned from operating theatre at 1600 hrs post a right video assisted thoracotomy (VAT) and wedge biopsy for diagnosis of right lung pathology. He returned to the ward with oxygen 6 L/min via a Hudson mask (HM) maintaining oxygen saturations ($SpO_2$) greater than 94%. Intravenous 1 L 0.9% sodium chloride infusing at 80 mL/hour. Tolerating ice only orally. Fentanyl patient-controlled analgesia (PCA) providing effective pain relief, pain score as per patient 2/10. Indwelling urinary catheter (IDC) output 50 mL–110 mL/hour. Two chest drains (ICC) are combined into one underwater seal drain (UWSD) with 300 mL of haemoserous fluid drained, 10 cm $H_2O$ suction, swing and air leak are present. Cutifilm dressing is intact to right thoracotomy wound, clean and dry. Vital signs, blood pressure 100/84 mmHg, respiratory rate 12 breaths per minute, pulse rate 88 beats per minute.

Use this information to write a nursing progress note using the following formats: SOAPIE, PIE, DAR.

## CLINICAL INTEREST BOX 18.5 Focus reporting

Nursing 20/01/2016 1130 hrs

Mobility: Found sitting up on floor against bedside locker by myself at 1110 hrs. Mrs Smith stated she climbed over the bed rails and fell on the floor, hitting head on bedside table. Disoriented to time and place (normal for Mrs Smith). Swelling to left temporal area of skull, skin remains intact. Painful to touch, complaining of headache rated at 3/10. Vital signs within normal parameters. Not reporting pain elsewhere. Returned to bed by staff, bed rails down. Resident medical officer contacted at 1120 hrs to review Mrs Smith, instructed to commence 4/24 full neurological observations. Falls risk management tool completed. Falls prevention strategies implemented as per nursing care plan. Braden Score reassessed at 15, all strategies implemented and charted as per pressure ulcer risk assessment and minimisation. Glasgow Coma Scale Score (GCS) 14.

Signature, designation and print surname.

Nursing 20/01/2016 1700 hrs

Observations: GCS 12, agitated, confused and incontinent of urine. Resident medical officer informed, full neurological observations now 30 minutely as instructed. After hours nurse manager contacted at 1645 hrs. Behavioural observation form commenced and patient care assistant companion now in place. Awaiting cranial CT. Family notified.

Signature, designation and print surname.

of New South Wales Centre for Health Informatics to ensure the clinical safety and governance of the Personally Controlled Electronic Health Record (PCEHR) and e-Health products and solutions (National E-Health Transition Authority 2015).

**Computerised documentation** is data entry of individual information onto a computerised system. This may occur through keyboard, touch screen or voice-activated data entry. The advantages of computerised documentation include:

- Information is always legible
- Abbreviations can be restricted to agency-approved abbreviations
- Each field of a form needs to be completed before the nurse can progress to the next
- Individual identifying information is automatically generated with each page
- The addition of drop-down boxes creates standardisation and can reduce data entry time for the nurse
- Automatic storing of access numbers to individual staff and logging of date and time assists with information integrity.

To ensure contemporaneous recording of information bedside data entry options are essential. These may be fixed or computers on wheels (COW). Additional confidentiality considerations include orientating the computer screens away from public view; use of automatic timed screen savers and logout mechanisms; assigning individual access numbers and passwords; restricting levels of individual data to authorised groups of staff; automatic storing of date, time and access numbers when individual records are accessed; and encrypting individual information transmitted through the internet.

Some computer programs use predictive text and/or autocorrect which may cause problems if the nurse does not check the entry made (Staunton & Chiarella 2013).

**Computer-assisted documentation** includes the implementation of advanced speech recognition technology (voice recognition programs) to increase the quality and accuracy of transcribed documents and reduce the turnaround for clinical notes and the cost of medical transcription processes (Rozmus 2010). In nursing services voice recognition programs may improve efficiency and access to records, particularly in nurse-led clinic environments and emergency departments when timely discharge of information is required (see also Chapter 5).

### CRITICAL THINKING EXERCISE 18.3

While you are entering into electronic progress notes the nurse call bell rings. At this stage you have entered only half of the required information into the computer. What actions should you undertake to ensure that safe individual care is performed quickly and efficiently and privacy is also maintained?

## Care pathways or individual management guidelines

A **care pathway** (CPW) or individual management guideline is a document outlining a standardised, evidence-based multidisciplinary management plan, which identifies the appropriate sequence of clinical interventions, timeframes, milestones and expected outcomes for a common individual group. These pathways aim to have the most current evidence incorporated into clinical practice and provide recommendations, processes and timeframes for the management of specific medical conditions. CPWs identify the expected course of events for the majority of individuals (approximately 70%) (Zhang & Liu 2011). In a Cochrane review of CPWs it was found that when they were used there was a significant decrease in in-hospital complications (including bleeding and infection) and length of stay, and therefore cost to the hospital. Documentation appeared to improve, which supports the theory that there was an increase in communication (Rotter et al 2010). As there will always be exceptions, the pathway should be followed in accordance with the nurse's assessment of each individual case. A process of charting by exception (CBE) may be adopted when utilising CPWs. Charting by exception involves the nurse charting only

significant findings or exceptions to the standards or norms of the predicted care pathway for the individual, as supported by local and governing policies (Kerr 2013). Often a statement will be made within the individual's medical records such as 'nursed as per care pathway with nil variances'.

### Flow sheets

Flow sheets are records to reflect the individual's condition. They enable the nurse to document routine care such as the individual's vital signs, medications, fluid intake and output. Flow charts have traditionally been utilised in the critical care areas; however, more recently, flow charts have evolved for physiological monitoring into 'track and trigger' charts for general wards. These charts prompt the nurse to graphically chart the individual's observations (track) and when abnormal parameters are reached, a prescribed response or escalation plan is documented and expected of the nurse (trigger) (see Figure 18.2).

## DOCUMENTATION IN AGED CARE

In 2002, the National Framework for Documenting Care in Residential Aged Care Services (NATFRAME) was developed to provide guidance to aged care workers and facilities to provide high-quality care for older people. As previously discussed, accurate documentation is an essential component of quality care.

This framework combines all the necessary components documenting care. At the centre of the conceptual framework is the resident, with the resident being the focus of care and the reason for documentation and accountability to exist. While the care process and accountability process are identified separately they are connected to meet the needs of the individual. NATFRAME lists 'the elements that are fundamental to both processes as:

- The assessment of the resident
- The identification of resident capabilities, needs or problems
- The development of interventions, actions and strategies
- The development of strategies required to meet the needs of the resident
- The ongoing evaluation of the resident's response to the care given' (Commonwealth Department of Health and Ageing 2015).

NATFRAME provides examples of assessment tools which may be adopted by aged care facilities, covering five areas: social, cultural and spiritual; physical; functional; communication; and cognitive and mental health. Clinical Interest Box 18.6 provides information on the steps/timing for effective documentation.

### CLINICAL INTEREST BOX 18.6 NATFRAME steps for effective documentation

**Step 1—On admission**

Initial assessment to determine immediate care needs

*Resident care assessment record*

**Step 2—Ongoing assessment**

Assess the resident according to facility policy and timetable. Complete the ongoing assessment section using further *assessment tools* if indicated.

Not all assessment areas will be required for all residents. Record results of the assessment process in the *care profile* including the results obtained from the tools used.

*Ongoing assessment*
*Assessment tools*
*Care profile*

**Step 3—Analysis**

Analyse the results of the assessment process and identify the care needs for the resident.

**Step 4—Identify and record**

Identify the care interventions and strategies that will meet the resident's capabilities and identified care needs based on evidence and best practice. Record these strategies in summary form on the *care profile* and the relevant *management chart*.

**Step 5—Monitor and record**

Monitor the resident's response to care as indicated by the resident or on a regular basis. Record responses on the relevant *management chart* and if unexpected or different from usual response, record in *progress notes* in accordance with state and territory legislation.

If an incident, error or adverse event occurs these also should be recorded in the *progress notes* and on the facility's incident reporting forms.

**Step 6—Continuous update**

Continuously draw on the *progress notes* and evaluations in the *management charts* to ensure that ongoing update of the *care profile* occurs, as per facility policy.

**Step 7—Continuous assessment and planning**

Use the documents to continue to assess the resident, identify care needs, plan care to meet these needs and evaluate the response to care given.

*(Department of Social Services 2015. © Commonwealth of Australia)*

## CLINICAL HANDOVER

The NSQHS Standards include 'Communicating for safety'. Effective communication is critical at all points where information is transferred. The Standard focuses on ensuring safe care by supporting the principles of coordination and continuity of care (ACSQHC 2015). Errors with communication and **clinical handover** are contributing elements in 70% of hospital events and therefore lead to an increased risk of adverse events. It is pertinent to say that ineffective clinical handover or the absence of clinical handover has serious

Government of **Western Australia**
Department of **Health**

# Adult Observation and Response Chart

Facility: _____

(Affix patient identification label here)

URN:

Family name:

Given names:

Date of birth: Sex: ☐ M ☐ F

## Other Charts In Use

| | | |
|---|---|---|
| ☐ Alcohol Withdrawal | ☐ Insulin Infusion | ☐ Pain/Epidural/Patient Controlled Analgesia |
| ☐ Anticoagulant | ☐ Neurological | |
| ☐ Fluid Balance | ☐ Neurovascular | |

## General Instructions

- You must record appropriate observations:
  - On admission
  - At a frequency appropriate for the patient's clinical state.
- You must record a full set of observations:
  - If the patient is deteriorating or an observation is in a shaded area
  - Whenever you are concerned about the patient.
- When graphing observations, place a dot (•) in the centre of the box which includes the current observation in its range of values and connect it to the previous dot with a straight line. For blood pressure, use the symbol indicated on the chart.
- Whenever an observation falls within a shaded area, you must initiate the actions required for that colour, unless a modification has been made (see below).
- If observations fall within two or more different coloured areas for the same time period, the actions required for the darker colour apply.

## Modifications

If abnormal observations are to be tolerated for the patient's clinical condition, write the acceptable ranges (where a response will not be triggered) below, and tick the box overleaf. Modifications must be reviewed at least every 48 hours. Further modifications will require a new chart.

| | | | |
|---|---|---|---|
| Respiratory Rate | | to | |
| $O_2$ Saturation | | to | |
| Systolic BP | | to | |
| Heart Rate | | to | |
| Temperature | | to | |
| Consciousness | | to | |
| Urine Output | | to | |
| B.G.L. | | to | |

Doctor's name (please print)

Designation

Signature

Date / /

Time :

**48 hour review**

Review by DR _____ Date _____ Time _____

Comments _____ Signature _____

**Phone order for modifications**

| Date/time | Modifications | Nurse / Midwife Initials 1st | 2nd | Doctor's Name |
|---|---|---|---|---|
| | | | | |
| | | | | |

OBSERVATION AND RESPONSE CHART

MR 140A

**Figure 18.2** Adult observation and response chart

*(Sample Chart: Adult Observation and Response Chart, MR 140A Form. WA Country Health Service)*

(Affix patient identification label here)

URN:

Family name:

Given names:

Date of birth: Sex: ☐ M ☐ F

## Interventions

If you administer an intervention, record here and note letter in intervention row over page in appropriate time column.

| | |
|---|---|
| A | |
| B | |
| C | |
| D | |
| E | |
| F | |
| G | |
| H | |
| I | |
| J | |
| K | |

### Pain Assessment Tool

## Additional Observations

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | | | | | | | | | | | | | | | | | | | | |
| **Time** | | | | | | | | | | | | | | | | | | | | |
| **Blood Glucose Level** (mmol / L) Refer Response Criteria | > 19 | | | | | | | | | | | | | | | | | | | > 19 |
| | 3–19 | | | | | | | | | | | | | | | | | | | 3–19 |
| | < 3 | | | | | | | | | | | | | | | | | | | < 3 |
| **Weight** (kg) | | | | | | | | | | | | | | | | | | | | |
| **Bowels** | | | | | | | | | | | | | | | | | | | | |
| **Urinalysis** | Specific gravity | | | | | | | | | | | | | | | | | | | |
| | pH | | | | | | | | | | | | | | | | | | | |
| | Leukocytes | | | | | | | | | | | | | | | | | | | |
| | Blood | | | | | | | | | | | | | | | | | | | |
| | Nitrite | | | | | | | | | | | | | | | | | | | |
| | Ketones | | | | | | | | | | | | | | | | | | | |
| | Bilirubin | | | | | | | | | | | | | | | | | | | |
| | Urobilinogen | | | | | | | | | | | | | | | | | | | |
| | Protein | | | | | | | | | | | | | | | | | | | |
| | Glucose | | | | | | | | | | | | | | | | | | | |

**Figure 18.2** Cont'd

| Date | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | | | | | | | | | | | | | | | | | | | | | |
| If Respiratory Rate ≥ 36, write value in box<br>**Respiratory Rate**<br>(breaths / min) | Write ≥ 36 | | | | | | | | | | | | | | | | | | | | Write ≥ 36 |
| | 30–35 | | | | | | | | | | | | | | | | | | | | 30–35 |
| | 25–29 | | | | | | | | | | | | | | | | | | | | 25–29 |
| | 20–24 | | | | | | | | | | | | | | | | | | | | 20–24 |
| | 15–19 | | | | | | | | | | | | | | | | | | | | 15–19 |
| | 10–14 | | | | | | | | | | | | | | | | | | | | 10–14 |
| | 5–9 | | | | | | | | | | | | | | | | | | | | 5–9 |
| | ≤ 4 | | | | | | | | | | | | | | | | | | | | ≤ 4 |
| If $O_2$ Saturation ≥ 95, write value in box<br>**$O_2$ Saturation**<br>(%) | Write ≥ 95 | | | | | | | | | | | | | | | | | | | | Write ≥ 95 |
| | 91–94 | | | | | | | | | | | | | | | | | | | | 91–94 |
| | 85–90 | | | | | | | | | | | | | | | | | | | | 85–90 |
| | ≤ 84 | | | | | | | | | | | | | | | | | | | | ≤ 84 |
| **$O_2$ Flow Rate**<br>(L / min) | L/Min | | | | | | | | | | | | | | | | | | | | L/Min |
| | Mask/NP | | | | | | | | | | | | | | | | | | | | Mask/NP |
| If systolic BP ≥ 200, write value in box<br>**Blood Pressure**<br>(mmHg)<br>**Score systolic BP** | Write ≥ 200 | | | | | | | | | | | | | | | | | | | | Write ≥ 200 |
| | 190s | | | | | | | | | | | | | | | | | | | | 190s |
| | 180s | | | | | | | | | | | | | | | | | | | | 180s |
| | 170s | | | | | | | | | | | | | | | | | | | | 170s |
| | 160s | | | | | | | | | | | | | | | | | | | | 160s |
| | 150s | | | | | | | | | | | | | | | | | | | | 150s |
| | 140s | | | | | | | | | | | | | | | | | | | | 140s |
| | 130s | | | | | | | | | | | | | | | | | | | | 130s |
| | 120s | | | | | | | | | | | | | | | | | | | | 120s |
| | 110s | | | | | | | | | | | | | | | | | | | | 110s |
| | 100s | | | | | | | | | | | | | | | | | | | | 100s |
| | 90s | | | | | | | | | | | | | | | | | | | | 90s |
| | 80s | | | | | | | | | | | | | | | | | | | | 80s |
| | 70s | | | | | | | | | | | | | | | | | | | | 70s |
| | 60s | | | | | | | | | | | | | | | | | | | | 60s |
| | 50s | | | | | | | | | | | | | | | | | | | | 50s |
| | 40s | | | | | | | | | | | | | | | | | | | | 40s |
| If heart rate ≥ 140, write value in box<br>**Heart Rate**<br>(beats / min) | Write ≥ 140 | | | | | | | | | | | | | | | | | | | | Write ≥ 140 |
| | 130s | | | | | | | | | | | | | | | | | | | | 130s |
| | 120s | | | | | | | | | | | | | | | | | | | | 120s |
| | 110s | | | | | | | | | | | | | | | | | | | | 110s |
| | 100s | | | | | | | | | | | | | | | | | | | | 100s |
| | 90s | | | | | | | | | | | | | | | | | | | | 90s |
| | 80s | | | | | | | | | | | | | | | | | | | | 80s |
| | 70s | | | | | | | | | | | | | | | | | | | | 70s |
| | 60s | | | | | | | | | | | | | | | | | | | | 60s |
| | 50s | | | | | | | | | | | | | | | | | | | | 50s |
| | 40s | | | | | | | | | | | | | | | | | | | | 40s |
| | 30s | | | | | | | | | | | | | | | | | | | | 30s |
| If temperature ≥ 39, write value in box<br>**Temperature**<br>(C) | Write ≥ 39.0 | | | | | | | | | | | | | | | | | | | | Write ≥ 39.0 |
| | 38.5 | | | | | | | | | | | | | | | | | | | | 38.5 |
| | 38.0 | | | | | | | | | | | | | | | | | | | | 38.0 |
| | 37.5 | | | | | | | | | | | | | | | | | | | | 37.5 |
| | 37.0 | | | | | | | | | | | | | | | | | | | | 37.0 |
| | 36.5 | | | | | | | | | | | | | | | | | | | | 36.5 |
| | 36.0 | | | | | | | | | | | | | | | | | | | | 36.0 |
| | 35.5 | | | | | | | | | | | | | | | | | | | | 35.5 |
| | 35.0 | | | | | | | | | | | | | | | | | | | | 35.0 |
| **Consciousness**<br>If necessary, wake patient before scoring | Alert | | | | | | | | | | | | | | | | | | | | Alert |
| | To Voice | | | | | | | | | | | | | | | | | | | | To Voice |
| | To Pain | | | | | | | | | | | | | | | | | | | | To Pain |
| | Unresp. | | | | | | | | | | | | | | | | | | | | Unresp. |
| **Urine Output**<br>(mL / hour) | ≥ 30 | | | | | | | | | | | | | | | | | | | | ≥ 30 |
| | ≤ 29 | | | | | | | | | | | | | | | | | | | | ≤ 29 |
| **Pain Score**<br>None (0) – Worst (10) | 8-10 | | | | | | | | | | | | | | | | | | | | 8-10 |
| | 4-7 | | | | | | | | | | | | | | | | | | | | 4-7 |
| | 0-3 | | | | | | | | | | | | | | | | | | | | 0-3 |
| **Intervention** | E.g. 'A' | | | | | | | | | | | | | | | | | | | | E.g. 'A' |

DO NOT WRITE IN BINDING MARGIN

**Figure 18.2** Cont'd

(Affix patient identification label here)

URN:

Family name:

Given names:

Data of birth: Sex: ☐ M ☐ F

☐ **Modifications in use**

## Medical Emergency Response Call

| Response Criteria | Actions Required |
|---|---|
| • **Any observation in a purple area**<br>• Airway threat<br>• Respiratory or cardiac arrest<br>• Sudden fall in level of consciousness<br>• Drop in $O_2$ saturation ≤ 84%<br>• Seizure<br>• A medical review that has not been attended<br>• You are worried about the patient but they do not fit the above criteria | • Place Emergency call<br>• Initiate ALS/BLS protocols |

## Medical Review

| Response Criteria | Actions Required |
|---|---|
| • **Any observation in a red area**<br>• New or unrelenting chest pain<br>• New or unrelenting shortness of breath<br>• Increased or unexpected fluid or blood loss<br>• Pain not relieved by current analgesia<br>• Drop in $O_2$ saturation ≤ 90%<br>• BGL < 3 or > 19<br>• Urine output ≤ 29 mL/hr<br>• You are worried about the patient but they do not fit the above criteria | • Doctor to review patient within 30 minutes (via phone or in person)<br>• Record observations every 15 minutes<br>• If medical review not attended within 30 minutes, initiate MER call |

## Senior Nurse Review

| Response Criteria | Actions Required |
|---|---|
| • **Any observation in an orange area**<br>• You are worried about the patient but they do not fit the above criteria | • Senior Nurse must review patient<br>• Senior Nurse must contact Medical Officer to discuss whether a Clinical Review is required<br>• Record observations at least once every hour<br>• Review $O_2$ requirement<br>• Manage fever, pain, fiuids, blood loss or distress |

## Increased Surveillance

| Response Criteria | Actions Required |
|---|---|
| • **Any observation in a yellow area**<br>• You are worried about the patient but they do not fit the above criteria | • Inform Shift Coordinator<br>• Record observations at least every 2 hours<br>• Carry out appropriate interventions as prescribed<br>• Manage fever, pain, fiuids, blood loss or distress<br>• Review $O_2$ requirement |

**Figure 18.2** Cont'd

## CLINICAL INTEREST BOX 18.7 Principles of handover (ACSQHC 2012)

**Principle 1 Preparing for handover**

- Clearly allocating staff roles is essential to reduce disruptions and ensure safe individual care during handover.
- Ensure all participants, the venue and the time of handover are nominated.
- Prior to handover the clinicians should obtain all relevant documents.

**Principle 2 Organising the relevant members to participate**

- Make sure all participants have arrived before starting the handover.
- Handover of individuals should be supervised by a designated leader.

**Principle 3 Being aware of the clinical contexts and their needs**

- Handover should include notification about individuals who might require significant levels of care or immediate attention; are deteriorating or might deteriorate; or present occupational safety issues.

**Principle 4 Participating in effective handover resulting in transfer of responsibility and accountability of care**

- The handover of individuals must be achieved through a standardised content delivery and should include the transfer of accountability and responsibility.

*(ACSQHC 2012)*

consequences for the individual's safety. Clinical Interest Box 18.7 lists the four principles of clinical handover as per the ACSQHC Standard (ACSQHC 2012; 2015) (see also Chapter 7).

There are many methods that may be utilised to perform safe clinical handover. Figure 18.3 summarises the appropriate methods and situations in which clinical handover should be conducted as per the 'Communicating for safety' Standard. See Clinical Skill 18.2.

## Transfer of care

The two main uses of verbal reporting are when a nurse transfers care to another healthcare provider and when the nurse recognises and responds to changes in the health and functional status of the individual. It is at this time that the nurse provides a summary of the individual's condition, care plan, interventions and response to interventions for the purpose of transferring the accountability of care for the individual to another healthcare provider. Handover record formats can vary slightly, depending on the context of practice. Standardising the process of individual handover is seen as key in improving individual safety (James et al 2013) with

## CRITICAL THINKING EXERCISE 18.4

Mr K is a 76-year-old man admitted with bradycardia. He has a history of ischaemic heart disease (IHD), previous percutaneous coronary interventions (PCI) 6 months ago and was recently diagnosed with non-insulin-dependent diabetes mellitus (NIDDM). You have responded to his call bell and he states that he has severe chest pain, radiating down his left arm. The pain began after he returned from the toilet. Individual is alert but diaphoretic. Vital signs: temperature 36.5°C, blood pressure 170/90 mmHg, respiratory rate 28 breaths per minute, heart rate 50 beats per minute, pain score is 9/10 and oxygen saturations 95% on room air. Document the observations on the observation chart, document your interventions based on the escalation plan outlined in the adult observation and response chart included in this chapter (Figure 18.2) and document the verbal report you would provide to the medical officer.

some organisations adopting a documented clinical handover checklist tool as well as bedside handover to increase individual safety (see Case Study 18.2, Decision-making Exercise 18.1).

The **ISBAR** framework is often used as part of the reporting process. It represents a standardised approach to communication which can be used in any situation. It stands for Introduction, Situation, Background, Assessment and Recommendation (see also Chapter 8).

## Bedside nursing handover

Bedside nursing handover involves the nursing team and the individual and/or their family. Nurses recognise that bedside handover facilitates more accurate information exchange and individuals feel that their care is individualised and personalised as they are included in clinical handover (Tobiano et al 2013). In a study by Maxson et al (2012), bedside nurse-to-nurse shift handover had a positive impact on individuals and nursing staff with individuals noting a significant increase in their perception of being informed of the plan of care for the day and there being an increase in accuracy as individuals were able to contribute to clinical handover. Not only has the introduction of bedside handover not extended the time taken for handover (a commonly cited barrier to implementation), it has improved the comprehensiveness, visualisation and identification of care priorities (Bradley & Mott 2012).

Chaboyer et al (2010) further identify that bedside clinical handover provides the additional benefit of student teaching and mentoring, assists less experienced staff to learn professional goals and values and promotes cohesion within the nursing group. 'In this style of handover, students begin to see nursing as something done with rather than for patients' (Chaboyer et al 2010:28).

Legitimate concerns relating to individual privacy and confidentiality are managed through individual organisation's policies, which outline what information is to be conveyed at the bedside handover. This is particularly important in shared rooms.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **WHY** Implement standard key principles? | | Provide the best patient care by improving the transfer of clinical information, responsibility and accountability. | | | | | | |
| **WHAT** Clinical information is handed over? | | Locally defined minimum data set that meets the key principles, ensuring the most imporatant clinical information is handed over.** | | | | | | |
| **WHO** Should attend the handover? | | Key participants is the handover process are identified and available to attend the clinical handover of their patients. | | | | | | |
| **WHEN** Should handover occur? | | **Escalation of deteriorating patient** | **Patient transfers to another ward** | **Shift to shift change over** | **Patient transfers for a test or appointment** | **Patient transfers to another facility** | **Multi-disciplinary team handover** | **Patient transfers to/from the community** |
| **HOW** Should handover be delivered? | Face to face + checklist | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ |
| | In the patient's presence (bedside handover) | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ |
| | Face to face verbal only | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ |
| | Checklist | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ |
| | In a common staff area | ●●● | ●●● | ✓✓✓ | ●●● | ●●● | ✓✓✓ | ●●● |
| | Telephone handover | ✓✓✓ | ✓✓✓ | ●●● | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ |
| | Mobile electronic tools | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ | ✓✓✓ |
| | Detailed transfer letter | ××× | ●●● | ××× | ●●● | ××× | ●●● | ××× |
| | Tape recording | ××× | ××× | ××× | ××× | ××× | ××× | ××× |

Adapted from source: Implementation Toolkit: Standard Key Principles for Clinical Handover, NSW Department of Health 2009

| LEGEND | |
|---|---|
| ✓✓✓ | Recommended Options |
| ●●● | Not Recommended |
| ××× | Should Never Occur |

**Figure 18.3** Clinical handover matrix

*(NSQHSS Standard 6 (p. 15, 2012) Table 1: Clinical handover solutions matrix. Adapted from NSW Department of Health 2009)*

## CLINICAL SKILL 18.2 Clinical handover

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Handover sheet<br>Individual flow charts as necessary |

| **Skill activity** | **Rationale** |
|---|---|
| **All clinical handover** | |
| Review standard steps for all nursing procedures and interventions | These steps must be performed consistently with each individual to ensure safe nursing care is provided |
| Be interactive in communication | The receiver of the information must be allowed to question the deliverer of the handover for clarification and more extensive information if needed |
| Use medical terminology, clear language and avoid confusing abbreviations and jargon | Allows a report to be complete and concise, demonstrates knowledge of the medical terminology and acknowledges the professional status of the person being handing over to |
| Use effective communication techniques in a timely manner | Effective communication will help decrease the time for handover to be complete and ensures the information is communicated clearly |
| Prepare for handover. Read the individual's medical record and check the individual's bedside chart to ensure accuracy. Plan what you are going to say using a time planner guide or prompts as necessary | Provides consistency and allows those who are receiving the report to listen and assimilate the material more easily |
| Use up-to-date information regarding individual's condition and treatment. Information must be accurate, concise and complete | Inaccurate or incomplete information during handover can jeopardise the individual's comfort and safety. You need to be aware of what information is relevant and what is irrelevant. Missing or incorrect information can impact on the individual's recovery, delay diagnosis, decrease individual satisfaction, increase length of hospital stay and increase the risk of potential complications |
| Limit interruptions during the handover process and conduct the handover in private surroundings | Handover must be conducted in private surroundings to maintain confidentiality. If performing bedside handover and information may be overheard by other individuals or staff, keep voices low and refrain from personal comment other than what is strictly necessary. If appropriate you may ask any uninvolved people to vacate the area |
| **General clinical handover format** | |
| State individual's demographics including name, age, location (room number, or indicate if they are off the ward and where) and attending medical officer's name | Ensures the individual is identified and identifies the multidisciplinary team caring for the individual |
| Describe the individual's history or complaint, treatment, diagnosis and the date of surgery and day post operation if applicable | Gives a general overview of the individual and allows a plan of nursing care to be implemented |

## CLINICAL SKILL 18.2 Clinical handover—cont'd

| | |
|---|---|
| Describe the individual's response to treatment or medications. Include physical, psychological and emotional response to treatment initiated, alterations in medications ordered and response to medications | The individual's response to treatment is imperative in ensuring the treatment is effective or ineffective, and in either continuing or changing the treatment plan |
| State any tubes (IVs, NGT) and include site, fluid, amount, rate and time to change. Also state any drains (IDC, wound) the individual has including location, type and amount of drainage | Any information regarding tubes and drains needs to be accurate to ensure any changes in the individual's condition are identified in a timely manner |
| Describe the individual's physical assessment, vital signs and pain assessment. Note any information that indicates a change in condition | Important for prompt recognition of changes in condition |
| State any laboratory results or imaging | Prompt reporting of results can ensure the individual's treatment is effective, and if ineffective changes can be implemented |
| Discuss the current treatment plan, include procedures scheduled, preparation done or needed, education, treatments, consents required, new orders and any concerns of staff about the individual | Ensures continuity of care provided to the individual |
| State any consultations requested or completed including specialist physicians, physiotherapy, dietitian or occupational therapy | Provides the individual with effective holistic care; different health professionals may be needed to treat the individual |
| Discuss any special needs such as aids (hearing, walking etc), equipment needed, family concerns, spiritual or cultural concerns, anything else important not yet mentioned | Special needs of individuals need to be discussed to ensure the individual receives tailored care |
| Discuss any future plans or concerns about the individual including discharge planning, community referrals, expected date of discharge | Discharge planning should be discussed with the individual throughout their admission to ensure they have continuity of care when they leave the department |
| **Bedside handover using ISBAR format (identify, situation, background, assessment, recommendation)** | |
| Prepare the individual's bedside environment. Determine if the individual wishes family to be present during the handover and ask non-family members to wait outside while handover is completed | Ensures privacy and confidentiality is maintained and allows a quiet area for handover to be completed |
| Introduce the nurses who will be taking over care and call the individual by name, establishing their identity | Ensures individual identification and also allows the individual to know who their care providers will be |
| Exchange the information using the ISBAR format which encompasses the following:<br>• State the individual's condition and severity<br>• Provide background information related to the situation<br>• Include the following information: admitting diagnosis, date of admission, list of current medications, allergies, test results, vital signs, code status and any other pertinent clinical information<br>• Give assessment of the situation during the transfer of care<br>Discuss any recommendations regarding the individual to the oncoming nurse | The use of a standardised communication tool provides a predictable structure for communication between healthcare professionals and improves the individual's safety during handover from one nurse to another. It ensures the quality of the content and simplifies the communication of complex information |
| Involve the individual; ask them if they have any concerns. If the oncoming nurse wishes to clarify information they can do this with both the individual and the nurse who is handing over | Individual-centred care is the basis of nursing and by involving the individual in the handover process they are able to discuss their concerns and priorities, which may be different from that of the healthcare team |

*Continued*

## CLINICAL SKILL 18.2 Clinical handover—cont'd

| | |
|---|---|
| The oncoming nurse will need to perform a safety scan including checking the call bell is within the individual's reach, the suction and oxygen equipment are working and reviewing the bedside chart, ensuring accurate records are maintained | A safety check is important for both the individual's and the nurses' safety within the room. It also ensures all equipment is in working order in case of emergency. By reviewing the bedside chart, the incoming nurse is reviewing the individual's flow charts and ensuring these are completed and they are prepared to take responsibility of the individual |
| If there is sensitive information that needs to be handed over, this can be done outside the room in a private area | Some information may be too sensitive to address within the individual's room; this may be due to their comfort, knowledge or wish to not discuss certain issues. To ensure privacy and confidentiality this must be completed in a private area |
| **Following the handover** | |
| Verify information received, including a read back or repeat back process. This is where a plan of ongoing care for the individual is confirmed | Allows clarification of information and decreases the incidence of communication errors occurring |

Note: Reporting on individual's condition during handover should be completed as per healthcare organisation policy; therefore, it is important for nurses to familiarise themselves with the relevant format before they give the handover. All nursing shift-to-shift handovers should follow a standardised approach to ensure continuity of individual care and effective transfer of accountability and responsibility. The handover process should include a clear transfer of responsibility as this relates to the accountability of care for individuals and the transfer of this accountability of care from one nurse to another.

*(Rebeiro et al 2013; Perry et al 2012; Tollefson 2016; Tollefson et al 2016)*

## CASE STUDY 18.2

Mr X was admitted to hospital with a brainstem stroke. Once there he deteriorated, was intubated and was transferred to ICU where he had a prolonged stay. Mr X was in and out of consciousness and had a tracheostomy which prevented him from speaking. While conscious he was able to do what was instructed of him.

At night time Mr X would become agitated and needed sedating and restraining. During these episodes Mr X removed his nasogastric tube about three times, and even did this on the night before he was transferred to the ward.

Handover from ICU to the acute stroke ward was given verbally, it appeared incomplete and the content was not documented.

On the ward Mr X was not restrained or sedated during the night. Subsequently he removed his nasogastric tube and his tracheostomy tube. When he was found he was unresponsive and unable to be resuscitated.

During investigation it was not clear if information about the individual's night-time agitation, sedating and restraining was communicated.

1. How would a handover using the ISBAR format and a documented handover checklist have helped in this situation?
2. What would be the advantages of a structured clinical handover in this situation?

*(NSW Department of Health 2009)*

## DECISION-MAKING FRAMEWORK EXERCISE 18.1

You are allocated beds 20–25 for your afternoon shift. The person allocated to bed 21 is due to be transferred from ICU. The ICU nurse arrives with the person. The person is settled into the room and you prepare for clinical handover from the ICU nurse. The ICU nurse states, 'This person is routine post left anterior resection. Everything is documented, I'm really busy and need to get back to the ICU, call me if you have any questions.' The ICU nurse prepares to leave.

Using the decision-making framework:

1. Do you accept this handover as a reasonable bedside clinical handover?
2. What strategies could you adopt to gain a sound clinical handover?
3. If a resolution is not made, what would your course of action be?

Individual groups that may not participate in handover include those who are:

- Asleep
- Confused
- Comatose
- In isolation
- Having difficulty communicating in English
- Experiencing other conditions that preclude participation.

Sensitive information that may be shared away from the bedside includes blood tests of a diagnostic nature (e.g. HIV positive, pregnancy); communicable disease information (e.g. hepatitis); psychiatric issues (e.g. thoughts of self-harm, ethanol abuse); not for resuscitation orders; some family issues (e.g. conflicts, domestic violence); other information the individual may wish to be held in confidence.

'With the public expecting more transparency regarding patient safety in health care, it is only logical patients participate in their plans of care' (Maxson et al 2012:144).

Clinical Interest Box 18.8 is a sample of a standard operating protocol for implementing bedside handover in nursing.

## CLINICAL INTEREST BOX 18.8 Bedside handover

| | |
|---|---|
| Preparation | RN Annie is a team leader. She reads the individual's medical record before handover ensuring she is up to date with the medical decisions recorded in the doctor's notes. She checks the bedside chart to ensure everything in the handover is accurate.<br>Towards handover time, RN Annie gets the team members together to update the handover sheet. Annie tells the individual that handover will occur shortly, ascertains whether the individual wishes family to be present during the handover and asks non-family members to wait outside for a short while.<br>All oncoming staff members are given a handover sheet. |
| Introduction | 'Mr Smith, good afternoon, this is Sylvia, an RN, Cindy an EN and Susan, a nursing assistant. They will be taking care of you in the evening shift.' |
| Information exchange<br>S<br>B<br>A<br>R | RN Annie keeps her voice low but ensures that Mr Smith and the oncoming staff can hear her.<br>S: Mr Smith came to the ED complaining of chest pain and shortness of breath. He was placed on oxygen via nasal cannula at 2 L/min. He is on an antihypertensive, aspirin and a beta-blocker (medication chart shown to RN Sylvia).<br>B: Mr Smith has a history of chest pain over the past 2 days, which radiates down his left arm. He has PRN anginine at home. Over the past 6 months he has had several bouts of chest pain, and has been followed up by his GP. Today, prior to being admitted, he developed chest pain but is currently pain free.<br>A: This afternoon, his BP = 130/88, Temp = 38 and heart rate = 76. He is currently pain free.<br>R: Dr Jones has arranged a cardiac echo for him. He has had an ECG today with no significant changes. Blood tests all attended and are waiting on results.<br>RN Sylvia then asks about any treatment for his raised temperature and also asks about mobility. RN Annie replies: 'Dr Jones is aware and has asked to be notified if it goes above 38.5°C. Mr Smith can mobilise with assistance but only toilet and shower privileges.' |
| Individual involvement | RN Annie asks, 'Mr Smith, have you been to cardiac echo?' Mr Smith says 'yes'. RN Annie then asks, 'Did the doctor say anything to you?' Mr Smith says, 'She said, I may need a cardiac catheter.' RN Sylvia then asks, 'Do you have any questions, Mr Smith?' Mr Smith replies, 'Can you find out if I need the cardiac test?' |
| Safety scan | EN Cindy undertakes a safety check of the equipment, including checking that the call bell is within reach, the suction and oxygen equipment are functioning.<br>RN Sylvia and RN Annie review the bedside chart, checking the following: care plan, observation chart, medication chart and the pressure ulcer assessment. RN Sylvia asks, 'Has Mr Smith needed any GTN recently?' RN Annie said, 'Oh, I forgot, Mr Smith had chest pain around 9.30 am and took one GTN sublingually. This was relieved within 5 minutes. Yes. I will sign for the med now.' |
| Handover completed | RN Annie says, 'Mr Smith, we have finished the handover. Do you want to add anything before we leave?' Mr Smith says, 'No, I'll wait to hear about that other heart test.' |
| Confidentiality | After finishing the handover in the four-bed room, all staff went out of the room. In the corridor RN Annie said, 'I have to hand over some sensitive information related to Mr Smith; he has hepatitis C, so make sure that you adhere to universal precautions when undertaking his care.' |

*(Chaboyer et al 2008:15–16)*

## Reporting changes in individual condition

The mechanism for nurses to report changes in the health and functional status of the individual will be determined by the:

- Organisation's policy to activate a clinical review of the individual
- Timelines established by the organisation for the level of deterioration of the individual.

## Telephone reports

Nurses are required to communicate individual information through telephone reporting in a variety of contexts, from conveying a laboratory result to a hospital doctor to conveying complex assessment and treatment information to a medical officer at a remote site. The minimum data set for individual handover includes identification of the nurse and individual, situation and status of the individual, observations, background and history, assessment and actions and responsibility and risk management (ACSQHC 2012) (see Figure 18.4). Documentation must be made relating to the phone call and should include the date and time, the name of the person giving the information and what information was given (Crisp et al 2013).

Most organisational policy and procedure will include the requirement for the nurse to read back and confirm the therapy or plan prescribed by the medical officer. When medications are ordered, this includes a repeating of the medication order to a second nurse, who will also be required to read back to confirm the order. The ACSQHC (2009) provides guidelines for telephone and verbal orders for medications.

## Incident reporting

Healthcare facilities have policies in place that require nurses to complete an incident form following a near miss or an incident such as a medication error or fail. These **incident reports** are confidential documents and are filed separately from the individual's health record. The reports may be written or electronic and are an important part of the quality improvement programs for healthcare facilities. Regardless of whether incident reports are used, nurses have professional accountability to document the facts of the care provided to the individual and the outcome for the individual (see Clinical Interest Box 18.9).

### CLINICAL INTEREST BOX 18.9 Reporting a clinical incident in the health record

A medical officer prescribes morphine 10 mg orally and you mistakenly administer 15 mg. Your medical record documentation should read like this:

| | |
|---|---|
| 08/01/2015 1430 hrs | Nursing: Administered morphine 15 mg orally at 1300 hrs for abdominal pain, which the individual rated at 7/10. Dr Smith notified of above dose at 1315 hrs and gave no additional orders. Observations increased in frequency to every 30 minutes for 4 hours, vital signs have remained within normal parameters at time of report. Mr Jones rates pain as 1/10. Name of nurse, signature, nurse designation. |

## Summary

Nurses provide 24-hour care; therefore, information exchange, whether verbal or documented, is a significant part of nurse activity and must be reliable. Through documentation the nurse communicates to other nurses and the healthcare team their assessment of the status of the individual, the nursing interventions that were carried out and the outcome of these interventions.

Individual records are kept for a number of purposes, including communication, research and quality activities, funding arrangements, legal documentation and healthcare analysis.

Clinical handover is an essential part of the communication of individual care and is practised in numerous ways depending on the clinical setting. It includes both written and verbal information. The two main uses of verbal reporting by a nurse are when a nurse is transferring care to another healthcare provider and when the nurse recognises and responds to changes in the health and functional status of the individual. Research has proven that effective clinical handover is an essential component of ensuring safe and effective care to individuals.

The healthcare record is a legal document. It includes paper documents or electronic documents such as faxes, emails, audio or images (including video or digital images). Legislation governs the privacy and confidentiality of the healthcare record.

All information relating to the individual's healthcare is gathered by subjective or objective methods. Any change in an individual's condition requires immediate documentation of the nurse assessment, nurse actions and the individual's response to the nursing interventions.

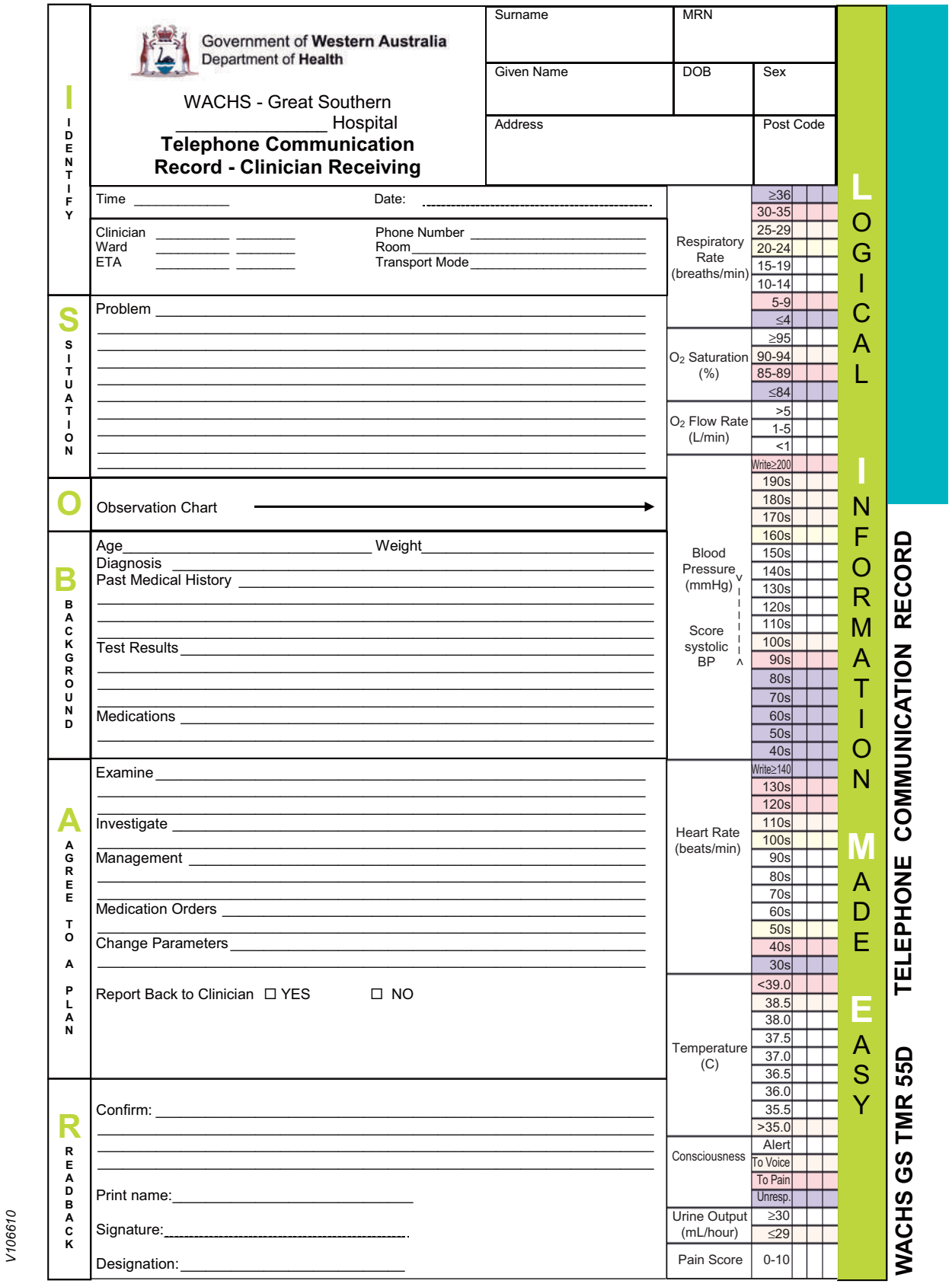


**Figure 18.4** Telephone communication record

*(Sample chart. Telephone Communication Record: Medical Emergency Response Call. WA Country Health Service)*

## Review Questions

1. What is the primary purpose of documentation?
2. Name some other purposes of documentation.
3. Name the seven (7) critical themes for effective nursing documentation.
4. What does the acronym SOAP stand for?
5. What is Standard 6 of the 2012 ACSQHC NSQHS Standards and what is its intention?
6. List the benefits of bedside clinical handover.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

ISBAR: www.sahealth.sa.gov.au

NEHTA: www.nehta.gov.au

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UNIT
6

# Health assessment

CHAPTER 19
Health assessment frameworks: initial and ongoing

CHAPTER 20
Vital sign assessment

CHAPTER 21
Admission, transfer and discharge processes

CHAPTER
19

# Health assessment frameworks: initial and ongoing

*Kate Stainton and Gabrielle Koutoukidis*

## KEY TERMS

clinical handover
focused assessments
general assessment
nursing health history
objective data
physical assessment
subjective data

## LEARNING OUTCOMES

At completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Identify the purposes of undertaking a health assessment
- Identify the expected outcomes of a health assessment
- Describe the techniques used with each assessment skill
- Identify information from the nursing health history before performing a physical assessment
- Document assessment findings appropriately
- Understand the importance of information gathered during assessment in clinical handover
- Identify assessment tools used as part of the initial and ongoing health assessment

## CHAPTER FOCUS

Obtaining a general health assessment is vital to managing comprehensive nursing care. It is performed at various stages during admission to a healthcare facility. The four basic types of assessment are the initial comprehensive assessment, ongoing assessment, focused assessment and emergency assessment (Lewis et al 2014). The initial assessment involves a detailed review of the individual's condition, with the nurse collecting a **nursing health history** and performing a behavioural and physical examination. Data is collected about the individual's past and current level of wellness, family and sociocultural history and psychosocial responses to illness. These provide a baseline database for ongoing care and against which changes can be evaluated (Crisp et al 2013; Jarvis et al 2012). Periodic assessments are performed on a regular basis throughout the shift and when there is an event that may change the individual's condition. Effective assessment skills can facilitate the identification of new signs and symptoms that indicate complications of an illness or adverse reaction. Standardised assessment forms are used to ensure that regulatory requirements are met, and vary according to the healthcare facility. These forms include initial assessment forms, ongoing assessment forms and specialised and screening assessment forms. One of the main tasks of nurses in the provision of person-centred nursing care is recognition of normal and abnormal signs and symptoms in assessment, intervention and evaluation of individual health and functional status (ANMC 2002). The National Safety and Quality Health Service Standards (NSQHS) provide a framework for an organisational approach to identifying and preventing avoidable risks. Those that form part of the initial and ongoing health assessment are included in this chapter.

## LIVED EXPERIENCE

Ms Cath Kidson, 54 years of age, was 3 days post op after a right hip replacement. Her dressing had become moist and required a dressing change. I was so excited that the Registered Nurse asked me to do this that I did not check that Ms Kidson was actually allergic to the waterproof dressing I was about to place on her wound—until she reminded me. I saw that she had a red allergy band on her wrist but assumed it was related to medications, not dressings and tapes. This was a reminder to me to always assess an individual holistically.

**Stephanie, Enrolled Nursing Student**

## GUIDELINES FOR CONDUCTING A GENERAL HEALTH ASSESSMENT

Conducting a general health assessment allows nurses to be engaged with individuals. By engaging, nurses are able to establish baseline responses of individuals under their care to physical and psychosocial needs such that when there is an altered response or a deviation from the baseline, appropriate nursing measures can be established by applying clinical judgment (Phaneuf 2008). The information gathering as part of the health assessment must be factual and complete as it provides the basis for clinical decision making (Jarvis et al 2012; Lewis et al 2014).

General health assessments need to include overall health status, detailed health history and physical examination, using a holistic approach. When commencing a general health assessment the nurse should:

- Set priorities for assessment based on individual presenting signs and symptoms
- Utilise a framework to collect data as this facilitates an effective assessment. This could be based on functional health patterns, body systems or a head-to-toe approach (Lewis et al 2014). Gordon's 11 functional health patterns framework (see Table 19.1) is a holistic framework that can assist in developing a nursing perspective to health assessment
- Engage the individual by allowing active participation in the assessment process
- Record quick notes to facilitate accurate documentation
- Integrate health promotion and education into physical assessment activities
- Consider the cultural background of the individual (see Table19.2).

Zambas (2010) and Lewis and colleagues (2014) suggest that a systematic approach to assessment does not necessarily involve a formal assessment each time. In fact, every encounter a nurse has with the individual is an opportunity for assessment of physiological functioning and coping. These forms of assessments can be done while the nurse is administering medication; assisting the person to change position in bed; assisting with toileting and shower or at any other times the nurse observes the person during the course of the shift. This type of assessment may also be performed in a hospital, community or home setting. Continued assessments encourage a person-centred approach and thus help to reduce incidences of adverse events. Douglas and colleagues (2014) explored the barriers to nurses undertaking physical assessment and found that inadequate physical assessment by nurses may lead to a failure to recognise individuals at risk of clinical deterioration.

General health assessments conducted at the emergency department are brief so that the information gathered can

**TABLE 19.1 | Functional health patterns health assessment framework**

| Functional health pattern | Focus of health assessment |
|---|---|
| Health perception–health management pattern | *Describes the individual's perceived pattern of health and well-being and how health is managed*<br>Reason for seeking healthcare<br>Description of present illness (onset, course, treatment)<br>Description of health (usual)<br>Relevance of health to activities<br>Preventative measures, general healthcare behaviour<br>Previous hospitalisations, expectations for this episode |
| Nutritional–metabolic pattern | *Describes patterns of food and fluid consumption relative to metabolic needs and pattern indicators of local nutrient supply*<br>Usual food and fluid intake (24-hour dietary recall)<br>Daily eating times<br>Recent weight change and reason<br>Food restrictions or preferences, supplements<br>Swallowing, chewing, eating problems, food allergies<br>Skin lesions and general ability to heal<br>Condition of the skin, hair, nails, mucous membranes and teeth |
| Elimination pattern | *Describes patterns of excretory function (bowel, bladder and skin)*<br>Bowel, bladder and skin excretion<br>Regularity of urination and bowel evacuation<br>Colour, quality and quantity of urine and faeces<br>Aids used to facilitate function, such as routines, devices (laxatives, suppositories, enemas) and methods to control excretion<br>Changes or disturbances in bowel or bladder elimination |
| Activity–exercise pattern | *Describes patterns of exercise, activity, leisure and recreation. The activity–exercise pattern describes three functions that are important to everyone's daily life:*<br>Mobility—movement, posture, balance and gait<br>Independent self-care—ability to perform activities of daily living (ADLs)<br>Exercise and leisure—exercise tolerance, activities requiring energy expenditure |
| Cognitive–perceptual pattern | *Describes sensory-perceptual and cognitive patterns. The ability to collect information from the environment and use it in reasoning and other thought processes*<br>Adequacy of hearing, vision, smell, touch, taste<br>Impact on ADLs and compensation or devices used such as glasses or hearing aids<br>Pain and how it is managed<br>Cognitive functional abilities such as orientation, memory, reasoning, judgment and decision making |
| Sleep–rest pattern | *Describes patterns of sleep, rest and relaxation in a 24-hour period*<br>Usual sleep routine, sleep pattern<br>Perception of quality and quantity of sleep<br>Rest and relaxation or quiet periods during the day<br>Sleep disturbances<br>Use of aids to sleep, such as medications or night-time routines |
| Coping–stress tolerance pattern | *Describes the client's general coping pattern and the effectiveness of the pattern in terms of stress tolerance*<br>Stressors and stress tolerance<br>General coping strategies<br>Support systems<br>Perceived ability to control or manage situations |
| Role–relationship pattern | *Describes the work, family and social roles and relationships of individuals that may be influenced by health-related factors or may offer support during illness*<br>Life roles and responsibilities<br>Satisfaction or dissatisfaction in family, work and social relationships<br>Impact of illness on roles and relationships |

## TABLE 19.1 | Functional health patterns health assessment framework—cont'd

| Functional health pattern | Focus of health assessment |
|---|---|
| Self-perception–self-concept pattern | *Describes the client's self-concept pattern and perceptions of self (e.g. self-identity, esteem and body image, self-efficacy, mood state)*<br>Self-description<br>Effects of illness on self-concept<br>Body image, identity, self-esteem<br>Posture, eye contact, voice and speech patterns |
| Sexuality–reproductive pattern | *Describes the client's patterns of satisfaction and dissatisfaction with sexuality pattern; describes reproductive pattern*<br>Perceived satisfaction or dissatisfaction with sexuality–reproductive pattern<br>Impact of illness or treatments on sexual activity<br>Adequacy of sexual knowledge<br>Reproductive development and state (e.g. menstruation and menopause) |
| Values–beliefs pattern | *Describes patterns of values, beliefs (including spiritual) and goals that guide the client's choices or decisions*<br>Values, goals or beliefs that are basis for decision making<br>Spiritual or religious affiliation<br>Spiritual practices and religious needs |

*(Adapted from Gordon M 2007 Manual of nursing diagnosis, ed 11. Ontario, Jones & Bartlett; Crisp et al 2013, p. 573, Table 27.1)*

## TABLE 19.2 | Cultural considerations in health assessment

| What you need to know | Why you need to know it |
|---|---|
| Ethnicity and country of birth | This information can be an indicator of the individual's culture, traditions, customs, health beliefs and preferred languages.<br>Remember that:<br>Ethnicity may be more significant than country of birth. For example, individuals may have been born in a country where their parents lived briefly. |
| Preferred language | May indicate the need for an interpreter<br>Remember that:<br>Preferred language may not be related to country of birth.<br>It is the health professional's responsibility to ensure that communication is conducted in the preferred language of the individual and can be understood by the individual.<br>This is a Victorian Government requirement at critical points of communication. |
| Literacy | May affect the individual's capacity to respond to written information provided during the assessment.<br>May indicate the individual's social status and education level in their previous country of residence or origin.<br>Remember that:<br>Individuals may rely on family members to read and explain written information.<br>Individuals and their families may not be literate in the language they prefer to speak. |
| Interpreter preferences | Identifying an appropriate interpreter, and ensuring that the individual is comfortable using an interpreter, is essential for clear and appropriate communication.<br>Remember that:<br>The individual may not be familiar with using an interpreter—you may need to explain the process.<br>Individuals may have concerns about the confidentiality of interpreters.<br>There is a small chance that the individual may know the interpreter, which may raise privacy concerns.<br>Consider individual preferences regarding the gender and ethnicity of the interpreter, and whether an on-site or telephone interpreter is preferred.<br>Only qualified interpreters should be used: the individual's family members should not be used as interpreters. |

*Continued*

**TABLE 19.2 | Cultural considerations in health assessment—cont'd**

| What you need to know | Why you need to know it |
|---|---|
| Migration status and experience | Stress and trauma resulting from pre-migration, migration or post-migration experiences can greatly affect an individual's health and wellbeing.<br>Visa status can affect access to subsidised health services. |
| Beliefs about health and illness | Individuals' beliefs and past experience affect the way they view health, causes of illness and treatment.<br>Understanding and acknowledging the individual's health beliefs and practices is an important step in creating a mutually acceptable care plan. |
| Understanding of the health system | Individuals may not be familiar with the structure of the health service system or how to access various services.<br>Individuals may not be familiar with health system processes (e.g. waiting lists for hospitals, Medicare support, etc) |
| Family and social support | The responsibility for care may not lie only with the individual: other people, including extended family, may assume responsibility for care.<br>Remember that:<br>In some cultures, 'family' may include non-related individuals.<br>An individual's social support networks may be limited.<br>An individual may be able to access support through community organisations. |
| Religious practices | Individuals may wish to access spiritual or religious leaders.<br>Particular times for prayer may be important.<br>Religious practices may occasionally conflict with treatment plans.<br>Particular customs may need to be followed during birth, illness and death and dying. |
| Dietary practices | There may be religious restrictions on food consumption.<br>Some foods may have cultural meanings for individuals (e.g. the belief that certain foods are beneficial or harmful to health). |

*(Centre for Culture, Ethnicity & Health 2011)*

effectively rule out differential diagnoses and quickly allow appropriate nursing measures to be taken. On the other hand, assessments performed for an admission need to include a comprehensive set of individuals' information so that nurses can plan for actual as well as potential nursing interventions for the length of the hospitalisation (see Figure 19.1 and Chapter 17).

Enrolled Nurses may undertake assessments under the delegation of the Registered Nurse (NMBA 2016). Abnormal findings must be validated and interpreted by the Registered Nurse and reported to the medical officer.

## General assessment

A **general assessment** includes the following steps (Crisp et al 2013):

- Assess the individual's responses
- Review baseline vital signs (see Chapter 20 for vital signs)
- Review the individual's fluid intake and output
- Assess posture and position and body movements
- Assess speech
- Observe hygiene and grooming:
  - Observe the colour, distribution, quantity, thickness, texture and lubrication of hair
  - Inspect the condition of the nails
  - Assess the presence or absence of body odour
- Assess the eyes:
  - Inspect pupils for size, shape and equality
  - Note the condition of the individual's vision
- Assess hearing
- Inspect the nose externally for shape, skin colour, alignment and presence of deformity or inflammation. Note the colour of the mucosa and any lesions, discharge, swelling or presence of bleeding
- In an individual with nasogastric tubes, inspect the nares for excoriation or inflammation
- Assess the mouth, inspect the oral mucosa, tongue, teeth and gums for hydration; determine whether the individual wears dentures
- Inspect the skin surfaces, comparing the skin colour of symmetrical body parts
- Inspect the character of any secretions: note colour, odour, amount and consistency
- Assess skin turgor
- Assess the condition of the skin for pressure injury (see Clinical Skill 19.1)
- Assess consciousness, feelings and emotional status

*Text continued on p. 372*

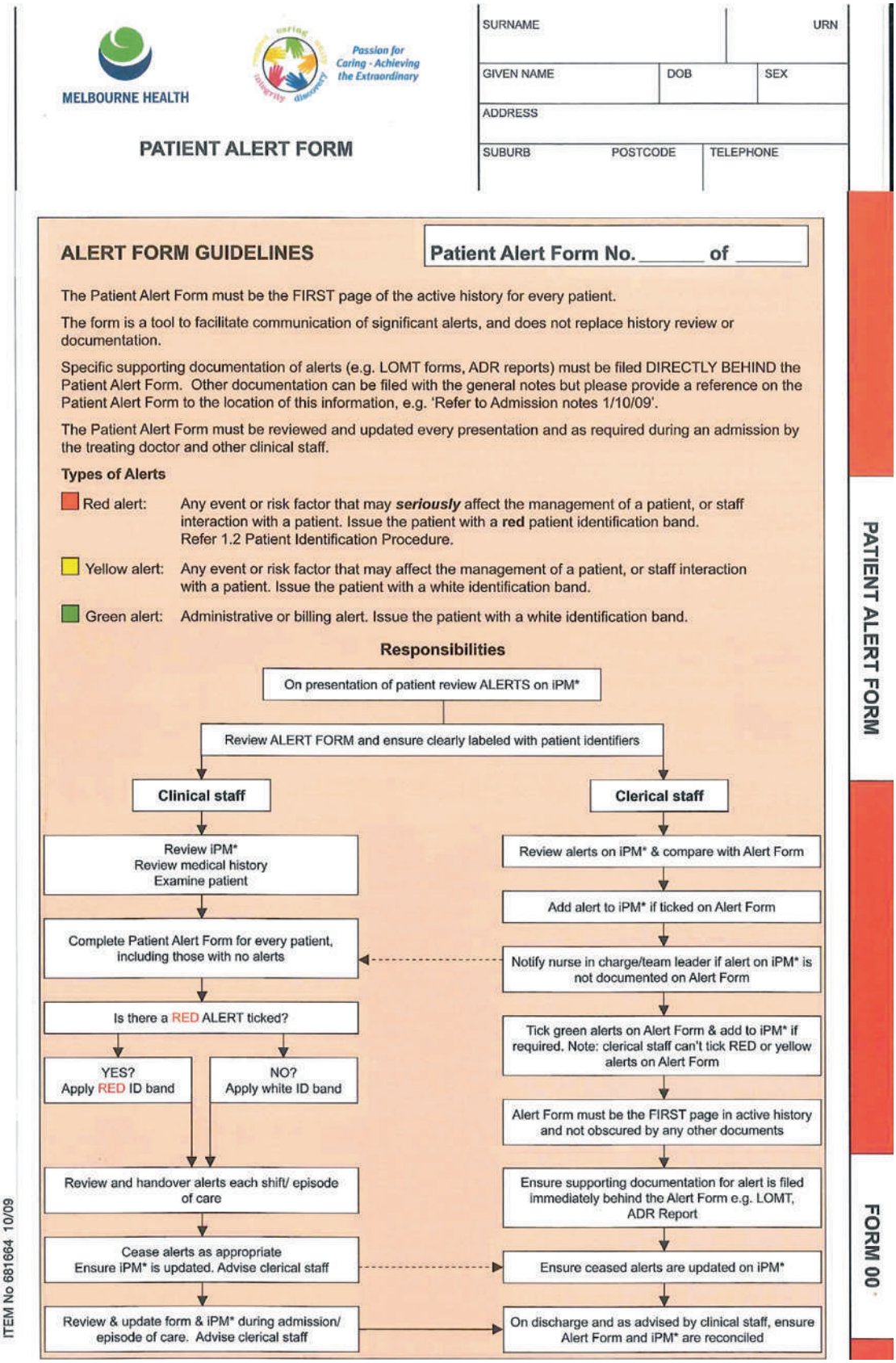
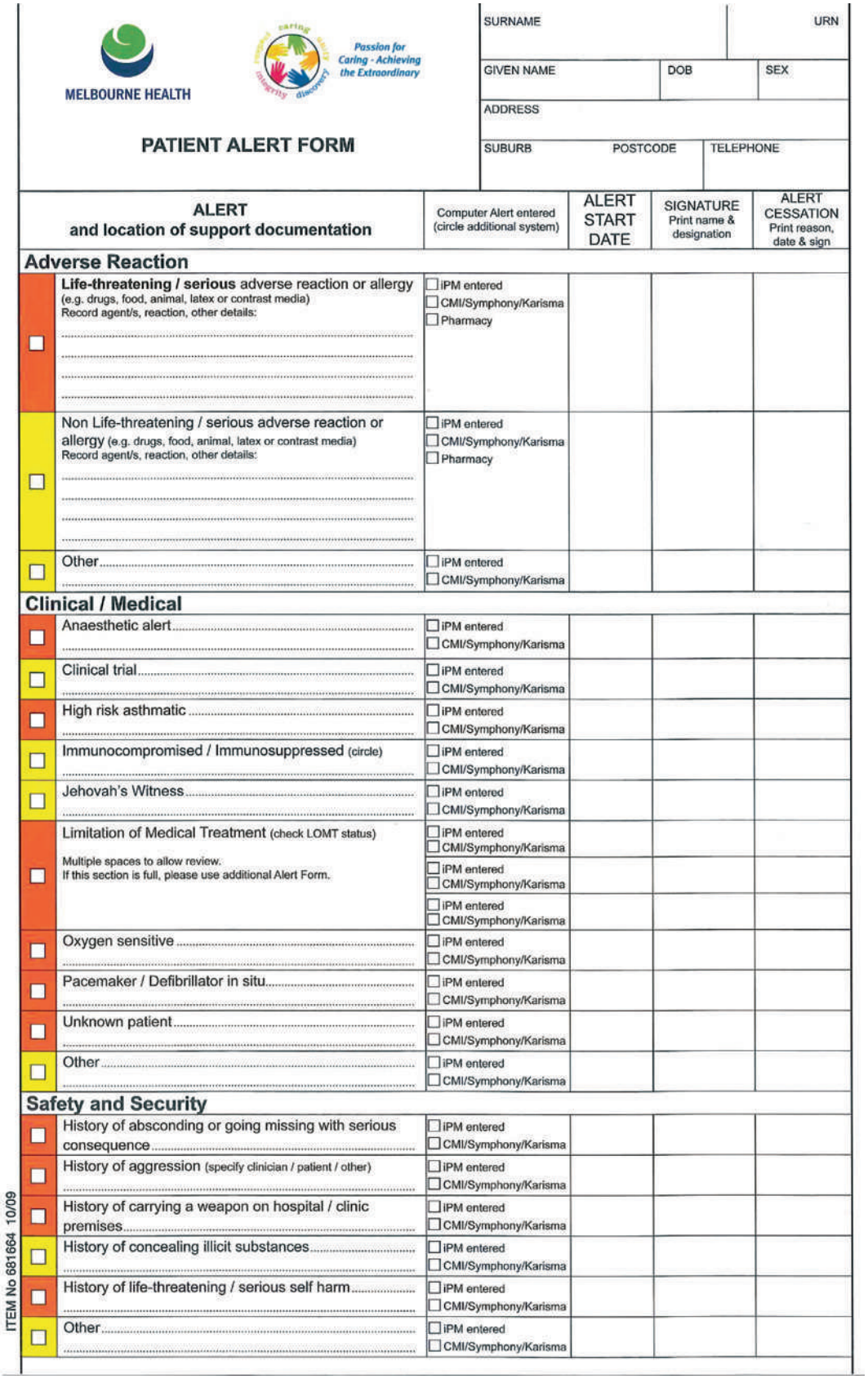



**Figure 19.1** Melbourne Health Individual Alert Form

*(Courtesy of Melbourne Health)*



MELBOURNE HEALTH

Passion for Caring - Achieving the Extraordinary

**PATIENT ALERT FORM**

| SURNAME | | URN |
|---|---|---|
| GIVEN NAME | DOB | SEX |
| ADDRESS | | |
| SUBURB POSTCODE | | TELEPHONE |

| ALERT and location of support documentation | Computer Alert entered (circle additional system) | ALERT START DATE | SIGNATURE Print name & designation | ALERT CESSATION Print reason, date & sign |
|---|---|---|---|---|
| **Adverse Reaction** | | | | |
| ☐ **Life-threatening / serious** adverse reaction or allergy (e.g. drugs, food, animal, latex or contrast media) Record agent/s, reaction, other details: ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma ☐ Pharmacy | | | |
| ☐ Non Life-threatening / serious adverse reaction or allergy (e.g. drugs, food, animal, latex or contrast media) Record agent/s, reaction, other details: ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma ☐ Pharmacy | | | |
| ☐ Other..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| **Clinical / Medical** | | | | |
| ☐ Anaesthetic alert..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Clinical trial..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ High risk asthmatic ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Immunocompromised / Immunosuppressed (circle) ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Jehovah's Witness..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Limitation of Medical Treatment (check LOMT status) Multiple spaces to allow review. If this section is full, please use additional Alert Form. | ☐ iPM entered ☐ CMI/Symphony/Karisma<br>☐ iPM entered ☐ CMI/Symphony/Karisma<br>☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Oxygen sensitive ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Pacemaker / Defibrillator in situ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Unknown patient..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Other..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| **Safety and Security** | | | | |
| ☐ History of absconding or going missing with serious consequence..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ History of aggression (specify clinician / patient / other) ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ History of carrying a weapon on hospital / clinic premises..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ History of concealing illicit substances..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ History of life-threatening / serious self harm..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Other..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |

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**Figure 19.1** Cont'd

| ALERT and location of support documentation | Computer Alert entered (circle additional system) | ALERT START DATE | SIGNATURE Print name & designation | ALERT CESSATION Print reason, date & sign |
|---|---|---|---|---|
| **Infectious Risk** | | | | |
| ☐ CJD-Intradural Procedure 3/12 Group (contacted). If patient for surgical procedure contact IPSS pager 700 | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Multi-Resistant Organism, contact IPSS pager 700 ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ..... Multiple spaces to allow review. If this section is full, please use an additional Alert Form. | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Other..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| **Legal** | | | | |
| ☐ Contact Order ..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Guardian / Power of Attorney (Medical) / Advance Directive ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Intervention Order..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Non-custodial Supervision Order ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Restriction on disclosure of clinical information..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Social Contact Limitation..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Other..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| **Special Needs** | | | | |
| ☐ Falls risk (high risk)..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Hearing / Speech / Swallowing / Visual impairment (circle) ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Other..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| **Home Environment** | | | | |
| ☐ Animals present..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Hazard..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Other..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| **Administrative** | | | | |
| ☐ HARP..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |
| ☐ Other..... ..... | ☐ iPM entered ☐ CMI/Symphony/Karisma | | | |

| This patient does NOT have any known RED Alerts (cross out this section if an Alert is found) | | | |
|---|---|---|---|
| ☐ | Review date | Print Name | Signature |
| ☐ | Review date | Print Name | Signature |
| ☐ | Review date | Print Name | Signature |
| ☐ | Review date | Print Name | Signature |
| ☐ | Review date | Print Name | Signature |
| ☐ | Review date | Print Name | Signature |

**Figure 19.1** Cont'd

## CLINICAL SKILL 19.1 Pressure injury risk assessment

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Assessment tool used in the clinical facility/organisation<br>The individual's nursing care plan and history |
| **Skill activity** | **Rationale** |
| Identify indications and rationale for performing the activity. This may include identifying:<br>• Past history of pressure injuries<br>• Intrinsic and extrinsic factors that may contribute to pressure injuries<br>• Understanding reasons why the pressure injury risk assessment needs to be performed or has been ordered | Reduces unnecessary assessments performed on an individual |
| Identify the individual using three individual identifiers. This may include but is not limited to:<br>• Identification—allocated healthcare number on hospital bracelet/band<br>• Verbal confirmation from the individual of given and family name<br>• Date of birth<br>• Gender<br>• Address<br>• Medical record number | Reduces the incidence of performing an assessment on the incorrect individual |
| Explain and communicate the activity clearly to the individual. This may include but is not limited to explaining to the individual:<br>• Why the procedure has been ordered<br>• Why the procedure will be undertaken and frequency<br>• What is involved in undertaking the procedure<br>• What will be done with the data collected | Reduces anxiety/apprehension and gains an individual's trust and cooperation |
| Ensure therapeutic interaction. This may include but is not limited to:<br>• Introducing oneself<br>• Ensuring privacy before undertaking the assessment<br>• Listening to the individual's concerns or questions about the assessment before it is undertaken<br>• Ensuring the individual is aware of the responsibilities required of them before undertaking the assessment<br>• Maintaining professional boundaries<br>• Assessing any cultural/language barriers | Assists with alleviation of fear prior to the assessment |
| Gain the individual's consent:<br>• By explaining the assessment, reasons for undertaking and risks if not undertaken<br>• By asking the individual for verbal or written consent before undertaking the assessment | Ensures that the individual understands why the assessment needs to be performed, therefore promoting cooperation |
| Perform hand hygiene | Prevents cross-infection |
| Ensure provision of comfort measures prior to the assessment including the removal of restrictive clothing and providing pain relief if required | Promotes an individual's cooperation, removes risk factors with clothing and ensures accurate data is collected |

## CLINICAL SKILL 19.1 Pressure injury risk assessment—cont'd

| | |
|---|---|
| Assess and document the individual's sensory perception in the progress notes and facility/organisational chart:<br>• By assessing the individual's ability to detect pain<br>• In unconscious individuals, the ability to react to pain | Assesses the individual's ability to verbalise pressure-related discomfort that will indicate skin damage<br>Prompts the EN to apply interventions and strategies on how often to replace and clean linen, incontinence aids<br>Assesses the unconscious individual's ability to react to pressure-related discomfort which will indicate skin damage |
| Assess and document the individual's degree of exposure to moisture in the progress notes and organisation chart by direct observation or assessment of turgor, dampness, excessive moisture loss affecting skin<br>Assess continence | Assesses the individual's risk of skin damage and degeneration if exposed to excessive moisture<br>Prompts the EN to apply interventions and strategies on how often to replace and clean linen, incontinence aids |
| Assess and document the individual's activity and mobility status in the progress notes and organisational chart:<br>• By assessing the ability of the individual to move or the ability to be moved<br>• In unconscious individuals, the ability to be moved<br>• Observing for any reddened skin that blanches white under light pressure | Assesses the individual's risk of skin damage and degeneration from the degree of physical mobility<br>Prompts the EN to apply interventions and strategies on how often to assist the individual in changing body position to relieve pressure on the skin<br>Prompts the EN to engage the use and expertise of an occupational therapist and physiotherapist |
| Assess and document the individual's nutritional status in the progress notes and organisational chart<br>Nutritional data collection will include:<br>• Loss of appetite of an individual<br>• Unusual weight loss or gain in an individual<br>• Fluid intake of an individual | Assess the individual's risk of skin damage and degeneration caused by malnutrition or poor nutritional status<br>Prompts the EN to apply interventions and strategies on how often to assist the individual with meals<br>Prompts the EN to engage the use and expertise of a dietitian |
| Assess and document the individual's risk of friction and shear when moving in the progress notes and organisational chart by:<br>• Assessing and identifying any mechanical force that could occur when two surfaces rub together, creating resistance between the skin and a surface<br>• Identifying typical areas where this will occur (e.g. heels and elbows), resulting from repositioning<br>• Assessing and identifying any mechanical force created from parallel loads (e.g. movement on a bed sheet), which can create an occlusion or displacement of tissue | Assesses the individual's risk of skin damage and degeneration from friction or shearing of the skin when moving<br>Prompts the EN to apply interventions and strategies on how often to assist the individual in changing body position to relieve pressure on the skin<br>Prompts the EN to engage the use and expertise of an occupational therapist and physiotherapist<br>Shear forces are a significant risk for pressure injury formation as blood flow is disrupted |
| Undertake a head-to-toe assessment of the skin to identify any existing or new skin tears, especially over bony prominences such as sacrum, elbows, shoulder blades.<br>This includes:<br>• Identifying intact skin or skin loss<br>• Blanchable or non-blanchable skin<br>• Areas that may be painful, warmer, cooler or oedematous<br>If skin breaks have been identified:<br>• Skin break is measured and documented in depth and width on the pressure area risk tool<br>• Colour and/or ooze is documented on the pressure area risk tool<br>• Location is identified on the pressure area risk tool<br>• Treatment plan is documented on the pressure risk tool | Ensures pressure areas are identified early and treated early<br>These are warning signs of impending skin damage |

*Continued*

| CLINICAL SKILL 19.1 Pressure injury risk assessment—cont'd | |
|---|---|
| Ensure provision of comfort measures after the assessment including repositioning of the individual | Promotes an individual's comfort and privacy |
| Identify the individual's need for assistance and comorbidities by accessing the individual's nursing care plan prior to undertaking the assessment | Ensures the nurse has factored into the assessment already-known risk factors prior to the assessment being undertaken |
| Determine the frequency of the pressure risk monitoring by identifying and evaluating the individual's risk status, such as high, medium or low, according to the pressure injury chart | Ensures a range of data is collected over different situations and times. |
| Link theory to practice | An understanding of why the nurse is undertaking the assessment ensures a thorough collection of data and an understanding of the data collected |
| Demonstrate current best practice in the care provided by understanding the current trends in pressure injury management | Ensures quality care is provided to the individual |
| Adhere to the policy and procedures of the facility/ organisation by locating and reading prior to assessment to ensure the delegation is valid | Policies and procedures are written documents that include guidelines and practices developed to address legal, ethical and regulatory requirements<br>Both policies and procedures convey to employees and to other stakeholders the organisation's interests and the vision, mission and methods they intend to use to achieve those goals |
| Work in collaboration with other allied healthcare staff by working with the Registered Nurse and identifying referral to allied health staff if required | Referral to other health professions ensures holistic care with appropriate interventions |
| Demonstrate a structured clinical handover process, either verbal or written, using the identified organisation policy | Ensures current and correct information is relayed to other health professionals for continuity and safety of care |
| Document assessment findings using the correct documentation tools as per the policy of the organisation | Ensures a systematic record for reference by other allied healthcare professionals |
| Record the assessment findings with the date, time and signature on the pressure injury chart | Provides a baseline observation for assessment improvement or deterioration |
| Report abnormal assessment findings to the Registered Nurse | Ensures appropriate strategies and intervention are put in place to encourage positive outcomes |
| *(Adapted from ACSQHC 2012; Jensen 2013; NSW Government 2010; State Government of Victoria 2010; Viljoen & Uys 2001)* | |

- Observe the individual's interaction with their spouse or partner, older adult child or carer
- Observe for signs of abuse:
  - for a child, blood on underclothing, pain in the genital area or difficulty in sitting or walking may be indicative of child sexual abuse
  - for a female individual, injury or trauma inconsistent with a reported cause, or obvious injuries to face or neck, could indicate domestic violence
  - for an older adult, injury or trauma inconsistent with a reported cause, injuries in unusual locations (neck or genitalia), pattern injuries, parallel injuries and burns may suggest abuse.

A general health assessment consists of assessing an individual's physical, mental health, socioeconomic and financial status. The data collected will assist the nurse to focus on the effects that health and illness have on quality of life (Jensen 2013). Different interview styles and approaches to physical examinations are used for individuals of different age groups. See Clinical Interest Box 19.1.

## Focused assessment

Sometimes a more focused assessment may be necessary. **Focused assessments** are used to observe and monitor systems-related complications. A focused assessment is a more detailed assessment of a particular problem (Lewis et al 2014; Brown et al 2015). For example, if a person suddenly presents

## CLINICAL INTEREST BOX 19.1 Assessment of age groups

### 1. Children

The focus of a paediatric assessment is usually on growth and development, sensory screening, dental examination and behavioural assessment, and is normally conducted by an experienced nurse.

> The nursing history will need to be obtained mostly from parents or a guardian
> The examination should be performed in a non-threatening area and provide the child with time to play
> Do not pass judgment on the parents and offer support
> Call children by their given name
> Use open-ended questions to allow parents to describe the child's problems
> Interview older children and observe the parent–child interactions
> Adolescents will respond better if they are treated as adults
> Adolescents have the right to confidentiality.

*(Crisp et al 2013)*

### 2. Older adults

Health assessment of older adults should include an evaluation of mental status, family relationships, group involvement and religious and occupational pursuits. An important part of the assessment will involve analysis of activities of daily living (dressing, bathing, toileting, grooming, feeding and continence) and more complex activities such as preparing meals and managing money (Crisp et al 2013).

> Do not stereotype ageing individuals
> Understand that sensory or physical limitations can affect how quickly you are able to interview older adults
> Perform the examination with adequate space
> Older adults may find giving some health information stressful. Illness may be seen as a threat to independence
> Perform the examination near bathroom facilities
> Be aware of signs of fatigue (e.g. irritability, leaning against objects for support and drooping of the head and shoulders).

*(Crisp et al 2013)*

with lowered conscious status, the nurse needs to pay close attention to the immediate assessment of the neurological status in order to plan appropriate interventions. These assessments are usually initiated by identifying and responding to an acute onset of the individual's symptoms. Even when a focused assessment is performed, it is still important to look at the entire individual presentation. This is because a problem in one body system will affect or be affected by another body system. So it is important to observe from head to toe and note any changes in other body systems.

Comprehensive assessment provides a framework to ensure all areas of potential risk are covered. Assessments commonly performed by nurses include the following.

## Mental health assessment

A comprehensive mental health assessment will involve clinical assessment and information gathering in the following areas:

- Presenting problems
- History of presenting problems (onset, duration, course, severity)
- Current functioning (across domains; e.g. employment/education, family, social)
- Relevant cultural issues (personal and family)
- Previous assessments and interventions
- Psychiatric history (personal and family history)
- Current medications
- Medical history and family history
- Developmental history
- Substance use
- Forensic and legal history
- Risk screen (e.g. suicide, self-harm, aggression, vulnerability; absconding risk, risks to dependent children and risk of disrupted attachment)
- Goals for treatment
- Mental status examination.

This assessment is usually completed by a psychiatrist, psychologist, social worker or mental health nurse (Queensland Health 2010).

See Clinical Skill 19.2.

## Falls risk assessment

A falls risk assessment is used to identify any person who may be at risk of falls. Some of these risks can be classified as personal or environmental. Personal risk factors include age, gender, ability and health conditions. Environmental factors refer to hazards found in and around the home and in public places (e.g. uneven surfaces, lack of hand rails) (Queensland Health 2012). A falls risk assessment can help determine what interventions should be implemented. (See Clinical Skill 19.3 and Nursing Care Plan 19.1.)

## Venous thromboembolism (VTE) assessment

VTE is one of the leading causes of preventable death in Australia. People at risk of forming a VTE are those with medical illnesses including cancer, people who have been involved in a trauma, individuals admitted to intensive care units, women hospitalised during pregnancy and the puerperium and those who have had surgery (NHMRC 2009). See Clinical Skill 19.4.

## Nutrition assessment

Nutritional intake can be affected by disease, genetic disorders, injury and surgical and medical treatments. A subjective assessment will include the person's description of their daily dietary and fluid intake, use of dietary supplements, food

*Text continued on p. 383*

## CLINICAL SKILL 19.2 Mental health assessment

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Assessment tool used in the clinical facility/organisation<br>The individual's nursing care plan and history |

| **Skill activity** | **Rationale** |
|---|---|
| Identify indications and rationale for performing the activity | Reduces unnecessary assessments performed on an individual |
| Identify the individual using three individual identifiers. This may include but is not limited to:<br>• Identification—allocated healthcare number on hospital bracelet/band<br>• Verbal confirmation from the individual of given and family name<br>• Date of birth<br>• Gender<br>• Address<br>• Medical record number | Reduces the incidence of performing an assessment on the incorrect individual |
| Explain and communicate the activity clearly to the individual. This may include but is not limited to explaining to the individual:<br>• Why the procedure has been ordered<br>• Why the procedure will be undertaken and frequency<br>• What is involved in undertaking the procedure<br>• What will be done with the data collected | Reduces anxiety/apprehension and gains an individual's trust and cooperation |
| Gain the individual's consent | Ensures that the individual understands why the assessment needs to be performed therefore promoting cooperation |
| Assess presenting problems<br>Assess history of presenting problems (onset, duration, course, severity)<br>Assess current functioning (across domains e.g. employment/education, family, social)<br>Assess previous assessments and interventions<br>Assess psychiatric history (personal and family history)<br>Assess current medications<br>Assess medical history<br>Assess family history of mental health<br>Assess developmental history<br>Assess substance use<br>Assess forensic and legal history<br>Assess risk screen (e.g. suicide, self-harm, aggression, vulnerability, absconding risk, risks to dependent children) | Provides a baseline data set and possible links to an individual's mental health |
| Assess mental status | Gathers data on the individual's current status and highlights indications of the individual's mental health status |

| CLINICAL SKILL 19.2 Mental health assessment—cont'd | |
|---|---|
| *Appearance:*<br>• Usual and unusual appearance (e.g. statue)<br>• Grooming or any evidence of neglect<br>• Apparent age vs real age<br>• Facial features<br>• Identifying features such as skin marks, moles | Provides a baseline data set and possible links to an individual's mental health |
| *Behaviour:*<br>• Any physical signs of anxiety<br>• Restlessness, relaxed<br>• Hand or facial gestures<br>• Eye contact | Provides a baseline data set and possible links to an individual's mental health |
| *Speech:*<br>• Rate—slow, fast, normal<br>• Logic<br>• Ability to complete sentences<br>• Absence | Provides a baseline data set and possible links to an individual's mental health |
| *Mood and affect:*<br>• Responses to questions<br>• Emotional status—crying, laughing inappropriately<br>• Anger<br>• Anxiety<br>• Irritability | Provides a baseline data set and possible links to an individual's mental health |
| *Form of thought, content of thought:*<br>• Hallucinations—visual or auditory<br>• Hearing of voices<br>• Concerns<br>• Evidence of paranoia | Provides a baseline data set and possible links to an individual's mental health |
| *Insight and cognition:*<br>• Orientation to time, place, person<br>• Understanding of health issues<br>• Understanding of medication therapy and treatment | Provides a baseline data set and possible links to an individual's mental health |
| *Memory:*<br>• Long-term memory<br>• Short-term memory | Provides a baseline data set and possible links to an individual's mental health |
| Identify lifespan, cultural and language barriers | Identifies any considerations required by the nurse when undertaking the assessment, influenced by an individual's past experience, ability to understand and comprehend instructions and age-related considerations |
| Provide privacy | Reduces distraction and reduces the risk of disclosing an individual's information, decreasing embarrassment, and ensures the individual's self-worth is maintained |
| Ensure provision of comfort measures | Promotes an individual's cooperation, removes risk factors with clothing and ensures accurate data is collected |
| Ensure therapeutic interaction | Assists with alleviation of fear prior to the assessment |
| Identify the individual's need for assistance and comorbidities by accessing the individual's nursing care plan prior to undertaking the assessment | Ensures the nurse has factored into the assessment already-known risk factors prior to the assessment being undertaken |

*Continued*

| CLINICAL SKILL 19.2 Mental health assessment—cont'd | |
|---|---|
| Prepare the environment to ensure safety measures are addressed for the individual | Removes risk factors that will interfere with the assessment data collection |
| Demonstrate current best practice in the care provided | Ensures quality care is provided to the individual |
| Adhere to the policy and procedures of the facility/organisation to ensure the delegation is valid | Policies and procedures are written documents that include guidelines and practices developed to address legal, ethical and regulatory requirements<br>Both policies and procedures convey to employees and to other stakeholders the organisation's interests and the vision, mission and methods they intend to use to achieve those goals |
| Ensure the individual's rights are respected<br>Ensure informed consent | Demonstrates quality individual care<br>Demonstrates informed consent |
| Work in collaboration with other allied healthcare staff | Referral to other health professions ensures holistic care with appropriate interventions |
| Demonstrate a structured clinical handover process, either verbal or written | Ensures current and correct information is relayed to other health professionals for continuity and safety of care |
| Document assessment findings using the correct documentation tools | Ensures a systematic record for reference by other allied healthcare professionals |
| Record the assessment findings with the date, time and signature | Provides a baseline observation for assessment improvement or deterioration |
| Report abnormal assessment findings to the Registered Nurse | Ensures appropriate strategies and intervention are put in place to encourage positive outcomes |
| *(Adapted from ACSQHC 2012; Jensen 2013; NSW Government 2010; State Government of Victoria 2010; Viljoen & Uys 2001)* | |

| CLINICAL SKILL 19.3 Falls risk assessment | |
|---|---|
| **Review and carry out the standard steps for all clinical skills/interventions** | |
| **NMBA Decision-making Framework considerations:**<br>1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | **Equipment:**<br>Assessment tool used in the clinical facility/organisation<br>Appropriately fitted mobility aids if required<br>The individual's nursing care plan and history |
| **Skill activity** | **Rationale** |
| **Step 1: Preparation for the activity** | |
| Identify indications and rationale for performing the activity. This may include identifying:<br>• Past history of falls<br>• Intrinsic and extrinsic factors that may contribute to falls<br>• Understanding reasons why the falls risk assessment needs to be performed or has been ordered | Reduces unnecessary assessments performed on an individual |

| CLINICAL SKILL 19.3 Falls risk assessment—cont'd | |
|---|---|
| Identify the individual using three individual identifiers. This may include but is not limited to:<br>• Identification—llocated healthcare number on hospital bracelet/band<br>• Verbal confirmation from the individual of given and family name<br>• Date of birth<br>• Gender<br>• Address<br>• Medical record number | Reduces the incidence of performing an assessment on the incorrect individual |
| Explain and communicate the activity clearly to the individual. This may include but is not limited to explaining to the individual:<br>• Why the procedure has been ordered<br>• Why the procedure will be undertaken and frequency<br>• What is involved in undertaking the procedure<br>• What will be done with the data collected | Reduces anxiety/apprehension and gains an individual's trust and cooperation |
| Ensure therapeutic interaction. This may include but is not limited to:<br>• Introducing oneself<br>• Ensuring privacy before undertaking the assessment<br>• Listening to the individual's concerns or questions about the assessment before it is undertaken<br>• Ensuring the individual is aware of the responsibilities required of them before undertaking the assessment<br>• Maintaining professional boundaries<br>• Assessing any cultural/language barriers | Assists with alleviation of fear prior to the assessment |
| Gain the individual's consent:<br>• By explaining the assessment, reasons for undertaking and risks if not undertaken<br>• By asking the individual for verbal or written consent before undertaking the assessment | Ensures that the individual understands why the assessment needs to be performed, therefore promoting cooperation |
| **Step 2: Perform the activity** | |
| Undertake an assessment data collection and document this on the falls risk chart and progress notes by reading and researching the individual's:<br>Medical history:<br>• Past and current health history<br>• Medications<br>Social situation:<br>• Whether the individual lives alone or with family | Provides an understanding of any medical conditions on the individual's falls risk history. This assessment will include relevant medical history including medications<br>This data will provide an understanding of any family members requiring the need for education or assistance when planning care<br>If the individual is alone, this data will provide an insight into the individual's need for assistance or aids. This assessment will include whether an individual lives alone or with a carer and carer/individual difficulty managing at home |
| Identify and document on the falls chart history past or recent falls by talking to the individual or identifying this in the past medical history of the individual:<br>• When<br>• Where<br>• Any underlying cause of fall | This data will provide insight into a pattern of recent or past falls by an individual that can be used in the planning of care |

*Continued*

## CLINICAL SKILL 19.3 Falls risk assessment—cont'd

Collect and document on the falls risk chart and in the individual's progress notes intrinsic assessment data (data collected from the individual, family or by direct observation):

- Past and present medical history
- Past or present vision impairments
- Past or present nutritional impairments
- Past or present mobility impairments including gait, balance and transfer
- Past or present cognitive impairments
- Past or present continence (faecal/urinary) impairments
- Past or present medication history

Medical history includes:

- Past history of the individual
- Relevant history of the individual
- Symptoms of dizziness voiced by an individual
- Any unsteadiness on standing by an individual
- Any visible signs after a head-to-toe assessment of bleeding, bruising or skin breaks

Vision data collection includes:

- Visual aids used by an individual
- Difficulty in seeing obstacles by an individual

Nutritional data collection includes:

- Loss of appetite of an individual
- Unusual weight loss or gain in an individual
- Fluid intake of an individual

Mobility data collection includes:

- Identifying concerns in an individual's gait such as swaying or holding onto furniture to assist with walking
- Identifying an individual's concerns with limb weakness or reduced sensation
- Identifying an individual's incorrect usage of previously prescribed mobility aids
- Identifying ill-fitting footwear

Cognitive data collection includes:

- Identifying difficulties in an individual's ability to follow or interpret instructions

Continence data collection includes:

- Identifying an individual's concerns about urinary or faecal urgency, nocturia or incontinence that may be identified as risk factors in falls management

Medication data collection includes:

- Identifying an individual's emaciation management plan
- Identifying if the individual is prescribed more than two of the following medications, which may be identified as risk factors in falls management:
  - Diuretics
  - Psychotropic medications
  - Parkinson's disease medications
  - Antidepressants
  - Antihypertensives
  - Sedative medication

Intrinsic data collection provides an insight into risk factors that may require invasive actions that will reduce or minimise falls of an individual

| CLINICAL SKILL 19.3 Falls risk assessment—cont'd | |
|---|---|
| Collect and document on the falls risk chart and in the individual's progress notes extrinsic assessment data on past or present environmental hazards by direct observation or talking with the individual or family<br>This will include identifying:<br>• An individual's reporting of difficulty with stairs<br>Observation or reporting of:<br>• Indoor and outdoor hazards<br>• Poor lighting<br>• Restricted traffic ways or cluttering<br>• An individual's reporting of difficulty moving on and off the bed/toilet/chair | Extrinsic data collection provides an insight into risk factors that may require invasive actions that will reduce or minimise falls of an individual |
| Collect and document on the falls risk chart and in the individual's progress notes assessment data on activities of daily living. This can be obtained via direct observation of the individual or by talking to the individual and family<br>This will include identifying:<br>• An individual's reporting of feeling unsafe when performing activity or difficulty in bending down<br>• Observation of an individual's ability to perform the ADL (e.g. showering, cleaning teeth, combing hair safely without rushing)<br>• An understanding of whether the individual already receives assistance with these activities | Activities of daily living collection provides an insight into risk factors that may require invasive actions that will reduce or minimise falls of an individual |
| Collect and document on the falls risk chart and in the individual's progress notes lifespan and cultural and language barriers by direct observation or by talking to the individual and family | Identifies any considerations required by the nurse when undertaking the assessment, influenced by an individual's past experience, ability to understand and comprehend instructions, and age-related considerations |
| Provide privacy by closing bedside curtains or by undertaking the falls risk assessment in a private room | Reduces distraction and reduces the risk of disclosing an individual's information, decreasing embarrassment, and ensures the individual's self-worth is maintained |
| Ensure provision of comfort measures prior to the assessment including the removal of restrictive clothing and providing pain relief if required | Promotes an individual's cooperation, removes risk factors with clothing and ensures accurate data is collected |
| Identify the individual's need for assistance and comorbidities by accessing the individual's nursing care plan prior to undertaking the assessment | Ensures the nurse has factored into the assessment already-known risk factors prior to the assessment being undertaken |
| Prepare the environment to ensure safety measures are addressed for the individual by removing furniture or items such as electrical cords that could cause an individual to fall | Removes risk factors that will interfere with the assessment data collection |
| Determine the frequency of the falls risk monitoring by identifying and evaluating the individual's risk status, such as high, medium or low, according to the falls risk chart | Ensures a range of data is collected over different situations and times. The higher the falls risk the more frequent the individual's monitoring should be |
| **Step 3: Completion of activity** | |
| To link theory to practice, the Enrolled Nurse should understand the pathophysiology of the individual's health conditions and why this activity was undertaken | An understanding of why the nurse is undertaking the assessment ensures a thorough collection of data and an understanding of the data collected |
| Demonstrate current best practice in the care provided by understanding the current trends in falls risk management | Ensures quality care is provided to the individual |

*Continued*

| CLINICAL SKILL 19.3 Falls risk assessment—cont'd | |
|---|---|
| Adhere to the policy and procedures of the facility/ organisation by locating and reading prior to assessment | Policies and procedures are written documents that include guidelines and practices developed to address legal, ethical and regulatory requirements<br>Both policies and procedures convey to employees and to other stakeholders the organisation's interests and the vision, mission and methods they intend to use to achieve those goals |
| Work in collaboration with other allied healthcare staff by working with the Registered Nurse and identifying referral to allied health staff if required | Referral to other health professions ensures holistic care with appropriate interventions |
| Demonstrate a structured clinical handover process, either verbal or written, using the identified organisational policy | Ensures current and correct information is relayed to other health professionals for continuity and safety of care |
| Document assessment findings using the correct documentation tools as per the policy of the organisation | Ensures a systematic record for reference by other allied healthcare professionals |
| Record the assessment findings with the date, time and signature on the falls risk chart and progress notes | Provides a baseline observation for assessment improvement or deterioration |
| Report abnormal assessment findings to the Registered Nurse | Ensures appropriate strategies and intervention are put in place to encourage positive outcomes |
| *(Adapted from ACSQHC 2012; Jensen 2013; NSW Government 2010; State Government of Victoria 2010; Viljoen & Uys 2001)* | |

## NURSING CARE PLAN 19.1

**Assessment:** Mrs Cain, 80 years, is admitted to the ward with cellulitis of her left leg. She is physically immobile and unable to get out of bed. Whilst completing the pressure-risk screening tool as part of your admission assessment you note that she has an area on her buttocks that is reddened and warm to touch. Mrs Cain is incontinent of urine, which leads to moisture on her skin.
**Issue/s to be addressed:** Risk for impaired skin integrity related to immobility and incontinence.
**Goal/s:** Mrs Cain will not develop any further skin breakdown during her stay at the facility.

| Care/Actions | Rationale |
|---|---|
| Obtain and place a pressure relieving device on bed | Redistributes amount of pressure on bony prominences |
| Reposition Mrs Cain at least once every 2 hours | Repositioning redistributes pressure<br>Positioning interventions reduce pressure and shearing force to the skin |
| Maintain the elevation of the head of the bed to 30 degrees or less when supine | Prevents shear<br>Moisture softens the skin and causes a break in the skin integrity |
| Keep the skin clean and dry<br>Complete pressure risk assessment daily | Systematic inspection can identify impending problems early |

**Evaluation**

Mrs Cain's skin is monitored daily and has no signs of worsening or advanced impairment.

## CLINICAL SKILL 19.4 Venous thromboembolism assessment

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Assessment tool used in the clinical facility/organisation<br>The individual's nursing care plan and history |
| **Skill activity** | **Rationale** |
| Identify indications and rationale for performing the activity. This may include identifying the individual's:<br>• Past history of thromboembolisms<br>• Intrinsic and extrinsic factors that may contribute to emboli<br>• Understanding reasons why the venous thromboembolism assessment needs to be performed or has been ordered | Reduces unnecessary assessments performed on an individual<br>Can allow for early intervention |
| Identify the individual using three individual identifiers. This may include but is not limited to:<br>• Identification—allocated healthcare number on hospital bracelet/band<br>• Verbal confirmation from the individual of given and family name<br>• Date of birth<br>• Gender<br>• Address<br>• Medical record number | Reduces the incidence of performing an assessment on the incorrect individual |
| Explain and communicate the activity clearly to the individual. This may include but is not limited to explaining to the individual:<br>• Why the procedure has been ordered<br>• Why the procedure will be undertaken and frequency<br>• What is involved in undertaking the procedure<br>• What will be done with the data collected | Reduces anxiety/apprehension and gains an individual's trust and cooperation |
| Gain the individual's consent:<br>• By explaining the assessment, reasons for undertaking and risks if not undertaken<br>• By asking the individual for verbal or written consent before undertaking the assessment<br>• Assessing any cultural/language barriers | Ensures that the individual understands why the assessment needs to be performed, therefore promoting cooperation |
| Assess individual's level of mobility. Mobility data collection includes:<br>• Identifying concerns in an individual's gait such as swaying or holding onto furniture to assist with walking<br>• Identifying an individual's decrease in mobility<br>• Identifying an individual's concerns with limb weakness or reduced sensation | The indication of VTE risk can be established by identifying if an individual is a medical or surgical patient |

*Continued*

## CLINICAL SKILL 19.4 Venous thromboembolism assessment—cont'd

| | |
|---|---|
| Assess baseline risk (intrinsic factors) from the individual, family or by direct observation:<br>• Past and present medical history<br>• Past or present medication history<br>• Past or present nutritional impairments<br>Medical history includes:<br>• Past history of the individual<br>• Relevant history of the individual<br>• Symptoms of shortness of breath<br>• Medication history<br>Medication data collection includes:<br>• Identifying an individual's emaciation management plan<br>• Identifying if the individual is prescribed more than two of the following medications, which may be identified as risk factors in falls management:<br>> Diuretics<br>> Psychotropic medications<br>> Parkinson's disease medications<br>> Antidepressants<br>> Antihypertensives<br>> Sedative medication<br>Nutritional data collection includes:<br>• Loss of appetite of an individual<br>• Unusual weight loss or gain in an individual<br>• Fluid intake of an individual | The indication of VTE risk can be established by identifying an individual's age, pregnancy status, previous history of VTE, obesity, varicose veins, active malignancy |
| Assess additional risk of VTE (extrinsic) by direct observation or talking with the individual or family:<br>• Dehydration status<br>• Surgical risk by type (pelvic, orthopaedic, joint surgery)<br>• Medical risk by type (stroke, heart failure, myocardial infarction) | The indication of additional VTE risk can allow for early intervention |
| Administer and document in the individual's medication chart pharmacological treatments as ordered by reviewing the individual's medication chart | The administration of prescribed pharmacological treatments will decrease the VTE risk |
| Assess contraindications to pharmacological treatments by reviewing the individual's medication chart. This may include but is not limited to:<br>• Known hypersensitivity to agents used in pharmacological prophylaxis<br>• Active bleeding or risk of bleeding | Understanding the contraindications of administering the pharmacological treatment and drug interactions will decrease the risk of bleeding or reaction. This must be reported to the Registered Nurse before the treatment is withheld |
| Apply and document in the individual's progress notes mechanical VTE inventions as ordered:<br>• Anti-embolic stockings at correct size by measuring length and width of extremity and applying the appropriate size as indicated on the packaging | The application of mechanical compression stockings will decrease the VTE risk. Bunching of the stockings from incorrect fitting could result in leg ulceration, pressure injuries, slipping and falling on mobilisation |
| Assesses any contraindications to mechanical prophylaxis treatment. This may include but is not limited to:<br>• Morbid obesity where correct fitting cannot be achieved<br>• Inflammatory conditions of the lower leg<br>• Severe peripheral arterial disease<br>• Diabetic neuropathy (there is a risk of injury due to decreased sensation and discomfort if there is a problem with the fitting)<br>• Severe oedema of the legs<br>• Unusual leg deformity<br>• Allergy to stocking material<br>• Cardiac failure | Understanding the contraindications of administering mechanical treatment will decrease the risk of reduced blood flow, pressure ulcers or risk of falls. This must be reported to the Registered Nurse if a decision is made to withhold the treatment |

| CLINICAL SKILL 19.4 Venous thromboembolism assessment—cont'd | |
|---|---|
| Discuss overall risk assessment and management with the Registered Nurse before treatment is applied | Ensures that evidence-based decisions have been considered and are appropriately required (e.g. risk vs benefits of treatment) |
| Identify the individual's need for assistance and comorbidities by accessing the individual's nursing care plan prior to undertaking the assessment | Ensures the nurse has factored into the assessment already-known risk factors prior to the assessment being undertaken |
| Prepare the environment to ensure safety measures are addressed for the safety of the individual | Removes risk factors that will interfere with the assessment data collection |
| To link theory to practice, the Enrolled Nurse should understand the pathophysiology of the individual's health conditions and why this activity was undertaken | An understanding of why the nurse is undertaking the assessment ensures a thorough collection of data and an understanding of the data collected |
| Demonstrate current best practice in the care provided by understanding the current trends in VTE risk management | Ensures quality care is provided to the individual |
| Adhere to the policy and procedures of the facility/organisation by locating and reading prior to assessment to ensure the delegation is valid | Policies and procedures are written documents that include guidelines and practices developed to address legal, ethical and regulatory requirements<br>Both policies and procedures convey to employees and to other stakeholders the organisation's interests and the vision, mission and methods they intend to use to achieve those goals |
| Work in collaboration with other allied healthcare staff by working with the Registered Nurse and identifying referral to allied health staff if required | Referral to other health professions ensures holistic care with appropriate interventions |
| Demonstrate a structured clinical handover process, either verbal or written, using the identified organisational policy | Ensures current and correct information is relayed to other health professionals for continuity and safety of care |
| Document assessment findings using the correct documentation tools as per the policy of the organisation | Ensures a systematic record for reference by other allied healthcare professionals |
| Record the assessment findings with the date, time and signature on the clinical tool | Provides a baseline observation for assessment improvement or deterioration |
| Report abnormal assessment findings to the Registered Nurse | Ensures appropriate strategies and intervention are put in place to encourage positive outcomes |
| *(Adapted from ACSQHC 2012; Jensen 2013; NSW Government 2010; State Government of Victoria 2010; Viljoen & Uys 2001)* | |

preferences, eating patterns, ability to chew, nutritional knowledge, activity and exercise. Questions are focussed on recent alterations in weight; appetite; nausea and vomiting; condition of hair, skin and nails; and any medications. Physical assessment will also include examination of the mouth, measurement of height and weight and assessment of abdomen, hair, skin and nails (Crisp et al 2013). See Clinical Skill 19.5.

**CRITICAL THINKING EXERCISE** 19.1

Mr Leonard enters the hospital with a history of weight loss and general fatigue. What questions will you ask to elicit the appropriate responses that will help to establish the nursing assessment?

## Physical assessment

A **physical assessment** or examination of an individual in a healthcare facility is obtained to:

- Gather baseline data about the person's health
- Supplement, confirm or refute data obtained in the nursing history
- Confirm and identify nursing diagnoses
- Make clinical judgments about an individual's changing health status and management
- Identify issues for health promotion
- Evaluate the outcomes of care.

(Crisp et al 2013; Berman et al 2015; Potter et al 2015)

A nurse must learn how to really discern an individual's condition so that, even in passing or without conscious effort, clues to an individual's health or ill health are not missed.

## CLINICAL SKILL 19.5 Nutritional assessment/weight, height and BMI

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Assessment tool used in the clinical facility/organisation<br>The individual's nursing care plan and history |

| **Skill activity** | **Rationale** |
|---|---|
| Identify indications and rationale for performing the activity | Reduces unnecessary assessments performed on an individual |
| Identify the individual using three individual identifiers. This may include but is not limited to:<br>• Identification—allocated healthcare number on hospital bracelet/band<br>• Verbal confirmation from the individual of given and family name<br>• Date of birth<br>• Gender<br>• Address<br>• Medical record number | Reduces the incidence of performing an assessment on the incorrect individual |
| Explain and communicate the activity clearly to the individual. This may include but is not limited to explaining to the individual:<br>• Why the procedure has been ordered<br>• Why the procedure will be undertaken and frequency<br>• What is involved in undertaking the procedure<br>• What will be done with the data collected | Reduces anxiety/apprehension and gains an individual's trust and cooperation |
| Gain the individual's consent:<br>• By explaining the assessment, reasons for undertaking and risks if not undertaken<br>• By asking the individual for verbal or written consent before undertaking the assessment | Ensures that the individual understands why the assessment needs to be performed, therefore promoting cooperation |
| Assess the individual's past and current history:<br>• Past medical and surgical history<br>• Medication history<br>• Alcohol and drug use<br>• Bowel habits | Establishes data on past history which may contribute to weight loss or gain |
| Assess the individual's psychosocial history:<br>• Economic status<br>• Occupation<br>• Education level<br>• Living and cooking arrangements<br>• Education level<br>• Mental status | Establishes a data base that may identify any effects on nutritional status |
| Undertake a nutritional history by asking and/or observing the individual:<br>• Nausea/vomiting (>3 days)<br>• Diarrhoea<br>• Dysphagia<br>• Usual adult weight—refer to normal BMI charts<br>• Current weight by weighing the individual<br>• Recent changes in appetite or food tolerance<br>• Oedema and/or abnormal swelling | Provides data on appetite |

## CLINICAL SKILL 19.5 Nutritional assessment/weight, height and BMI—cont'd

| | |
|---|---|
| Undertake a nutritional intake history by asking and/or observing the individual:<br>• Diet restrictions<br>• Appetite<br>• Eating patterns and intakes<br>• Taste changes<br>• Dentition<br>• Dysphagia<br>• Feeding independence<br>• Vitamin/mineral intake<br>• Abdominal pain<br>• Nausea and vomiting<br>• Changes in bowel pattern (normal or baseline); diarrhoea (consistency, frequency, volume, colour, presence of cramps)<br>• Difficulty swallowing (solids vs liquids, intermittent vs continuous)<br>• Indigestion or heartburn<br>• Mouth sores (ulcers, tooth decay)<br>• Pain in swallowing<br>• Sore tongue or gums | Establishes nutritional assistance and modality |
| Assess unexplained weight loss or gain<br>Undertake a current weight<br>Undertake a height measurement | Collects data for possible undiagnosed medical conditions |
| Assess other factors that may affect nutritional status:<br>• Age<br>• Level of physical activity | Establishes other not-identified risk factors |
| Identify lifespan, cultural and language barriers | Identifies any considerations required by the nurse when undertaking the assessment, influenced by an individual's past experience, ability to understand and comprehend instructions, and age-related considerations |
| Provide privacy | Reduces distraction and reduces the risk of disclosing an individual's information, decreasing embarrassment, and ensures the individual's self-worth is maintained |
| Ensure provision of comfort measures prior to the assessment including the removal of restrictive clothing | Promotes an individual's cooperation, removes risk factors with clothing and ensures accurate data is collected |
| Ensure therapeutic interaction | Assists with alleviation of fear prior to the assessment |
| Identify the individual's need for assistance and comorbidities by accessing the individual's nursing care plan prior to undertaking the assessment | Ensures the nurse has factored into the assessment already-known risk factors prior to the assessment being undertaken |
| Prepare the environment to ensure safety measures are addressed for the individual | Removes risk factors that will interfere with the assessment data collection |
| Adhere to the policy and procedures of the facility/organisation by locating and reading prior to assessment | Policies and procedures are written documents that include guidelines and practices developed to address legal, ethical and regulatory requirements<br>Both policies and procedures convey to employees and to other stakeholders the organisation's interests and the vision, mission and methods they intend to use to achieve those goals |
| Ensure the individual's rights are respected<br>Ensure informed consent | Demonstrates quality patient care<br>Demonstrates informed consent |

*Continued*

| CLINICAL SKILL 19.5 Nutritional assessment/weight, height and BMI—cont'd | |
|---|---|
| Work in collaboration with other allied healthcare staff | Referral to other health professions ensures holistic care with appropriate interventions |
| Demonstrate a structured clinical handover process, either verbal or written | Ensures current and correct information is relayed to other health professionals for continuity and safety of care |
| Document assessment findings using the correct documentation tools | Ensures a systematic record for reference by other allied healthcare professionals |
| Record the assessment findings with the date, time and signature | Provides a baseline observation for assessment improvement or deterioration |
| Report abnormal assessment findings to the Registered Nurse | Ensures appropriate strategies and intervention are put in place to encourage positive outcomes |
| *(Adapted from ACSQHC 2012; Jensen 2013; NSW Government 2010; State Government of Victoria 2010; Viljoen & Uys 2001)* | |

## CLINICAL INTEREST BOX 19.2 Purpose of the systematic physical assessment in everyday practice

A less obvious purpose of the physical assessment but one that is no less important is that of enhancing communication and caring opportunities with the individual. The incorporation of physical assessment into the nurse's everyday practice brings the nurse to the bedside—touching, observing and communicating with the individual. Physical assessment can provide an opportunity to take the time to be with the individual, an important component in developing a therapeutic relationship.

*(Zambas 2010; Lewis et al 2014)*

This includes being aware of an individual and their general appearance, colour, expression and body posture. During closer contact with the individual no significant external feature should escape the nurse's notice. The nurse must be able to recognise deviations from what is acceptable and usual for the person. To do this the nurse must know what to look for and what constitutes the acceptable and usual for each individual.

Observation skills are critical to taking a thorough health history, performing a physical assessment and relying on these accumulated skills for the interpretation of clinical data (Pellico et al 2009). (See Clinical Interest Box 19.2.)

Individuals are assessed when they are first admitted to a healthcare institution or when community or home nursing care is initiated. Thereafter, assessment is performed continuously to evaluate the individual's progress and to identify changing needs. Table 19.3 lists the observations to be made during the admission assessment, the acceptable findings and various deviations from the norm.

In addition to the observations listed in this table, the nurse must assess the individual's:

- Degree of independence
- Ability to perform the activities of daily living
- Ability to interact with others
- Reactions and responses to treatment; for example, medications
- Basic needs; for example, for food, water, oxygen, safety, exercise and comfort
- Specific needs; for example, for wound care or pain relief
- Excretions and secretions; for example, urine, faeces, vomitus, wound drainage.

Information on these topics is provided in the relevant chapters; for example, Chapter 23 addresses comfort needs and Chapter 33 addresses the need for freedom from pain.

Subjective and objective data are included in the assessment of the individual. **Subjective data** are collected by interviewing the individual during the nursing history. This includes information that can only be described or verified by the individual. Family members and caregivers can also contribute to subjective data about the individual. Subjective data are also referred to as symptoms. **Objective data** are data that can be observed and measured. These types of data are obtained using inspection, palpation, percussion, auscultation and olfaction during the physical examination. Objective data are also called signs and may be obtained from the healthcare record (Lewis et al 2014). Although subjective data are usually obtained by interview and objective data are obtained by physical examination, it is common for the individual to provide subjective data while the nurse is performing the physical examination, and it is also common for the nurse to observe objective signs while taking the individual's history (Brown et al 2015; Berman et al 2015; Fawcett & Rhynas 2012).

## Before the assessment

Preparing the individual before the assessment involves:

- A full explanation of the type of assessment to be performed
- An opportunity to empty the bladder and/or bowel. The individual will feel more comfortable and the

## TABLE 19.3 | Admission assessment

| Aspect | Normal | Deviations from normal |
|---|---|---|
| General physical appearance | Normal weight for age, sex, height, body build<br>Personal hygiene and grooming satisfactory | Overweight, underweight<br>Appears to be neglected |
| Skin | Normal colour for race<br>Neither dry nor moist<br>Normal temperature<br>Smooth<br>Elastic<br>No lesions | Pallor, cyanosis, jaundice<br>Excessively dry or moist<br>Elevated temperature, localised warmth or coldness<br>Rough, or localised changes or irregularities<br>Diminished by dehydration or oedema<br>Rashes, bruises, scars, abrasions, ulcers, nodules |
| Hair | Normal texture for age, race<br>Normal distribution<br>Scalp clean and healthy<br>Shiny and clean | Brittle, dry, coarse<br>Areas of hair loss<br>Dandruff, lesions, lice<br>Dull, neglected |
| Nails | Transparent<br>Smooth<br>Convex<br>Pink nail beds | Streaks (red or white)<br>Ridged<br>Concave curves<br>Cyanosed, pale |
| Eyes | Sclerae and corneas clear<br>Eyelashes turn out and away<br>Open eyelids do not fall over pupils<br>Pupils equal and reacting to light<br>No discharge<br>Tolerance to light<br>Normal visual acuity | Pale, inflamed, jaundiced<br>Rubbing on eyeball<br>Ptosis (drooping)<br>Dilated, pinpoint, unequal, non-reactive<br>Watery or purulent discharge<br>Photophobia (intolerance to light)<br>Visual impairment |
| Ears | Normal hearing acuity<br>Ear canal clean<br>No discharge | Hearing impairment<br>Inflamed, presence of excessive wax<br>Watery or purulent discharge<br>Itching, pain, tinnitus |
| Mouth | Lips pink, moist, smooth<br>Mucosa pink, moist, glistening<br>Gums pink, moist, smooth<br>Teeth white, straight, smooth<br>Tongue pinky red, moist<br>Breath fresh | Pale, cyanosed, dry, cracked<br>Pale, cyanosed, dry, ulcers, cracks<br>Inflamed, swollen, bleeding, lesions<br>Discoloured, chalky, decayed<br>Coated, cracked<br>Halitosis (bad breath), ketone odour |
| Thorax and lungs | Normal-shaped chest<br>Normal breath sounds | Barrel-shaped chest<br>Wheezing, rales, gurgles, dry or moist cough |
| Abdomen | Slightly convex, symmetrical | Excessively concave, asymmetrical, distended |
| Posture and gait | Able to sit, stand and walk normally | Postural abnormalities (e.g. kyphosis, scoliosis); abnormal gait |
| Mobility | Full range of joint motion | Stiffness or instability of a joint, unusual joint movement, swelling of a joint, pain on movement |
| Muscle tone and strength | Normal tone and strength | Increased or decreased tone, decreased strength |
| Speech | Ability to speak clearly | Speech impairment (e.g. lisp or stammer) |
| Mental and emotional status | Appropriate emotional responses | Responses inappropriate, apprehension, anxiety, depression, hostility |
| Level of consciousness and orientation | Alert, responsive, oriented to time, place, person | Disoriented, unresponsive to stimuli, shortened attention span |
| Presence of prosthesis or aids | None, although aids to sight and hearing are common | Spectacles, contact lenses, artificial eye, hearing aids, walking sticks, frames, wheelchairs, artificial limb, dentures |

assessment will be performed more effectively if the bladder and rectum are empty
- Providing privacy by closing any doors or windows or by drawing the screens around the bed
- Providing a drape for warmth and privacy. The upper bedclothes should be folded to the bottom of the bed
- Allowing for cultural differences and consider cultural or social norms with physical closeness during the assessment, especially if performing an examination of a person of the opposite gender
- Assistance to the required position (information on various positions is provided in Chapter 23). The pillows should be arranged to provide comfort and support. The positions normally used are:
  - for examining the chest and back, the individual is assisted into a sitting position. The nightgown or pyjama top is undone or removed if necessary and a drape positioned to provide privacy
  - for examining the abdomen, the individual is assisted into the recumbent position. The clothing is adjusted to expose the abdomen and a drape is positioned to provide privacy
  - for a rectal examination, the individual is assisted to assume the left lateral position. A drape is positioned so that only the anal area is exposed
  - for a vaginal examination, the individual is assisted to assume either the dorsal or Sims' position, according to the medical officer's instructions. Adequate draping is necessary to ensure that only the vaginal area is exposed.

(Crisp et al 2013; Potter et al 2015)

Before the assessment the nurse may need to assist the medical officer in collecting the equipment required. Check each health facility's protocol for the list of equipment and procedure outline.

### During the assessment

During the assessment the nurse should remain with the individual to provide physical and emotional support and assist when a change of position is required, remembering to provide adequate physical support and privacy (Crisp et al 2013). Emotional support is partially provided by the nurse's presence, and further support may be given in the form of encouragement and explanations of what is to happen. Observe facial expressions for fear and body movements for anxiety. The nurse may also be required to assist the medical officer or receive any specimen obtained.

### After the assessment

The individual is assisted into a position of comfort, clothing is readjusted and the bedclothes are arranged to meet needs. If a rectal or vaginal examination was performed, the person should be provided with tissues to wipe off any excess lubricant (Crisp et al 2013). The equipment is removed and attended to in the appropriate manner. Any specimens are despatched to the laboratory as soon as possible. The assessment and the person's response to it is reported to the nurse in charge and documented.

## ASSESSMENT TECHNIQUES

Inspection, palpation, percussion, auscultation and olfaction are the five basic assessment techniques. Each skill enables the nurse to collect a broad range of physical data about individuals (Brown et al 2015; Potter et al 2015).

### Assessment through inspection

While observation of all the aspects mentioned in this chapter is essential, one of the most important skills a nurse develops is the ability to look at a person and determine whether they are comfortable. A person's comfort depends on many things, the most basic of which are that needs for hygiene, posture, maintenance of body temperature and freedom from pain are met. deWit and Williams (2014) listed the following as items that the nurse observes and assesses when looking at an individual:
- Rest and activity needs: (see Clinical Skill 19.6)
  - Body proportion and appearance
  - Range of motion in joints
  - Muscular strength
  - Balance
  - Ability to perform activities of daily living
  - Sleep pattern
  - Pain
- Nutritional, fluid and electrolyte needs:
  - Height and usual weight (See Clinical Interest Box 19.3)
  - Unusual gain or loss of weight
  - Amount and types of foods eaten
  - Compliance with prescribed diet
  - Fluid intake and output
  - Abnormal loss of body fluid
  - Skin turgor and moistness of mucous membranes

### CLINICAL INTEREST BOX 19.3 Height and weight

Height and weight are performed as part of the initial and ongoing assessment. To measure the height of a weight-bearing person, remove their shoes, have the person stand erect with heels together and the heels, buttocks and back of the head against the measuring device. Eyes should look straight ahead.

Weight should be measured on the same scale each time, at the same time each day and with a similar amount of clothing. If weight bearing, the person may be weighed on a standing scale. People who cannot stand can be weighed on a chair or stretcher/bed scale.

*(Berman et al 2015; Potter et al 2015)*

## CLINICAL SKILL 19.6 Mobility assessment

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Assessment tool used in the clinical facility/organisation<br>The individual's nursing care plan and history<br>Mobility aids |
| **Skill activity** | **Rationale** |
| Identify indications and rationale for performing the activity. This may include identifying:<br>• Past history of falls<br>• Intrinsic and extrinsic factors that may contribute to falls<br>• Understanding reasons why the falls risk assessment needs to be performed or has been ordered | Reduces unnecessary assessments performed on an individual |
| Identify the individual using three individual identifiers. This may include but is not limited to:<br>• Identification—allocated healthcare number on hospital bracelet/band<br>• Verbal confirmation from the individual of given and family name<br>• Date of birth<br>• Gender<br>• Address<br>• Medical record number | Reduces the incidence of performing an assessment on the incorrect individual |
| Explain and communicate the activity clearly to the individual. This may include but is not limited to explaining to the individual:<br>• Why the procedure has been ordered<br>• Why the procedure will be undertaken and frequency<br>• What is involved in undertaking the procedure<br>• What will be done with the data collected | Reduces anxiety/apprehension and gains an individual's trust and cooperation |
| Ensure therapeutic interaction. This may include but is not limited to:<br>• Introducing oneself<br>• Ensuring privacy before undertaking the assessment<br>• Listening to the individual's concerns or questions about the assessment before it is undertaken<br>• Ensuring the individual is aware of the responsibilities required of them before undertaking the assessment<br>• Maintaining professional boundaries<br>• Assessing any cultural/language barriers | Assists with alleviation of fear prior to the assessment |
| Gain the individual's consent:<br>• By explaining the assessment, reasons for undertaking and risks if not undertaken<br>• By asking the individual for verbal or written consent before undertaking the assessment | Ensures that the individual understands why the assessment needs to be performed, therefore promoting cooperation |
| Prepare equipment<br>Identify the correct mechanical aids that will assist in the assessment such as four-prong walking frame, wheelie frame | Ensures that the procedure is conducted appropriately, promptly and efficiently with the tools required<br>Includes timely documentation |

*Continued*

| CLINICAL SKILL 19.6 Mobility assessment—cont'd | |
|---|---|
| Assesses the individual's cognitive status. This may include but is not limited to:<br>• Identifying the individual's conscious state<br>• Identifying if the individual has trouble remembering instructions<br>• Identifying if the individual understands instructions<br>• Identifying if the individual has trouble remembering conversations<br>• Identifying if the individual has difficulty finding the right word or often uses incorrect words | Identifies the individual's ability to understand instructions and ability to mobilise safely |
| Assess the individual's trunk strength. This may include but is not limited to:<br>• Identifying if the individual can stand from a sitting position<br>• Identifying if the individual can stand unsupported<br>• Identifying if the individual can sit from a standing position with or without support<br>• Identifying if an individual can pick up items from the floor safely without falling<br>• Identifying any symptoms or signs of paralysis | Identifies the individual's ability to be seated safely |
| Assess the individual's lower extremity for strength, symmetry and tone. This may include but is not limited to:<br>• Identifying the strength of both limbs as equal—this can be done by having the individual resist your force as you move the body part against the direction of pull<br>• Identifying the muscle bulk of both limbs is equal—this can be done by observation of symmetry of both limbs<br>• Identifying the coordination of both limbs is equal—this can be done by observation of a sequence of movements<br>• Identifying the abnormal movements of the limbs such as tremors, dystonia, weakness<br>• Identifying any symptoms or signs of paralysis | Identifies the individual's lower extremity stability in order to stand |
| Assesses the individual's standing balance and gait. This may include but is not limited to:<br>• Identifying the symmetry of gait<br>• Identifying the length of stride<br>• Identifying walking at normal pace<br>• Identifying the ability to turn at normal pace using the least amount of steps<br>• Identifying the ability to walk in a straight line<br>• Identifying any symptoms or signs of paralysis | Identifies the individual's ability to stand and mobilise safely |
| Adhere to the policy and procedures of the facility/ organisation by locating and reading prior to assessment<br>Ensure the 'no lift' policy is adhered to | Policies and procedures are written documents that include guidelines and practices developed to address legal, ethical and regulatory requirements<br>Both policies and procedures convey to employees and to other stakeholders the organisation's interests and the vision, mission and methods they intend to use to achieve those goals |
| Work in collaboration with other allied healthcare staff by working with the Registered Nurse and identifying referral to allied health staff if required | Referral to other health professions ensures holistic care with appropriate interventions |

| CLINICAL SKILL 19.6 Mobility assessment—cont'd | |
|---|---|
| Demonstrate a structured clinical handover process, either verbal or written, using the identified organisation policy | Ensures current and correct information is relayed to other health professionals for continuity and safety of care |
| Document assessment findings using the correct documentation tools as per the policy of the organisation | Ensures a systematic record for reference by other allied healthcare professionals |
| Record the assessment findings with the date, time and signature on the chart identified by the organisation and progress notes | Provides a baseline observation for assessment improvement or deterioration |
| Report abnormal assessment findings to the Registered Nurse | Ensures appropriate strategies and intervention are put in place to encourage positive outcomes |
| *(Adapted from ACSQHC 2012; Jensen 2013; NSW Government 2010; State Government of Victoria 2010; Viljoen & Uys 2001)* | |

- Safety and security:
  - Potential risks for injury
  - Sensory deficits
  - Ability to speak and understand English
  - Need for side rails or safety devices
- Hygiene and grooming:
  - Ability to bathe, dress and groom self
  - Amount of assistance needed
- Oxygenation and circulation needs:
  - Rate and depth of breathing; breath sounds; cough or sputum production
  - Level of consciousness
  - Blood pressure
  - Pulse rate and characteristics
  - Peripheral pulses
  - Skin colour and temperature
- Psychosocial needs:
  - Desire for spiritual assistance
  - Supports
  - Usual coping mechanisms
  - Financial concerns
  - Fears and concerns
- Elimination:
  - Characteristics and amount of urinary output
  - Characteristics and regularity of bowel movements
  - Alterations in elimination
  - Presence of pain, burning or other discomfort.

As well as observing and assessing the individual and their needs, the nurse must also use the sense of sight to assess the functioning of equipment used in individual care. Nurses assess various items of equipment to determine whether they are functioning correctly when they are in use, for example:

- Intravenous fluid apparatus
- Oxygen apparatus
- Urinary drainage systems
- Wound drainage systems
- Traction apparatus.

While Enrolled Nurses may not be directly responsible for the management of specific items of equipment, they have a responsibility to observe their functioning and report any deviations from normal immediately to the appropriate person so that appropriate measures can be taken.

## Assessment through palpation

Palpation uses the sense of touch. Through palpation the hands make delicate and sensitive measurements of specific physical signs. Palpation detects resistance, resilience, roughness, texture, temperature and mobility. The nurse uses different parts of the hand to detect specific characteristics. For example, the back of the hand is sensitive to temperature variations. The pads of the fingertips detect subtle changes in texture, shape, size, consistency and pulsation of body parts. The palm of the hand is sensitive to vibration. The nurse measures position, consistency and turgor by lightly grasping the body part with fingertips. Assist the individual to relax and position comfortably as muscle tension during palpation impairs the ability to palpate correctly. Asking the individual to take slow, deep breaths enhances muscle relaxation. Palpate tender areas and ask individual to point out areas that are more sensitive and note any non-verbal signs of discomfort (Elkin et al 2012; Potter et al 2015).

The sense of touch should be developed so that a nurse is able to detect abnormalities such as:

- Abnormally hot, cool, moist, dry, inelastic or roughened skin
- An excessively hard or soft peripheral vein
- A rapid, slow, weak or irregular pulse
- Rigid or flaccid muscles
- Swelling of part of the body; for example, a joint.

Touch is also used when examining an individual by palpation or percussion. Palpation, usually performed by a medical officer or a Registered Nurse, is a technique whereby the examiner feels the texture, size, consistency and location of certain parts of the body with the hands. For example, the examiner may palpate the upper abdomen to determine the size of the liver.

## Assessment through percussion

Percussion, usually performed by a medical officer or a Registered Nurse, is a technique in which the examiner strikes

the body surface with a finger, producing vibration and sound. An abnormal sound suggests the presence of a mass or accumulation of fluid within an organ or cavity. For example, the examiner may percuss the posterior chest wall to determine the presence of fluid in the lungs.

### Assessment using the sense of auscultation

It is important that a nurse learns to listen effectively, so that not only what a person says is registered but also the tone of voice, which often conveys a great deal. A nurse must also learn how to recognise abnormal sounds. Information on the art of effective listening in communication is provided in Chapter 8 and emphasises the importance of recognising that listening is an active process that involves much more than just hearing the spoken word. In person-centred care, recognising abnormal sounds involves the ability to detect:

- Abnormalities of breathing; for example, respirations that are wheezing, noisy or distressed
- Abnormalities of heart sounds, blood pressure, bowel sounds or fetal heart sounds when using a stethoscope
- Manifestations of an individual's distress; for example, coughing, expectorating sputum, vomiting, crying or moaning
- Changes in the sound or rhythm of technical equipment such as suction or artificial ventilation apparatus.

Auscultation is listening with a stethoscope to sounds produced by the body. To auscultate correctly, listen in a quiet environment. To be successful, the nurse must first be able to recognise normal sounds from each body structure, including the passage of blood through an artery, heart sounds and movement of air through the lungs (Elkin et al 2012). See Case Study 19.1.

### Assessment using the sense of olfaction (smell)

A well-developed sense of smell enables a nurse to detect odours that are characteristic of certain conditions. Some alterations in body function and certain bacteria create characteristic odours, for example:

- The 'fishy' smell of infected urine
- The ammonia odour associated with concentrated or decomposed urine
- The musty or offensive odour of an infected wound
- The offensive rotting odour associated with gangrene (tissue necrosis)
- The smell of ketones on the breath in ketoacidosis (accumulation of ketones in the body)
- The smell of alcohol on the breath, due to ingestion of alcohol
- Halitosis (offensive breath) accompanying mouth infections; for example, gingivitis or certain disorders of the digestive system such as appendicitis
- The foul odour associated with steatorrhoea (abnormal amount of fat in the faeces)
- The characteristic odour associated with melaena (abnormal black tarry stool containing blood)
- The faecal odour of vomitus associated with a bowel obstruction
- Bromhidrosis (offensive smelling perspiration) caused by bacterial decomposition of perspiration on the skin. (Crisp et al 2013; Potter et al 2015)

### Assessment using equipment

A nurse should acquire proficiency in the correct operation of equipment used to provide information about an individual (Crisp et al 2013); for example:

- Clinical thermometer
- Sphygmomanometer
- Stethoscope
- Weighing scales
- Urine-testing equipment
- Tape measure; for example, to measure head, limb or abdominal circumference
- Auriscope, to visualise the ear canal
- Pen-light torch.

## ROUTINE SHIFT ASSESSMENT

Each person should also be assessed at the beginning of each shift, as this helps the nurse to establish priorities of care and organise the work for the shift (Elkin et al 2012). Clinical Interest Box 19.4 outlines the routine shift assessment. The nurse introduces themself to each person at the start of the shift and observes:

- Skin colour
- Appearance
- Ease of respiration
- How the person is feeling
- Ability to respond to questions
- Ability to communicate
- Level of consciousness
- Vital signs
- Voiding status
- Ability to move easily

### CASE STUDY 19.1

A 58-year-old woman presented at the emergency department with dyspnoea. She claims that she has been having difficulty breathing for the past 3 days. It gets worse when walking up stairs and unloading groceries from the car.

General health assessment:

- Inability to complete sentences, moderately obese
- Physical assessment: BP 145/89 mmHg, RR 22/min with distended neck veins and productive cough.

What does the general health assessment indicate and what should the focused assessment be aimed at?

## CLINICAL INTEREST BOX 19.4 Checklist for routine shift assessment

1. Mental and neurological status
   a. Level of consciousness (LOC)/responsiveness
   b. Alertness/orientation
   c. Pupils equal, round, and reactive to light and accommodation (PERRLA)
   d. Mood
   e. Behaviour
2. Vital signs
   a. Blood pressure
   b. Pulse
   c. Respiration
   d. Temperature
   e. Pain and comfort level
3. Motor sensory function
   a. Range of motion (ROM)
   b. Movement
   c. Strength
   d. Presence of numbness or tingling
4. Integument (skin/mucous membranes)
   a. Colour
   b. Temperature
   c. Turgor
   d. Moisture
   e. Oedema
   f. Integrity
5. Cardiopulmonary system
   a. Heart sounds
   b. Apical rate and rhythm
   c. Lung sounds
   d. Breathing pattern
   e. Peripheral pulses
   f. Capillary refill
6. Gastrointestinal (GI) system
   a. Bowel sounds
   b. Abdominal palpation
   c. Degree of abdominal distension
   d. Bowel elimination problems (e.g. diarrhoea, constipation, flatulence)
7. Wounds
   a. Cleanliness
   b. Presence of swelling, redness, infection or drainage
   c. Bandage/dressing
8. Invasive tubes (e.g. intravenous (IV) lines, nasogastric (NG) tubes, wound drains, catheters)
   a. Device and location
   b. IV line: Correct fluid/medicine infusing
   c. Patency and position
   d. Presence of redness, swelling or tenderness at site
   e. Drainage rate or infusion rate
   f. Date of last tubing change

*(Elkin et al 2012)*

- Skin lesions or pressure areas
- Presence of oedema.

It is important to note that an individual should be assessed whenever the nurse first has contact with that person (Elkin et al 2012; Berman et al 2015). Nurses also need to:

- Ascertain the time of the last bowel movement
- Check tubes and equipment (IV lines, nasogastric tubes, urinary catheters, dressings, wound suction devices, oxygen rates, traction)
- Ensure that call bell, TV control, water and tissues are in reach
- Check that room temperature is suitable
- Determine which supplies will be needed in the room for the remainder of the shift.

## DIAGNOSTIC INVESTIGATIONS

Apart from the physical examination, specific tests may be performed to assist diagnosis or aid in evaluating the individual's condition. Diagnostic procedures include:

- Radiological examination
- Ultrasonography
- Blood tests
- Urine tests
- Histological tests
- Microbiological tests
- Endoscopy
- Recording electrical activity
- CT scanning.

The nurse may be involved in preparing the individual before a diagnostic procedure, assisting throughout the procedure and providing care after the procedure (Crisp et al 2013). To determine the specific preparation and post-test care required for each procedure, the nurse should refer to the healthcare facility's policy manual.

### CRITICAL THINKING EXERCISE 19.2

Melissa is an 88-year-old woman who has been admitted for investigation. When undertaking a nursing history on admission you note that she appears slightly confused and her husband reports that she has been incontinent of urine, which is not usual for Melissa. What assessments will you undertake as an Enrolled Nurse and why?

Preparing the individual before any diagnostic procedure involves both physical and psychological preparation. The nurse should explain the purpose of the test and the procedure. If the person understands what is to happen and why, they may be less anxious about the test. Use an interpreter for individuals who do not speak or understand English. The nurse should ensure that the person is informed of when, where and who will perform the test, and that the individual's informed consent has been obtained. Many tests, especially those of an invasive nature, require that the individual gives informed consent for the test to be performed.

### CRITICAL THINKING EXERCISE 19.3

John Stuart, age 43, complains of increasing symptoms of dyspnoea and cough which worsen upon physical exertion. He also experiences chest tightness with occasional wheezing symptoms. Identify the types of diagnostic investigations that may be carried out to determine the cause(s) of John's condition. Explain the necessary preparation required for each of the investigations.

## RECORDING AND REPORTING

Documentation may occur during the assessment or at the end. Healthcare facilities use specific forms to document the data collected. After conducting a general health assessment the nurse should document the collected data as follows:

- Record the individual's vital signs on the vital signs chart
- Measure and record weight and height (see Clinical Interest Box 19.3)
- Record the description of alterations in the individual's general appearance
- Describe the individual's behaviours using appropriate terminology. Include the individual's description of their own signs and symptoms
- Report abnormalities and acute symptoms to the Registered Nurse or medical officer.
  (Elkin et al 2012)

Documentation of assessment data forms the baseline database for other members of the healthcare team. This information is used to plan care and communicates information to other healthcare staff (Lewis et al 2014). See Progress Note Example 19.1.

## TEACHING CONSIDERATIONS

While conducting the general survey, the nurse should use it as an opportunity to undertake health education with the individual (Crisp et al 2013). The following could be incorporated:

- During the general survey, inform the person of the acceptable ranges for vital signs and normal weight for height
- Discuss the person's dietary intake and discuss any problems the person has in terms of food preparation or food selection
- If the person has been undertaking any high-risk behaviour activity such as smoking, overexposure to the sun or drinking alcohol discuss the health risks of these.
  See Case Study 19.2.

## CLINICAL HANDOVER

Handover is about communicating the individual's relevant information including health assessment, past medical history, current health status and overall management to the healthcare team to establish an effective continuity of care (ACSQHC 2010; 2012; 2015). Nurses have the most contact with each individual. Therefore, they play a significant role in being able to identify the subtle changes that the individuals may be presenting prior to a deteriorating event.

The *OSSIE Guide to Clinical Handover Improvement* has been developed by the Australian Commission on Safety and Quality in Health Care. The document is aimed at improving nursing and medical handover—which include verbal and documented formats—from shift to shift.

### CASE STUDY 19.2

The following are details of Tom's health assessment:
General health assessment:

- A 64-year-old male with 4-year history of type 2 diabetes with non-compliance to medication
- Physical assessment: BMI 32.6 kg/m$^2$, BP 154/96 mmHg, RR 20/minute, Pulse 88/min
- After a physical health assessment was conducted, a pressure sore was identified on one of Tom's right toes. Tom was not aware of this sore.

1. What education considerations may Tom need in relation to his diabetes?
2. What could you do to educate Tom about foot care?

### PROGRESS NOTE EXAMPLE 19.1

| | |
|---|---|
| 10/05/2015<br>1300 hrs | Nursing: Mr Jones is 26 years, admitted to ward at 1230 hrs after sustaining an injury to his left ankle while playing football. His weight is 67 kg and height is 1.68 m. Vital signs were attended on admission and are within normal range. He has tenderness over the posterior aspect of his left tibia and swelling around the lateral malleolus. The area is warm to touch and the skin is intact. Neurovascular observations were attended and no deficits noted. He states that the pain is worse over his ankle and he is unable to weight bear on his left foot. He is awaiting x-ray and review by medical officer.<br>***K. Adams* (Adams) EN** |

According to the guide, **clinical handover** is the transfer of professional responsibility and accountability for some or all aspects of an individual or a group of individuals to another person or professional group on a temporary or permanent basis. It is identified that proper clinical handover can reduce risk of unnecessary delays in diagnosis, treatment and care. See Chapters 8 and 18 for further information on clinical handover.

## ADVANCE HEALTH DIRECTIVES

With advances in medical technology, there has been increasing effort by healthcare professionals to reduce mortality and prolong life through artificial means. When the individual can no longer communicate their own decision, doctors and family can find themselves having to decide for them when to withhold or withdraw life-sustaining treatments (RACGP 2010).

An advance health directive is a document voluntarily completed by an individual which specifies their decisions about future medical treatment (see Chapter 2 and Clinical Interest Box 19.5).

On admission, it is important to find out if the individual has completed an advance health directive prior to admission to the healthcare setting. If there is one, it must be acknowledged, clearly documented and handed over to all members of the healthcare team.

### CLINICAL INTEREST BOX 19.5 Advance health directives

What is an advance health directive?

An advance health directive is a document that contains the individual's decisions about future treatment—including medical, surgical and dental treatment and other healthcare—that they are prepared to accept, or refuse.

Why prepare an advance health directive?

Some people, perhaps because of personal experience, religious beliefs or advice from loved ones, feel it is important to specify the treatments they want, or do not want, to receive in the future. It is not mandatory to complete a directive.

*(Department of Health, Government of Western Australia nd)*

### DECISION-MAKING FRAMEWORK EXERCISE 19.1

You are an enrolled nursing student who is on their first acute care placement for the course. On day 2 in a very busy surgical ward, you are asked to take a full nursing history by the Registered Nurse you are working with, which includes undertaking a general health assessment for William Benjamin, a 44-year-old male who will be having surgery on his lower back and is in a lot of pain. You have only practised taking a nursing history with a friend in the simulation nursing lab at your education provider and are very nervous. Using the decision-making framework, what action are you going to take?

## Summary

The general health assessment is conducted to assess the function and integrity of the individual's body. Baseline assessment findings of an individual provide a basis for comparison with subsequent assessment findings. Ongoing focused assessment of an individual monitors their progress and response to treatments. The health assessment is conducted in a systematic manner that requires the fewest position changes for the individual. In addition, applicable health education should be integrated through assessments to assist individuals learn about health promotion and illness prevention. The data obtained in the physical health examination supplement, confirm or refute data obtained during the nursing history. Physical assessments should be ongoing when the nurse assists the individual with care, including assessing for both mental and emotional status (Crisp et al 2013).

## Review Questions

1. What is the difference between general and focused assessments?
2. What are the four (4) methods of assessment that a medical officer would use when performing a physical examination on an individual?
3. An individual is admitted with a diagnosis of diabetes mellitus and the nurse detects unpleasant, musky odours during the general assessment. What assessment technique is being used?
4. Before undertaking a physical assessment, how can the nurse prepare the individual?
5. List assessments of the skin that you would make as part of your admission and ongoing assessments.
6. Cecilia is a 74-year-old woman who is 1 day postoperative after a right knee replacement. What focused assessments should you undertake?
7. While admitting Mrs Midler, an 84-year-old woman, to the medical ward for investigation of chest pain, you note that she is confused to time and place. Do you assume that this could be due to her age or do you undertake an assessment? Outline the actions you would undertake.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Recommended Reading

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## Online Resources

Australian Commission on Safety and Quality in Health Care (ACSQHC): www.safetyandquality.gov.au

Centre for Culture, Ethnicity & Health: www.ceh.org.au

Department of Health, Government of Western Australia. Advance Health Directives (AHD): www.health.wa.gov.au/advancehealthdirective/home/faqs.cfm#1

CHAPTER 20

# Vital sign assessment

*Rachel Gilder*

## KEY TERMS

bradycardia
bradypnoea
Cheyne–Stokes breathing
cyanosis
dyspnoea
external respiration
hypertension
hyperthermia
hypotension
hypothermia
hypoxia
internal respiration
Korotkoff sounds
Kussmaul's breathing
oxygen saturation
respiration
tachycardia
tachypnoea
vital signs

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Describe factors that affect the vital signs
- Identify the variations in acceptable ranges for body temperature, pulse, respirations and blood pressure that occur from infancy to older adulthood
- Describe advantages and disadvantages of using each body temperature site
- Verbalise the factors involved in the maintenance of the pulse and blood pressure
- Identify the sites commonly used to assess the pulse and state the reasons for their use
- State the factors necessary for an adequate supply of oxygen to the cells
- Identify the characteristics that should be included in a respiratory assessment
- Describe the various methods and sites to measure blood pressure
- Describe the importance of accurate and timely vital sign assessment in recognising a deteriorating individual

## CHAPTER FOCUS

Assessment is an essential part of the nursing process, as a comprehensive assessment of the body, which includes recording vital signs, will gather in-depth information about each body system and establish a baseline measure (Clarke 2014). Enrolled Nurses have a key role in performing vital sign assessments, and it is pivotal that they detect and respond to a changing or deteriorating individual (Chua et al 2013).

Continued, timely and accurate assessment enables the nurse to determine the clinical health of the individual, any change in the individual's clinical condition and the effectiveness of the implemented nursing care plan. These assessments not only assist the medical officer in making a diagnosis and treatment plan, but underpin many care decisions and can predict and prevent adverse events (Yeung et al 2012). (See Nursing Care Plan 20.1 and Progress Notes Example 20.1.) Information on critical thinking and reflective practice is provided in Unit 5, which should be referred to in conjunction with this chapter, as critical thinking and critical reasoning are vital components in the development of accurate clinical judgment (Fisher & King 2013).

Vital signs are a quick and efficient way of monitoring an individual's condition or identifying problems and evaluating the individual's response to interventions. To assess an individual effectively, the nurse requires knowledge of the acceptable ranges in measurements of vital signs in order to identify deviations or abnormalities. Documentation, recognition and action on any changes in an individual's vital signs are essential roles of a nurse (Yeung et al 2012). The nurse must also understand how to use the equipment necessary to complete vital signs assessment to ensure it is accurate. Vital signs, however, are only part of the clinical picture of an individual's assessment and should be interpreted with other factors such as level of consciousness, muscle strength, urine output, diet and bowel actions.

## LIVED EXPERIENCE

The last time I was admitted into hospital I had a young student nurse look after me. The student was very meticulous and looked after all my needs. The only time that I felt uncomfortable and a little scared was the first time he took all my vital signs. He pumped up the cuff to take my blood pressure, with an intense look on his face, and deflated it. He then proceeded to do this three times. He then took my pulse and temperature and then, without telling me what was wrong, left the room with a panicked look on his face, telling me that he would have to go and get his teacher. I was so worried, I thought there was something wrong with me and that I wouldn't be able to go home. As I sat there waiting, thinking the worst, the student came back with the teacher and it turned out that he had placed the stethoscope the wrong way in his ears so he was unable to hear anything for my blood pressure and all my other observations were good.

**Bill, age 70**

## NURSING CARE PLAN 20.1

**Assessment:** Nicholas Peters, a 63-year-old man, has low blood pressure (101/59) and feels dizzy when ambulating.
**Issue/s to be addressed:** Low blood pressure
Feeling dizzy when ambulating
**Goal/s:** Monitor blood pressure
Increase blood pressure
Maintain safety and reduce dizzy feeling when ambulating

| Care/Actions | Rationale |
|---|---|
| Monitor individual's blood pressure 2/24 and report changes appropriately | To evaluate other care actions and monitor the individual's blood pressure |
| Monitor individual's blood pressure before ambulating | To maintain safety of the individual and prevent patient harm |
| Educate the person to ensure there is a nurse present when ambulating | To maintain safety of the individual and prevent patient harm |
| Encourage oral fluid intake | To avoid dehydration, increase circulating volume and increase blood pressure |

**Evaluation**
The individual's safety was maintained through frequency of monitoring and ensuring nurse presence when ambulating.

## GUIDELINES FOR TAKING VITAL SIGNS

**Vital signs** (temperature, respiration rate, heart rate, blood pressure and oxygen saturation) are the key indicators for physiological health status through the indication of the body's ability to regulate body temperature, maintain blood flow and oxygenate body tissues. Pain assessment is also considered an important part of a vital sign assessment, as pain can be accompanied by the body's stress response. This can be indicated by an increased heart rate, blood pressure and sweating and pallor. Therefore pain must be assessed and documented regularly to ensure the individual's entire clinical situation is critically assessed (Gregory 2014) (see Chapter 33). When checking vital signs or 'taking an individual's observations', a nurse must be able to measure the vital signs correctly, understand and interpret the values, document, communicate and action any changes in the individual's physiological health status. An individual's vital signs are taken:

- On admission to a healthcare facility
- On a routine schedule according to your clinical judgment, a medical officer's order or hospital policy
- During a home healthcare visit
- Before and after a surgical procedure or an invasive diagnostic procedure
- Before and after administration of certain medications that affect the cardiovascular, respiratory or temperature control function
- When an individual's general physical condition changes
- Before and after nursing interventions influencing a vital sign
- When an individual reports non-specific symptoms of physical distress; for example, 'feeling funny'
- Before, during and after a transfusion of blood products.

When taking vital signs the nurse should:

- Check that the equipment is functioning and appropriate
- Know the acceptable range for all vital signs
- Have knowledge of the person's medical history and any conditions that could affect this individual's vital signs
- Have knowledge of the individual's ongoing therapies and prescribed medications
- Control or minimise environmental factors that may affect the vital signs
- Use an organised systematic approach
- Use clinical judgment to interpret their significance and make clinical decisions about the individual's care
- Use clinical judgment to alter the frequency of vital sign assessments on the basis of the person's clinical condition
- Recognise and communicate significant changes in vital signs to the Registered Nurse (RN) and the medical officer.

### Recognising and responding to clinical deterioration

To recognise and respond to clinical deterioration appropriate interpretation of an individual's observations must be made. This can be done by:

- Comparison with the acceptable ranges for a given group of people
- Knowledge of the individual's previous results and clinical condition
- Analysing the whole clinical condition of a person.

For example, for a nurse to be able to analyse the significance of an abnormal pulse rate, the entire clinical condition, including blood pressure, temperature, respiration rate, oxygen saturation, level of consciousness and pain, must be considered, as well as the acceptable pulse range, previous results and clinical condition of the individual. Therefore, while a single observation provides some information about a person, all observations must be completed to enable a more accurate assessment of their condition.

The National Safety and Quality Health Service (NSQHS) Standards have ensured the implementation of an observation chart that specifies physiological abnormalities and how they should be escalated; however, it is still the responsibility of the nurse to document, recognise, report and action these abnormalities (ACSQHC 2012).

## BODY TEMPERATURE

Accurate measurement and assessment of the body temperature provides the nurse with an objective evaluation of the body's ability to maintain temperature regulation—a deviation from the normal range is an important clinical indication of altered physiological status requiring further investigation (Grainger 2013).

The human body has inbuilt mechanisms that maintain a balance between heat production and heat loss. This results in the internal or core temperature being stable independent of our environment. However, during ill health or periods of prolonged exposure to extreme temperatures the balance may be upset and considerable stress may be placed on the body's adaptive mechanisms. The temperature range of a normal adult, which is tightly controlled, depends on age, physical activity, status of hydration and state of health, including the presence of infection (Sund-Levander & Grodzinsky 2013). Accurate temperature monitoring is an essential nursing skill and when monitored in combination with other clinical observations can aid in detecting a deteriorating individual (Grainger 2013).

### Regulation of body temperature

The body requires maintenance of its temperature to ensure cellular function can occur, and this is controlled by both voluntary actions and involuntary mechanisms (Grainger 2013). The surface temperature of the body varies with changes in the environmental temperature, and people adjust to these changes by adapting their immediate surroundings;

for example, selecting appropriate clothing, moving away from or towards the source of heat or cold, and altering the temperature of heaters or coolers can help to provide a comfortable environmental temperature.

Core temperature is maintained in the brain by the hypothalamus which acts as an internal thermostat. The hypothalamus processes and reacts to the heat of arterial blood flow while also receiving information from peripheral receptors to maintain the individual's temperature to a set point or range (Sund-Levander & Grodzinsky 2013). If the core temperature is outside this set point the hypothalamus will initiate impulses to the peripheral nervous system to attempt to correct this (Grainger 2013).

## Heat production and heat loss

Heat is continually being produced by the process of cellular metabolism and is constantly being lost to the environment through the following processes.

### Radiation

Body heat is transferred to cooler objects in the environment without physical contact. Loss of heat by radiation means loss in the form of infrared rays. For example, the sun transfers heat to the Earth through radiation.

### Conduction

Body heat is lost through physical contact with another object or person. For example, a cool or ice mat, applied directly to the skin, can be used to reduce an individual's temperature.

### Convection

Convection is the dispersion of heat by air currents across the skin; for example, the air movement of a fan to cool the body.

### Evaporation

Insensible evaporation of water directly through the skin results from continual diffusion of water molecules, regardless of body temperature. However, when the body becomes overheated, large quantities of sweat are secreted onto the surface of the skin to provide rapid evaporative cooling of the body.

### Balancing heat production and heat loss

Through the control of the hypothalamus the body aims to balance the rate of heat production and heat loss. When the body temperature rises, the hypothalamus sends impulses to the peripheral nervous system to dilate the skin arterioles, with loss of heat occurring from radiation, conduction, convection and evaporation of sweat. When the body temperature falls, the impulses from the hypothalamus are increased, causing vasoconstriction of the skin arterioles, reducing heat loss and increasing the flow of blood to vital internal organs. Shivering is an important source of heat, and is initiated by involuntary impulses from the central nervous system travelling to the skeletal muscles. These impulses begin intense physiological work through increased skeletal muscle tone, resulting in increased muscle metabolism and increased rate of heat production (Grainger 2013).

## Factors affecting body temperature

A range of intrinsic processes and activities affect body temperature. These include circadian rhythm, age, exercise and thyroid hormones (McCallum & Higgins 2012). An individual's stress and environment can also contribute. Factors that lower the body temperature include exposure to a cold damp environment, insufficient warm clothing and an under-secretion of the hormone thyroxin. Factors that raise the body temperature include:

- Exposure to a hot humid environment
- Strenuous muscular activity
- Intake of foods high in fat or carbohydrates
- Strong emotions such as anger
- An over-secretion of the hormone thyroxin
- Changes in production of the hormone progesterone (e.g. in menopause or menstrual cycle)
- Insufficient fluid intake.

There are also several actions an individual may undertake to assist the physiological processes of body temperature control. These could include altering their surrounding environment to ensure a comfortable temperature, selecting appropriate clothing to suit the climate, altering their level of physical activity and changing their diet and fluid intake to suit the climate (McCallum & Higgins 2012).

## Assessing body temperature

There are both routine and clinical indicators for measuring an individual's body temperature. They include:

- Obtaining a baseline temperature for future comparisons
- Monitoring and observing an individual for changes from resolving hypothermia/hyperthermia which could indicate infection or the effect of antimicrobial treatment
- Monitoring for signs of a reaction before, during and after the administration of blood products (McCallum & Higgins 2012).

There are several different methods to assess an individual's body temperature, so it is essential the nurse determines the most appropriate technique to ensure it is measured accurately, as inaccurate assessment could compromise individual safety and fail to identify deterioration of an individual (McCallum & Higgins 2012). Measuring the individual's temperature together with assessment of the other vital signs is an important method of determining their general condition. The nurse must also use sense of sight and touch to aid the clinical decision-making process (see Clinical Interest Box 20.1).

## Measuring body temperature

Several types of clinical thermometers, both invasive and non-invasive, are used to measure body temperature. The most commonly used types are electronic, tympanic electronic and infrared devices. Electronic thermometers (Figure 20.1) are most commonly used in healthcare facilities as research shows they are the most accurate (El-Radhi 2014).

## CLINICAL INTEREST BOX 20.1 Measuring temperature in older adults

- As neurological feedback and response in an older person have become slower the temperature of older adults is at the lower end of normal temperature range: 36°C (Grainger 2013)
- Temperatures considered within acceptable range may reflect a fever in an older adult
- Older adults are sensitive to slight changes in temperature

**Figure 20.1** An electronic thermometer

*(photo courtesy of Welch Allyn)*

An electronic thermometer enables an accurate temperature reading to be obtained within a few seconds and may also be used when it is necessary to monitor an individual's temperature continuously.

## Body temperature sites

Body temperature may be measured using the oral, tympanic membrane or axillary sites. The taking of rectal temperature with a rectal thermometer is rarely performed because of the trauma and pain it causes individuals and because of the risk of cross-contamination. Even though some consider rectal temperature assessment as the gold standard for core temperature analysis in neonates, it is no longer performed (El-Radhi 2014).

### Tympanic site

The tympanic membrane is now the most commonly used site for taking temperature. An otoscope-like speculum with an infrared sensor tip detects heat radiated from the tympanic membrane. Within 2–5 seconds of placement in the auditory canal, a reading appears on the display unit (Figure 20.2). The advantages of using this site are that it is easily accessible and minimally invasive; minimal individual repositioning is required; the reading is unaffected by oral intake of food, fluids or smoking; and it can be used with individuals with tachypnoea without affecting breathing. Due to its position situated near the hypothalamus it has also been reported to detect rapid fluctuations in the core temperature (McCallum & Higgins 2012). Disadvantages of using this site are that it can be uncomfortable and it involves the risk of injuring the tympanic membrane if the probe is inserted too far, the presence of cerumen (wax) and purulent discharge can affect the reading and it requires removal of a hearing aid before measurement (McCallum & Higgins 2012). It is imperative to check the manufacturer's guidelines for use of this device, as operator error and poor technique can alter accuracy and reliability.

**Figure 20.2** Measuring temperature with tympanic thermometer

*(R. Gilder 2015)*

### The oral site

The thermometer is placed under the person's tongue, close to the sublingual artery in the sublingual pocket, and the person closes their lips. This ensures changes in core temperature can be monitored (McCallum & Higgins 2012). The advantages of this site are that it is easily accessible, comfortable for the individual, reflects rapid change in core temperature and provides accurate surface temperature reading. Some factors that affect accuracy of this site are recent ingestion of hot/cold fluids or foods, and recent smoking or receiving oxygen by mask or nasal cannula (McCallum & Higgins 2012). Care must also be taken when an individual has dentures as it may be difficult for the individual to keep their mouth closed for the measurement. To obtain an accurate temperature measurement, the person must be:

- Able to close their lips completely and retain the thermometer in the correct position
- Able to breathe comfortably through their nose for the length of time the thermometer is in their mouth

- Have not smoked cigarettes in the previous 15–30 minutes
- Have not consumed cold or hot fluids in the previous 15–30 minutes.

The oral site is unsuitable for people who:

- Have an oral infection or painful mouth
- Have higher than 6 L/min of supplemental oxygen being supplied (McCallum & Higgins 2012)
- Have recently had oral surgery
- Experience any impairment of breathing or obstruction of the nasal passages
- Have a history of seizure activity
- Are children
- Are unconscious.

### The axilla

Using the axilla provides a less accurate measurement of body temperature, but may be used when it is not possible to measure the temperature orally (see Clinical Interest Box 20.2). It is safe and non-invasive and can be used with newborns and unconscious individuals. The thermometer is placed in the axilla in contact with two dry skin surfaces and is kept in place in the axilla by bringing the person's arm over their chest (Figure 20.3). A disadvantage of using this site is that the thermometer must be left in place for a long time to obtain an accurate measurement; it can be affected by exposure to environmental factors and requires continuous positioning by the nurse (Sund-Levander & Grodzinsky 2013).

### The skin

Various types of single-use disposable thermometers are available. A temperature-sensitive strip of tape is placed on the forehead or abdomen to record the heat of the body (Figure 20.4). These are often used in nurseries of newborns. Directions on the package explain how to use these thermometers. Most disposable thermometers will register the temperature within 60 seconds. The advantages of this site are that it is inexpensive, provides continuous reading and is safe and non-invasive. The disadvantages are that measurement lags behind other sites during temperature changes, it is sometimes affected by environmental temperature, diaphoresis or sweat can impair adhesion and due to a newborn's sensitive skin it must be moved frequently (Schafer et al 2014).

### Temporal artery thermometer

The temporal artery thermometer scans across the forehead of the individual in a single direction and senses the infrared emissions that radiate from the skin. One advantage of this device is that there is no need for disposable covers because the device can be cleaned with alcohol swabs between individuals. Another advantage is that the device doesn't actually touch the skin of the individual so can be used on a sleeping child. A disadvantage of this mode is that its reliability and validity have not been tested widely to ensure accuracy (McCallum & Higgins 2012).

## STEPS IN OBTAINING AN ACCURATE MEASUREMENT OF BODY TEMPERATURE

To obtain an accurate measurement of body temperature and to promote the individual's comfort and safety, the nurse should:

- Select the appropriate site
- Check that the thermometer is undamaged, not contaminated and is working properly

**Figure 20.3** Taking temperature from the axilla

*(© Elsevier Australia)*

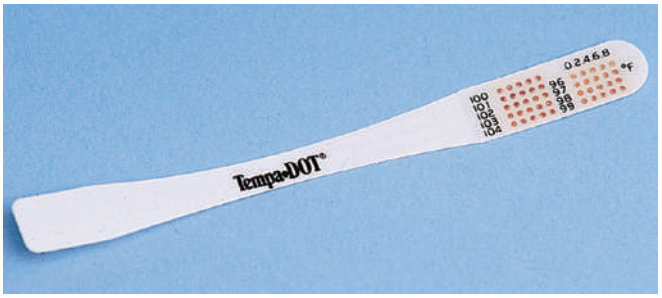


**Figure 20.4** Disposable, single-use thermometer strip

*(Potter & Perry et al 2013)*

### CLINICAL INTEREST BOX 20.2 Axillary temperature in paediatrics

- Axillary temperature cannot be relied on to detect fevers in infants and young children
- Although axillary temperature has a lower sensitivity, it is safe and has no complications. The thermometer must be kept in place for 5 minutes (Sahin et al 2012)
- Infants are sensitive to slight changes in environmental temperatures

**TABLE 20.1 | Measuring body temperature**

| | Oral | Axilla | Skin | Tympanic |
|---|---|---|---|---|
| Time thermometer is left in position | 1 minute | 3 minutes | 60 seconds | 2–5 seconds |
| Normal range of temperature | 36–37.2°C | 36–37°C | 36–37°C | 35.5–37.6°C |
| Position of individual | Lying or sitting | Lying or sitting with arm across the chest | Lying or sitting | Lying or sitting |

*(McCallum & Higgins 2012)*

- Ensure that the person is informed of the procedure
- Position the person according to the site selected
- Wash hands to prevent cross-infection and ensure that the thermometer has been disinfected before the procedure
- Use the correct probe for the site selected when using an electronic thermometer.

Depending on the site being used, some variations occur in the time that the thermometer is left in position, the normal range of temperature and the position in which the person is placed (see Table 20.1). Because of variations between sites it is important to note on the observation or vital signs chart what method was used to take the temperature. For example, if the temperature was taken orally, the temperature would be recorded: 36.7 PO (Latin: *per os* (by mouth)). Temperature measurements are then usually recorded on graph-style charts (Figure 20.5). These enable the pattern of temperature variations to be observed readily. While the actual procedure for measuring temperature may vary slightly in different healthcare settings, the general principles remain the same (see Clinical Skill 20.1).

## Alterations in body temperature

Core body temperature is tightly regulated and reflects body function, and a deviation from the acceptable temperature range is an indication of body dysfunction. An imbalance between the production and the loss of heat results in a rise or fall in normal body temperature. An elevated temperature can be referred to as either hyperthermia or fever, although these two terms have different meanings. A temperature above 41°C is referred to as hyperpyrexia. A temperature below the acceptable range is referred to as hypothermia.

**Hyperthermia** occurs when the heat-loss mechanisms within the hypothalamus fail, resulting in excessive heat production which exceeds the body's adaptive abilities. This can be a manifestation of a metabolic disorder or induced by various medications (Musselman & Saely 2013). **Fever** is generally defined as a temperature above 38 degrees, and occurs when the hypothalamus increases the core body temperature in response to an infection (Musselman & Saely 2013). **Hypothermia** is a body temperature below 35 degrees and is not compatible with life (Grainger 2013). The thermal regulating centre in the hypothalamus is greatly impaired when the temperature of the body falls below 34.4°C and at this level, the activity of the cells is decreased, less heat is produced and sleepiness and coma can develop (Sund-Levander & Grodzinsky 2013). Those at risk of hypothermia include postoperative individuals who have been cooled during surgery, newborn infants, elderly or debilitated individuals and any person who is subjected to prolonged exposure to a cold environment (Grainger 2013). Alterations in body temperature produce certain physiological effects, as shown in Table 20.2.

**TABLE 20.2 | Effects of altered body temperature**

| Hyperthermia | Hypothermia |
|---|---|
| Elevated temperature, pulse and ventilation rates (rigor may occur) | Subnormal temperature, decreased pulse and ventilation rates |
| Warm flushed skin and sweating may be present | Cool, pale or mottled dry skin |
| Restlessness, drowsiness or confusion | Drowsiness, shivering |
| Aching muscles and joints | Muscle weakness |
| Headache | Mental confusion |
| Photophobia | Unconsciousness (if prolonged) |
| Loss of appetite | Hypotension |
| Increased thirst | Frostbite (nose, fingers, toes) |
| Dehydration (if prolonged) | Decreased urinary output |

*(Grainger 2013)*

## Nursing care of an individual with altered body temperature

### Hyperthermia and fever

The first priority for an individual with hyperthermia is to assess their airway, breathing and circulation, and then

*Text continued on p. 410*

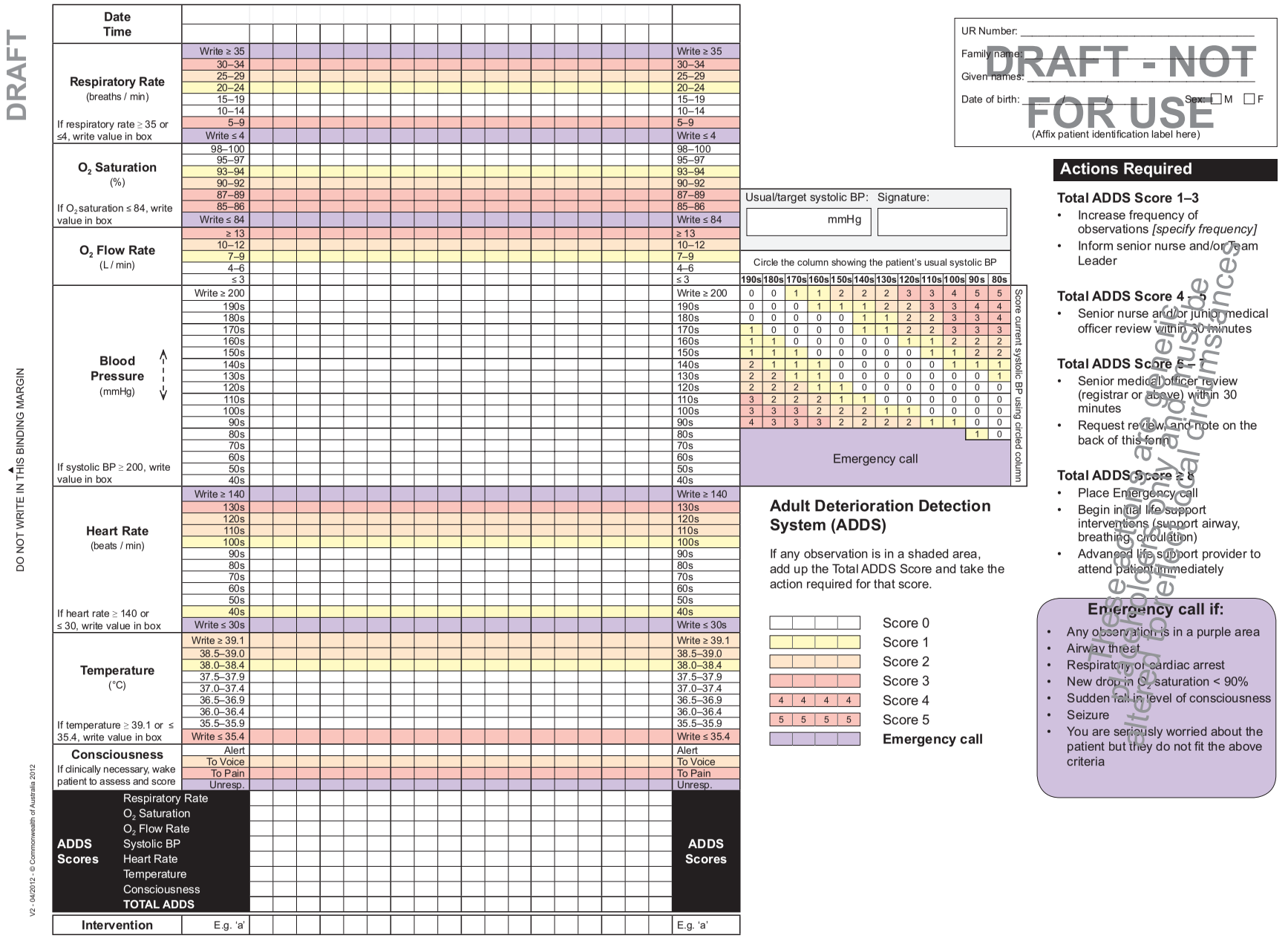


**Figure 20.5** Adult Deterioration Detection System (ADDS) chart with blood pressure table, draft version

*(Australian Commission on Safety and Quality in Health Care. **http://www.safetyandquality.gov.au/**)*

*Continued*

DRAFT

DO NOT WRITE IN THIS BINDING MARGIN

ADDS CHART WITH BP TABLE DRAFT

| <INSERT SITE LOGO><br><br>Adult Deterioration Detection System (ADDS) Chart | UR Number: _____<br>Family name: _____<br>Given names: _____<br>Date of birth: _____/_____/_____ Sex: ☐ M ☐ F<br>(Affix patient identification label here) |
|---|---|

## Other Observation Charts In Use

| | | |
|---|---|---|
| ☐ Alcohol Withdrawal | ☐ Insulin Infusion | ☐ Pain/Epidural/Patient Controlled Analgesia |
| ☐ Anticoagulant | ☐ Neurology | |
| ☐ Fluid Balance | ☐ Neurovascular | |

## General Instructions

» You must record appropriate observations:
- On admission
- At a frequency appropriate for the patient's clinical state.

» You must calculate a Total ADDS Score:
- If the patient is deteriorating or an observation is in a shaded area
- Whenever you are concerned about the patient.

» When graphing observations, place a dot (•) in the centre of the box which includes the current observation in its range of values and connect it to the previous dot with a straight line. For blood pressure, use the symbols indicated on the chart.

» Whenever an observation falls within a shaded area, you must enter the ADDS Score for that vital sign in the appropriate row of the ADDS Scores table, unless a modification has been made (see below).

## Modifications

- If abnormal observations are to be tolerated for the patient's clinical condition, write the acceptable ranges below (where the ADDS Score will be 0).
- Modifications must be reviewed at least every 72 hours.
- If **any** vital sign needs further modifying, draw two diagonal lines through the entire Modification record in use and write the new acceptable ranges in the next Modification record.

| | Modification 1 | Modification 2 | Modification 3 | Modification 4 |
|---|---|---|---|---|
| Respiratory Rate | - breaths / min | - breaths / min | - breaths / min | - breaths / min |
| $O_2$ Saturation | - % | - % | - % | - % |
| $O_2$ Flow Rate | - L / min | - L / min | - L / min | - L / min |
| Systolic BP | - mmHg | - mmHg | - mmHg | - mmHg |
| Heart Rate | - beats / min | - beats / min | - beats / min | - beats / min |
| Temperature | - °C | - °C | - °C | - °C |
| Consciousness | - | - | - | - |
| Doctor's name | | | | |
| Signature | | | | |
| Date | / / | / / | / / | / / |
| Time | : | : | : | : |

| DRAFT | UR Number: _____<br>Family name: _____<br>Given names: _____<br>Date of birth: _____/_____/_____ Sex: ☐ M ☐ F<br>(Affix patient identification label here) |
|---|---|

## Interventions Associated With Abnormal Vital Signs

If you administer an intervention, record here and note letter in Intervention row over page in appropriate time column.

| Reference Letter | Intervention (initial if required) |
|---|---|
| a | |
| b | |
| c | |
| d | |
| e | |
| f | |
| g | |
| h | |

## Clinical Review Requests

**Review requested** Date / / Time : ☐ Ward doctor ☐ Registrar ☐ Emergency

Specify reason:

**Review requested** Date / / Time : ☐ Ward doctor ☐ Registrar ☐ Emergency

Specify reason:

**Review requested** Date / / Time : ☐ Ward doctor ☐ Registrar ☐ Emergency

Specify reason:

## Additional Observations

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | | | | | | | | | | | | | | | | | | | | |
| **Time** | | | | | | | | | | | | | | | | | | | | |
| **Blood Glucose Level** (mmol / L) | | | | | | | | | | | | | | | | | | | | |
| **Weight** (kg) | | | | | | | | | | | | | | | | | | | | |
| **Bowels** | | | | | | | | | | | | | | | | | | | | |
| **Urinalysis** Specific gravity | | | | | | | | | | | | | | | | | | | | |
| pH | | | | | | | | | | | | | | | | | | | | |
| Leukocytes | | | | | | | | | | | | | | | | | | | | |
| Blood | | | | | | | | | | | | | | | | | | | | |
| Nitrite | | | | | | | | | | | | | | | | | | | | |
| Ketones | | | | | | | | | | | | | | | | | | | | |
| Bilirubin | | | | | | | | | | | | | | | | | | | | |
| Urobilinogen | | | | | | | | | | | | | | | | | | | | |
| Protein | | | | | | | | | | | | | | | | | | | | |
| Glucose | | | | | | | | | | | | | | | | | | | | |

**Figure 20.5** Cont'd

## CLINICAL SKILL 20.1 Assessing body temperature

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Appropriate thermometer<br>Disposable probe cover or sleeve<br>Pen (blue/black) and observation chart |

| **Skill activity** | **Rationale** |
|---|---|
| **Before assessing body temperature** | |
| Assess the individual for temperature alterations and anything that may interfere with the accuracy of temperature measurement<br>Wait 15–20 minutes if the individual has smoked or ingested hot or cold foods or fluids | Physical signs and symptoms of temperature alterations may be present such as the individual being flushed or shivering<br>If using an oral thermometer, intake of some foods can cause inaccurate readings<br>If using a tympanic thermometer, hearing aids can increase temperature readings |
| Determine appropriate temperature site and temperature device for the individual | Different individuals will have different requirements due to their health conditions |
| **Assessing body temperature with a tympanic membrane electronic thermometer** | |
| Assist the individual in assuming a comfortable position, with head turned away from the nurse | Ensures comfort and exposes auditory canal for accurate temperature measurement. Ensures individual safety and comfort |
| Observe for ear wax (cerumen) in individual's ear canal | Lens cover of speculum must not be impeded by earwax (will not obtain an accurate measurement). Switch to other ear or select an alternative measurement site |
| Remove thermometer from charging base and slide disposable speculum cover over otoscope-like tip until it locks into place, being careful not to touch lens cover | Base provides battery power. Soft plastic probe cover prevents transmission of microorganisms |
| If holding handheld unit with right hand, obtain temperature from individual's right ear; left-handed persons should obtain temperature from individual's left ear | The less acute the angle of approach the better the probe will seal inside the auditory canal |
| Insert speculum into ear canal, following manufacturer's instructions for tympanic probe positioning. Pull pinna backwards, up and out for an adult, move thermometer in a figure-eight pattern, fit probe snugly in canal and do not move, point towards the nose | Correct positioning of probe will ensure accurate readings as there will be maximum exposure of the tympanic membrane |
| As soon as probe is in place, depress scan button. Leave thermometer probe in place until an audible signal is given and individual's temperature appears on the digital display | Depression of scan button causes infrared energy to be detected. Otoscope tip must stay in situ until signal occurs to ensure accurate measurement |
| Carefully remove speculum from auditory meatus. Push ejection button on unit to discard plastic probe cover into an appropriate receptacle | Reduces transmission of microorganisms |
| Return handheld unit to charging base | Protects sensor tip from damage and keeps unit charged ready for next use |

*Continued*

| CLINICAL SKILL 20.1 Assessing body temperature—cont'd | |
|---|---|
| Assist individual in reassuming a comfortable position | Restores comfort and sense of wellbeing |
| Perform hand hygiene | Reduces risk of transmission of microorganisms |
| Discuss findings with individual as needed | Promotes participation in care and understanding of health status |
| If this is the first time temperature has been measured, if in normal range establish as baseline | Used to compare future readings |
| If this is not the first time, compare with baseline and acceptable temperature range for individual's age group | Normal body temperature fluctuates within normal range, comparison of readings can reveal presence of abnormality |
| Record the time and temperature on the vital signs chart. Record measurements in the progress notes if the temperature was elevated and report abnormal findings to the relevant Registered Nurse or medical officer | Verifies that temperature was taken and makes measurement data available |
| **Measurement of body temperature with electronic thermometer** | |
| **Oral temperature** | |
| Remove thermometer from charging unit. Slide disposable plastic probe cover over thermometer probe until cover locks in place | Charging provides battery power. Soft plastic cover prevents transmission of microorganisms |
| Ask the individual to open their mouth then gently place thermometer probe under the tongue in posterior sublingual pocket lateral to centre of jaw | Heat from superficial blood vessels in sublingual pocket produces temperature reading |
| Ask individual to hold thermometer probe with lips closed | Maintains proper position of thermometer during recording |
| Leave thermometer probe in place until audible signal occurs and individual's temperature appears on digital display | To ensure accurate reading, probe must stay in place until signal occurs |
| Remove thermometer probe from under individual's tongue, push ejection button and discard plastic probe cover into an appropriate receptacle | Reduces risk of transmission of microorganisms |
| Return thermometer to storage position of thermometer unit and return to charger | Maintains battery charge |
| Discuss findings with individual as needed | Promotes participation in care and understanding of health status |
| If this is the first time temperature has been measured, if in normal range establish as baseline | Used to compare future readings |
| If this is not the first time, compare with baseline and acceptable temperature range for individual's age group | Normal body temperature fluctuates within normal range, comparison of readings can reveal presence of abnormality |
| Record the time and temperature on the vital signs chart. Record measurements in the progress notes if the temperature was elevated and report abnormal findings to the relevant Registered Nurse or medical officer | Verifies that temperature was taken and makes measurement data available |

## CLINICAL SKILL 20.1 Assessing body temperature—cont'd

| | |
|---|---|
| **Measurement of axillary temperature** | |
| Draw curtain around bed and/or close door | Provides privacy |
| Position individual either lying supine or sitting and move clothing away from shoulder and arm | Provides easy access to axilla and exposes area for correct thermometer probe placement |
| Remove thermometer from charging unit. Slide disposable plastic probe cover over thermometer probe until cover locks in place | Charging provides battery power. Soft plastic cover prevents transmission of microorganisms |
| Raise individual's arm away from torso and make sure the axilla is dry | Moisture may interfere with accurate reading and give a false low reading |
| Place thermometer into centre of axilla, lower arm over probe and place arm across individual's chest | Maintains position of thermometer against blood vessels in axilla |
| Hold thermometer in place until audible signal occurs and individual's temperature appears on digital display; remove probe from axilla | Ensures an accurate reading |
| Push ejection button on thermometer probe stem to discard plastic probe cover into an appropriate receptacle | Reduces risk of transmission of microorganisms |
| Return thermometer to storage position of thermometer unit and return to charger | Maintains battery charge |
| Assist individual to assume a comfortable position | Restores comfort and promotes privacy |
| Discuss findings with individual as needed | Promotes participation in care and understanding of health status |
| If this is the first time temperature has been measured, if in normal range establish as baseline | Used to compare future readings |
| If this is not the first time, compare with baseline and acceptable temperature range for individual's age group | Normal body temperature fluctuates within normal range, comparison of readings can reveal presence of abnormality |
| Record the time and temperature on the vital signs chart. Record measurements in the progress notes if the temperature was elevated and report abnormal findings to the relevant Registered Nurse or medical officer | Verifies that temperature was taken and makes measurement data available |
| **Measuring temporal artery temperature** | |
| Ensure the forehead is dry | Moisture may interfere with accurate readings |
| Place sensor flush on individual's forehead | Ensures accurate measurement |
| Press red scan button with your thumb. Then slowly slide the thermometer straight across the forehead while keeping the sensor flush with the skin | Scanning for the highest temperature continues until you release the scan button |
| Keeping the scan button pressed, lift the sensor from the forehead and touch the sensor to the skin on the neck just below the earlobe. Peak temperature occurs when the clicking sound during scanning stops. Then release scan button | Sensor confirms highest temperature behind the ear lobe |
| Clean sensor | Prevents transmission of microorganisms |
| Assist individual to assume a comfortable position | Restores comfort and promotes privacy |

*Continued*

| CLINICAL SKILL 20.1 Assessing body temperature—cont'd | |
|---|---|
| Discuss findings with individual as needed | Promotes participation in care and understanding of health status |
| Perform hand hygiene | Reduces risk of transmission of microorganisms |
| If this is the first time temperature has been measured, if in normal range establish as baseline | Used to compare future readings |
| If this is not the first time, compare with baseline and acceptable temperature range for individual's age group | Normal body temperature fluctuates within normal range, comparison of readings can reveal presence of abnormality |
| Record the time and temperature on the vital signs chart. Record measurements in the progress notes if the temperature was elevated and report abnormal findings to the relevant Registered Nurse or medical officer | Verifies that temperature was taken and makes measurement data available |
| Note:<br>• In an infant or young child it may be necessary to hold the arm against the child's side when using axillary method. If infant is in a side-lying position, the lower axilla will record the higher temperature.<br>• Do not use axilla if skin lesions are present because local temperature may be altered and area may be painful to touch. | |
| *(Crisp et al 2013; Perry et al 2012; Rebeiro et al 2012; Tollefson et al 2012)* | |

investigate why they have this condition (Vijay 2014). The nurse should ask the following questions:

- Have I accurately checked this temperature? Did the person recently have a hot drink?
- Can I check this with another device to reduce user or device errors?
- Why is the individual febrile?
- What other clinical information such as tachycardia adds to the clinical picture of the individual?
- Who should I inform of this clinical change in the individual's assessment—the nurse in charge or the medical officer?

These questions need to be answered prior to any care aimed at reducing the temperature, as the medical officer may want to obtain blood cultures while the individual is febrile to identify any microorganisms causing an infection in the individual. Giving medications to reduce an individual's fever prior to obtaining blood cultures can affect the results (Clinical Excellence Commission 2012). The most important question to always ask is 'Why, and what other pieces of assessment data add to the clinical picture?' Is the individual febrile, tachycardic, with burning sensation on urination, or is the individual febrile, tachycardic, tachypnoeic with a productive cough? When coupled with other assessment data the potential reasons the individual is febrile can be identified and treated.

Once the need for collection of blood cultures is assessed or potential reasons for hyperthermia are identified the nurse should focus on the following areas and nursing actions:

- Reducing body temperature to an acceptable range through administration of prescribed medication such as antipyretics and antibiotics. This is very important as it will reduce the individual's metabolic demands and oxygen consumption. The person's vital signs should be measured 30 minutes after completion
- Sponging the individual with tepid water
- Relieving any associated discomfort through regular mouth care and ensuring the individual's bed linen is clean and dry
- Encouraging rest to decrease the production of body heat
- Continually checking the individual's skin colour, temperature and general condition to assess the effectiveness of nursing interventions
- Monitoring renal function and maintaining nutritional and fluid status through providing adequate fluids, which are necessary to prevent dehydration. The individual should be encouraged to drink large amounts of cool or iced fluids. If the person is unable to tolerate fluids orally, intravenous administration of fluids may be necessary. The input and output of all fluids should be closely monitored and the person observed for any signs of dehydration (Vijay 2014).

Information on the signs and symptoms of dehydration is provided in Chapter 26.

A rigor sometimes occurs in response to the physiological processes associated with hyperthermia. The nurse should assess the individual's condition throughout the three typical stages of a rigor, and implement the nursing actions necessary to promote individual comfort:

- Stage 1: As the body temperature begins to rise the individual feels cold and may shiver violently. Comfort should be promoted by keeping the individual warm but avoiding overheating. The intake of fluids should be encouraged

- Stage 2: The temperature rises to approximately 40°C and the individual feels very hot and uncomfortable. Minimal clothing and bed linen should be used and other actions to reduce the body temperature should be implemented; for example, encouraging the individual to drink large amounts of cool fluid
- Stage 3: Profuse sweating occurs and as a result body temperature begins to fall. Actions to reduce temperature should be stopped and any damp clothing or bed linen should be changed to maintain a dry environment. The individual should be encouraged to rest quietly in an attempt to reduce the production of body heat.

### Hypothermia

Hypothermia can occur due to physiological factors such as an impaired hypothalamus and inadequate heat production to counteract heat loss. Hypothermia can occur from other factors such as excessive heat loss. The first priority of any changes to an individual's temperature is to assess their airway, breathing and circulation, as this is compromised during moderate to severe hypothermia, then the cause must be investigated (Kunde 2014). See the section above on hyperthermia for questions to ask prior to treatment of any alteration in temperature.

The aims and nursing actions of caring for an individual with hypothermia include:

- Restoring body temperature to an acceptable range through passive warming, such as additional blankets or a space blanket, or active warming, increasing the ambient temperature or applying forced-air blanket systems (Kunde 2014). Rewarming needs to occur slowly to avoid haemodynamic changes and possible shock (Scaravilli et al 2012).
- Relieving any discomfort associated with hypothermia
- Encouraging mobilisation to increase the production of body heat if the individual is able to stand
- Maintaining nutritional and fluid status through encouragement of warm food or fluid that is high in carbohydrate to aid heat production.
- Continually checking the individual's vital signs and general condition to assess the effectiveness of nursing interventions.

#### CRITICAL THINKING EXERCISE 20.1

1. What is the most appropriate temperature measurement site for a child?
2. What are some other physiological observations that would change if an individual is febrile and why?
3. A colleague suggests that oral thermometers are the only accurate measurement of temperature. How would you respond to this statement?
4. Mr Sam Neugen, a 65-year-old retiree, has been admitted to a medical–surgical ward. Sam is febrile at 38°C with a suspected chest infection. He has non-significant past medical history. Sam is thirsty, tired and short of breath. Identify two nursing diagnoses and at least four interventions for each diagnosis while caring for Sam as an individual.

## PULSE

With each contraction of the heart the increased volume of blood pushed into the arteries can be palpated at certain points on the body (Elliott & Coventry 2012). Measuring the pulse or heart rate, which is one of the measurable characteristics of the pulse, gives the nurse vital information about the health of an individual. The pulse can be affected by a variety of factors including age, medical conditions, medications and fluid status.

As described in Chapter 25, the cardiovascular system transports essential substances to the tissue cells, and waste substances from the tissue cells to various organs for excretion. An adequate supply of blood is necessary for the cells to function effectively, and any disruption to the blood supply may have serious consequences. An adequate flow of blood throughout the body is dependent on the ability of the heart to pump, the ability of the blood vessels to transport the blood and the quantity and quality of the blood.

The most important factor responsible for the transport of substances to the tissues is cardiac output, which is the volume of blood pumped by the heart during each minute. It is the product of the volume of blood pumped at each beat (stroke volume) and the number of beats during one minute (heart rate). A healthy heart in a healthy adult ejects 5–6 litres of blood per minute (Marik 2013). This amount can be increased by an increase in either heart rate and/or stroke volume and can also vary with:

- Body size, as cardiac output increases in proportion to the surface area of the body
- Age, as with increasing age the cardiac output decreases
- Posture, as cardiac output is greater when a person is standing
- Exercise, as the greater the degree of physical activity the greater the cardiac output needs to be. Strenuous physical activity can result in an increased heart rate and a cardiac output of 30 L/min
- A sudden increase in total blood volume; for example, the infusion of fluid intravenously
- Certain disease states—cardiac output is increased in conditions such as pulmonary disease and anaemia, and is decreased in conditions such as shock or myocardial infarction.

The rate at which the heart beats is controlled by the conducting system of the heart and the autonomic nervous system. The sinoatrial node initiates impulses that spread throughout the conducting system and to all areas of the cardiac muscle, resulting in atrial then ventricular contraction. Stimulation of the parasympathetic nerve fibres, primarily the vagus nerves, reduces the heart rate, while stimulation

of the sympathetic nerve fibres increases the heart rate. Various chemicals and ions can also affect heart activity; for example, adrenaline inhibits the parasympathetic nerves, resulting in increased heart rate. An excess of potassium ions in the blood decreases the ability of the heart to contract. Heart, and therefore pulse, rate varies according to age, gender, body build, level of physical activity and emotions.

## Assessing the pulse

Cardiovascular function is assessed by monitoring the pulse and blood pressure as well as observing the general appearance of the individual and detecting the signs and symptoms of dysfunction, such as cyanosis, pallor, cool skin temperature, oedema and dyspnoea. The frequency with which the pulse and blood pressure are assessed depends on the person's condition and how closely it needs to be monitored. Residents in long-term care facilities will generally require pulse and blood pressure measurement infrequently, whereas people who are acutely ill may have continuous monitoring or measurements performed at intervals ranging from every 30 minutes to six times a day.

Assessment of the pulse characteristics, which includes strength, equality and regularity, provides significant information about a person's cardiac function and peripheral perfusion (Elliott & Coventry 2012). The waves of blood that cause pulsation through the arteries can be felt when a superficial artery is partially compressed by the fingers, and is most easily felt over a large artery that lies close to the skin and crosses over a bone or firm tissue (see Clinical Skill 20.2).

## Pulse sites

The pulse sites (Figure 20.6) where the pulse may be palpated are:

- Temporal: the temporal artery is palpated immediately in front of the ear
- Carotid: the carotid artery is palpated at the front of the neck, to the side of the thyroid cartilage
- Apical: the apical pulse is the beat heard at the apex of the heart, and is assessed using a stethoscope. The stethoscope is placed over the apex of the heart, in the left centre of the chest just below nipple level
- Brachial: the brachial artery is palpated in the antecubital fossa at the elbow joint
- Radial: the radial artery is palpated in the wrist just above the thumb
- Femoral: the femoral artery is palpated in the inguinal area
- Popliteal: the popliteal artery is palpated at the back of the knee (Figure 20.7)
- Posterior tibial: the posterior tibial artery is palpated just behind the medial malleolus of the ankle (Figure 20.8)
- Pedal: the dorsalis pedis artery is palpated on the anterior surface of the foot (Figure 20.9).

The radial artery is the most commonly used site, as it is conveniently located and readily accessible (Figure 20.10). The femoral or carotid sites may be used if it is difficult to palpate the radial artery easily; for example, the individual has poor peripheral perfusion. The remaining sites are used when there are specific indications for assessing the flow of blood through a particular artery; for example, the popliteal and pedal pulses are assessed after certain types of surgery to the leg.

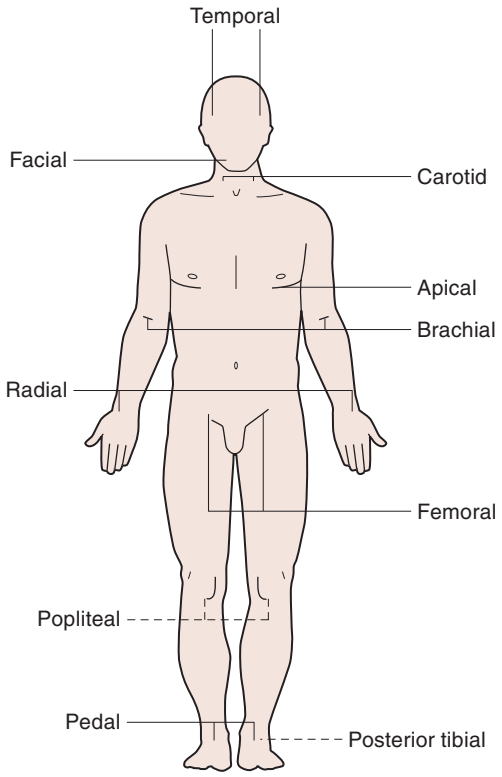


**Figure 20.6** Location of the pulse sites

**Figure 20.7** Measuring the popliteal pulse

*(Potter & Perry et al 2013)*

## CLINICAL SKILL 20.2 Assessing pulse (radial)

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Watch<br>Pen (blue/black)<br>Observation chart |

| **Skill activity** | **Rationale** |
|---|---|
| Check individual's previous baseline resting pulse rate | It is important to know the individual's usual pulse rate to compare changes with that measurement |
| The radial pulse is normally assessed unless indicated. If individual is supine, place individual's forearm straight alongside or across lower chest or upper abdomen with wrist extended straight. If sitting, bend individual's elbow 90 degrees and support lower arm on chair or on nurse's arm. If not using the radial pulse, position individual so appropriate peripheral pulse point is accessible | Relaxed position of lower arm permits full exposure of artery to palpation |
| Place the index and middle fingers over the site and press gently until pulsation can be felt. Obliterate pulse initially and then relax pressure so pulse becomes easily palpable. Slightly extend the wrist with palm down until you note the strongest pulse | The assessor's thumb is not used, as it has a strong pulse and may be felt instead of the individual's pulse. Pressure that is too light will fail to detect the pulse, and firm pressure may obliterate the pulse |
| Determine the strength of the pulse, noting whether it is bounding, strong, weak or thready | Strength reflects volume of blood ejected against arterial wall with each heart contraction. Accurate description of strength improves communication among nurses and other healthcare professionals |
| Using a watch with a second hand, count the pulse for 1 minute. While the rate is being counted, the rhythm and volume are also assessed. If pulse is regular count rate for 30 seconds and multiply total by 2. If pulse is irregular, count rate for 60 seconds. Assess frequency and pattern of irregularity and compare radial pulses bilaterally | Allows sufficient time to detect the rate and any abnormalities. It requires 30 seconds to determine if the pulse is regular in rhythm. Inefficient contraction of heart fails to transmit pulse wave, interfering with cardiac output, resulting in irregular pulse. Longer time period ensures more accurate count. A marked difference between radial pulses may indicate arterial flow is compromised in one extremity and action should be taken immediately |
| When pulse is irregular, compare radial pulses bilaterally | A marked inequality indicates compromised arterial flow to one extremity and you need to take action |
| Assist individual to assume a comfortable position | Restores comfort and promotes privacy |
| Discuss findings with individual as needed | Promotes participation in care and understanding of health status |
| Document the time of assessment and the rate and characteristics of the pulse. Record the pulse measurement | A record provides information about the individual's condition |
| Any abnormalities must be reported immediately, as an apical measurement may be indicated | An apical measurement provides a more accurate assessment of the pulse |

**Note:** If pulse is irregular, assess for a pulse deficit. Count apical pulse while colleague counts radial pulse. Begin apical pulse, initiating counting by a signal to simultaneously assess pulses for a full minute. If pulse count differs by more than 2 beats per minute, a pulse deficit exists, which may indicate alteration in cardiac output.

*(Crisp et al 2013; Perry et al 2012; Tollefson et al 2012)*\

**Figure 20.8** Measuring the posterior tibial pulse
*(R. Gilder 2015)*

**Figure 20.9** Measuring the pedal pulse
*(R. Gilder 2015)*

The apical pulse is assessed when a more accurate estimation of heart rate or regularity is required, or when there is any doubt about the rate or regularity of a peripheral pulse (Figure 20.11). It is routinely used for infants and children up to 3 years of age. Apical–radial pulse assessment may be indicated for an individual with certain cardiovascular disorders. This assessment requires two healthcare workers as one person palpates and assesses the radial pulse while a second person assesses the apical pulse at the same time—the apical and radial rates should be identical. Some heartbeats that can be detected at the apex are not strong enough to be palpated at peripheral sites. Any difference between the two measurements is called the pulse deficit, and should be reported immediately.

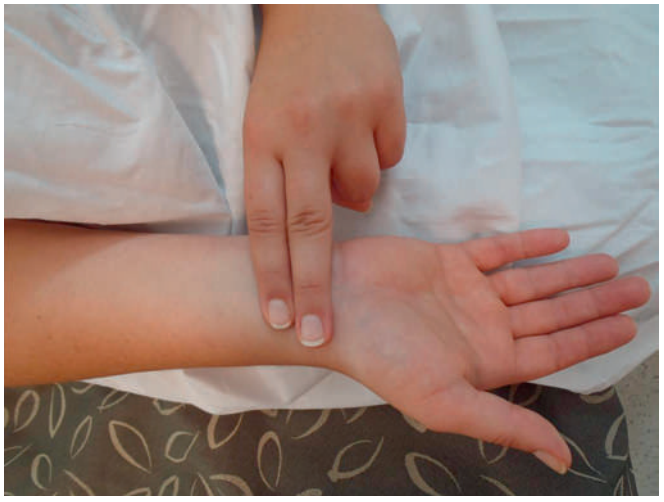

**Figure 20.10** Measuring the radial pulse
*(R. Gilder 2015)*

**Figure 20.11** Counting the apical pulse
*(© Elsevier Australia)*

## Character of the pulse

The pulse is assessed for rate, regularity and strength:

- *Rate*: the pulse rate is the number of beats per minute, and the acceptable rate varies according to age: 120–140 beats/min for an infant, 90–120 beats/min for a child, 60–100 beats/min for an adult. It should be noted that athletes and other physically fit individuals commonly have a pulse rate below 60 beats/min. A large proportion of elderly people also have a pulse rate below 60 beats/min

## CLINICAL INTEREST BOX 20.3
## The pulse in older adults

It is often difficult to palpate the pulse of an older adult or obese individual. A stethoscope provides a more accurate reading.

Once elevated, the pulse rate of an older adult takes longer to return to a normal resting rate.

- *Regularity*: a normal pulse has a regular rhythm, with the same intervals between each beat
- *Strength*: an acceptable pulse is strong and easily palpated.

## Factors affecting pulse characteristics

The pulse characteristics can vary according to age (see Clinical Interest Box 20.3), sex, body build, level of physical activity, fever, medications, haemorrhage, position changes, pregnancy, stress and emotions. The pulse may also be affected during various disease states, which result in alterations to its character.

### Rate

An increase in the pulse rate above 100 beats/min is called **tachycardia** and may result from fear, anxiety, excitement, anger or pain. Tachycardia may also occur in conditions such as haemorrhage, shock, fever, thyrotoxicosis or congestive cardiac failure. A decrease in the pulse rate below 60 beats/min is called **bradycardia** and may occur during absolute relaxation or sleep. Bradycardia may also occur in conditions such as cerebral haemorrhage, heart block, myxoedema or drug toxicity, such as with digitalis.

### Regularity

An irregular rhythm, when the intervals between each beat vary, is called arrhythmia, or dysrhythmia, and may occur in conditions such as electrolyte imbalance or cardiac tissue damage. Examples of irregular rhythm include:

- Ectopic beats, which are premature heartbeats and may be occasional or frequent
- Coupled beats (or bigeminal pulse), in which two beats in close succession are followed by a pause during which no pulse is felt
- Atrial fibrillation, in which fibrillation of the atria results in random ventricular contractions and, consequently, an irregular pulse.

### Strength

An increased strength, when the pulse is referred to as being full and bounding, can result from strenuous physical exercise or strong emotions. An increased strength can also occur in conditions such as hypertension, thyrotoxicosis or aortic valve incompetence. A decreased strength, when the pulse is referred to as being weak and thready, can occur in conditions such as haemorrhage, shock, acute myocardial infarction or cardiac failure. When the pulse is so weak that it cannot be palpated it is referred to as being imperceptible.

When assessing the pulse, any deviations from an individual's acceptable range should be reported immediately and documented. Pulse measurements are recorded and graphed on an Adult Deterioration Detection System chart (see Figure 20.5) which allows healthcare workers to see changes and trends in an individual's measurements.

## Alterations in pulse rate

For an individual with an altered pulse rate, the priority should be ensuring a full vital sign assessment has been completed and documented to ensure that acute deterioration is identified and managed appropriately (Clarke 2014). The nurse should ask the following questions:

- Have I completed the assessment accurately?
- Is this normal for this individual?
- What other clinical information is consistent with an altered pulse rate?
- Do I need to inform the appropriate person of alterations in the individual's condition?

As healthcare becomes more complicated due to individuals with co-morbidities, it is essential that nurses use the decision-making framework and their clinical judgment to ensure a positive outcome for the individual (Purling & King 2012).

Review Case Study 20.1 and apply the above information when answering the questions.

## CRITICAL THINKING EXERCISE 20.2

1. Rita Ryan has been allocated into your care and you conduct a vital sign assessment. The pulse you palpate is irregular and fast at 150 beats per minute. Using Figure 20.5, identify what action you would take next while caring for Rita.
2. Rita asks you what an irregular pulse means. How would you answer her question?
3. A medical officer asks you to palpate bilateral popliteal pulses and document the results. Where do you place your fingers?
4. What are the possible reasons for requesting bilateral pulses be palpated and documented?

# RESPIRATION

Oxygen, a colourless and odourless gas, makes up about 20% of the atmosphere, and is essential for sustaining most forms of life. The respiratory system gives the body the ability to absorb oxygen and excrete waste products, such as carbon dioxide. The capillary alveoli membrane in the lungs allows the exchange of oxygen from the atmosphere to the bloodstream and carbon dioxide to be diffused out. (Further information about the structure and function of the respiratory system is provided in Chapter 25.)

The cardiovascular system and the respiratory system work together to bring about **respiration**, the exchange of

## CASE STUDY 20.1

George Callahan, a 65-year-old male, is admitted to the cardiac ward with atrial fibrillation. This is a new presentation and George has never been admitted to hospital before. George's wife has many questions about what atrial fibrillation is and how it will affect his life. George wants to know why he finds it difficult to breathe when he is walking.

Past history: hypertension, high cholesterol
Allergies: none known
Observations:

- Pulse: 110 beats per minute and irregular
- Blood pressure: 100/55 mmHg
- Temperature: 36.8°C
- Respiratory rate: 14 breaths per minute
- Oxygen saturation: 96% on room air

1. Which observations are abnormal?
2. Why is George's pulse irregular?
3 What advice would you give to George's family about his admission?
4. Why does George become short of breath on exertion?

oxygen and carbon dioxide. **External respiration** is the exchange of oxygen and carbon dioxide between the external environment and the blood by the process of diffusion in the lungs. **Internal respiration** is the exchange of oxygen and carbon dioxide between the blood and the body tissues by the process of diffusion between the capillaries and the cell membrane (Klocke 2014).

The passage of oxygen from the atmosphere to the alveoli in the lungs and the passage of carbon dioxide from the alveoli to the atmosphere require:

- An unobstructed airway
- Adequate oxygen in the atmosphere
- A functioning respiratory tract
- Functioning thoracic muscles and nerves to control the thoracic cage
- Blood to transport the gases
- Capillaries in close proximity to the cells to allow the exchange of gases (Klocke 2014).

## Regulation of breathing and respiration

The automatic control of breathing stems from the respiratory centres located in the brainstem. From these sites, neural networks send impulses along the spinal cord to the nerves that control the diaphragm and intercostal muscles. Reflex responses and chemical signals control these nerve centres and thus the rate of breathing. During actions such as speaking and swallowing, impulses from the throat are conveyed to the respiratory centre and breathing stops temporarily. The chemical control of breathing mainly depends on the level of carbon dioxide in the blood, which is detected by chemoreceptors. The presence of excess carbon dioxide causes the respiratory rate to increase until the excess carbon dioxide is eliminated. Conversely, a decreased carbon dioxide level slows the respiratory rate (Klocke 2014).

## Factors affecting respiratory function

Factors that affect the process of respiration include:

- *Availability of oxygen*. Oxygen makes up 20% of the air and normally this is sufficient to meet the needs of the body, but a decrease in this amount of oxygen can cause problems. Two instances where the available oxygen may be deficient are:
  1. High altitude. The total pressure of all gases, including oxygen, in the air decreases at high altitude. Therefore, people experience difficulty in obtaining adequate oxygen until they become acclimatised. As a result, the respiratory rate is increased in an attempt to supply the body with sufficient oxygen
  2. The presence of noxious gases. Noxious gases in the air displace the oxygen and reduce the amount normally available for inspiration (Klocke 2014).
- *Regulating mechanisms*. Any factor that interferes with the control mechanisms in the respiratory centre of the brain may cause respiratory difficulties; for example, cerebral oedema or medications such as morphine. Respirations increase when the pH of the blood is lowered, as a respiratory response to rid the body of the excess acid.
- *Passage of oxygen and carbon dioxide*. The efficiency of respiration can be affected by any factor that obstructs the patency of the respiratory tract or the actions of the respiratory muscles; for example, an accumulation of secretions resulting from a reduced cough reflex. Respirations may be reduced by factors that affect the actions of the respiratory muscles; for example, injury or disease that restricts the movements of the diaphragm (Klocke 2014).
- *Diffusion of oxygen and carbon dioxide*. Any dysfunction of the lungs (e.g. pulmonary oedema, asthma or chronic obstructive airways disease) may impede the transfer of oxygen and carbon dioxide (Klocke 2014). (Information on these and other respiratory disorders is provided in Chapter 25.)
- *Transport of oxygen and carbon dioxide to and from the cells*. Any condition affecting the efficiency of the heart, the blood vessels or the blood can interfere with the transportation of oxygen to the cells and carbon dioxide away from the cells. Such conditions include congestive cardiac failure, atherosclerosis and anaemia. (Information on these and other cardiovascular disorders is provided in Chapter 25.)
- *Influences on the rate, depth and rhythm of breathing*. Several factors influence the characteristics of breathing; for example, the degree of physical activity. Oxygen requirements are greatest during exertion and least during sleep. The respiratory rate and depth vary in response to the body's demand for oxygen; for example, during strenuous exercise the volume of air drawn into

## CLINICAL INTEREST BOX 20.4
## Respiration in older adults

- Ageing causes ossification of costal cartilage and downward slanting of ribs, resulting in a more rigid rib cage, which reduces chest wall expansion
- Depth of respirations tends to decrease with ageing

*(Cooper & Gosnell 2015)*

the lungs with each breath may be increased from the usual 500 mL to as much as 4000 mL. Changes in mood or emotion may also affect the rate, depth and rhythm of ventilation; for example, the respiration rate is commonly increased during anxiety, pain or anger. Smoking also affects breathing and often causes short-term effects such as coughing and shortness of breath, or long-term effects such as severe dyspnoea, resulting from emphysema.

See Clinical Interest Box 20.4 for the effects of ageing on respirations.

## Assessing respirations

An individual's respiratory status is the first observation that will indicate a deterioration in a person's condition and predict a serious adverse event, such as cardiac arrest (Philip et al 2013). Assessment is not only to ascertain whether the individual is receiving an adequate supply of oxygen to meet their body's needs, but aids in evaluating airway patency, the status of the respiratory muscles and the individual's metabolic state (Elliott & Coventry 2012). Assessment is made by observing the individual for signs and symptoms of an inadequate oxygen supply, assessing their respirations and identifying any deviations from normal. The frequency with which respirations are subsequently assessed depends on how closely the individual's condition needs to be monitored. Residents in long-term care facilities commonly have their respirations assessed less often than acutely ill individuals, whose condition may need to be monitored continuously.

Respirations are assessed without the individual's knowledge by noting the rise and fall of the chest. If a person is aware that their respirations are being assessed they may become conscious of them and may unintentionally change their character. The nurse may assess the respirations by observing the person or by placing a hand on the individual's chest to feel the rise and fall. To avoid making the individual aware that their respirations are being assessed, the nurse may place fingers on the person's radial pulse site and continue as if counting the pulse (Elliott & Coventry 2012). (See Clinical Skill 20.3.)

Respirations are assessed for rate, rhythm, depth and sound:

- *Rate*. The respiratory rate is the number of respirations per minute. One inhalation and one exhalation equal one respiration (Figure 20.12). The rate of respiration varies according to age, level of activity and emotions. The normal respiratory rates according to age are about 20–40 breaths per minute for a 1-year-old, 20–30 in a 3-year-old, 16–22 in a 6-year-old and 12–20 in an adult (Kinney 2014; Van Kuiken & Huth 2013)
- *Rhythm*. The rhythm of respiration is the pattern or regularity of breathing. Normal respirations are evenly spaced, with little variation from one breath to another
- *Depth*. Depth of respirations depends on the volume of air being inhaled and exhaled with each respiration. The depth should be constant with each breath and is assessed by observing the individual's chest movement for adequate expansion. Respirations are described as being normal, shallow or deep
- *Sound*. Normal respirations are inaudible (Klocke 2014).

**Figure 20.12** Measuring respirations

*(© Elsevier Australia)*

Assessing respiratory status and identifying any actual or potential problems are assisted by obtaining information from an individual regarding:

- Allergic reactions, such as coughing, sneezing or shortness of breath, that occur as a result of exposure to allergens such as dust, pet hairs or pollen
- Exposure to environmental air pollutants such as chemical wastes
- Smoking habits
- Presence of a cough and/or the production of sputum
- Chest pain.

## CLINICAL SKILL 20.3 Assessment of respirations

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Watch<br>Pen (blue/black)<br>Observation chart |

| **Skill activity** | **Rationale** |
|---|---|
| Ensure that the individual is resting in a position of comfort, preferably sitting or lying with the head of the bed elevated 45–60 degrees | Exercise or discomfort alters the nature of respirations<br>Sitting erect promotes full ventilator movement |
| Check individual's previous baseline respirations | It is important to know the individual's usual respiration rate to compare with that measurement |
| Assess for signs and symptoms of respiratory alterations such as cyanotic appearance, restlessness, irritability, confusion, reduced level of consciousness, pain, difficulty breathing, production of sputum, presence of a cough | Physical signs and symptoms may indicate alterations in respiratory status related to ventilation |
| Place individual's arm (or your hand) in relaxed position across the abdomen or lower chest, directly over individual's upper abdomen | Individual's or nurse's hand rises and falls during the respiratory cycle, which makes it easier to count the respirations |
| Observe complete respiratory cycle (one inspiration and one expiration) | The nurse determines an accurate rate only after viewing the entire respiratory cycle |
| Using a watch with a second hand, without changing the position of your hand on the pulse and without the individual's knowledge, count the respirations for 1 minute | Maintaining the same position keeps individual from being aware that their respirations are being assessed. Inconspicuous assessment prevents individual from consciously or unintentionally altering rate and depth of breathing. The intervals between respirations may be inconsistent, and counting for a full minute enables an accurate measurement of rate |
| If rhythm is regular, count number of respirations in 30 seconds and multiply by 2. If rhythm is greater than 16 respirations per minute, count for a full minute | Respiratory rate is equivalent to number of respirations per minute. Suspected irregularities require assessment for at least 1 minute |
| While measuring the rate, also observe the rhythm (regular and irregular), depth (shallow, normal or deep) and sound of respirations | A complete assessment of respirations is necessary |
| Observe for evidence of dyspnoea (increased effort to inhale and exhale). Ask individual to describe subjective experience of shortness of breath compared with usual breathing pattern | Individuals with chronic lung disease may experience difficulty breathing all the time and can best describe their own discomfort from shortness of breath |
| Assist individual to assume a comfortable position | Restores comfort and promotes privacy |
| Discuss findings with individual as needed | Promotes participation in care and understanding of health status |
| Perform hand hygiene | Prevents risk of transmission of microorganisms |
| Document the time of measurement and the rate and character of the respirations on the appropriate chart using numbers or dots | A record of the respirations provides information about the individual's condition to members of the healthcare team |
| Report any deviations from usual acceptable ranges | Appropriate care may be planned and implemented |

**Note:** Occasional periods of apnoea are a symptom of underlying disease in the adult and must be reported to the medical officer or relevant Registered Nurse. Irregular respirations and short episodes of apnoea are normal in a newborn. Sighing is not an abnormality and should not be confused with an abnormal rhythm; it is one deep breath that opens up the small airways in the individual.

It is important to observe the skin colour for signs of cyanosis. **Cyanosis** is a bluish discolouration of the skin and mucous membranes due to inadequate oxygenation and can be either peripheral or central. Peripheral cyanosis is caused by local vasoconstriction and is usually visible only in the nail beds and sometimes the lips. Central cyanosis is the result of prolonged **hypoxia** (diminished availability of oxygen to the body tissues) and affects all body organs. It is most visible in highly vascular areas such as the lips, nail beds, tip of the nose, the external ear and the underside of the tongue. In people with naturally dark brown or black skin, cyanosis can be most readily detected by inspecting the mucosa inside the lips.

Hypoxia may result from disorders that limit the volume of air entering the lungs or from obstructive lung diseases such as asthma and emphysema. The signs and symptoms of hypoxia and respiratory distress include:

- Elevated blood pressure and pulse rate
- Shortness of breath and fatigue
- Cyanosis
- Abnormal ventilations
- Use of accessory muscles during breathing and flaring of the nares
- Retraction of the sternum and intercostal muscles
- Apprehension or agitation
- Confusion or reduced level of consciousness
- Visible perspiration.

A person who has a chronic respiratory disorder should also be observed for a barrel-shaped chest, which is a thoracic deformity commonly associated with chronic obstructive airways disease. When chronic hypoxia exists, a person experiences general fatigue and intolerance to exercise and may have clubbing of the fingers (Hill Bailey et al 2013).

## Alterations in respirations

Research suggests that alterations in respiratory rate can be an early sign that the individual is deteriorating. However, research studies have also found that some nurses believe that this observation is not completed as accurately as pulse or blood pressure measurements. It is imperative that accurate measurement of the respirations is done to ensure early signs of clinical deterioration are identified (Philip et al 2013). Many factors may cause alterations to the rate, rhythm, depth or sound of respirations and deviations from the acceptable range and pattern.

### Rate

An increase in the rate above the acceptable range is called **tachypnoea** and may occur as a result of physical exercise; states such as fear, pain, anxiety, excitement or anger; and disease states such as fever, infection, respiratory disorders, thyrotoxicosis and congestive cardiac failure. A decrease in the rate below the acceptable range is called **bradypnoea** and may occur as a result of absolute rest or sleep, trauma to the brain, uraemia, diabetic coma or medications that depress the respiratory centre, such as morphine.

### Rhythm

The normal regular pattern of breathing may be altered by a variety of disease states. In obstructive airways disease, such as asthma, chronic bronchitis or emphysema, there is a prolonged expiratory phase. In heart failure or increased intracranial pressure, **Cheyne–Stokes breathing** may occur. This is an abnormal pattern characterised by periods of apnoea. The cycle of Cheyne–Stokes breathing begins with slow shallow breaths that gradually increase in depth and rate. Breathing then gradually becomes slower and more shallow, culminating in a 10–60 second period without ventilation (apnoea), before the cycle is repeated.

### Depth

If a person inhales and exhales only small amounts of air, the respirations are described as shallow. *Hypoventilation* is the term used to describe a reduced rate and depth of ventilation, and may occur as a result of a decreased response of the respiratory centre to carbon dioxide, or in respiratory disorders such as bronchitis or atelectasis. Unresolved hypoventilation results in hypoxia and increased amounts of carbon dioxide in the blood.

When large amounts of air are inhaled and exhaled the respirations are described as deep. **Kussmaul's breathing** is the term used to describe abnormally deep, very rapid, sighing respirations. This pattern of breathing may occur as a result of disorders such as renal failure or metabolic acidosis.

**Dyspnoea** is the term used to describe shortness of breath or difficulty in breathing and may occur after strenuous exercise (temporarily) or as a result of certain respiratory or cardiac disorders. Dyspnoea is commonly accompanied by hypoventilation or *hyperventilation*, which is rapid deep breathing. Sustained hyperventilation, which is sometimes a consequence of extreme anxiety, causes loss of carbon dioxide and a decrease in carbonic acid concentration in the blood. This alters the acid–base balance causing respiratory alkalosis to occur.

Orthopnoea is the term used to describe the condition in which an individual must sit up or stand to breathe deeply or comfortably. This condition occurs in various respiratory or cardiac disorders, such as emphysema, pulmonary oedema and asthma.

Pursed-lip breathing is a technique commonly employed by people with severe dyspnoea or orthopnoea; for example, as a consequence of emphysema. This technique of breathing funnels expired air through a narrow opening, thus creating a positive back pressure on the airways to keep them open.

### Sound

Abnormal breath sounds can occur when air passes through narrowed airways or moisture, or when there is inflammation of the lungs or pleura.

*Stertorous breathing* is the term used to describe laboured respirations that have a snoring sound, which commonly result from an obstructed airway.

*Wheezing* results from narrowed airways, such as in asthma, and respirations sound high pitched and squeaking.

*Bubbling* refers to gurgling sounds heard as air passes through moist secretions in the respiratory tract.

*Crackles* refer to an abnormal non-musical sound heard on auscultation of the lungs during inspiration when air enters alveoli that contain serous secretions. It sounds like hair rubbed between the fingers next to the ear (Klocke 2014).

*Stridor* results from an obstruction or spasm in the trachea or larynx, as in laryngotracheobronchitis (croup), in which the respirations have a high-pitched musical sound, particularly on inspiration.

When the nurse is assessing an individual's breathing, any deviations from the acceptable range and sound should be reported immediately so that appropriate actions can be planned and implemented. Respiration rates are documented using dots on a chart similar to the one illustrated in Figure 20.5.

In certain circumstances an instrument called a spirometer is used to assess pulmonary function by measuring and recording the volume of inhaled and exhaled air.

### CRITICAL THINKING EXERCISE 20.3

1. Why are unequal bilateral breath sounds clinically significant?
2. A nursing colleague states that she only writes down 12 breaths per minute on an individual's chart when assessing respiratory rate. What does the research suggest about the accuracy of respiratory rate and its importance when detecting clinical deterioration?
3. When auscultating breath sounds what difference would you expect before and after ventolin administration?
4. Mr Lui was admitted to a medical ward with a respiratory infection. What would you expect Mr Lui's respiratory rate and oxygen saturations to be, and why?

## PULSE OXIMETRY—MEASURING OXYGEN SATURATION

Pulse oximetry is the non-invasive measurement of arterial blood **oxygen saturation**; that is, the extent to which haemoglobin is loaded with oxygen and is expressed as a percentage. For example, an $SpO_2$ reading indicates that 96% of the haemoglobin molecules are carrying oxygen molecules. A pulse oximeter is a probe with a light-emitting diode (LED) connected by cable to an oximeter. Light waves emitted by the LED are absorbed then reflected back by oxygenated and deoxygenated haemoglobin molecules. The reflected light is processed by the oximeter, which calculates pulse oxygen saturation ($SpO_2$) (Slade 2014).

$SpO_2$ is a reliable estimate of arterial oxygen saturation and is a simple painless measurement (Figure 20.13). The nurse should attach the non-invasive sensor to the individual's finger when possible; however, a toe, earlobe or bridge of nose can be used (Slade 2014). In addition, sensors for infants and children can be applied to the palm or the sole of the foot. Graphed trends over time provide the best information about the individual's oxygenation. The measurement can be affected by factors that affect light transmission, such as outside light sources or an individual's motion. Conditions that decrease arterial blood flow such as peripheral vascular disease, hypothermia, medications, hypotension or peripheral oedema affect accurate determination of $SpO_2$ (see Clinical Interest Boxes 20.5–20.7) (Slade 2014). Anaemia can also affect the accuracy of the oxygen saturation reading interpretation. An individual with anaemia may have oxygen saturations above 95%; however, as a result of less haemoglobin circulating the individual may still be hypoxic. It is

### CLINICAL INTEREST BOX 20.5 Pulse oximetry in older adults

Identifying an acceptable pulse oximeter probe site may be difficult with older adults because of the likelihood of peripheral vascular disease, decreased carbon dioxide level, cold-induced vasoconstriction and anaemia (Cooper & Gosnell 2015).

### CLINICAL INTEREST BOX 20.6 Factors affecting determination of pulse oxygen saturation

**Interference with light transmission**

- Outside light sources can interfere with the oximeter's ability to process reflected light
- Carbon monoxide (caused by smoke inhalation or poisoning) artificially elevates $SpO_2$ by absorbing light similar to oxygen
- Individual motion can interfere with the oximeter's ability to process reflected light
- Jaundice may interfere with the oximeter's ability to process reflected light
- Intravascular dyes (methylene blue) artificially lower saturation

**Reduction of arterial pulsations**

- Peripheral vascular disease (Raynaud's disease, atherosclerosis) can reduce pulse volume
- Hypothermia at assessment site decreases peripheral blood flow
- Pharmacological vasoconstrictors (adrenaline, phenylephrine, dopamine) will decrease peripheral pulse volume
- Low cardiac output and hypotension decrease blood flow to peripheral arteries
- Peripheral oedema can obscure arterial pulsation

*(Slade 2014)*

## CLINICAL INTEREST BOX 20.7 Inaccuracy in oxygen saturation readings

An individual was admitted to a medical–surgical ward following a right lower lobe lobectomy. The individual was still on oxygen 4 days after the surgery, the individual's respiratory rate was normal and the individual did not appear short of breath; however, he continually had low oxygen saturation readings on room air. A senior nurse was asked to review the individual. When the individual was reviewed the senior nurse noted the poor peripheral circulation. She used instead an ear probe as the colour to the individual's ear appeared pink. The saturation was 95% on room air. This example highlights the importance of knowing what can make the reading of oxygen saturation inaccurate.

essential that the reading is interpreted as part of the clinical picture of an individual (Slade 2014) (see Clinical Skill 20.4).

## BLOOD PRESSURE

Blood pressure is the force exerted by the blood on the walls of the blood vessels as the heart contracts and relaxes. The pressure that the blood exerts against arterial walls during contraction of the left ventricle is called the systolic pressure. Diastolic pressure is the arterial pressure during left ventricular relaxation, and is a measurement of the minimum pressure being exerted on the arterial walls (Elliott & Coventry 2012). Measuring blood pressure provides significant information about the individual's cardiovascular function. A series of blood pressure measurements may show the development of a trend and is therefore more significant than a single measurement.

Blood pressure is maintained by the complex interaction of the body's homeostatic mechanisms and is influenced and related to:

- Cardiac output
- The force of ventricular contractions
- The viscosity (thickness) of the blood
- Peripheral vascular resistance
- Elasticity of blood vessel walls (Elliott & Coventry 2012).

It is generally measured by a non-invasive or indirect method, using a manometer and a stethoscope. It may also be measured directly by the insertion of a probe or catheter into a blood vessel. Blood pressure varies according to age, time of day, body posture and emotions. Blood pressure is not a routine part of assessment in children under age 3.

### Assessing blood pressure

Indirect blood pressure measurement is made using one of several devices (Figure 20.14), which include:

- **The sphygmomanometer**, consisting of a cloth-covered rubber bag (the cuff) from which two rubber tubes extend. One of the tubes is connected to a hand-operated bulb that has a valve which can be tightened and released. The second tube is connected to the manometer that registers millimetre calibrations. Thus, blood pressure is measured in millimetres of mercury (mmHg). Blood pressure cuffs come in various sizes because the bladder must be the correct width and length for the individual's arm (Figure 20.15). If the bladder is too narrow, the blood pressure reading will be erroneously elevated; if it is too wide, the reading will be erroneously low (Flynn Makic et al 2013).
- **The stethoscope**, which is used with the sphygmomanometer to hear the Korotkoff sounds, must be used appropriately for an accurate blood pressure measurement to be obtained. When using a doubled-sided stethoscope, ensure it is placed on the appropriate side for the sound you are listening for, either bell or diaphragm. The bell side is for hearing

**Figure 20.13** Pulse oximetry
*(R. Gilder 2015)*

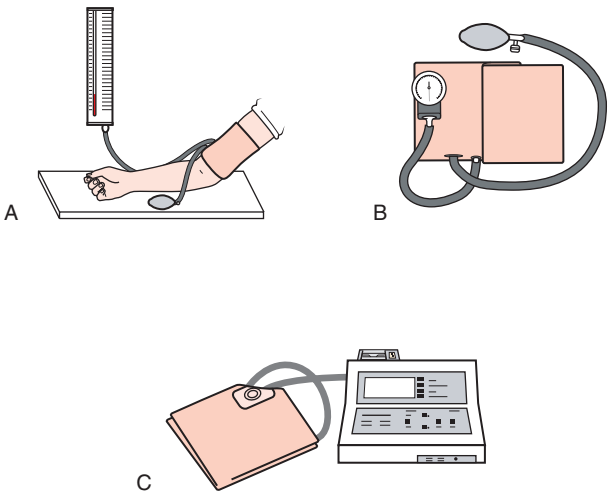


**Figure 20.14** Devices for measuring blood pressure
A: Mercury manometer and cuff B: Aneroid manometer and cuff
C: Electronic sphygmomanometer

## CLINICAL SKILL 20.4 Measuring oxygen saturation (pulse oximetry, $SpO_2$)

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Pulse oximeter monitor<br>Sensor probe and cord<br>Pen (blue/black)<br>Observation chart<br>Nail polish remover if required |

| **Skill activity** | **Rationale** |
|---|---|
| Assess for signs and symptoms of alterations in oxygen saturation such as altered respiratory status, cyanotic appearance, restlessness, irritability, confusion, reduced level of consciousness, laboured or difficulty breathing | Physical signs and symptoms may indicate abnormal oxygen saturation |
| Assess for factors that normally influence measurement of $SpO_2$ including oxygen therapy, haemoglobin level and temperature | Allows for accurate assessment of oxygen saturation variations. Peripheral vasoconstriction related to hypothermia can interfere with $SpO_2$ determination |
| Instruct individual to breathe normally | Prevents large fluctuations in respiration and possible error in reading |
| Assess the site most appropriate for sensor probe placement. Site must have adequate local circulation and be free of moisture. If finger is to be used, remove nail polish | Peripheral vasoconstriction can interfere with $SpO_2$ determination. Opaque coatings such as nail polish decrease light transmission |
| Determine capillary refill at site. If less than 3 seconds, select alternative site | Cool temperature with vasoconstriction or vascular disease may decrease circulation, impede refill and prevent sensor from measuring $SpO_2$ |
| Position individual comfortably. If finger is chosen as monitoring site, support lower arm. Instruct individual to keep sensor probe site still | Movement interferes with $SpO_2$ determination. Pressure of sensor probe's spring tension on finger or earlobe may be uncomfortable |
| Attach sensor probe to monitoring site | Select sensor site based on peripheral circulation and extremity temperature |
| Turn on oximeter by activating power and observe pulse waveform. Correlate oximeter pulse rate with individual's radial pulse | Enables detection of valid pulse |
| Leave probe in place until oximeter readout reaches constant value and pulse display reaches full strength during each cardiac cycle. Read $SpO_2$ on digital display | Pulse waveform and intensity display enables detection of valid pulse or presence of interfering signal. Reading may take from 10 to 30 seconds |
| If continuous $SpO_2$ monitoring is planned, verify $SpO_2$ alarm limits, which are pre-set by the manufacturer at a low of 85% and a high of 100%. Limits for $SpO_2$ and pulse rate should be determined as indicated by individual's condition. Verify that alarms are on, assess skin integrity under sensor every 2 hours. Relocate sensor at least every 4 hours, and more frequently if skin integrity is altered | Spring tension of sensor or sensitivity to disposable sensor adhesive can cause skin irritation and lead to disruption of skin integrity |
| If intermittent or spot-checking $SpO_2$ measurements are planned, remove sensor probe and turn oximeter power off. Store sensor probe in appropriate location | Sensor probes are expensive and vulnerable to damage |

| CLINICAL SKILL 20.4 Measuring oxygen saturation (pulse oximetry, $SpO_2$)—cont'd | |
|---|---|
| Discuss findings with individual as needed | Promotes participation in care and understanding of health status |
| Remove probe and turn oximeter power off. Clean according to manufacturer's instructions | Maintains battery charge, reduces risk of transmission of microorganisms |
| Assist individual in returning to comfortable position | Restores comfort and promotes sense of wellbeing |
| Perform hand hygiene | Reduces risk of transmission of microorganisms |
| Document the time of measurement and the rate and character of the respirations on the appropriate chart using numbers or dots | A record of the respirations provides information about the individual's condition to members of the healthcare team |
| Report any deviations from usual acceptable ranges | Appropriate care may be planned and implemented |

**Note:**
- Do not attach probe to finger, ear or bridge of nose if area is oedematous or skin integrity is compromised.
- Do not attach sensor to fingers that are hypothermic as vasoconstriction will alter the reading.
- Do not place sensor on same extremity as electronic blood pressure cuff. Blood flow to finger will be temporarily interrupted when cuff inflates and cause inaccurate blood pressure reading that triggers alarm.
- Do not place pulse oximeter on a limb that has an arterial or intravenous line in situ as fluid entering the arterial line may dilute the blood to alter the reading, and an intravenous line may reduce the outflow of blood from the limb so there is congestion of the venous blood, also altering the reading.
- If oximeter pulse rate, individual's radial pulse rate and apical pulse rate are different, re-evaluate oximeter sensor placement and reassess pulse rates.

*(Crisp et al 2013; Perry et al 2012; Tollefson et al 2012)*

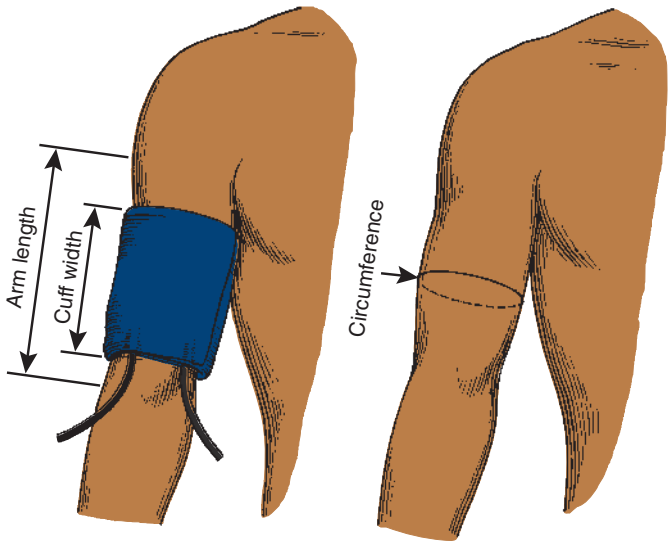


**Figure 20.15** Guidelines for proper blood pressure cuff size

Cuff width = 20% more than upper arm diameter, or 40% of circumference and two-thirds of arm length

*(Potter & Perry et al 2013)*

low-pitched sounds (heart sounds) and the diaphragm side is for high-pitched sounds (lung sounds).

- **An electronic device** where the measurement is displayed on a screen. These devices are sometimes applied when frequent blood pressure assessment is required, such as in the critically ill or potentially unstable individual. The system includes either a microphone or a pressure sensor built into the inflatable cuff. The microphone or acoustic system hears Korotkoff sounds and registers diastolic and systolic readings. The pressure sensor or ultrasonic system responds to the pressure waves generated by the movement of blood through the artery. These devices however should be used with caution on individuals with blood clotting deficiencies, such as a person on a heparin infusion, because the cuff can cause damage to capillaries if it over-inflates.

**Korotkoff sounds** are sounds heard during the taking of blood pressure using a sphygmomanometer and stethoscope. In some individuals, the sounds are clear and distinct, whereas in others only the beginning and ending sounds are heard. As air is released from the cuff, pressure on the brachial artery is decreased and the blood is heard pulsing through the vessel. These sounds are described in phases:

- *Phase I*: systolic pressure indicated by a sharp thump
- *Phase II*: a blowing or whooshing sound that increases as the cuff is deflated
- *Phase III*: crisp intense tapping that occurs with each heartbeat
- *Phase IV*: a softer blowing sound that fades
- *Phase V*: silence (Frese et al 2011).

Blood pressure should be obtained using a sphygmomanometer, manual method, before applying automatic devices and to confirm any abnormal blood pressure readings

## CLINICAL INTEREST BOX 20.8
## Palpating the systolic blood pressure

- Apply blood pressure cuff to the upper arm in the same method as the auscultation method
- Continually palpate the radial artery
- Inflate blood pressure cuff 30 mmHg above the point at which the radial pulse can no longer be palpated
- Release valve and allow mercury to fall by 2 mmHg
- As soon as the radial pulse is palpable, note the manometer reading, which is the systolic blood pressure

*(Flynn Makic et al 2013)*

obtained. The advantages of automatic devices are the ease of use and efficiency when repeated or frequent measurements are indicated. No stethoscope is required. The microphone or pressure sensor must be positioned directly over the artery for proper function.

### Palpation

The indirect palpation technique is useful for individuals whose atrial pulsations are too weak to create Korotkoff sounds, such as with severe blood loss and decreased heart contractility; however, the diastolic pressure is difficult to determine by palpation. When the palpation technique is used, the systolic value and the manner in which it was measured are recorded; for example, RA 90/–, palpated, supine. Clinical Interest Box 20.8 outlines the method for palpating the systolic blood pressure.

## Blood pressure sites

The site commonly used to measure arterial blood pressure indirectly is the brachial artery in the antecubital fossa at the elbow joint (Figure 20.16). If the upper extremities are inaccessible due to dressings, casts, arteriovenous fistulas or shunts, and axillary lymph-node dissection, it may be measured at the popliteal artery behind the knee (Figure 20.17) (see Clinical Skill 20.5).

Blood pressure measurements are recorded using arrows and dots on a graph similar to the one illustrated in Figure 20.5, or in longhand. If the longhand method of recording is used, the systolic pressure is recorded above the diastolic pressure; for example, 120/70 mmHg. If taking an individual's blood pressure for the first time during the current admission, it should be taken in both arms. As the heart is not centrally located, but slightly to the left, there should be a difference of no more than 5–10 mmHg between the arms. The arm found to have the higher pressure should be used for subsequent examinations. Document and record, where appropriate, which arm to use. Figure 20.18 provides the usual site for measuring blood pressure and placement of the stethoscope diaphragm.

**Figure 20.16** Upper extremity blood pressure cuff positioning

*(© Elsevier Australia)*

**Figure 20.17** Lower extremity blood pressure cuff positioning

*(Potter & Perry et al 2013)*

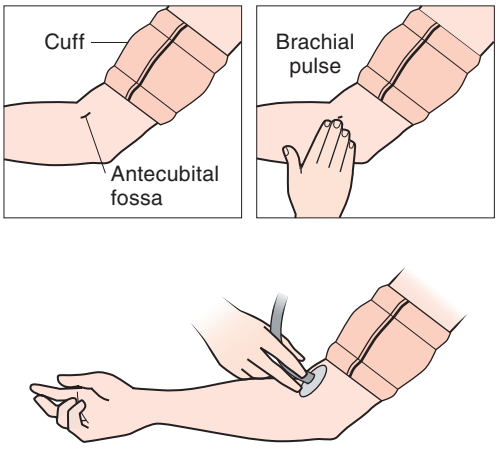


**Figure 20.18** The usual site for measuring blood pressure

The diaphragm of the stethoscope is placed over the brachial artery

## CLINICAL SKILL 20.5 Measuring blood pressure

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sphygmomanometer—including manometer, an appropriate-sized cuff and bladder, and a bulb and pressure valve<br>Stethoscope<br>Alcohol swab<br>Pen (blue/black)<br>Observation chart<br>For electronic blood pressure:<br>Electronic blood pressure machine<br>Blood pressure cuff of appropriate size as recommended by manufacturer<br>Source of electricity |

| **Skill activity** | **Rationale** |
|---|---|
| Ensure that the individual is rested and in a position of comfort. Encourage individual to avoid exercise, caffeine and smoking for 30 minutes prior to assessment of blood pressure and have them rest at least 5 minutes before measuring. Provide privacy and reduce environmental noise | Activity or discomfort may increase blood pressure. Allows you to hear the blood pressure sounds more accurately and puts the individual at ease |
| Observe for signs and symptoms of blood pressure alterations, either high (headache, face flushing, nosebleed, fatigue) or low (dizziness, mental confusion, restlessness, pale skin, cool and mottled skin over extremities) | Physical signs and symptoms may indicate alterations in blood pressure |
| Determine best site for blood pressure assessment. Avoid applying cuff to extremity when intravenous fluids are infusing; an arteriovenous shunt or fistula is present; breast or axillary surgery has been performed on that side; extremity has been traumatised, is diseased or requires a cast or bulky bandage. The lower extremities may be used when the brachial arteries are inaccessible | Inappropriate site selection may result in poor amplification of sounds causing inaccurate readings. Application of pressure from inflated bladder temporarily impairs blood flow and can further compromise circulation in extremity that already has impaired blood flow |
| Select an appropriate cuff size | A cuff that is too small may result in a false high reading, while a cuff that is too large may result in a false low reading |
| Have the individual assume a sitting position if possible | Sitting is preferred to lying. Diastolic pressure measured while sitting is approximately 5 mmHg higher then when measured supine |
| Remove any constricting clothing from the individual's arm. Support the arm in an extended position with the palm facing up. Position the arm so that the brachial artery is at the level of the heart | Tight clothing may reduce blood flow or create venous congestion in the arm. Correct arm placement enables accurate blood pressure measurement. If arm is extended and not supported, individual may perform isometric exercise that can increase diastolic pressure 10%. Placement of arm above the level of the heart causes false low readings. Placement of arm lower than the level of the heart causes false high readings. Even in the supine position a diastolic increase of as much as 3 to 4 mmHg can occur for each 5 cm the arm is below the level of the heart |
| Check for air leaks in the cuff, tubing and valves of the sphygmomanometer | Leakage of air may result in an inaccurate measurement |
| Squeeze the cuff to expel any air, then tighten the valves | Prepares the cuff for use<br>Inflating bladder directly over artery ensures proper pressure is applied during inflation |

*Continued*

## CLINICAL SKILL 20.5 Measuring blood pressure—cont'd

**Two-step method**

| | |
|---|---|
| Position the sphygmomanometer on a level surface, at eye level | An incorrectly placed, or loosely applied, cuff may result in an inaccurate measurement |
| Palpate the radial pulse and, with the fingers on the pulse, rapidly inflate cuff to 30 mmHg above point at which pulse disappears, slowly deflate cuff and note point when pulse reappears | Errors in measurement can occur if the manometer is not vertical<br>This measurement provides an approximation of the systolic pressure, and prevents the cuff from subsequently being overinflated |
| Deflate the cuff completely and allow 30 seconds for arm to rest before re-inflating the cuff | Releases remaining air. Allows blood trapped in the veins to be returned to circulation |
| Place the disc of the stethoscope over the brachial artery in the antecubital fossa and hold in place with the thumb and index finger of your non-dominant hand. Reflate the cuff 30 mmHg above the palpated systolic pressure reading during the previous inflation | Pulse beat can be heard when the disc is placed directly over the artery, allowing for precise measurement of the systolic pressure |
| Use the valve on the hand pump to release air, and slowly deflate the cuff at 2–3 mmHg per second—no faster than 5 mmHg per second | If the cuff is deflated too rapidly, there will be insufficient time to assess the pressure accurately. Deflating too rapidly or too slowly gives false readings. Avoid contact of the stethoscope tubing with the clothing, cuff or tubing of the sphygmomanometer to decrease the possibility of extraneous noise |
| Note the pressure reading on the manometer as soon as the pulse beat is heard through the stethoscope. The sound slowly increases in intensity | This measurement indicates the systolic pressure |
| Continue to slowly deflate the cuff. Note the pressure reading as soon as the pulse sounds muffled or disappears. Listen for 10–20 mmHg after the last sound then allow the remaining air to escape quickly | This measurement indicates the diastolic pressure, releases remaining air and decreases individual discomfort |
| Remove the cuff and adjust the individual's clothing | Promotes comfort |
| If this is the first assessment of individual, repeat procedure on other extremity | Comparison of blood pressure in both extremities detects circulation problems (normal difference of 5–10 mmHg exists between extremities) |
| Discuss findings with individual as needed | Inform the individual of the blood pressure. If possible, discuss risk factors for high blood pressure. If blood pressure is elevated, inquire as to any factors that may have affected blood pressure, including general health, life stress or diet changes. If individual takes blood pressure medication, determine if anything has interfered with prescribed regimen. Promotes participation in care and understanding of health status |
| Record the measurement immediately | Prevents errors or omissions |
| Perform hand hygiene.<br>Clean earpieces and diaphragm of stethoscope and cuff with alcohol swab | Reduces risk of transmission of microorganisms |
| Report any deviations from normal | Appropriate care can be planned and implemented |

## CLINICAL SKILL 20.5 Measuring blood pressure—cont'd

| | |
|---|---|
| **One-step method** | |
| Place stethoscope earpieces in ears and be sure sounds are clear and not muffled | Ensures each earpiece follows angle of ear canal to facilitate hearing |
| Relocate brachial artery, and place diaphragm of stethoscope over it. Do not allow chest-piece to touch cuff or clothing | Proper stethoscope placement ensures optimal reception |
| Close valve of pressure bulb clockwise until tight | Tightening of valve prevents air leak during inflation |
| Quickly inflate cuff to 30 mmHg above individual's usual systolic pressure | Inflation above systolic level ensures accurate measurement of systolic pressure |
| Slowly release pressure bulb valve, and allow manometer needle to fall at a rate of 2–3 mmHg/sec. Note point on manometer when you hear the first sound. The sound will slowly increase in intensity | Too rapid or slow a decline in pressure release causes inaccurate readings. The first Korotkoff sounds reflect systolic pressure |
| Continue to deflate cuff gradually, noting point at which sound disappears in adults. Note pressure to nearest 2 mmHg. Listen for 20 to 30 mmHg after the last sound, and then allow remaining air to escape quickly | Beginning of the fifth Korotkoff sound is an indicator of diastolic pressure in adults. Fourth Korotkoff sound involves distinct muffling of sounds and is an indication of diastolic pressure in children |
| Remove the cuff and adjust the individual's clothing | Promotes comfort |
| Record the measurement immediately | Prevents errors or omissions |
| Discuss findings with individual as needed | Inform the individual of the blood pressure. If possible, discuss risk factors for high blood pressure. If blood pressure is elevated, inquire as to any factors that may have affected blood pressure, including general health, life stress or diet changes. If individual takes blood pressure medication, determine if anything has interfered with prescribed regimen. Promotes participation in care and understanding of health status |
| Perform hand hygiene.<br>Clean earpieces and diaphragm of stethoscope and cuff with alcohol swab | Reduces risk of transmission of microorganisms |
| Report any deviations from normal and document | Appropriate care can be planned and implemented |
| **Assessing blood pressure electronically** | |
| Determine appropriateness of using electronic blood pressure measurement | Individuals with irregular heart rate, peripheral vascular disease, seizures, tremors and shivering are not candidates for this device |
| Determine best site for blood pressure assessment. Avoid applying cuff to extremity when intravenous fluids are infusing; an arteriovenous shunt or fistula is present; breast or axillary surgery has been performed on that side; extremity has been traumatised, is diseased or requires a cast or bulky bandage. The lower extremities may be used when the brachial arteries are inaccessible | Inappropriate site selection may result in poor amplification of sounds causing inaccurate readings. Application of pressure from inflated bladder temporarily impairs blood flow and can further compromise circulation in extremity that already has impaired blood flow |
| Assist individual to comfortable position, either lying or sitting. Plug in device and place near individual ensuring that connector hose reaches between cuff and machine | Ensures individual comfort and that equipment is prepared and in a good position to use |
| Locate on/off switch and turn on machine to enable device to self-test computer systems | Ensures it is working |

*Continued*

| CLINICAL SKILL 20.5 Measuring blood pressure—cont'd | |
|---|---|
| Select appropriate cuff size for individual extremity and appropriate cuff for machine | Ensures accurate reading. Electronic blood pressure cuff and machine are matched by manufacturer and are not interchangeable |
| Expose extremity for measurement by removing constricting clothing | To ensure proper cuff application, cuff must not be placed over clothing |
| Prepare blood pressure cuff by manually squeezing the air out of the cuff and connecting cuff to connector hose | Prepares the cuff for use |
| Wrap flattened cuff snugly around extremity, verifying that only one finger fits between cuff and individual's skin. Make sure that the 'artery' arrow marked on the outside of the cuff is correctly placed | An incorrectly placed, or loosely applied, cuff may result in an inaccurate measurement |
| Verify that connector hose between cuff and machine is not kinked | Kinking prevents proper inflation and deflation of cuff |
| Following manufacturer's directions, set the frequency control to automatic or manual, and then press start button. The first blood pressure measurement pumps the cuff to a peak pressure of about 180 mmHg. After this pressure is reached, the machine begins a deflation sequence that determines blood pressure. The first reading determines the peak pressure inflation for additional measurements | Following manufacturer's directions is important in obtaining an accurate measure |
| When deflation is complete, digital display provides the most recent values and flashes time in minutes that have elapsed since the measurement occurred | If the individual is having their blood pressure measured at intervals, this function can inform you of when the last measurement was |
| Set frequency of blood pressure measurements and upper and lower alarm limits for systolic, diastolic and mean blood pressure readings. Intervals between blood pressure measurements are set from 1 to 90 minutes | The nurse determines frequency and alarm limits based on individual's acceptable range of blood pressure, nursing judgment, facility/organisation's standards or healthcare provider order |
| Obtain additional readings at any time by pressing the start button. Pressing the cancel button immediately deflates the cuff | Additional readings may be needed if the individual's condition changes |
| If frequent blood pressure measurements are required keep the cuff in place. Remove cuff every 2 hours to assess underlying skin integrity and if possible alternate blood pressure sites | Individuals with abnormal bleeding tendencies are at risk for microvascular rupture from repeated inflations |
| Compare electronic blood pressure readings with auscultated blood pressure measurements to verify accuracy of electronic blood pressure device | Individuals with hypertension, hypotension or an arrhythmia may have inaccurate electronic blood pressure monitor readings |
| Report any deviations from normal and document | Appropriate care can be planned and implemented |
| Discuss findings with individual as needed | Inform the individual of the blood pressure. If possible, discuss risk factors for high blood pressure. If blood pressure is elevated, inquire as to any factors that may have affected blood pressure, including general health, life stress or diet changes. If individual takes blood pressure medication, determine if anything has interfered with prescribed regimen. Promotes participation in care and understanding of health status |
| *(Crisp et al 2013; Perry et al 2012; Tollefson et al 2012)* | |

## Alterations in blood pressure

It is generally considered that an acceptable systolic blood pressure for an adult is 100–120 mmHg, and acceptable diastolic blood pressure ranges from 60–80 mmHg. Commonly, systolic pressure is regarded as being elevated when it is higher than 140 mmHg, and diastolic pressure elevated when it is above 90 mmHg (AIHW 2015) (see Clinical Interest Box 20.9).

The significance of a recorded blood pressure level can only be reliably assessed in the knowledge of previous levels, and in relation to the individual's current health state. For example, a person with a blood pressure of 95/60 mmHg may be perfectly healthy. Conversely, a person displaying signs of clinical shock but with a blood pressure of 135/90 mmHg may normally have a blood pressure exceeding this level.

At times it may be necessary to measure the blood pressure with the individual assuming first a lying then a standing position, particularly if the person is on certain medications and/or has certain cardiovascular problems. It is important to report and document any differences observed between the two measurements.

If the blood pressure is to be measured frequently (e.g. every half hour), the cuff may be left on the person's arm but, after each measurement, the nurse must ensure that the cuff is deflated completely. Care must be taken to avoid inflating the cuff repeatedly within a short time, as this action may result in venous congestion and cause the individual pain.

**Hypertension** is the term used to describe an elevated arterial blood pressure. Hypertension is a feature of many disease states but frequently its cause is unclear—when the cause is unclear it is described as 'essential' hypertension. The potential for onset of hypertension increases with obesity, smoking, a family history of high blood pressure or high serum sodium or cholesterol levels (AIHW 2015). Hypertension is associated with cardiac enlargement, heart failure, coronary artery disease and cerebrovascular accidents. Sustained hypertension is associated with a high mortality rate, so the importance of preventing and controlling hypertension is considerable (Warren 2014).

### CLINICAL INTEREST BOX 20.9
### Hypertension in older adults

Hypertension is common in older adults. An older adult's blood pressure range is usually 140–160/80–90 mmHg. Systolic blood pressure is a better predictor of coronary heart disease, heart failure and stroke than is diastolic blood pressure.

Older adults are instructed to change position slowly and pause after each change to avoid postural hypotension and to prevent injuries.

*(Cooper & Gosnell 2015)*

**Hypotension** is the term used to describe a low blood pressure in relation to an individual's usual pressure. Hypotension is associated with low cardiac output states (e.g. left ventricular failure), and with hypovolaemic and cardiogenic shock. With sustained hypotension the blood pressure is not adequate for normal tissue perfusion and oxygenation and may result in renal failure.

### CRITICAL THINKING EXERCISE 20.4

1. You are working in a nursing home and the Registered Nurse asks you to complete a blood pressure reading on a new admission. The individual is morbidly obese and the cuff only just fits around the individual's arm. How would this affect the accuracy of the reading?
2. You are working in a community health centre and you need to complete a blood pressure reading on a 75-year-old female, Rita Smith. Rita wants to keep her thick woollen jumper on while you complete the blood pressure. How would you respond to Rita's request?
3. You are caring for Renae Polontee, a 30-year-old apprentice chef, who has accidentally cut off her right thumb. There was considerable blood loss prior to first aid administered at the scene. Would you expect Renae to be hypotensive or hypertensive? Justify your answer.
4. Which arm would you assess Renae's blood pressure on and why?

## RECOGNISING AND RESPONDING TO CLINICAL DETERIORATION IN ACUTE HEALTHCARE

The Australian Commission on Safety and Quality in Health Care (ACSQHC) has released the National Safety and Quality Health Service (NSQHS) Standards, in which one of the standards refers to early recognition of clinical deterioration. Recognition of clinical deterioration, when followed by effective action, can minimise the occurrence of adverse events such as a cardiac arrest (ACSQHC 2012). There are guiding principles that build on this standard and revolve around early recognition of deterioration, documentation and communication, appropriate escalation of care with supportive responses from healthcare staff and maintaining a person-centred care approach (ACSQHC 2010). ACSQHC (2010) identified that changes to respiratory rate, oxygen saturation, heart rate, blood pressure, temperature and level of consciousness indicate deterioration of an individual's condition. The ACSQHC Working Party developed a colour-coded observation chart, which all hospitals have adopted and customised for local use, to identify when an individual may be deteriorating and what further assessment and escalation of care the nurse should undertake (see the Adult Deterioration

Detection System (ADDS) chart, Figure 20.5). While the ADDS chart should allow for early recognition of an individual's deterioration through colour coding, it is essential that all nurses have the underpinning clinical knowledge and clinical judgment to respond appropriately (see Clinical Interest Box 20.10).

Communication is extremely important in the event of clinical deterioration, and it is always essential to follow ISBAR handover when escalating the care of an individual. ISBAR handover will ensure that all information is passed on efficiently and correctly so the individual can be managed appropriately (see Chapter 8 on Communication for more information on ISBAR).

## CLINICAL INTEREST BOX 20.10 Clinical deterioration

'Individual admitted with pneumonia. Became short of breath and had low oxygen levels. Staff did not call for assistance in a timely way. The individual died' (ACSQHC 2008). It is imperative that nursing staff identify clinical deteriorations and act accordingly for individual safety.

## DECISION-MAKING FRAMEWORK EXERCISE 20.1



You have just been employed as a graduate Enrolled Nurse at a healthcare facility. You are completing a vital sign assessment on one of your allocated individuals, and you discover her blood pressure is 98/55 and heart rate is 95 bpm; all other vital signs are in normal limits. The individual states she does feel a bit light headed and can't remember the last time she passed urine. After approaching the medical officer and handing over the individual and current situation, the medical officer asks you to insert an IV cannula and orders the commencement of IV therapy.

Using the decision-making framework:

1. From the interventions ordered by the medical officer, are all interventions within your current scope of practice?
2. What actions are required in this situation?
3. How would you document the above situation in your nursing notes?

## PROGRESS NOTE EXAMPLE 20.1

| | |
|---|---|
| 04/06/2016 1300 hrs | Nursing: CNS: pt alert and orientated to person, place and time. Nil complaints of pain. CVS: complained of feeling dizzy when ambulating, vital signs checked—BP 101/59, HR 66, RR 15, $SaO_2$ 99% on RA, Temp 36.5. BP monitored 2/24, oral fluids encouraged and ambulation supervised. BP increased to 115/70. GIT: tolerating diet and fluids. BNO. Renal: pt voiding on sensation. FBC maintained. ADLs: showered independently. Supervision when ambulating with nil mobility aids. Legal: medication given as per medication chart. |

***Zoe Morgan*** **(Morgan) EN**

## Summary

Vital signs reflect changes in body function and therefore provide the nurse with important information about the clinical health status of an individual. Various sites and methods can be used to assess vital signs, and the nurse selects the site and method that is safest for the individual and that will provide the most accurate measurement possible. It is important to note that changes in one vital sign can trigger changes in other vital signs.

Vital signs are generally assessed when an individual is admitted to a healthcare agency, to establish baseline data, when there is a change or possibility of change in the individual's condition and as part of routine care. Data obtained from measurements of vital signs are then used to plan and implement appropriate nursing interventions, as well as to evaluate an individual's response to nursing interventions or prescribed medical therapy. It is important for the nurse to have knowledge of the normal ranges of vital signs and of the factors that regulate and influence vital signs, as this helps them interpret the measurements that deviate from normal. It is also imperative that the nurse has the underpinning clinical knowledge and judgment to recognise and respond to a deteriorating individual and act accordingly to maintain the clinical health status (ACSQHC 2012).

## Review Questions

1. What are the factors that can affect vital signs?
2. What are the advantages and disadvantages of using each body temperature site?
3. What characteristics should be included in a respiratory assessment?
4. What is an early indicator of a clinical deterioration in an individual?
5. Ms Hawdon has just given birth to a healthy baby boy. After the delivery she has a postpartum haemorrhage and loses 1200 mL of blood. Would you expect Ms Hawdon's blood pressure to increase or decrease? State the reason for your answer.
6. Identify two sites for taking blood pressure in an adult. Describe the procedure.
7. What are the three (3) characteristics of a pulse? What characteristic(s) would be altered during atrial fibrillation and why?
8. Mr Ryan, 82 years of age, has just been admitted with shortness of breath. Describe the observation you would conduct.
9. Review the information in the observation chart below, then answer the questions that follow.

| | |
|---|---|
| Admission obs | T—36.7, P—100, R—22, B/P—140/90: 1600 hrs |
| Preoperative obs | T—36.4, P—80, R—18, B/P—130/70: 0800 hrs |
| Postoperative obs | T—35.8, P—60, R—16, B/P—120/70: 1400 hrs |
| | T—36.4, P—80, R—18, B/P—130/70: 1800 hrs |
| | T—36.4, P—76, R—18, B/P—120/70: 2000 hrs |
| Day 1 Post op | T—36.4, P—80, R—20, B/P—130/70: 1000 hrs |
| | T—36.4, P—80, R—20, B/P—130/70: 1800 hrs |
| | T—36.8, P—88, R—20, B/P—130/70: 2200 hrs |
| Day 2 Post op | T—37.0, P—88, R—20, B/P—130/70: 0100 hrs |
| | T—37.8, P—90, R—22, B/P—135/80: 1400 hrs |
| | T—38.5, P—90, R—24, B/P—135/90: 2000 hrs |
| Day 3 Post op | T—37.4, P—88, R—22, B/P—135/70: 0700 hrs |

   a Suggest a reason that, on the day of her admission, Mrs Seagal's vital signs were slightly elevated.
   b Suggest a reason why Mrs Seagal's vital signs had decreased on the preoperative assessment.
   c What could you infer from the overall change in vital signs in the postoperative period?
   d What further objective and subjective data would you need to collect to confirm your assumptions?
10. Chart the above observations (in Q 9) on the Adult Deterioration Detection System chart (Figure 20.5). Identify if an escalation of care is required for this individual. If so, what type of escalation and why?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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# Admission, transfer and discharge processes

*Susan Jones*

CHAPTER 21

## LEARNING OUTCOMES

At completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Describe the planning and implementation of care for the individual who requires admission, transfer or discharge
- Describe the means by which a child may be prepared for admission to hospital
- Identify common stressors related to illness and hospitalisation
- Describe the physiological and psychological responses to stress
- Demonstrate a range of nursing skills that alleviate stress in the anxious person

## KEY TERMS

admissions
anxiety
continuity of care
discharge
emergency admissions
guided imagery
health education
play therapy
pre-admission
stress
transfer

## CHAPTER FOCUS

The scenario when an individual is admitted to a healthcare facility such as a hospital can represent a major disruption for the person and their significant others, resulting in anxiety, not only regarding their admission but also the implications and causes of their illness. While all hospitals have subtle variations in the process of admission, the basic protocols generally remain the same. During this time of heightened anxiety and fear, the nurse has a key role in alleviating some of the fears of hospitalisation, not only for the person but also for their loved ones. This chapter focuses on the admission process, the transferring and the discharge of children, adolescents and adults and the nurse's role in ensuring these processes cause minimal disruption.

## LIVED EXPERIENCE

My son was 3 when he was first admitted to hospital. He'd been having continuous ear infections and sinus problems and his specialist decided that he should have grommets inserted and his adenoids removed. We booked a date, and I tried to put it to the back of my mind, and then the day was finally here. I was so nervous and worried for him. I tried to keep replaying what the specialist had said about how 'routine' his surgery was, but when they came to wheel him away, I broke down. The theatre nurse was so warm and caring, but I still felt so silly. It's not easy leaving your child in the care of strangers.

**Eleanor, mother, age 37**

## TYPES OF ADMISSION

**Admissions** are classified as either elective or non-elective. Admissions are deemed elective when they are planned and not emergent and, while acuity is generally not severe, the potential to deteriorate and require intervention is possible (Berman et al 2012). People awaiting an elective admission can often be on waiting lists until such time that a hospital bed becomes vacant. An average wait period can be between 2 and 3 months for an elective procedure in Australian hospitals; some procedures can have a wait time up to and exceeding 12 months. The individual will receive either a letter or a phone call to advise them that their procedure has been scheduled. However, this can change depending on the volume of **emergency admissions**, which can further delay the individual's elective procedure due to cancellation (Johar et al 2013).

Non-elective or emergency admissions occur, by their very nature, suddenly, and may be associated with severe injury or life-threatening disease. They are the cause of about 90% of all hospital admissions (Symons et al 2013). People in emergent situations may be admitted any number of ways, including through referral from their medical practitioner, or the emergency department of a hospital, or perhaps by ambulance.

Healthcare facilities individually have policies regarding the admission and discharge process for elective and emergency admissions. In most cases individuals presenting for elective procedures will report to an admitting department on a prearranged date and time for the purpose of commencing the admission process. Prior to reporting for their procedure the individual should have received some written material with information regarding their diet prior to admission (e.g. fasting for surgery), whether to cease taking particular prescription or over-the-counter medications, what items to bring (e.g. toiletries, clothing) and information regarding visiting hours, the provision of telephones and televisions and location of the cafeteria. An efficient admission process can reduce waiting times for both admitted and discharged persons as well as reducing the stress factors related to admission to hospital (Kang et al 2014; Willis et al 2012).

## REACTIONS TO ADMISSION

With the possible exception of maternity, the majority of individuals facing admission to a hospital do so with apprehension and reluctance. Regardless of the duration of the hospital visit, admission is likely to cause a degree of stress, and reactions to this stress will vary depending on a number of factors including age, gender, past experiences and expectations and comorbidities. The admission nurse must take into consideration the impact of how admission to hospital will further exacerbate the stress for our Indigenous and culturally and linguistically diverse populations, (see Chapters 10 and 11). The principal causes of **anxiety** that hospitalised individuals experience are predominantly related to fears associated with anaesthesia, pain and associated complications (Sveinsdóttir 2010; Davydow et al 2013). While elective procedures are often associated with lower levels of anxiety, the nurse must acknowledge that all individuals will have an individual and valid reaction to the impending stress of hospitalisation in their life. A nurse can reduce a person's potential anxiety by ensuring a well-organised admission process is completed in a respectful and understanding manner. Effective admission procedures are directed towards:

- Confirming the person's identity
- Assessing the individual's physical and psychological status
- Promoting the individual's comfort in an unfamiliar environment

- Providing items needed for care
- Providing the individual with information about various practices and protocols
- Providing the person the opportunity to ask questions
- Ensuring adequate orientation to the hospital, ward and room are conducted as needed (Berman et al 2012; Zator Estes et al 2013).

**Stress** is widely regarded as an aversive state of arousal in which a physiological response occurs in reaction to a demand or stressor (Davydow et al 2013; Kring et al 2013). Stress can be experienced as either psychological or physical and can result in a range of varying responses which require a response or change. The stressful impact of hospitalisation on an individual's self-esteem, self-concept and body image are varying and diverse and include:

- Loss of independence and vulnerability
- Relationship disruptions and fretting about loved ones
- Unfamiliar environment, equipment and personnel
- Potential loss of income and impacts on employment
- The nature and implications of the illness
- Painful and/or embarrassing tests or procedures
- Impacts on activities of daily living (ADLs)
- Loss of privacy and dignity
- Loss of emotional or moral support
- Fear of dying and death.

Reactions to stress and coping mechanisms include:

- Nervousness
- Anxiety
- Irritability
- Emotional lability
- Anger or hostility
- Decreased tolerance towards others
- Forgetfulness
- Confusion
- Indifference
- Withdrawal
- Depression
- Difficulty sleeping.

Physiological manifestations of stress include:

- Palpitations
- Elevated blood pressure, pulse and respirations
- Diaphoresis (perspiration)
- Gastrointestinal upset
- Insomnia
- Muscle tension
- Trembling
- Dry mouth
- Difficulty concentrating (Kring et al 2013; Crisp et al 2013).

It is essential for the benefit of the individual that the nurse acknowledges the distress this anxiety may be causing the person, and demonstrates empathy, warmth and respect while preserving dignity and independence. The nurse should anticipate fluctuations in the person's psychosocial status and offer routine and relaxed socialisation in the clinical setting. The nurse should adopt a collaborative approach to care that is inclusive of the individual's rights and needs, through empowerment and mutual understanding (Crisp et al 2013). Advocating for collaboration in care is fundamental; when individuals are empowered and involved in the decision-making processes of their treatment, improved nursing outcomes ensue (Norman 2010).

### CRITICAL THINKING EXERCISE 21.1

Fifty-year-old Thomas has been admitted to the medical ward with exacerbation COAD. When you are completing his admission it is apparent that Thomas is experiencing a high level of stress and anxiety due to his admission. When you ask what is upsetting him, he tells you that he has two cats at home that cannot get outside, and he been unable to contact any friends to let them know he is being admitted to hospital. What nursing interventions could the nurse develop to decrease Thomas's anxiety and stress?

## Illness and stress

### Hospitalised adults

Hospitalisation means that individuals are not, for the duration of their stay, able to follow their usual daily routines; for example, the diet or exercise they are used to. They often severely miss the lack of home comforts and the presence of family, friends and familiar things. They may also be stressed by an unknown diagnosis and frightened about possible pain and discomfort, potential treatments and outcomes. The nurse can help alleviate some of this anxiety by providing full and timely information. Anxiety can affect concentration and memory, so when a person is anxious it is particularly important to ascertain whether the information has been understood, to repeat it if necessary and provide written information that the person may consider later (Crisp et al 2013).

Hospitalised individuals also have to adapt to stressors such as the lack of privacy, which may include concerns about sharing a room with strangers, strangers finding out about their medical details, having to wear hospital gowns that are open down the back, exposure of private areas during surgery, investigative procedures or treatments and having healthcare workers coming into their room during toileting or bathing. The nurse can help alleviate some of these stressors by introducing newly admitted people to those in the shared room, by being diligent about protecting confidentiality and taking practical steps to prevent unnecessary exposure. Nurses not assisting with personal care should themselves undertake not to enter the room or the area behind closed curtains without first confirming that the individual is not exposed.

Some individuals may be very anxious about the ability to meet religious dietary, worship, modesty or hygiene requirements. Those with limited spoken English are likely to be stressed about the ability to understand or be understood. A nursing assessment that carefully identifies cultural and spiritual needs is the tool that helps the nurse minimise associated stressors. Resolution might include coordinating

care to allow time for prayer, adapting Western-oriented hygiene methods to suit specific modesty needs and involving an interpreter.

Other stressors include worry about family responsibilities, costs of medical treatment and perhaps loss of earnings while ill. Compounding the problem there may be an inability to sleep because of pain, discomfort, noise, a strange bed or missing the usual sleeping partner. Empathic and considerate general nursing care activities can significantly reduce these common anxieties.

A significant aspect of care related to minimising stress is the establishment of a relationship that demonstrates respect and empathy for the person. **Health education** plays a major part in lessening the anxiety and stress levels of the individual. The nurse must ensure the individual has received the correct information surrounding their health issues using evidence-based practice. This includes being prepared to sit and listen to the individual and facilitating the expression of fears and anxieties (Brown et al 2015; Kell 2014; Pèrez & Luquis 2013).

## Children

It is not unusual for children to feel anxiety. Very young children often fear strangers or being left alone; preschoolers often fear imaginary creatures, animals and the dark. School-age children may experience anxiety about their own safety; for example, being very anxious during a storm. As children move towards the middle years of school and head into adolescence, anxieties tend to become more focused on performance at school, appearance and other social and health issues.

It is quite common for children to develop fears about losing their parents (separation anxiety). When this anxiety is strong, children may be diagnosed with separation anxiety disorder. Children who have separation anxiety may experience physical symptoms such as nausea, vomiting, stomach pains, palpitations, respiratory difficulty and dizziness. Separation anxiety can occur at any age. Children may follow parents around the house, needing to be constantly in very close proximity, they may refuse to go to school and may worry about being kidnapped and killed, or their parents being killed. Most children outgrow this fear but some have symptoms that recur periodically and especially when attachments are threatened or disrupted, such as at the time of hospitalisation (Copanitsanou & Valkeapaa 2014). See Chapters 12 and 13 for further reading on this topic.

The nurse who is aiming to reduce stress in children is most therapeutic when able to listen actively and encourage dialogue with open questioning such as, 'Tell me about what you like playing with at home'. It is best to avoid the specific question–answer format because children tend to feel uncomfortable about this and answer with very short, simple responses that give little information. Communicating effectively with children is a specific communication skill. Children are very sensitive to insincere platitudes and fake sentiments and are usually very quick at determining if a nurse is genuine and can be trusted.

Working with emotionally stressed children in the area of mental health is an area of specialty. A variety of therapies are helpful, including play therapy, art therapy and guided imagery. The goals of therapy are to:

- Establish rapport
- Help children reveal feelings they are unable to verbalise
- Enable children to act out feelings, anxieties or tension in a constructive manner
- Understand children's relationships and interactions with others of significance to them in their lives
- Teach adaptive socialisation skills
- Enhance self-esteem.

***Play therapy and children*** **Play therapy** is based on the belief that the relationship between the child and the health-care professional is the primary healing factor for the child. Play therapy recognises play as the child's developmentally appropriate vernacular when the individual is experiencing difficulties arising from circumstantial changes causing internal struggles, such as during hospitalisation. Play therapy can assist the child to:

- Assume greater self-responsibility
- Become more self-directing
- Engage in self-determined decision making
- Experience a feeling of control
- Become sensitive to the process of coping (Crenshaw & Stewart 2014:7).

***Guided imagery and children*** **Guided imagery** is an anxiety-reducing technique that many adults find helpful. It is a form of therapy that helps people consciously visualise positive images to lift their mood, reduce their anxiety, deal with the effects of illness or trauma or prevent illness (Forsner et al 2014). In a simple form it can successfully be used with children to increase their coping skills and enhance their feelings of self-worth. Children usually have strong imaginations and are able to conjure up mental pictures quite easily. Guided imagery begins with a short relaxation exercise followed by general directions for the imagery (visualisation). Children may be gently guided towards mental images of heroes and heroines that help them cope, and may be able to visualise themselves and their families as happy and cheerful. They may also imagine different ways of interacting with others (Crisp et al 2013). For example, Laura, aged 10, had frequent nightmares and was very frightened of the 'dark monster who comes in the night'. She was able to imagine herself a friend to a fire-breathing dragon. Through guided imagery she learned how to call on her dragon friend, whom she called Sheba, to come and stay by her to protect her whenever she felt scared.

## Adolescents

Sometimes high levels of stress during hospitalisation can result in adolescent behaviours that challenge the nurse. The adolescent years are a time of incredible physical and psychological adjustment. The tasks of adolescence include acceptance of a changed body image, establishing independence

from parents, deciding on a career pathway and adjusting to a comfortable sexual role. The adolescent may be supersensitive to recent body changes and may have concerns about body image. The threat of body exposure may be a source of great embarrassment. The nurse can help reduce adolescent stress by respecting individual autonomy and valuing the adolescent as a person, facilitating the verbalisation of fears, demonstrating sensitivity to concerns about body image, exposure and function and providing clear explanations about all care, treatment and procedures (Spurr et al 2013). See Chapter 13 for more reading on adolescents.

Common reasons for hospitalisation in adolescence include vehicle and sporting accidents, unsuccessful suicide attempts, teenage pregnancy, sexually transmitted infections, drug abuse and depression. Anorexia nervosa and bulimia nervosa are also common but are generally treated on an outpatient basis unless severe enough to be life threatening. It is the professional responsibility of the healthcare worker to view and treat the individual objectively (Crisp et al 2013).

Sometimes concerns are overwhelming for the adolescent and may result in emotional responses such as resentment, hostility or guilt. The hospitalised adolescent may become isolative and manipulative, and reject hospital rules or even physical care if feelings such as fear, guilt or embarrassment are unmanageable.

A case study and a corresponding example of an entry into progress notes have been developed on these themes (see Case Study 21.1 and Progress Note Example 21.1).

Stressors may be lessened by supportive peer interactions. Visits from friends are important, especially when adolescents are placed on wards with only adults for company. This may help relieve anxiety about missing school, social activities or losing touch with the peer group. Sometimes the adolescent individual's feelings and fears can be exacerbated because adult persons in a shared room tease or give erroneous advice or information. It should be acknowledged that while the adolescents may strive to demonstrate adult behaviour, they may be struggling with homesickness—hospitalisation is sometimes the first time young teenagers have been separated from parents or family without being with their peers (Yamuna 2013; Crisp et al 2013). Nursing interventions to address adolescent emotional responses and some of the more common behaviours are identified in Table 21.1.

### CRITICAL THINKING EXERCISE 21.2

Thirteen-year-old Jess has been admitted to the adolescent ward for an exacerbation of asthma. It becomes apparent that Jess has not been taking her preventer medications. What is the nurse's role in health education for Jess, and what approach might the nurse take?

## Older adults

People in the older age group frequently experience many losses and changes in a relatively short timeframe. Some older people adapt effectively to the stress this causes. Many are able to plan and implement a successful transition from work to retirement. Many are able to respond positively to the challenges and find exciting and creative activities that provide

### CASE STUDY 21.1

**The link between fears and behaviour**

Melanie, 15, was diagnosed with diabetes. She was resentful and hostile towards the nurse who was encouraging her to self-administer her insulin medication. Melanie stormed away, shouting and refusing the treatment altogether. A little later the nurse sat and talked with Melanie, who eventually disclosed fears about how having diabetes would affect her social life. She also revealed beliefs that the diabetes was her own fault, a punishment for promiscuous behaviour and a termination of pregnancy that she had not told her parents about. The nurse listened without judging Melanie, alleviated some of the guilt by answering questions about the onset of diabetes and helped her to identify some ways that she might cope with the diabetes after discharge.

1. What strategies could you use to encourage Melanie to participate and self-administer her insulin? Think holistically when thinking about strategies.
2. Which allied health members could you involve in Melanie's care to ensure a successful outcome on discharge?

### PROGRESS NOTE EXAMPLE 21.1

| | |
|---|---|
| 03/02/2016<br>1300 hrs | Individual became verbally hostile and would not listen when staff were attempting to educate her regarding her diabetes and injection administration techniques. Staff stopped education at this time.<br>***M. Alexander* (Alexander) RN** |
| 03/02/2016<br>2100 hrs | Staff assessed individual and her ability to comply with her insulin administration. Individual admitted to being afraid that her new diagnosis would affect her social life, as well as having feelings of guilt and blaming herself for becoming diabetic. Staff answered all questions related to her diabetes and medication administration. Diabetic education was completed, which included strategies to assist her with diabetes post discharge. Request for counsellor assessment completed, waiting confirmation of appointment time.<br>***M. Alexander* (Alexander) RN** |

**TABLE 21.1 | Nursing interventions for a selection of common adolescent emotional responses and behaviours**

| Adolescent emotional response/behaviour | Nursing interventions |
|---|---|
| Embarrassment | Reassure and maintain confidentiality. Provide an opportunity to talk about concerns, without family present, if necessary<br>Be alert to feelings regarding body image and need for privacy<br>Encourage as much self-care as possible<br>Provide for personal space and minimal body exposure during care<br>Ensure that individual has received and understood the appropriate health education pertinent to the procedures or surgery, and expected impact on body |
| Homesickness | If possible, provide for home conveniences such as TV, telephone and snacks<br>Facilitate dietary preferences when appropriate<br>Encourage family members to bring in favourite foods, provided that they meet with medical dietary needs<br>Ensure person is kept informed of news from home<br>Encourage family visitation whenever possible |
| Fear | Accept without judgment any defences or behaviour used to retain control<br>Report any concerns to allow the appropriate healthcare professional the ability to discuss the issues with the person in an objective manner<br>Ensure the individual is provided with relevant health information including a detailed explanation regarding treatment, nursing care and progress |
| Resentment | Facilitate exploration of feelings of resentment to help identify underlying cause<br>Encourage visits from peers and siblings, with flexible visiting hours as much as possible<br>Coordinate care so that any school work can be continued when able<br>Do not 'side with' parents/carers in any criticism of the adolescent or their behaviour, even if the individual displays anger or hostility |

a high quality of life well into old age. Others experience difficulty with the transition, the accumulative losses and changes and suffer stress overload. Nurses may be able to observe signs of this, such as unconscious repetitive actions that serve to relieve tension and stress and, sometimes, changes to cognitive abilities. Many physical changes such as those that affect sight and hearing or mobility may occur gradually and this allows time for the process of adaptation. However, such stressors, whether slow or sudden, may compound with social losses and concerns about the future to the point where strong inner resources are needed to avert a stress crisis. Some of the stressors faced by older people include:

- Changes in body image
- Increases in rent or living costs and ability to manage financially now or in the future
- Coping with home maintenance
- Loss of driver's licence or transport independence
- Death of friends, siblings or pets
- Chronic or acute pain
- Concern about care and protection when frail and vulnerable
- Fear of losing, or loss of, mental abilities
- Fear of loneliness, dying alone or not being found
- Fear of institutionalisation and leaving own possessions or pets
- Inheritance conflicts
- Intolerance or negative ageist attitudes demonstrated by others
- Caring for a spouse with dementia (Brown et al 2015).

Anxiety and low self-esteem often occur together and particularly in older people who are ill, hospitalised or living in residential care settings. Hospitalisation for the older adult can have a complexity of ramifications due to the stress pattern response, which can be linked directly to sleep deprivation and is a common occurrence for the older person in hospital (Maffio et al 2013). See Chapter 15 for more reading on the older person.

The way care is provided and the nurse's communication with individuals or residents can have a highly positive effect on reducing anxiety and increasing morale. Two basic principles for minimising stress are:

1. Limiting change as much as possible; for example, when and where possible, have the same people provide services and care (change increases stress)
2. Coordinating care and implementing any essential change during the period when the person is best able

to cope. People frequently have times of the day, month or year when they are functioning better or are less stressed than others; for example, it would not be advisable to discuss changing a person's accommodation arrangements late in the evening if that is when they are most tired; it would be unwise to introduce any major changes near the anniversary of a significant bereavement (Maffio et al 2013).

The nurse can also help to limit the damage from the structural and chemical changes to the body and the risk of an exacerbation of illness caused by prolonged stress by ensuring that, whenever possible, the individual has a highly nutritious diet, and by sustaining an environment and associated nursing strategies that ensure the individual maintains adequate rest and sleep patterns (Brown et al 2015; Maffio et al 2013).

***Preventing and treating stress in the older person*** Preventing and treating stress in the older person includes promoting self-worth, a sense of control, feelings of connectedness and hope. The nurse can facilitate feelings of self-worth by complimenting individuals on their achievements and encouraging reflection on personal strengths. A sense of control can be promoted by allowing individuals to make decisions for themselves. For a person with dementia this may mean offering simple choices that do not confuse; for example, 'Would you like to wear this dress today?' Simple actions such as encouraging participation in group activities, introducing individuals to each other and smiling and speaking to the person that you pass in the corridor helps to foster feelings of connectedness. Providing pleasurable experiences and activities nurtures happiness and hope, even in very difficult circumstances. For example, the individual who has cancer or a degenerative disorder can still enjoy the pleasures of music, a beautiful garden, the smell of roses, the company of pets and children and other social interactions (Whyne & de Fras 2015).

**CRITICAL THINKING EXERCISE 21.3**

Mr Braddon, aged 77, is about to be discharged from the medical ward after a hip replacement. On assessment, you discover that he is single and lives alone in a two-storey townhouse. He has trouble making meals for himself. What do you need to consider before discharging Mr Braddon, and which community and interdisciplinary services might be involved?

# THE ADMISSION PROCESS

## Pre-admission

**Pre-admission** clinics are an important aspect in the provision of holistic and continuous care. They can reduce an individual's anxiety regarding their admission (this is particularly beneficial with children) and provide and obtain useful health history information and assessment of vital signs (McShane & Honeysett 2013). It is during pre-admission that discharge planning should (and does) commence (see Clinical Skill 21.1), as the person's needs are identified for the rehabilitation phase, and provides the individual with opportunities to ask questions, tour the ward (if applicable) and familiarise themselves with staff and routines (Kralik & van Loon 2011; Richardson-Tench et al 2012).

## Admitting an adult to a healthcare facility

When an individual is admitted to a healthcare facility, potential anxiety can be reduced by the efficiency and effective organisation of this process in an empathetic and sensitive manner. Effective admission procedures are directed towards:

- Confirming the person's identity
- Assessing the individual's physical and psychological status
- Promoting the individual's comfort in an unfamiliar environment
- Providing items needed for care
- Providing the individual with information about various practices and protocols
- Providing the person with the opportunity to ask questions (Berman et al 2012; Zator Estes et al 2013).

**CRITICAL THINKING EXERCISE 21.4**

What would you say to make an anxious person and their family more relaxed during admission?

## Day of surgery admission

Many hospitals are admitting elective surgical admissions to a specialty unit designed to facilitate admissions to theatre. This ensures a smoother transition to the operating theatre. Nursing and medical staff work together to ensure each person is prepared for theatre. Individuals are sent home with a friend or relative who can watch them (of particular importance after a general anaesthetic), and a brochure highlighting health education and what signs and symptoms to look for in the event of an emergency, analgesia management and emergency contacts (Concannon et al 2013).

## Admitting department

Medical admissions and many elective surgical admissions are transferred from the admitting department directly to the unit. Clerical staff obtain and clarify the individual's demographics and financial information for registration purposes. This includes scheduling pre-admission testing, room allocation and transfers and discharge. The admission department is responsible for maintaining meticulous census statistics and disseminating data to the relevant units within the hospital. The staff are also responsible for escorting the individual to the allocated unit, where they are received by the nurse (Griffin 2012).

## CLINICAL SKILL 21.1 Admission and discharge process

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA decision-making framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | *For admission:*<br>Thermometer<br>Sphygmomanometer<br>Stethoscope<br>Pulse oximeter<br>Penlight torch<br>Digital watch<br>Scales<br>Tape measure<br>Facility/organisation admission forms and charts<br>ID bands<br>Relevant information brochures<br>Pen (blue/black)<br>*For discharge:*<br>Relevant information brochures<br>Discharge medications and instructions for administration<br>Appointment cards and referral letters<br>X-rays and relevant scans and reports<br>Any further discharge supplies (e.g. mobility aids, appliances) |

| **Skill activity** | **Rationale** |
|---|---|
| **For admission** | |
| Ensure the room and environment is ready for the individual. Bed may need to be adapted for the individual, extra items such as oxygen equipment, intravenous poles, suction apparatus need to be placed in room if required. Ensure room is clean and welcoming | Ensures individual's needs will be met and they will be comfortable when entering the room |
| Ensure privacy. Close curtains and door | Protects individual privacy and confidentiality |
| Confirm the individual's identity and place identification band on individual's wrist and ankle as per facility/organisation policy | Safety precaution to ensure individual's identity |
| Introduce self, other staff and their roles to the individual. Inform the individual about mealtimes, visiting hours, ward/hospital facilities, smoking rules and use of mobile phones. Familiarise them with the call bell, bathroom, space for their belongings, TV, how to adjust the bed and introduce them to other people in the room | Allows individual to feel comfortable in the environment. Also gives individuals a sense of security and belonging, therefore decreasing stress and anxiety |
| Check if the individual has brought in any valuables and if they need to be stored and recorded as per facility/organisation policy. An inventory may be made of individual's personal belongings and any prostheses such as dentures, hearing aids or glasses, as per facility/organisation protocol | Decreases the risk of theft and loss of personal belongings while in the facility/organisation |
| Obtain a complete set of vital signs and document findings, reporting on any abnormalities | Acts as baseline individual data and also gives information regarding their current physiological status |
| If indicated, perform a pain assessment on the individual using a pain assessment tool | Adds to baseline data regarding the individual |
| Complete weight and height of individual and document | Some medications and treatments are height and weight dependent. This will also act as a baseline for the individual |

| CLINICAL SKILL 21.1 Admission and discharge process—cont'd | |
|---|---|
| Complete a urinalysis on the individual if indicated according to facility/organisation policy | For a baseline assessment |
| Identify any allergies. If individual has allergies place an alert band around their wrist | Alerts staff that the individual has an allergy and decreases the incidence of potentially adverse events occurring |
| Obtain a complete nursing history, including data about the individual's social and cultural background, surgical and medical history, history of the current illness and reason for admission. Assess any cultural/language barriers | Gains a broader understanding of the individual's health history and ensures accurate and effective treatment is provided to the individual. It can also be used to identify any potential knowledge deficits the individual has regarding their health |
| Throughout the assessment, note the individual's verbal and non-verbal behaviours, determine their conscious state and orientation by observing and talking to the individual | Behaviours may reflect specific physical abnormalities. Note timing of medications, especially analgesics and sedatives, which may cause the individual to be groggy or less responsive |
| Note their affect and mood, whether they are demonstrating appropriate emotional responses | Reflects their mental and emotional status, consciousness and feelings |
| Note individual's ability to communicate and understand English; also their speech and ability to speak clearly | Alterations reflect neurological impairment, injury or impairment of mouth, improperly fitting dentures or differences in dialect and language |
| If uncertain whether the individual has understood a question, rephrase or ask a similar question | Inappropriate response from an individual may be caused by language barriers, deterioration of mental status, preoccupation with illness or decrease in hearing acuity |
| During the admission process, observe how the individual interacts with family/carer. Be alert for any indications of fear, hesitancy to report health status or willingness to let caregiver control interview. Also observe for any signs of abuse and note if the individual has any obvious physical injuries | Suspect abuse in individuals who have suffered obvious physical injury or neglect, show signs of malnutrition or have bruises on the extremities or trunk. Report as per facility/organisation protocol |
| Identify next of kin, contact details and who to contact when the individual is ready for discharge | In case of an emergency and for any notifications needed to be provided to the next of kin |
| List all medications currently being taken by the individual; this should include both prescription and non-prescription. Any medications present should be locked in a medication drawer or ward cupboard as per facility/organisation policy and returned to the individual on discharge | Administration and storage of medications is completed as per the hospital policy. Medications taken prior to admission need to be listed so they can be reviewed by a medical officer and/or a pharmacist to determine their effectiveness, side effects and contraindications with other medications or treatments |
| Note the presence of any additional treatments and invasive tubes on or with the individual; for example, catheters, intravenous cannulas or drain tubes. Check each device and note the following: device and location, patency and position, correct fluid/medication infusing,<br>any presence of redness, swelling or tenderness, drainage rate or infusion rate and date of last tubing change | Ensures continuity of care to the individual. Any invasive tubes present need careful and accurate monitoring and consequently documentation. Any medical orders regarding additional treatments and invasive tubes need to be recognised and documented |
| Review the individual's fluid intake and output. Ask about their appetite, their bowel function, their bladder function and their oral intake. Commence a fluid balance chart if indicated | Important for fluid and electrolyte balance especially if the individual is at risk for imbalance due to electrolyte losses associated with vomiting, diarrhoea, gastrointestinal drainage or wounds such as burns |
| Note the individual's general physical appearance (weight, age, sex, height, body build) and their personal hygiene and any body odour | Grooming may reflect activity level before examination, resources available to purchase grooming supplies, individual's mood and self-care practices. Can also reflect their culture, lifestyle and personal preferences. Body odour can result from, for example, physical exercise or deficient hygiene |

*Continued*

| CLINICAL SKILL 21.1 Admission and discharge process—cont'd | |
|---|---|
| Inspect skin integrity, ensure that it is a normal colour for race with no areas of skin colour variation, neither dry nor moist, normal temperature, smooth, elastic, no lesions. Ask the individual if they have noticed any changes in their skin condition including pruritus, oozing, bleeding, changes in moles. While doing this identify any wounds present and their management. Inspect pressure points observing for signs of any pressure injury | Changes in colour can indicate pathological alterations. Changes in moles can indicate cancer. Itching could be a result from dry skin, oozing could indicate infection and bleeding may indicate a blood disorder |
| Complete a pressure injury risk assessment (Braden, Waterlow or Norton) if indicated | Most facilities/organisations will complete a pressure injury risk assessment on admission to determine if an individual is at risk of developing a pressure injury. If they are at high risk this allows strategies to be implemented immediately to decrease this risk |
| Assess hair, taking note of quality, texture, distribution and cleanliness | Changes in hair can reflect hormone changes, ageing changes, poor nutrition or use of certain hair care products |
| Monitor nails for any deviations from normal (both hands and feet) | Changes in condition of nails can indicate inadequate nutrition or grooming practices, nervous habits or systemic diseases |
| Note visual acuity and if need for any visual aids. Assess pupils for size, shape and equality. Assess eyes, inspect the position of eyes, colour and condition of conjunctivae and movement | If the individual has vision acuity loss, they may need to make adjustments to support self-caring measures. Normal pupils are round, clear and equal in size. If eyes are asymmetrical in position, this can reflect trauma or tumour growth. Changes in colour of conjunctivae can be due to local infection or symptomatic of another abnormality |
| Assess ears for cleanliness and discharge, assess hearing acuity | Hearing impairment can be caused by impacted cerumen, external otitis or swelling; therefore, the ear structure needs to be inspected |
| Assess mouth, look at lips, mucosa, gums, teeth and tongue, noting any abnormalities | Ill-fitting dentures can cause lesions in the mouth. Inadequate oral hygiene or unhealthy teeth may cause bad breath |
| Assess thorax and lungs, listen to breath sounds and note shape of chest, assess respiratory status, determine rate and rhythm of breathing | Abnormal airflow into the lungs can indicate airway obstruction or mucus. A 'barrel chest' (ribs become more horizontal) can be present in chronic lung disease. Individuals with breathing problems can also assume positions that improve ventilation |
| Assess abdomen, listen to bowel sounds if indicated, ask the individual about their current bowel and bladder function | Changes in symmetry or contour of abdomen can reveal underlying masses, fluid collection or gaseous distension. Normal bowel sounds occur in irregular sequence every 5–15 seconds. If absent can indicate cessation of gastric motility. Hyperactive bowel sounds not related to hunger or recent meal can indicate diarrhoea or early intestinal obstruction. Hypoactive bowel sounds can indicate paralytic ileus or peritonitis |
| Note level of consciousness and orientation. If individual's responses are inappropriate ask them short, direct questions regarding information they should know; for example, 'What is your name', 'What is the name of this place?', 'Where do you live', 'What day is it today?', 'What month is it?' | Measures individual's orientation to person, place and time. Document this as oriented x 3. If disoriented in any way, include subjective and objective data rather than documenting 'disoriented' |
| If indicated, perform a focused neurological assessment. This will include using the Glasgow Coma Scale, pupil size and reaction and limb assessment. A mental state examination may be performed if indicated | Gives further focused baseline data regarding the individual and their condition |

| CLINICAL SKILL 21.1 Admission and discharge process—cont'd | |
|---|---|
| Note gait and posture and if the individual is able to sit, stand and walk normally. Assess their body movements: are they purposeful? Do they display tremors? Are movements co-ordinated or uncoordinated? When assessing posture, note the alignment of the shoulders and hips, observe if they appear slumped, erect or bent | Reveals musculoskeletal problems, mood and presence of pain or difficulty breathing in certain positions. Can also indicate neurological or muscular problems |
| Note degree of mobility, level of independence and range of motion (ROM) | Assessment of individual's normal range of motion provides baseline for assessing changes. It also identifies muscle strength and detects limited ROM |
| Note use of prostheses or aids | May affect discharge home and indicates other devices that may be required. It can also indicate any current health deficits |
| Complete a falls risk assessment if indicated | Most hospitals will complete a falls risk assessment on admission to determine if an individual is a falls risk and, if they are, to implement strategies immediately to decrease the risk of falling |
| Ask the individual if there is any information about physical conditions or their health which hasn't been discussed with them | Allows individuals to discuss any health concerns they have. This is important as they may perceive other health concerns as being more important to them than the one that they have presented with; therefore, it is important to address this for provision of person-centred care |
| Identify and provide any relevant individual learning needs and provide teaching and brochures regarding these; for example, pain management or what to expect post surgery | It is important to ensure information is repeated when necessary and provided in written format if available. The individual may be stressed and demonstrating poor concentration and therefore may not remember the information provided to them |
| Conduct a physical assessment of individual if indicated | If the individual needs further physical assessments in any area of concern these need to be completed |
| Discuss findings with individual as needed | Promotes participation in care and understanding of health status |
| Before leaving the individual, ensure they are comfortable, that they have a water jug (if they are not fasting), they have the call bell within reach and that they have no further questions | If unable to answer any questions, it is important to refer the individual to the appropriate person who can |
| Develop nursing care plan suitable for the individual | Allows effective and efficient nursing treatment of the individual to commence in conjunction with a medical treatment plan |
| Perform hand hygiene | Reduces transmission of microorganisms |
| Document and report relevant information and any abnormalities detected | Verifies the information collected and makes this information available to other members of the healthcare team |
| **For discharge** | |
| Identify the following information about the individual's discharge:<br>• Location on discharge<br>• Who will pick up the individual<br>• How they will travel to their discharge location<br>• What time they will be picked up<br>• If there is a need to use a facility/organisation 'transit lounge' to wait to go home (this should be organised the day before discharge) | Ensures the individual and their family/carer are prepared for discharge |

*Continued*

| CLINICAL SKILL 21.1 Admission and discharge process—cont'd | |
|---|---|
| Ensure the individual is confident about performing any self-care activities that have been taught | Ensures compliance on discharge and that the individual will be able to care for themselves on discharge, reducing the risk of re-admission |
| Assess the individual and family/carer needs for health education; for example, self-care actions, use of equipment, changes to lifestyle as a result of the illness, understanding illness or changing personal behaviours that influence health, use of medications | Allows education to be provided to the individual and their family/carer to help them cope more effectively at home and decrease the risk of deterioration and re-admission |
| Check all referrals to community agencies such as Home and Community Care (HACC), Hospital in the Home (HITH) and physiotherapy have been completed and the individual has the relevant follow-up appointment cards | Ensures the individual will not miss any further follow-up care and that they will have continuity of care once they leave the facility/organisation |
| Ensure the individual has in their possession any aids and equipment necessary | Individuals will grow to rely on the facility/organisation's aids during their stay; therefore, it is important that they have aids available to them on discharge if necessary to ensure a smooth transition home |
| Give the individual advice if needed on where they can obtain any long-term supplies or equipment | If the individual is undecided about buying or hiring equipment while in the facility/organisation, it is important to give them options for when they are discharged to obtain anything they may require. Refer them to an occupational therapist to assist in this |
| If wound care is required, identify and teach the person who will be providing that care (unless it is a community nurse) and supply materials if indicated | Ensures wounds heal appropriately prior to and post discharge. Decreases re-admission. It is also important to identify if someone may need community nursing for wound care early in their admission process as there may be a waiting period for these services |
| Ensure any intravenous cannulas, drain tubes etc have been removed | Once they have been removed also educate the individual on signs of infection from the site |
| Ensure individual has received discharge medications with instructions on their administration. They may need verbal instructions along with written | Medication mismanagement can have dire consequences for the individual; therefore, it is important they understand the correct administration of their medications. A pharmacist review may also be necessary and provision of a Webster pack |
| Ensure private x-rays are returned to the individual | These are generally the property of the individual and may be needed for follow-up care in the community |
| Give any paperwork needed by that individual, for example medical certificates, Work Cover certificates or Transport Accident Commission (TAC) forms | Depending on the individual's circumstances, they may need a variety of different forms and certificates filled out; it is important that these are completed while in the facility/organisation (generally a few days before discharge) |
| Give the individual a copy of their discharge summary and explain any further details needed. Ensure individual has all details of discharge, review all discharge advice | Discharge forms include a summary from the multidisciplinary team and are concise and instructive. They are a good tool for the individual on discharge to assist in their ongoing management of their health |
| Provide the individual with any relevant brochures; for example, routine guidelines about postoperative care, cast care, driving etc | Written information is preferred over verbal as the individual may need this on discharge to clarify any doubts or concerns they have |
| Ensure the individual and their family/carer understand potential complications following discharge and what to do if these occur. Also ensure they are provided with contact details in lieu of any problems | Often this information is also provided on the discharge summary. If not, this needs to be supplied to the individual, preferably in written form |

| CLINICAL SKILL 21.1 Admission and discharge process—cont'd | |
|---|---|
| Ensure all belongings, clothing and valuables are returned to the individual. Help the individual collect and pack all their personal belongings. Assist the individual from the area with a wheelchair if needed and assist them to transfer into the vehicle | Ensures a safe transition for the individual |
| Document and report relevant information | Verifies the information given to the individual |
| Note:<br>• During the admission general health survey assessment, the nurse may need to perform more focused specific assessments as indicated by the individual's health condition.<br>• Discharge planning occurs at different points during the individual's admission to a facility/organisation and is an ongoing procedure. Therefore, on the individual's day of discharge the discharge process will consist of ensuring the individual understands and has all information required for their discharge. Key elements needed for effective discharge planning include collaboration with the individual, efficient communication, prompt assessment of potential interventions needed at home and an interdisciplinary approach. The goal is to assist the individual in making a smooth transition from one setting to another. | |
| *(Crisp et al 2013; Perry et al 2012; Tollefson et al 2012)* | |

## Room preparation

Prior to the individual's admission to the unit, the nursing team will determine the location of their bed. Depending on the person's individual needs and room availability, they may be admitted into a shared or single room. Prior to the orientation of the person to the unit, the nurse should ensure that the room is in order and that all necessary items are available. The room is likely to contain a bed, bedside locker, over-bed table, chair and wardrobe. The location of showering and toileting facilitates may be located in the individual's room, or communally out on the unit. The bed may need to be adapted to meet specific needs; namely the provision of extra pillows, a bed-cradle, high-low bed, falls mat, padded cot sides or a sheepskin blanket (Berman et al 2012).

Although the items placed in the room may vary slightly in different healthcare facilities, the basic items provided for each individual are two bath towels, two face washers and an information booklet. Information provided in this booklet usually involves aspects such as details of visiting hours; meal times; how to identify various personnel; cafeteria, telephone, television and laundry facilities available; regulations regarding smoking, and the time the individual is expected to vacate the room upon **discharge**. Extra items such as oxygen equipment, suction apparatus or an intravenous pole are placed in the room if required. The top of the bedclothes may be turned back or they may be folded down to receive a person who arrives on a trolley (Berman et al 2012).

## Reception of the person

Chapter 19 provides details of the admission assessment. Unless the admission is emergent, the individual should report to the admitting department of the healthcare facility prior to arrival in the unit. Here a member of the clerical staff obtains and records the demographics including the person's full name; age; gender; marital status; religion; next of kin contact details (name, address, phone number); private insurance details (if any) and Medicare number. A white identification band (Figure 21.1) is placed on the individual's wrist as a basic safety precaution against mistaken identity and treatment. If the individual has any known allergies (medication, food, environmental factors), a red identification band (Figure 21.2) replaces the white wrist band; only one band should be used at any one time (ACSQHC 2015). Some facilities require a wrist *and* ankle identification band. Should the person require an x-ray or pathology test, they will be referred to this department prior to admission to the unit. The individual will then be escorted to the unit where a nurse will receive and orientate them (Berman et al 2012).

**Figure 21.1** Standard (white) identification band
*(Medical Illustration, RMH)*

The nurse who has been allocated the admission of the person should greet them and any accompanying friend or relative in a warm and friendly manner. The nurse should

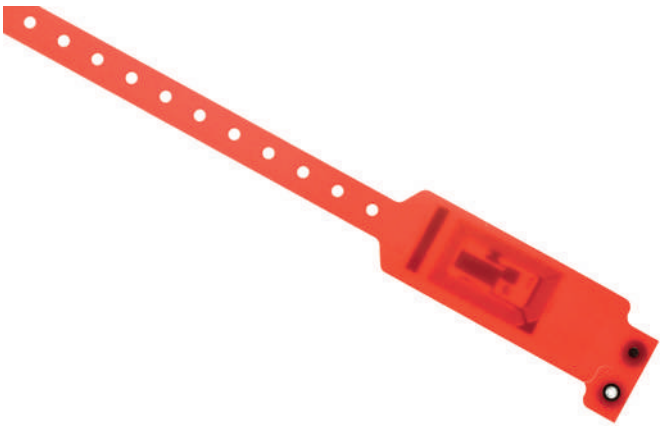


**Figure 21.2** Standard (red) identification band
*(iStockphoto/Mutlu Kurtbas)*

address the individual by their preferred name and introduce themselves, then escort the person to the room and begin the process of admission. Depending on the circumstances, a relative or friend may be present and/or be offered a seat in a waiting area.

The admission procedure is basically the same in most healthcare facilities but will vary in detail in different settings, and in sequence, according to circumstances. The individual is taken to their room and if they are sharing, introduced to any other person in the room. It is important to remember the significance of respecting privacy in a shared room by drawing curtains and lowering your voice in these situations. The individual should be shown the layout of the room, including where to stow personal belongings. It is important that the individual is shown how to use the signal device (call bell), and how to operate the electronic bed, lights, television and radio controls. The individual's identity band should be checked against the bed and or/treatment sheet to ensure they are correct. Depending on the circumstances, the person may remain in day clothes and be able to walk about the unit, or they may be required to change into hospital-provided clothes or personal night attire and get into bed.

Although the person will have been advised not to bring valuable items, an inventory is made of any personal effects. Generally it is not necessary to itemise clothing, but a list compiled of any items of value, such as wristwatch, jewellery, television set, radio and money may be needed. Some healthcare facilities also require that documentation is made of any prosthesis, such as dentures, eye glasses, hearing aids or a prosthetic limb. If the individual has arrived with a large sum of money they are encouraged to either send it home with a relative or to place it in the healthcare facility's safe. A 'valuables' envelope is provided for the safe keeping of money or other valuable items. It is very important to inform the individual that the healthcare facility accepts no responsibility for valuable items, unless they are deposited in their safe. The nurse is advised to follow individual hospital policies regarding the procedures to be followed when individuals' valuables are stored (Crisp et al 2013).

### CRITICAL THINKING EXERCISE 21.5

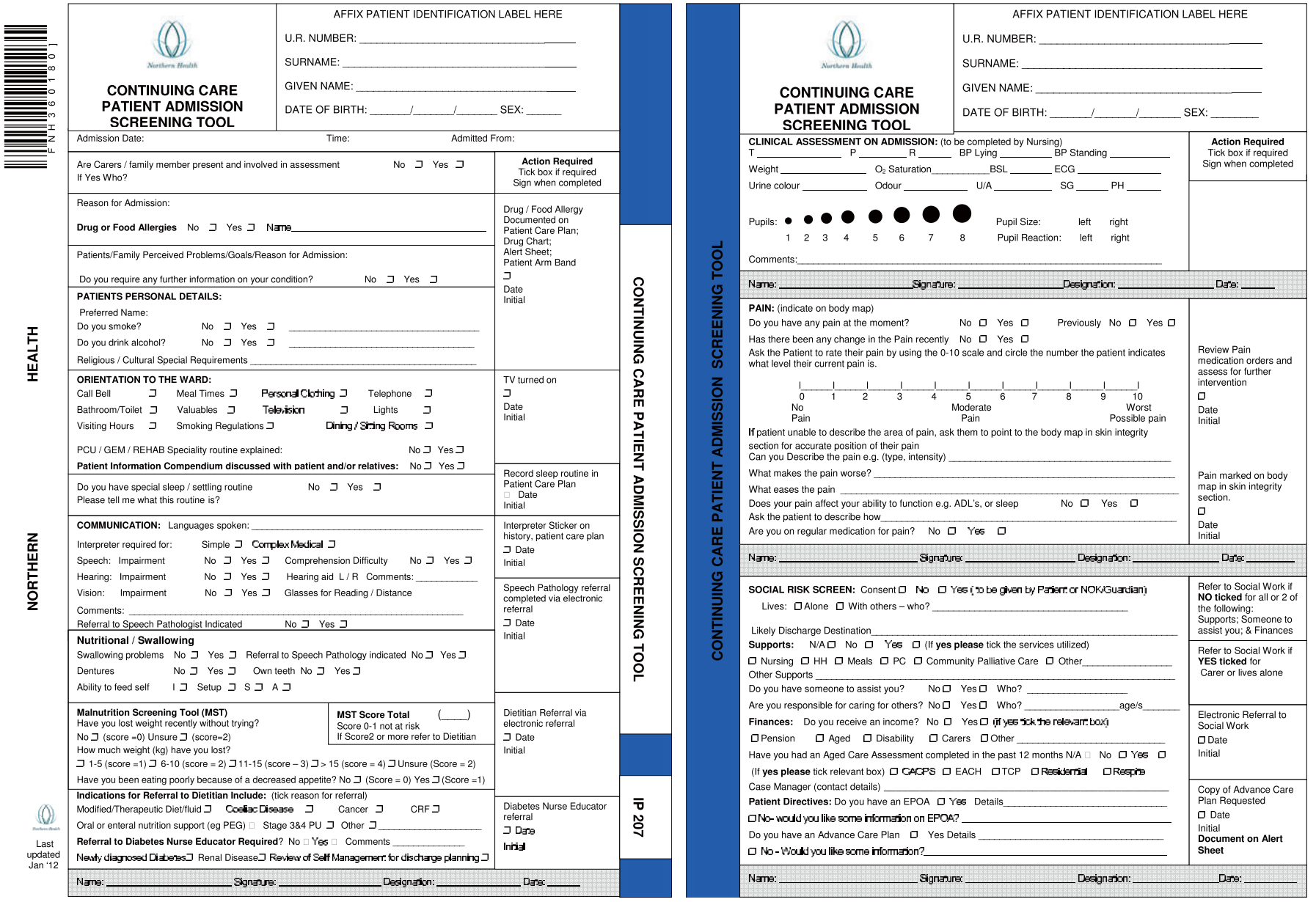
You are admitting Mrs Smith, a 45-year-old woman, to the surgical unit for a scheduled procedure tomorrow. Mrs Smith understands that she has to be admitted the night before due to the pre-operative preparation that is required. While you are helping Mrs Smith to unpack and settle into her room you notice that she has her purse in the suitcase and she has a jewellery box packed as well. You ask Mrs Smith if there are any valuables that need to be locked up with security. She replies that she always takes her diamonds and precious stones with her so they don't get stolen while she is away. You ask Mrs Smith if she has any money and cards in her purse that need to be locked with security. She opens her purse and you notice that she has a large wad of money plus credit/bank cards in her purse. You advise Mrs Smith that she will need to lock up all the valuables in security. She promptly declines stating that she will look after them. What are the nurse's responsibilities in this situation?

As soon as practicable, assessment is made of vital signs and weight, and this information is documented in the clinical file. A sample of urine may be obtained and urinalysis performed. (Information on vital signs and urinalysis is provided in Chapters 20 and 31.) The individual's height may also be measured and documented (Zator Estes et al 2013). Throughout the admission procedure the nurse should discreetly observe the individual to gain information that will assist in planning care. Nursing assessment is completed (and documented accurately on the relevant documentation (see Figure 21.3)) of the individual's:

- General physical appearance
- Degree of mobility
- Level of independence
- Psychological status
- Skin integrity
- Hearing and visual acuity
- Ability to communicate
- Level of consciousness and orientation
- Gait and posture
- Use of prostheses or aids (Berman et al 2012; Zator Estes et al 2013).

At the time of admission or as soon as practical afterwards, a nursing history is compiled and a nursing care plan developed. (Information on these and other aspects of the nursing process is provided in Chapters 16 and 17.)

Unless the individual is on fluid restriction due to their illness or impending surgery, they should be offered a jug of water and a cup of tea or coffee. Anyone accompanying the person may also be offered a drink, or directed to the cafeteria and telephone areas. This assistance is of particular importance in the event of an emergency admission. It is common for significant others to be very distressed, and it may be appropriate for them to be shown to a private area



NORTHERN HEALTH

AFFIX PATIENT IDENTIFICATION LABEL HERE

U.R. NUMBER: _____

SURNAME: _____

GIVEN NAME: _____

DATE OF BIRTH: _____/_____/_____ SEX: _____

**CONTINUING CARE PATIENT ADMISSION SCREENING TOOL**

Admission Date: Time: Admitted From:

Are Carers / family member present and involved in assessment No ☐ Yes ☐
If Yes Who?

**Action Required** Tick box if required Sign when completed

Reason for Admission:

**Drug or Food Allergies** No ☐ Yes ☐ Name_____

Drug / Food Allergy Documented on Patient Care Plan; Drug Chart; Alert Sheet; Patient Arm Band ☐ Date Initial

Patients/Family Perceived Problems/Goals/Reason for Admission:

Do you require any further information on your condition? No ☐ Yes ☐

**PATIENTS PERSONAL DETAILS:**

Preferred Name:

Do you smoke? No ☐ Yes ☐ _____

Do you drink alcohol? No ☐ Yes ☐ _____

Religious / Cultural Special Requirements _____

**ORIENTATION TO THE WARD:**

Call Bell ☐ Meal Times ☐ Personal Clothing ☐ Telephone ☐

Bathroom/Toilet ☐ Valuables ☐ Television ☐ Lights ☐

Visiting Hours ☐ Smoking Regulations ☐ Dining / Sitting Rooms ☐

TV turned on ☐ Date Initial

PCU / GEM / REHAB Speciality routine explained: No ☐ Yes ☐

**Patient Information Compendium discussed with patient and/or relatives:** No ☐ Yes ☐

Do you have special sleep / settling routine No ☐ Yes ☐
Please tell me what this routine is?

Record sleep routine in Patient Care Plan ☐ Date Initial

**COMMUNICATION:** Languages spoken: _____

Interpreter required for: Simple ☐ Complex Medical ☐

Speech: Impairment No ☐ Yes ☐ Comprehension Difficulty No ☐ Yes ☐

Hearing: Impairment No ☐ Yes ☐ Hearing aid L / R Comments: _____

Vision: Impairment No ☐ Yes ☐ Glasses for Reading / Distance

Comments: _____

Referral to Speech Pathologist Indicated No ☐ Yes ☐

Interpreter Sticker on history, patient care plan ☐ Date Initial

Speech Pathology referral completed via electronic referral ☐ Date Initial

**Nutritional / Swallowing**

Swallowing problems No ☐ Yes ☐ Referral to Speech Pathology indicated No ☐ Yes ☐

Dentures No ☐ Yes ☐ Own teeth No ☐ Yes ☐

Ability to feed self I ☐ Setup ☐ S ☐ A ☐

**Malnutrition Screening Tool (MST)**
Have you lost weight recently without trying?
No ☐ (score =0) Unsure ☐ (score=2)
How much weight (kg) have you lost?
☐ 1-5 (score =1) ☐ 6-10 (score = 2) ☐ 11-15 (score – 3) ☐ > 15 (score = 4) ☐ Unsure (Score = 2)
Have you been eating poorly because of a decreased appetite? No ☐ (Score = 0) Yes ☐ (Score =1)

**MST Score Total** (____)
Score 0-1 not at risk
If Score2 or more refer to Dietitian

Dietitian Referral via electronic referral ☐ Date Initial

**Indications for Referral to Dietitian Include:** (tick reason for referral)

Modified/Therapeutic Diet/fluid ☐ Coeliac Disease ☐ Cancer ☐ CRF ☐

Oral or enteral nutrition support (eg PEG) ☐ Stage 3&4 PU ☐ Other ☐_____

**Referral to Diabetes Nurse Educator Required**? No ☐ Yes ☐ Comments _____

Newly diagnosed Diabetes ☐ Renal Disease ☐ Review of Self Management for discharge planning ☐

Diabetes Nurse Educator referral ☐ Date Initial

Name: _____ Signature: _____ Designation: _____ Date: _____

CONTINUING CARE PATIENT ADMISSION SCREENING TOOL

IP 207

Last updated Jan '12

CONTINUING CARE PATIENT ADMISSION SCREENING TOOL

AFFIX PATIENT IDENTIFICATION LABEL HERE

U.R. NUMBER: _____

SURNAME: _____

GIVEN NAME: _____

DATE OF BIRTH: _____/_____/_____ SEX: _____

**CONTINUING CARE PATIENT ADMISSION SCREENING TOOL**

**CLINICAL ASSESSMENT ON ADMISSION:** (to be completed by Nursing)

T _____ P _____ R _____ BP Lying _____ BP Standing _____

Weight _____ $O_2$ Saturation_____BSL _____ ECG _____

Urine colour _____ Odour _____ U/A _____ SG _____ PH _____

Pupils: 1 2 3 4 5 6 7 8 Pupil Size: left right

Pupil Reaction: left right

Comments:_____

**Action Required** Tick box if required Sign when completed

Name: _____ Signature: _____ Designation: _____ Date: _____

**PAIN:** (indicate on body map)

Do you have any pain at the moment? No ☐ Yes ☐ Previously No ☐ Yes ☐

Has there been any change in the Pain recently No ☐ Yes ☐

Ask the Patient to rate their pain by using the 0-10 scale and circle the number the patient indicates what level their current pain is.

0 1 2 3 4 5 6 7 8 9 10

No Pain — Moderate Pain — Worst Possible pain

If patient unable to describe the area of pain, ask them to point to the body map in skin integrity section for accurate position of their pain

Can you Describe the pain e.g. (type, intensity) _____

What makes the pain worse? _____

What eases the pain _____

Does your pain affect your ability to function e.g. ADL's, or sleep No ☐ Yes ☐

Ask the patient to describe how_____

Are you on regular medication for pain? No ☐ Yes ☐

Review Pain medication orders and assess for further intervention ☐ Date Initial

Pain marked on body map in skin integrity section. ☐ Date Initial

Name: _____ Signature: _____ Designation: _____ Date: _____

**SOCIAL RISK SCREEN:** Consent ☐ No ☐ Yes (to be given by Patient or NOK/Guardian)

Lives: ☐ Alone ☐ With others – who? _____

Likely Discharge Destination_____

**Supports:** N/A ☐ No ☐ Yes ☐ (If **yes please** tick the services utilized)

☐ Nursing ☐ HH ☐ Meals ☐ PC ☐ Community Palliative Care ☐ Other_____

Other Supports _____

Do you have someone to assist you? No ☐ Yes ☐ Who? _____

Are you responsible for caring for others? No ☐ Yes ☐ Who? _____age/s_____

**Finances:** Do you receive an income? No ☐ Yes ☐ (if yes tick the relevant box)

☐ Pension ☐ Aged ☐ Disability ☐ Carers ☐ Other _____

Have you had an Aged Care Assessment completed in the past 12 months N/A ☐ No ☐ Yes ☐

(If **yes please** tick relevant box) ☐ CACPS ☐ EACH ☐ TCP ☐ Residential ☐ Respite

Case Manager (contact details) _____

**Patient Directives:** Do you have an EPOA ☐ Yes Details_____

☐ No - would you like some information on EPOA? _____

Do you have an Advance Care Plan ☐ Yes Details _____

☐ No - Would you like some information?_____

Refer to Social Work if **NO ticked** for all or 2 of the following: Supports; Someone to assist you; & Finances

Refer to Social Work if **YES ticked** for Carer or lives alone

Electronic Referral to Social Work ☐ Date Initial

Copy of Advance Care Plan Requested ☐ Date Initial **Document on Alert Sheet**

Name: _____ Signature: _____ Designation: _____ Date: _____

**Figure 21.3** Admission chart

*(Broadmeadows Health Service. Modified from the original, with permission)*

where they can rest or contact family. The hospital may also provide accommodation options for relatives if the person is very ill.

Prior to leaving the room the nurse should ensure that the individual and significant others have been given all the information they require, in conjunction with an opportunity to ask any questions. Should the nurse be unable to answer any questions, it is important that the family be referred to the appropriate person who can. When individuals are stressed they may demonstrate poor concentration and may not remember information provided to them; therefore, it is important to ensure that information is repeated whenever necessary and/or provided in written format as available and in the required language (Berman et al 2012; Zator Estes et al 2013).

## ADMITTING THE PERSON TO THE MENTAL HEALTH UNIT

When a person arrives at a mental health unit it can often be under duress, resulting in distress and, more frequently, anger. Individuals presenting to a mental health unit can be scheduled as 'voluntary' or 'involuntary' (see Chapter 39). The initial reception of a person to the mental health unit is an opportunity for the nurse to commence the foundations for developing a therapeutic relationship. The therapeutic relationship in the mental health setting is an imperative aspect of nursing, and its development and maintenance has significant impacts on outcomes (Bingham 2012).

As with the admission of any individual, the nurse should demonstrate an empathetic manner, validate the person's distress at being detained involuntarily and adopt a warm and sensitive approach (McGuinness et al 2013). Care and sensitivity should be taken when discussing the legalities of an involuntary admission; the individual should be informed of their rights and the avenues of appeal. Care should also be taken when liaising with family or significant others. Consent must be obtained by the person prior to sharing information with family, and obviously this can result in significant distress when individuals do not want concerned family members to be informed of their treatment (Ryan et al 2014). Mental health nurses must maintain confidentiality regarding the individual's wishes, while acknowledging the distress of close family and friends who are experiencing exclusion at being uninformed. Mental health nurses must also be cognisant of the potential for the individual to engage in self-harming behaviours, and consequently remove any potentially dangerous items (see Clinical Interest Box 21.1) (Damon et al 2012).

### CLINICAL INTEREST BOX 21.1 Clinical risk factors and associated nursing interventions when admitting the individual to the mental health unit

Nursing goals for the individual include:

1. Safety
2. Stabilisation
3. Engagement
   - > Orientation to room and unit, including communal areas, toileting/showering facilities, kitchen and laundry areas, telephone
   - > Introduction to all other people (particularly those sharing a room)
   - > Introduction to medical, nursing, interdisciplinary staff
   - > Information regarding meal times; medication times; community meetings; group sessions and basic unit routines (including curfew if applicable)
   - > Search and documentation of belongings (for individuals with potential to harm self or others)
   - > Removal and documentation of valuables to units safe
   - > Removal of sharp items (razors, mirror, glass, scissors etc)
   - > Removal of potential other self-harming items (belts, stockings, tracksuit cords/ties, shoe laces, electrical cords)
   - > Assist individual with engaging in treatment on the unit
   - > Introduction to activities to decrease related psychiatric symptoms

*(Damon et al 2012)*

## ADMITTING A CHILD TO A HEALTHCARE FACILITY

When a child has a condition that requires hospitalisation the nurse should understand the effects of this admission on the child and their parents/carers. Admission to hospital for a child may be elective or an emergency and it is important to understand that an emergency admission to hospital for a child and their parents/carers is often a time of high stress and crisis. In the emergency situation it is imperative that the nurse provides a safe environment for the child and their parents, and that the nurse demonstrates good communication skills and adequate procedure explanations (Rudd & Kocisko 2014). Children in crisis situations will often mirror or mimic their parents'/carers' emotional responses, so it is imperative that the nurse reassures and comforts parents to alleviate their distress and ultimately that of the child (Rudd & Kocisko 2014). It is important that parents and healthcare providers are honest about hospitalisation, and that children are never threatened with an admission as a form of punishment or told they are going on a holiday (Hockenberry & Wilson 2015). From an elective admission perspective, research suggests that children and their parents/carers benefit from pre-admission visits and the provision of detailed leaflets on their procedure prior to admission (Glasper 2013).

Many factors influence the way in which a child and the child's family react when illness or an injury makes it necessary for the child to be admitted to hospital. These include:

- The age of the child and their cognitive ability
- The degree of preparation the child has been given by parents/carers prior to admission. Children who are emotionally secure usually adapt well if they are provided with a realistic explanation of hospital life, informed of the reason for their admission and reassured that their parents will spend as much time as possible with them. Parents/carers often fail to adequately inform their child about impending hospitalisation and can unintentionally transfer their own fears and anxieties which can result in the admission to hospital as a very frightening and traumatic experience for the child (Chiocca 2015; Hockenberry & Wilson 2015)
- The condition of the child. An acutely ill or severely injured child may not be totally aware of the situation but the parents/carers will be distressed and apprehensive
- The cultural background of the child. In some cultures there is an extended and very close-knit family pattern and the child who is accustomed to the loving protection and guidance from parents, grandparents, aunts and uncles can be quite devastated and distressed when separated from such an environment (Chiocca 2015). Also, the child who is accustomed to a little companionship or family support may find the noise and company of other children welcome, or completely overwhelming
- The parents'/carers' reactions to the situation can markedly impact the situation. Emotional outbursts, anxiety and tension are likely to increase feelings of anxiety, insecurity and apprehension in the child. On the contrary, emotionally composed, calm and confident parents/carers will allay their child's fears by promoting feelings of security (Chiocca 2015; Hockenberry & Wilson 2015)
- The relationship between the healthcare staff and the child's parents/carers is a very important factor, particularly in the case of an older child, who will relate more readily to nurses who have established rapport with the parents.

It is evident and widely held that the role of the parents/carers during a child's hospitalisation is important, and parents/carers are often provided unrestricted visiting opportunities and accommodation facilities as necessary (Chiocca 2015; Hockenberry & Wilson 2015; Damon et al 2012). Parents/carers are encouraged to participate in the treatment of their child; however, care should be taken as many parents/carers find this experience anxiety provoking and are confused by blurred or ill-defined roles (Damon et al 2012). When a parent/carer is restricted from spending time with their ill child due to home commitments or economic or travelling issues, they should be referred to the hospital's social worker with a view to arranging help.

## Preparation for admission

Research suggests that preparation is the key to children accepting hospitalisation as reality (Higham et al 2013; Damon et al 2012; Hockenberry & Wilson 2015). While difficulty lies in explaining hospitalisation to infants, children from the age of 2 years can be helped to adjust to hospitalisation by means of adequate preparation through use of drawings and role playing with dolls or their favourite soft toy (Chiocca 2015; Hockenberry & Wilson 2015). Many hospitals have independently published posters, books, DVDs and computer games in order to educate children (and their parents) on the likely procedures and processes of their impending hospital stay, and these tools in conjunction with adequate explanations can enhance understanding (The Royal Children's Hospital Melbourne 2015). Preparation is directed towards overcoming fears and anxieties, such as the fear of:

- Separation
- Bodily injury and pain
- Loss of routine and rituals
- Physical restrictions
- Enforced dependency and loss of independence
- Strangers
- Loss of body image (Hockenberry & Wilson 2015).

The process of preparing for admission includes explaining to the child what will happen to them in age-appropriate, meaningful language. Parents/carers should encourage their child to discuss all aspects of hospitalisation to help overcome any fears and anxieties. Many hospitals now encourage visits to the ward before admission so that the child can see the area and meet some of the personnel who will be involved in their care. Many hospitals with children's facilities also offer 'practice' opportunities prior to procedures, for treatments such as CT scans and MRIs where remaining motionless in a noisy area is imperative. Another way of preparing children prior to hospitalisation is to allow them to pack their own belongings such as favourite pyjamas and teddy in readiness for the trip (The Royal Children's Hospital Melbourne 2015).

Parents/carers are likely to also experience fear and anxiety when their child is to be admitted to hospital (Chiocca 2015). They can be helped to overcome this anxiety if they are provided with information about their child's condition, aspects of their hospitalisation and given an opportunity to ventilate any fears that they have. The emphasis on parental involvement and family-centred care can do much to relieve anxiety. Parents/carers should be informed of the facilities available should they wish to stay with their child and be provided with opportunities to participate in their child's care.

In an emergency admission there is no time to prepare the child or parents and the event can therefore be very traumatic for both. Encouraging one or both parents to stay as long as possible can reduce some of the child's fears and anxieties (Chiocca 2015; Hockenberry & Wilson 2015).

Many children go through various phases of disturbance when they are hospitalised, particularly if they are separated from their parents. During the initial phase, that of *protest*, the child may cry or scream for their parents and refuse the

attention of anyone else (Hockenberry & Wilson 2015). It is not unusual for the child to stop protesting only when physically exhausted. During the second stage, that of *despair*, the crying generally subsides and the child may become withdrawn and apathetic (Hockenberry & Wilson 2015). The child may feel abandoned and experience feelings of hopelessness and grief. During the third stage, that of *detachment*, the child appears to have adjusted to the separation but in reality the child is detaching from the parents in an attempt to escape the pain and wishing they were there (Hockenberry & Wilson 2015). When the parents do visit, the child may react with disinterest and, unless the parents understand these reactions, they may become very distressed. In order to provide an appropriate response, it is important that nurses are familiar with separation anxiety issues and accept that a portion of their time will be directed towards settling the child and helping the parents adjust to the reality of hospitalisation (Rudd & Kocisko 2014).

## Admission

Understandably an admission, either emergent or elective, can be frightening and distressing for the child and their family. Given that many children respond to their parents' emotional reactions with fear and apprehension, it is imperative that the nurse develops a rapport with parents/carers and gains their confidence from the time of admission (Lambert et al 2012). This will reassure the child, and likely calm a potentially distressing situation. Research shows that children experience fears and concerns regarding pain, mutilation, parental separation, immobility and loss of control (Rudd & Kocisko 2014). The nurse has a crucial role to play in alleviating some of this distress.

Prior to admission, the nurse in charge of the unit assigns a room based on the child's age and diagnosis. Some hospitals' paediatric units have age-segregated rooms or units (including adolescent units), while others, where possible, keep infants together to ensure older children can rest without interruption. Other children in the unit will be informed of the pending arrival so that they can be welcomed. Like any other admission, the room should be appropriately prepared with any necessary equipment prior to the child's arrival, as this ensures the nurse will not have to leave the child to gather items.

The admission procedure may vary slightly between hospitals, depending on hospital policy and the prevailing circumstances. The child should have their vital signs assessed, height and weight recorded, identity bands placed on their wrist and/or ankle (or pinned on their clothing if they become upset by this) and urinalysis done if required. The child and their family should also be orientated to the facilities on the unit, including call bells, bed controls, television and radio remotes, telephone and toileting facilities. The child and their family should also be shown the playroom and dining areas and the parents should be provided with details about rooming-in facilities (Glasper 2013; Chiocca 2015).

During the admission, the parents/carers are encouraged to remain with the child and to assist with activities such as undressing and settling at night. The functions of equipment should be explained and, where appropriate, the child should be encouraged to handle some equipment with supervision, to allay fears. Children and their parents/carers are likely to adapt better if they are informed in advance of the possibility of treatments involving the use of intravenous therapy equipment, drainage tubes, dressings, plasters or oxygen apparatus. Like adults, children benefit from participating in the decision-making process, and therefore the nurse should adopt a collaborative and inclusive approach to care (Copanitsanou & Valkeapaa 2014; Hockenberry & Wilson 2015).

## General aspects of paediatric nursing

Care of children differs from the care of adults in many ways; for example, the inability of very young children to communicate necessitates special skills of observation and interpretation. While each child must be treated as an individual, there are certain aspects of care which apply to all children:

- Complete honesty is important. Age-appropriate explanations should be given prior to any procedure. The nurse should not tell a child that a procedure will not hurt if, in fact, it is likely to cause pain; however, the nurse should avoid generating gratuitous concern and distress (The Royal Children's Hospital Melbourne 2015; Hockenberry & Wilson 2015). The nurse should be patient and anticipate that, for some children, becoming 'ready' for the procedure may take time
- The nurse should recognise the child's need for love and a feeling of security. Should the parents/carers be unable to be present all the time, the nurse should ensure the child receives extra time and affectionate support
- **Continuity of care** is important; therefore, where possible, the same nurse should care for the child during hospitalisation. Attempts should be made to maintain a routine similar to the one the child is accustomed to at home. A similar routine makes hospital life less bewildering for a child and promotes a feeling of security
- Efforts should be made to minimise a hospital-type environment; for example, by encouraging the child to wear their own clothes, to sit at a table for meals and by parents providing personal effects such as toys, blankets and photographs
- Encourage discussions on family, pets, friends and school in an attempt to lessen feelings of separation. If parents cannot be with the child all the time, it is sometimes helpful if they leave small presents for the child to open each day. School friends and siblings should be encouraged to visit
- Always attempt to maintain the child's dignity and independence after establishing the parameters with their parents. Developmental regression can be distressing for both the child and the parents/carers and can be exacerbated by hospitalisation
- Allow for periods of regression during hospitalisation and recognise that regressive behaviour is a feature of

illness. Given that regression is exacerbated by stress and hospitalisation is a known cause of stress, it is not uncommon for children to experience regression (Rudd & Kocisko 2014; The Royal Children's Hospital Melbourne 2015). For example, a previously toilet-trained child may begin bedwetting while in hospital

- The provision of opportunities for play is very important in paediatric units. 'Play' is a concept whereby children engage in creative activities of an exploratory nature that are fun, where they interact with their environment in a safe and unpredictable manner (The Royal Children's Hospital Melbourne 2015). Within the hospital environment, play can provide opportunities to reduce anxiety, ensure skill retention and enhancement, provide a diversion and therefore reduce feelings of homesickness and increase empowerment (Hockenberry & Wilson 2015). Children should have access to age-appropriate and safe toys and games in an appropriately supervised environment. Many hospitals now provide children opportunities to play with DVDs and game consoles, to be visited by play and music therapists and, for those with longer-term hospitalisations, to be provided with school programs. Some charitable organisations also fund activities such as clowns, and excursions off the hospital site
- Provide an atmosphere and opportunities that encourage free expression of feelings by the child and parents (Rudd & Kocisko 2014; The Royal Children's Hospital Melbourne 2015)
- Discharge preparation involves providing the parents/carers and child with information about medication or other forms of treatment, postoperative or wound care and follow-up appointments with their doctor or community nurse. It is important to explain to parents/carers that children may experience behavioural disruptions upon returning home such as sleep disturbances, difficulties at school or regressive behaviours (Hockenberry & Wilson 2015). The prevalence of home hospital care has seen an increase in the degree of medical technology used to treat ill individuals in the comfort of their home. Should a child be discharged with intravenous medications, oxygen or other medical treatment, parents/carers should be educated to use this equipment, given opportunities to practise and provided with a contact telephone number should they need advice (Hockenberry & Wilson 2015).

**CRITICAL THINKING EXERCISE 21.6**

You are admitting a 7-year-old girl to the paediatric unit with a chest infection. What are nursing responsibilities to ensure the child and parents remain calm during the period of hospitalisation?

## ADMITTING AN ADOLESCENT TO A HEALTHCARE FACILITY

Adolescence is an important stage of development during which the individual transitions from childhood, enhancing their maturity both physically and emotionally; it is characterised by the appearance of secondary sex characteristics and eventually a cessation of body growth (Chiocca 2015; Hockenberry & Wilson 2015). (More information on growth and development during adolescence is provided in Chapters 13 and 14.) When an adolescent requires hospitalisation, the most appropriate and beneficial environment is one that is specifically designed to cater for their needs. Every effort should be made to accommodate hospitalised adolescents in age-appropriate and, where available, gender-specific units and rooms (The Royal Children's Hospital Melbourne 2015).

Collaboration in care is a vital process in empowering the adolescent in decision making, and is adopted in conjunction with promoting independence and autonomy (Chiocca 2015; Hockenberry & Wilson 2015; Rudd & Kocisko 2014).

In Australia, accidents are the leading cause of death and injury in adolescence. They are largely the result of a tendency to risk-taking behaviours in conjunction with feelings of indestructibility (Crisp et al 2013). The nurse has the opportunity to provide health promotion regarding risk-taking behaviours in a non-judgmental and non-authoritarian manner.

## DISCHARGE PLANNING

There are a number of key elements to discharge planning, namely collaboration with the person, efficient communication, prompt assessment of potential interventions needed at home and an interdisciplinary approach (Lees 2012; Shepperd et al 2013) (see Clinical Skill 21.1). Ideally, discharge planning should commence at a pre-admission clinic or as soon as the person is admitted to hospital and may involve carers or significant others who will be involved with the individual after discharge (Lees 2012; Shepperd et al 2013; Kralik & van Loon 2011). The purpose of discharge planning is to assist the individual to make a smooth transition from one setting or level of care to another without impeding the progress already achieved. By adopting a holistic, interdisciplinary approach the nurse can utilise the diversity of skills in the team, resulting in a positive outcome for the person (Shepperd et al 2013; Kralik & van Loon 2011). While many people are discharged to their home, some move onto long-term rehabilitative settings, nursing homes or palliation. Community services such as Meals on Wheels, community day centres, home cleaners and district nurses all allow the transition from hospital to home to flow smoothly. It is important to acknowledge that a person's outcomes are improved when the discharge process is commenced promptly and efficiently, is inclusive of the individual and their wishes and provides appropriate follow-up at home, in the form of telephone support or postoperative counselling (Barkemeyer 2015; Kralik & van Loon 2011). Effective discharge planning is also associated with a decrease in readmission rates, a

reduction in the length of hospital stays and a reduction in the degree of follow-up community care (Barkemeyer 2015; Kralik & van Loon 2011).

Discharge planning should adopt a team approach and should be family inclusive, ensuring the involvement of the person, medical officers, nurses and other member of the interdisciplinary team; for example, occupational therapist, dietitian, psychologist and social worker (Barkemeyer 2015; Kralik & van Loon 2011). Clinical Interest Box 21.2 outlines the elements of a discharge form.

Steps involved in discharge planning are:

- Assessing the person and their significant others
- Interpreting data to identify specific needs and targeting those needs
- Planning to meet those needs
- Psychological preparation
- Implementing the plan
- Evaluating the discharge planning process and the results (Figure 21.4).

## Preparing individuals to go home

Nurses preparing the person to go home need to assess:

- The individual's personal and health data
- The individual's ability to safely perform the activities of daily living
- Any physical, cognitive or other functional limitations the individual may have
- Carers' responses and abilities
- Dependants
- Adequacy of individual's financial resources
- Community supports
- Hazards or barriers that the home environment presents (e.g. stairs, no shower)
- Need for healthcare assistance in the home.

### CLINICAL INTEREST BOX 21.2 Elements of a written discharge summary form

- Mode of discharge: ambulatory, wheelchair, stretcher
- Individual's instructions for self-care activities: medications, diet, food–drug interactions, wound care, self-catheterisation, pain management, tracheostomy care and treatments
- Signs, symptoms and actions to be taken regarding complications or drug reactions
- Permissible activities (e.g. lifting, driving)
- Correct settings for required equipment
- Follow-up instructions and appointments
- Health-promoting education and interventions
- Explanation of emergency procedures in meaningful language and/or print
- Person's signature, acknowledging understanding of instructions

*(Crisp et al 2013; Brown et al 2015)*

The following outcomes must be evaluated for an individual's discharge plan (Figure 21.5):

- Can the person and family, if appropriate, explain the diagnosis and the safe and effective use of discharge medication?
- What specialist instruction or training is required for the individual and family to be able to provide proper care after discharge?
- What community support systems need to be coordinated to enable the individual to return home safely?
- Are there any physical barriers to returning home (e.g. stairs)?
- Are the person and family able to cope with the individual's health status?
- Is relocation of the individual, coordination of support systems or transfer to another healthcare facility needed? (Crisp et al 2013; Brown et al 2015)

Clinical Interest Box 21.3 outlines home assessment parameters that need to be considered before discharging a person home.

## Teaching as a part of discharge planning

The goal is to provide the individual and their family with the knowledge and skills required to meet ongoing health needs. It is difficult to provide a person with information they need the evening before or the morning of discharge. Before beginning to teach you must determine what information has already been given by the medical officer or other carers. A useful way of determining a person's degree of understanding is to ask them to describe what they believe they are to do when they return home. Any discrepancies can then be identified and the nurse can work with the individual to ensure that they are aware of this information prior to discharge. It is important that the nurse be cognisant of any potential barriers to communication or learning issues that may disrupt the person from understanding their discharge needs (see Clinical Interest Box 21.4). In particular, language barriers must be addressed with interpreters and/or written instructions in the required language. It is important that the individual is provided with a medically trained interpreter, and not a family member. There are a number of reasons for this; namely issues pertaining to confidentiality and ensuring medical information is passed on correctly (Burke et al 2013; Barkemeyer 2015). Given that people from ethnically and linguistically diverse backgrounds have a higher likelihood of medication mismanagement than people from the dominant culture, it is very important that they understand messages clearly and that nurses make every effort to ensure this happens (Juckett & Unger 2014).

Learning will be enhanced if spoken instructions are reinforced with materials in other formats such as DVDs, booklets, audio and simulation which can be used in conjunction with community support groups and internet forums. The nurse should document any instruction that is given to an individual. After a family has learned how to perform any

## THE ALFRED Discharge Plan

U.R.

Surname

Given Names

Facsimile From: _____ Phone: (03) 9276 _____

Hospital Doctor: _____ Phone: (03) 9276 _____

Primary Nurse: _____ Phone: (03) 9276 _____

Allied Health: _____ Phone: (03) 9276 _____

GP Name: _____ Phone: _____

Case Manager: Yes ❒ No ❒ Name: _____ Phone: _____

Interpreter required: Yes ❒ No ❒ Language: _____

Discharge Date: _____ Discharging Ward: _____ Discharge Destination: _____ Discharge Time: _____

**Community Services Needed: Yes ❒ No ❒** Patient declined services offered ❒ (please indicate services declined in table below)

Please complete for all new and existing community services

| Service | ✔ if service involved | Name & title of Community Service staff member spoken to | Date service to commence | Contact phone number | Fax number |
|---|---|---|---|---|---|
| Alfred @ Home | | | | | Not Applicable |
| RDNS/ Community Nursing | | | | | ★ |
| Post Acute Care/ InterPAC | | | | | ★ |
| Council Services: MOW ❒ Home Help ❒ Personal Care ❒ | | | | | ★ |
| Palliative Care Services | | | | | ★ |
| Mental Health Services | | | | | ★ |
| Community Health/ Rehabilitation Centre _____ _____ | | | | | ★ |
| Other (specify) _____ | | | | | ★ |
| Other (specify) _____ | | | | | ★ |

★ please complete the continuation of this table over the page

| Follow up phone call appointment | Yes ❒ | No/Refused ❒ | N/A ❒ | Date: | Time: |
|---|---|---|---|---|---|

**Outpatients Appointments:**

| Doctor/Clinic | Place/Floor | Date | Time |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

**General Instructions:**

The above material has been reviewed with me. My questions have been answered and I understand the contents. I am aware that this information will be sent to my GP and the Community Services involved in my ongoing care.

**Patient's/Carer's Signature:** _____ **Nurse's Signature:** _____

This message is confidential and intended only for the person to whom it is addressed. If you have received it in error please notify the sender and destroy the document. Any unauthorised disclosure, copying or distribution or taking action in reliance on its contents is prohibited and may be unlawful. Bayside Health is not liable for the proper and complete transmission of the information contained in this communication or for any delay in its receipt.



**ORIGINAL TO REMAIN IN MEDICAL RECORD** Copy of front page to be given to patient on discharge and copy to be attached to call back data sheet (MR E-57)

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DISCHARGE PLAN

MR E66

**Figure 21.4** Discharge sheet

*(Reproduced with permission of the Alfred Hospital, Melbourne)*

**Table to be completed by the Alfred hospital staff member notifying/contacting the Community Service Provider.**

For example: if the Palliative Care Nurse Co-ordinator contacts a Palliative Care Community Service to notify them of a patient who will be needing their service, then he/she completes the relevant line in the table (palliative care services). If however, Nursing staff or another staff member (Allied Health etc) make this initial contact with the Community Service Provider, they are responsible for completing this line in the table.

| Service | Notification method | Date * notified ___/___/___ | EDD ** provided ___/___/___ | Date confirmed if appropriate | Name and Title of Alfred staff member *** | Pager number if appropriate |
|---|---|---|---|---|---|---|
| RDNS/ Community Nursing | ph ❒ fax ❒ in person ❒ | | | | | |
| Post Acute Care/ InterPAC | ph ❒ fax ❒ in person ❒ | | | | | |
| Council Services: MOW ❒ Home Help ❒ Personal Care ❒ | ph ❒ fax ❒ in person ❒ | | | | | |
| Palliative Care Services | ph ❒ fax ❒ in person ❒ | | | | | |
| Mental Health Services | ph ❒ fax ❒ in person ❒ | | | | | |
| Community Health/ Rehabilitation Centre | ph ❒ fax ❒ in person ❒ ph ❒ fax ❒ in person ❒ | | | | | |
| Other (specify) _____ | ph ❒ fax ❒ in person ❒ | | | | | |
| Other (specify) _____ | ph ❒ fax ❒ in person ❒ | | | | | |

* Date notified – date external Community Service Provider notified. This should be **at least 2 days prior to discharge** (or day prior to discharge if LOS ≤ 3 days).

** EDD provided – please indicate the estimated discharge date provided to the Community Service Provider on notification.

*** Contact details of the Alfred staff member notifying the Community Service Provider and which have been provided to the Community Service Provider if they require any additional information regarding the patient.

**Discharge Checklist:**

| Routine requirements | Yes | No | N/A | Provided and explained by: |
|---|---|---|---|---|
| Discharge Medications | | | | |
| Medication Education - verbal ❒ - written ❒ | | | | |
| Medical Certificate/Other paperwork (Centrelink, WorkCover, TAC) | | | | |
| Wound Care/Other Education Information | | | | |
| Dressing Materials | | | | |
| Clothing/Valuables returned | | | | |
| Private X-rays returned | | | | |
| Aids/Equipment required | | | | |
| Transport type: | | By Whom: | | |

**Page 2 of 2**

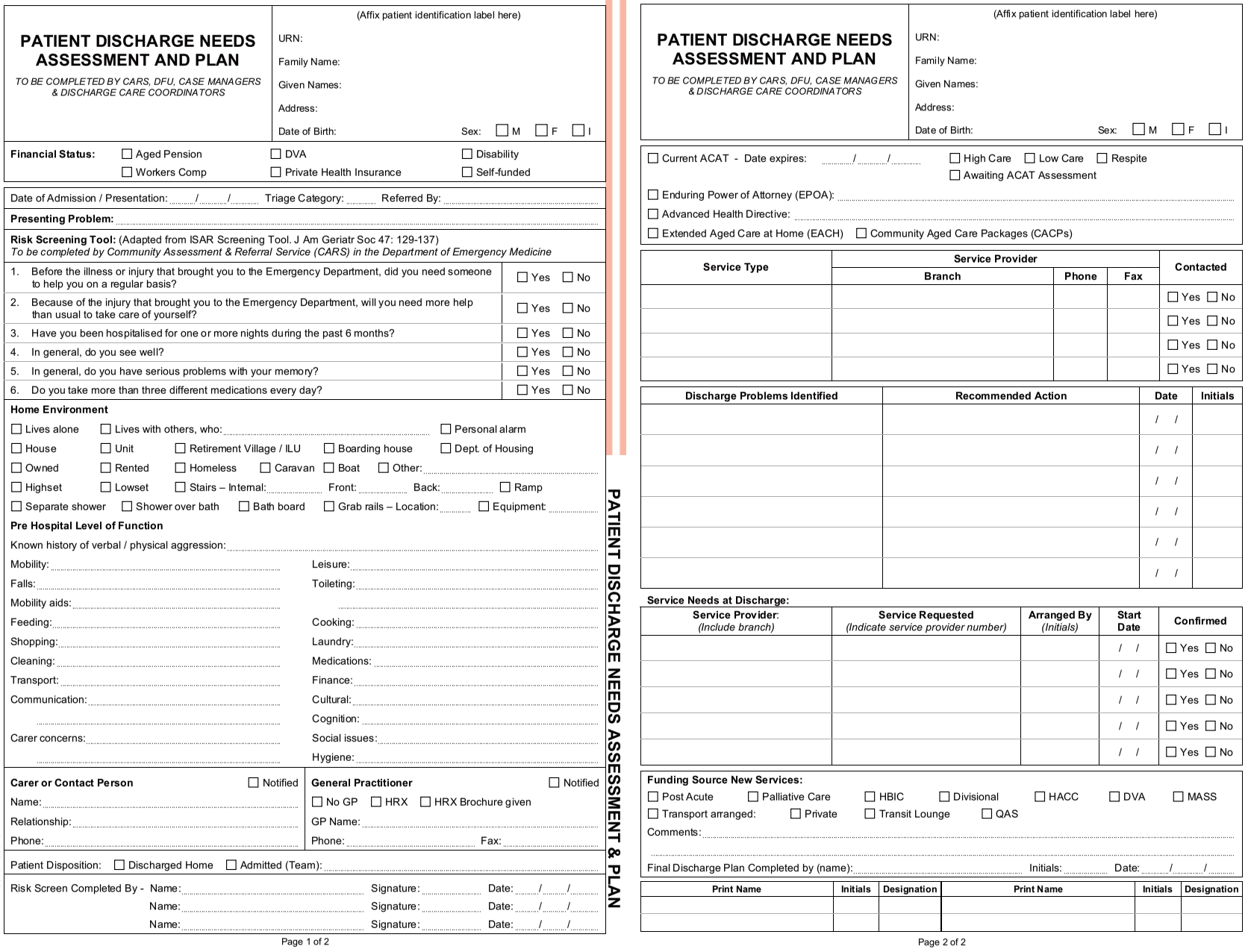
**Figure 21.4** Cont'd

necessary carer skills, have them assume care before the person returns home. Many hospitals require that family members manage care before the person is discharged home to ensure correct understanding of the discharge plan (Crisp et al 2013).

## Day of discharge

When the date and time of discharge have been determined, the individual and significant others are informed, preferably the day before. Transport should be arranged in the form of a taxi, or a transport ambulance, if necessary. Before the person leaves the healthcare facility the nurse should check that:

- The medical officer's discharge orders for prescriptions, changes in treatment or the need for special equipment have been organised
- Dismissal summary containing information pertaining to reason for admission, significant findings and results has been done



## PATIENT DISCHARGE NEEDS ASSESSMENT AND PLAN

*TO BE COMPLETED BY CARS, DFU, CASE MANAGERS & DISCHARGE CARE COORDINATORS*

(Affix patient identification label here)

URN:

Family Name:

Given Names:

Address:

Date of Birth: Sex: ☐ M ☐ F ☐ I

**Financial Status:** ☐ Aged Pension ☐ DVA ☐ Disability ☐ Workers Comp ☐ Private Health Insurance ☐ Self-funded

Date of Admission / Presentation: / / Triage Category: Referred By:

**Presenting Problem:**

**Risk Screening Tool:** (Adapted from ISAR Screening Tool. J Am Geriatr Soc 47: 129-137)
*To be completed by Community Assessment & Referral Service (CARS) in the Department of Emergency Medicine*

| | | |
|---|---|---|
| 1. | Before the illness or injury that brought you to the Emergency Department, did you need someone to help you on a regular basis? | ☐ Yes ☐ No |
| 2. | Because of the injury that brought you to the Emergency Department, will you need more help than usual to take care of yourself? | ☐ Yes ☐ No |
| 3. | Have you been hospitalised for one or more nights during the past 6 months? | ☐ Yes ☐ No |
| 4. | In general, do you see well? | ☐ Yes ☐ No |
| 5. | In general, do you have serious problems with your memory? | ☐ Yes ☐ No |
| 6. | Do you take more than three different medications every day? | ☐ Yes ☐ No |

**Home Environment**

☐ Lives alone ☐ Lives with others, who: ☐ Personal alarm

☐ House ☐ Unit ☐ Retirement Village / ILU ☐ Boarding house ☐ Dept. of Housing

☐ Owned ☐ Rented ☐ Homeless ☐ Caravan ☐ Boat ☐ Other:

☐ Highset ☐ Lowset ☐ Stairs – Internal: Front: Back: ☐ Ramp

☐ Separate shower ☐ Shower over bath ☐ Bath board ☐ Grab rails – Location: ☐ Equipment:

**Pre Hospital Level of Function**

Known history of verbal / physical aggression:

Mobility: Leisure:

Falls: Toileting:

Mobility aids:

Feeding: Cooking:

Shopping: Laundry:

Cleaning: Medications:

Transport: Finance:

Communication: Cultural:

Cognition:

Carer concerns: Social issues:

Hygiene:

**Carer or Contact Person** ☐ Notified

Name:

Relationship:

Phone:

**General Practitioner** ☐ Notified

☐ No GP ☐ HRX ☐ HRX Brochure given

GP Name:

Phone: Fax:

Patient Disposition: ☐ Discharged Home ☐ Admitted (Team):

Risk Screen Completed By - Name: Signature: Date: / /

Name: Signature: Date: / /

Name: Signature: Date: / /

Page 1 of 2

PATIENT DISCHARGE NEEDS ASSESSMENT & PLAN

DO NOT WRITE IN THIS BINDING MARGIN

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PATIENT DISCHARGE NEEDS ASSESSMENT AND PLAN

*TO BE COMPLETED BY CARS, DFU, CASE MANAGERS & DISCHARGE CARE COORDINATORS*

(Affix patient identification label here)

URN:

Family Name:

Given Names:

Address:

Date of Birth: Sex: ☐ M ☐ F ☐ I

☐ Current ACAT - Date expires: / / ☐ High Care ☐ Low Care ☐ Respite ☐ Awaiting ACAT Assessment

☐ Enduring Power of Attorney (EPOA):

☐ Advanced Health Directive:

☐ Extended Aged Care at Home (EACH) ☐ Community Aged Care Packages (CACPs)

| Service Type | Service Provider | | | Contacted |
|---|---|---|---|---|
| | Branch | Phone | Fax | |
| | | | | ☐ Yes ☐ No |
| | | | | ☐ Yes ☐ No |
| | | | | ☐ Yes ☐ No |
| | | | | ☐ Yes ☐ No |

| Discharge Problems Identified | Recommended Action | Date | Initials |
|---|---|---|---|
| | | / / | |
| | | / / | |
| | | / / | |
| | | / / | |
| | | / / | |
| | | / / | |

**Service Needs at Discharge:**

| Service Provider: (Include branch) | Service Requested (Indicate service provider number) | Arranged By (Initials) | Start Date | Confirmed |
|---|---|---|---|---|
| | | | / / | ☐ Yes ☐ No |
| | | | / / | ☐ Yes ☐ No |
| | | | / / | ☐ Yes ☐ No |
| | | | / / | ☐ Yes ☐ No |
| | | | / / | ☐ Yes ☐ No |

**Funding Source New Services:**

☐ Post Acute ☐ Palliative Care ☐ HBIC ☐ Divisional ☐ HACC ☐ DVA ☐ MASS

☐ Transport arranged: ☐ Private ☐ Transit Lounge ☐ QAS

Comments:

Final Discharge Plan Completed by (name): Initials: Date: / /

| Print Name | Initials | Designation | Print Name | Initials | Designation |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

Page 2 of 2

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**Figure 21.5** Discharge needs assessment form

*(Courtesy of the Royal Brisbane and Women's Hospital)*

## CLINICAL INTEREST BOX 21.3 Discharge planning—home assessment parameters

**Personal and health data**

Age, gender, height and weight, cultural data (religion), medical history, current health status, surgery

**Abilities to perform activities of daily living (ADLs)**

Abilities for dressing, eating, toileting, bathing (bath, shower, sponge), ambulating (with or without aids such as a cane, crutches, walker, wheelchair), transferring (from bed to chair, in and out of bath, in and out of car), meal preparation, transportation, shopping and the impact medications may have on completing these safely

**Disabilities/Limitations**

Sensory losses (auditory, visual, tactile), motor losses (paralysis, amputation), communication disorder (aphasia), mental confusion or depression, incontinence

**Carers' responses/abilities**

Principal carer's relationship to individual, thoughts and feelings about person's discharge, expectations for recovery, health and coping abilities, comfort with performing required care

**Financial resources**

Financial resources and needs (note equipment, supplies, medications, special foods required), impact of unemployment on financial situation

**Community supports**

Family members, friends, neighbours, volunteers, religious affiliations, resources such as nutrition services, health centres, community health nurses, day programs, specific interest groups (e.g. MS support groups or local diabetes support groups), legal assistance, home care (cooking, cleaning), respite care

**Home hazard appraisal**

Safety precautions (stairs with or without handrails; lighting in rooms, hallways and stairways; nightlights in hallways or bathroom; grab bars near toilet and bath; firmly attached carpets and rugs), self-care barriers (lack of running water, lack of wheelchair access to bathroom or home, lack of space for required equipment, lack of lift)

**Need for healthcare assistance**

Home-delivered meals; special dietary needs; volunteers for telephone reassurance, friendly visiting, transportation, shopping; assistance with bathing; assistance with housekeeping; assistance with wound care, ostomies, tubes, oxygen therapy, intravenous medication

*(Crisp et al 2013; Brown et al 2015)*

## CLINICAL INTEREST BOX 21.4 An individual's risk factors for discharge planning

- Lack of understanding/knowledge of treatment plan
- Altered cognition
- Newly diagnosed chronic disease
- Major or radical surgery
- More than three active medical problems
- Social isolation
- Emotional or mental instability
- Visual or hearing deficits
- Takes more than five medications
- Lack of financial resources
- Lack of available or proximal referral sources
- Terminal illness
- Lack of in-home carer
- Culturally or linguistically diverse background
- Being bedridden for long periods
- A lengthy hospital stay
- Readmission to hospital within 2 weeks of discharge
- Older than 70 years
- Poor family supports (lives alone)
- Aboriginal and Torres Strait Islander people over 60
- Premature admission to residential care

*(Crisp et al 2013; Barkemeyer 2015; Juckett & Unger 2014)*

- All personal possessions have been collected and packed, including any items of value being held in the facility's safe
- The person is assisted to dress, if necessary
- Any dressings or bandages have been applied as necessary
- Intravenous cannula has been removed
- The individual is provided with any prescribed medications together with instructions for their administration. The healthcare facility generally provides an instruction/information sheet that includes this
- The individual is aware of, and understands, any dietary or activity restrictions, including driving
- Reference material on their condition, or direction on how to access this, has been provided
- The visiting nurse service has been notified, if necessary
- The individual is aware of any follow-up appointments including referrals, if necessary
- The individual is confident about performing any self-care activities that have been taught, such as administering insulin, dressing a wound or caring for a colostomy
- The individual and significant others are provided with contact details should there be any problems after

discharge (Brown et al 2015; Berman et al 2012; Crisp et al 2013; Kralik & van Loon 2011).

When the person is ready to leave the unit they are accompanied to the discharge department and any documentation (usually health-insurance related) is completed. The person is then accompanied to the exit. In the unit, the nurse reports to the nurse in charge and documents that the discharge has been completed.

Current research (Chapin et al 2014) suggests that older persons are particularly vulnerable in the first few weeks post discharge; therefore, it is of paramount importance that the discharge planning process is managed effectively to prevent re-admissions and poor clinical outcomes for this age group.

### Transition lounges

Due to the increasing demands on the healthcare bed, discharge planning has taken a step forward with the development and implementation of transition lounges. The implementation of the transition lounge was due to a reduction in bed numbers which tended to result in 'bed blocking'. Utilising the transition lounge allows a safe and timely transfer/discharge. The individual is situated in an armchair in a specific room/unit until their driver arrives at the hospital to collect them (Blay et al 2012). Effective communication and coordination are essential tools needed to successfully implement early discharge strategies. One strategy is the implementation of a specific handover sheet which simplifies the process by streamlining the vast amount of discharge documentation onto one page, including topics such as discharge diagnosis, pharmacy requirements, mode of transport and the individual's specific requirements (Lees 2012). The transition lounges are staffed by Registered and Enrolled Nurses who specialise in efficient and effective patient discharges, ensuring that safe and optimal person-centred care delivery standards are adhered to at all times (Lees 2013).

## Discharging the mental health person

The day of discharge for the individual from the mental health unit is often one that fills the person with happiness, yet is often met with trepidation and apprehension from the family or carer. There are many considerations made when discharging a person from the mental health unit; importantly, bed shortages have seen an increase in discharge acuity levels (Elder et al 2013; Damon et al 2012). As in other areas of healthcare, discharge planning should commence from the time of admission (Elder et al 2013). While every effort should be made to adopt a collaborative approach to organising discharge, with the person heavily involved—with consent—it is highly beneficial for families and carers to also be involved in this process (see Clinical Interest Box 21.5). The burden of care for families with a mentally unwell loved one is very significant. Sensitivity and empathy should be adopted when liaising with families and support services, and resources should be provided for them. In particular, carers (with the person's consent) should be provided with emergency crisis contact details, case manager details and treatment regimen information. All belongings should be returned to the individual, paperwork signed by the treating psychiatrist and, if necessary, transportation arranged. Should the individual be discharged on a community treatment order, copies of this containing any provisions and further contact details (of case manager, general practitioner and treating psychiatrist) and review dates should be included. Where possible, a meeting between the community treating team, family and individual is useful prior to discharge (Noseworthy et al 2014; Elder et al 2013).

### CLINICAL INTEREST BOX 21.5 Discharge considerations in mental health

- Adherence to medication and treatment regimen
- Substance misuse history
- Potential for relapse or exacerbation of psychiatric symptomatology
- Family supports
- Dependants
- Financial considerations
- Commencement of disability support pension as necessary
- Housing (homelessness, housing affordability)
- Severity of illness
- Potential for harm to self/others
- Degree of insight into their illness and need for ongoing treatment
- Ability to identify future stressors and how this may exacerbate their illness
- Information regarding community follow-up care, including crisis intervention contacts
- Judgment

*(Noseworthy et al 2014; Nurjannah et al 2014)*

## Discharge against medical advice

A person may at any time decide to leave a healthcare facility against the advice of the medical officer and nursing staff. The only time healthcare professionals can stop a person from self-discharging is when they are sectioned under the Mental Health Act (Noseworthy et al 2014; Nurjannah et al 2014). In the event of a person requesting to self-discharge, the nurse must immediately report the incident to the nurse in charge and notify the individual's medical practitioner promptly. If the individual cannot be dissuaded from leaving, they are asked to sign a statement to the effect that they are leaving at their own risk and that they are responsible for the consequences. If the individual refuses to sign, this must be documented in their clinical file. The document is signed by at least one witness; this may be the medical officer or the nurse in charge. Given that self-discharge accounts for about 2% of hospital discharges overall, it is important to consider the reasons why people leave against medical advice, in an effort to identify those people potentially at risk

## CLINICAL INTEREST BOX 21.6 An individual's reasons for self-discharge

- Carer issues (dependants, family issues)
- Social issues
- Employment issues
- Unaffordability to pay hospital expenses
- Dissatisfaction with treatment
- Reporting they are feeling better
- Illicit drug and/or alcohol misusers
- Disempowerment
- Fear
- Boredom

*(Crisp et al 2013; Brown et al 2015)*

## CASE STUDY 21.2

You are caring for John, a 45-year-old man, who is 1 day post cardiac angiogram with three stents placed. While you are taking his morning observations he states that he wants to go out for a cigarette. You discuss his plan of care with him as per the cardiologist and say that it would be unsafe for him to go outside, especially to smoke. He becomes angry and starts yelling at you stating that it is none of your business if he goes out for a cigarette. You as the nurse reiterate in an objective manner that while he is on cardiac monitoring you are legally not permitted to disconnect him. You state you need a medical officer's order to disconnect the telemetry. John yells at you to contact the medical officer and tell him he will be going out for a cigarette no matter what he says. You contact the medical officer and advise him of the situation. The medical officer refuses to give the order to disconnect the monitoring equipment. The medical officer orders nicotine patches for John and asks you to tell John that he will be in later to discuss his treatment plan. You advise John of the medical officer's orders. He refuses the nicotine patches and starts to take the monitor leads off. You contact the charge nurse who attempts to change John's mind about leaving. John remains adamant that he is leaving and asks for the paper to sign as he was leaving against medical advice.

1. Discuss the ramifications of self-discharge from hospital.
2. What are the legal requirements a nurse must complete in this situation?

(Lin et al 2014; Rahimi & Khabbazzadah 2014). Statistically, young males without health insurance who misuse substances, have no regular general practitioner and are from lower socioeconomic backgrounds are more likely to discharge themselves from hospital against advice (Lin et al 2014; Rahimi & Khabbazzadah 2014) (Clinical Interest Box 21.6 and Case Study 21.2).

## Transfer

Sometimes it is necessary to transfer a person from one unit at a healthcare facility to another unit, or to an entirely different facility. **Transfer** of an individual may be necessary for a variety of reasons, such as change in condition, utilisation of private health insurance, demand for available beds or the requirement to be isolated from others. Regardless of the reasons, a transfer may be a distressing experience for the person, who is likely to feel apprehensive about the need to adapt to new surroundings and personnel. The individual may also be worried about the impacts on their family, particularly if the new service is a greater distance from home. Conversely, the transfer may be welcomed as an indication of an improvement in the person's condition, or an improvement in facilities available; for example, being transferred to a general ward from intensive care, or from a public hospital with shared accommodation to a private hospital with their own room. It is important to acknowledge that being transferred to rehabilitation, palliation or a long-term facility can be confusing and frightening for individuals. Whenever possible, have family or a close friend travel with the person or meet them when they arrive at the new facility (Wagner et al 2013; Sethi & Subramanian 2014).

As with discharge, when a person is to be transferred it is essential that they and their significant others are informed as soon as possible. A full explanation of the reasons for the transfer provides the person with time to adjust and provides their significant others time to make any changes necessary. In addition to preparing the person for the transfer, it is necessary to inform the staff in the receiving unit or facility of the individual's condition and care plan. Arrangements for transportation are made if necessary. Key aspects involved in transfer are:

- Informing the person and significant others of the date and time the transfer is to occur
- Assessing whether the individual is able to walk or if a wheelchair or trolley is necessary
- Arranging transportation (e.g. an ambulance) if being transferred to another facility
- Notifying the receiving unit or facility of the date and expected time of the transfer
- Notifying admissions department of the transfer
- Assisting the person to pack all personal possessions, including valuables stowed in the safe. The nurse should check the entire room to ensure nothing is left behind
- Assembling the documents that are to accompany the person
- Sending medications with the individual or returning them to the facilities pharmacy department
- Accompanying the person to the receiving unit, the ambulance or private care
- Introducing the person to the nursing staff in the receiving unit and remaining with them until the staff have received the person into their care
- Reporting to the nurse in charge and documenting that the transfer has been accomplished (Figure 21.6).

FN371000!

**PATIENT TRANSFER FORM**
**use within hospital & to non-acute facilites (non time critical)**

AFFIX PATIENT IDENTIFICATION LABEL HERE

U.R. NUMBER: _____

SURNAME: _____

GIVEN NAME: _____

DATE OF BIRTH: _____/_____/_____ SEX: _____

**Use this form for non time critical adult transfers between:**

- Hospitals within network
- Hospital to other non-acute facilities i.e. rehabilitation centres, aged care facilities

***(In Acute Care: use "ACUTE HOSPITAL (non time critical) PATIENT TRANSFER" form*** -IP 851(b)- *for adult transfers between Acute Health Services.*

**Prior to transfer attach:**

❒ Copy front page of Care Plan (ensure details are updated / correct)
❒ Copy last page of Care Plan (ensure details are updated / correct)
❒ Copy of Wound chart (if used)
❒ Copy Medication Chart

Transferred from:

□ The North Hospital, 185 North Street, North Melbourne 3051
□ Extended Care Centre. 1231 South Road, Melbourne, Vic 3000
□ Melbourne Health Service, 450 Smith Street, Fitzroy VIC 3065
□ Bundoora Health Service. 110 Wales Street Bundoora VIC 3083

Transferred to:_____ Reason for Transfer _____

Does the patient need an Escort: NO / YES If yes, escorted by_____

Health Consultant Doctor:_____

Medical Diagnosis/ Reason for admission:

Past medical History: ❒ Refer to Doctor's letter OR ❒ Details: _____

Most Recent (relevant) Vital Signs prior to Transfer: Temp_____ Pulse_____ Resp _____
BP_____ Blood Glucose _____ Other_____
Oxygen Saturation: On Room Air_____ On Oxygen_____

PERSONAL DETAILS:

**Next of kin** (1): Name_____ Relationship_____ Phone_____

**Next of kin** (2): Name_____ Relationship_____ Phone_____

N.O.K aware of Patient's condition? NO / YES
N.O.K aware of Patient's transfer? NO / YES

Sent with patient? Clothing: NO / YES Dentures: Upper / Lower / None
Spectacles: NO / YES Hearing Aid: Right / Left / None
Valuables: NO / YES

General Comments: _____
_____
_____
_____

Ward: _____ Contact Phone Number_____ Date:_____ Time:_____

Print Name:_____ RN's Signature: _____

**Place original form in patient's file. Photocopy to accompany patient when transferred**

PATIENT TRANSFER FORM

IP 851(a)

Last updated Jan 2012

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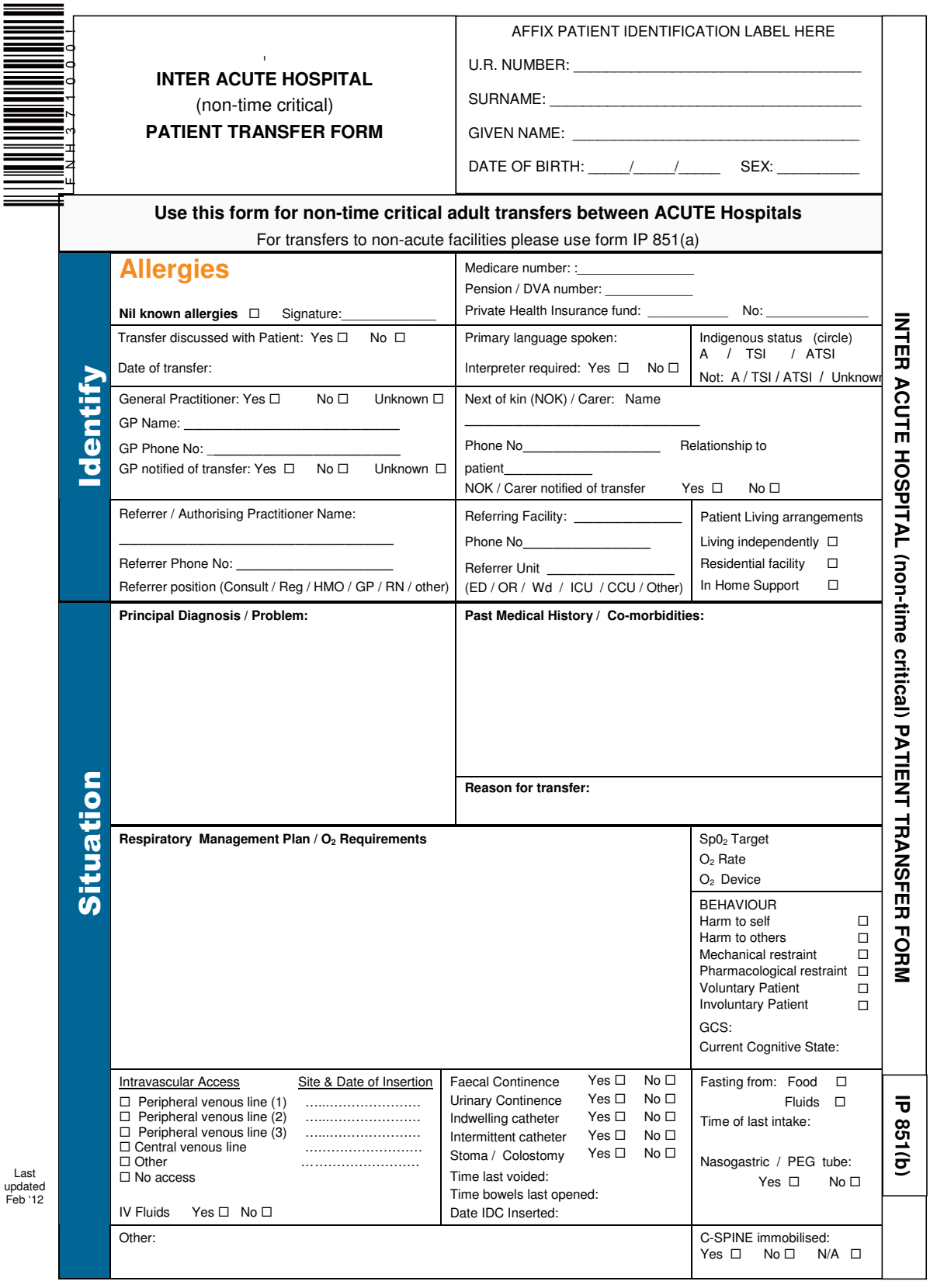
**Figure 21.6** Transfer form



**INTER ACUTE HOSPITAL**
(non-time critical)
**PATIENT TRANSFER FORM**

AFFIX PATIENT IDENTIFICATION LABEL HERE

U.R. NUMBER: _____

SURNAME: _____

GIVEN NAME: _____

DATE OF BIRTH: _____/_____/_____ SEX: _____

**Use this form for non-time critical adult transfers between ACUTE Hospitals**

For transfers to non-acute facilities please use form IP 851(a)

**Identify**

**Allergies**

**Nil known allergies** ☐ Signature:_____

Medicare number: :_____

Pension / DVA number: _____

Private Health Insurance fund: _____ No: _____

Transfer discussed with Patient: Yes ☐ No ☐

Date of transfer:

Primary language spoken:

Interpreter required: Yes ☐ No ☐

Indigenous status (circle)
A / TSI / ATSI
Not: A / TSI / ATSI / Unknown

General Practitioner: Yes ☐ No ☐ Unknown ☐

GP Name: _____

GP Phone No: _____

GP notified of transfer: Yes ☐ No ☐ Unknown ☐

Next of kin (NOK) / Carer: Name

_____

Phone No_____ Relationship to patient_____

NOK / Carer notified of transfer Yes ☐ No ☐

Referrer / Authorising Practitioner Name:

_____

Referrer Phone No: _____

Referrer position (Consult / Reg / HMO / GP / RN / other)

Referring Facility: _____

Phone No_____

Referrer Unit _____

(ED / OR / Wd / ICU / CCU / Other)

Patient Living arrangements

Living independently ☐

Residential facility ☐

In Home Support ☐

**Situation**

**Principal Diagnosis / Problem:**

**Past Medical History / Co-morbidities:**

**Reason for transfer:**

**Respiratory Management Plan / $O_2$ Requirements**

$Sp0_2$ Target

$O_2$ Rate

$O_2$ Device

BEHAVIOUR

Harm to self ☐

Harm to others ☐

Mechanical restraint ☐

Pharmacological restraint ☐

Voluntary Patient ☐

Involuntary Patient ☐

GCS:

Current Cognitive State:

Intravascular Access — Site & Date of Insertion

☐ Peripheral venous line (1) .....

☐ Peripheral venous line (2) .....

☐ Peripheral venous line (3) .....

☐ Central venous line .....

☐ Other .....

☐ No access

IV Fluids Yes ☐ No ☐

Faecal Continence Yes ☐ No ☐

Urinary Continence Yes ☐ No ☐

Indwelling catheter Yes ☐ No ☐

Intermittent catheter Yes ☐ No ☐

Stoma / Colostomy Yes ☐ No ☐

Time last voided:

Time bowels last opened:

Date IDC Inserted:

Fasting from: Food ☐ Fluids ☐

Time of last intake:

Nasogastric / PEG tube:
Yes ☐ No ☐

Other:

C-SPINE immobilised:
Yes ☐ No ☐ N/A ☐

INTER ACUTE HOSPITAL (non-time critical) PATIENT TRANSFER FORM

IP 851(b)

Last updated Feb '12

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**Figure 21.6** Cont'd

**Background**

| Date | Page 2 |
|---|---|

**Speciality Specific Information (incl. Alerts)**

AFFIX PATIENT IDENTIFICATION LABEL HERE

U.R. NUMBER: _____

SURNAME: _____

GIVEN NAME: _____

DATE OF BIRTH: _____/_____/_____ SEX: _____

**Speciality Specific Information / Comments:**

Alerts – Forensic Patient ☐ _____

Alerts – Bariatric Patient ☐ _____

Alerts – Infectious risk ☐ _____

Alerts – Pressure Ulcer risk ☐ _____

Advance Care Directives Yes ☐ No ☐ Unknown ☐

NFR / Limitation of Medical Treatment Order Yes ☐ No ☐ Unknown ☐

Alerts – Other:

Hearing _____ Aid ☐

Vision _____ Aid ☐

Mobility_____ _____ Aid ☐

Falls Risk _____

Weight_____

Dietary Needs_____

**Personal Items:**

| Items | N/A | Accompanying Patient | Sent with Family |
|---|---|---|---|
| Clothing | ☐ | ☐ | ☐ |
| Glasses | ☐ | ☐ | ☐ |
| Dentures | ☐ | ☐ | ☐ |
| Pt Medications | ☐ | ☐ | ☐ |

Equipment: _____

Valuables: Yes ☐ No ☐

List Valuables_____

Other: _____

**Investigation results:**

| | | |
|---|---|---|
| X-Rays | ☐ | Other: |
| Pathology Report | ☐ | _____ |
| ECG | ☐ | |

**Attached Copy of :** ( where applicable )

| | | | |
|---|---|---|---|
| Doctors Letter | ☐ | Cognitive Assessment Tool | ☐ |
| Allied Health Letter | ☐ | Advance Care Directives | ☐ |
| Observation Chart | ☐ | Nursing Care Plan / Pathway | ☐ |
| Medications Chart | ☐ | Fluid Balance Chart | ☐ |
| IV Orders | ☐ | Behaviour Management Plan | ☐ |

NFR / Limitation of Medical Treatment Order ☐

**Receiving Facility (RF)**

RF Name: _____

Appropriate time for transfer agreed: Yes ☐ No ☐

RF Ward Name: _____

Acceptance by Receiving Medical Practitioner Yes ☐ No ☐

Date : Time:

Receiving Medical Practitioner / Unit Name:

_____

Receiving Practitioner / Unit Phone No & Pager:

Acceptance by Receiving Facility Bed Coordinator Yes ☐ No ☐

Date : Time:

Receiving Bed Coordinator Name:

_____

Receiving Bed Coordinator Phone No & Pager:

Patient Transport Provider Name:

Date & Time Booked:

**Form completed by: Print name** _____ **Date:**_____/_____/_____ **Time:** _____

**Job designation:** _____ **Signature:**

- **Fax a copy of this form to receiving hospital prior to patient's departure**
- **Sent a copy of the form with the patient during transfer**
- **Place the original form in the patient's file**

Page 2 of 2

**Figure 21.6** Cont'd

## Summary

Admission to a healthcare facility, whether by means of an elective or emergency presentation, is a major event for an individual and their significant others. Both the person and their significant others are often anxious about the admission and the implications surrounding this (e.g. emotional, financial). An individual may react to admission in one or more ways, including apprehension, relief, irritability, anger or depression. It is therefore important that the nurse perform the admission in an empathetic, caring and sensitive manner.

Prior to receiving the person onto the unit, the nurse must prepare the room. Reception of the individual is directed towards verifying the person's identity, assessing the physical and psychological status, promoting the individual's comfort in an unfamiliar environment and providing items needed for care. It is also important that the nurse provide both written and verbal information to the person in meaningful language (plain English).

The challenges associated with admitting and discharging the individual from the mental health unit are unique and must be addressed in a sensitive and empathetic manner. It is important, where possible and with consent, to involve family and significant others to ensure the best possible outcomes are achieved for the mental health person with potentially complex issues. Safety is of paramount importance.

The individual may be transferred to another unit or healthcare facility and a full explanation as to the reasons for this is necessary for the person and their significant others. Discharge planning, which begins immediately upon admission (or, in the event of elective procedures, prior to it), is directed towards assisting the individual to make a smooth transition from one setting to another. Discharge planning involves assessment, analysis of data planning, implementation and evaluation.

### DECISION-MAKING FRAMEWORK EXERCISE 21.1

You are working on a busy surgical unit in an inner-city hospital. You have been allocated your section for the day; two beds are reserved for postoperative cases later in the morning. The individuals that are under your care are progressing appropriately in the rehabilitation phase of their surgery and you have managed to complete all your scheduled duties before the first person arrives from PACU. The first person underwent an abdominal laparotomy; he is awake and responding appropriately on arrival to the unit. You manage to settle him into the unit ensuring he has adequate pain management. Five minutes later you are called up to the nurses' station by the unit clerk, Mary, who tells you that the parents of your next postoperative case want to meet the nurse who will be looking after their daughter. You introduce yourself to the parents who appear extremely anxious and upset. The father promptly advises you that under no circumstances are you, or any hospital personnel, permitted to discuss the diagnosis or current treatment plan (palliative nursing care) with their daughter Sally. The parents then advise you that they will be in the waiting room and would appreciate being notified when their daughter arrives on the unit.

You contact the post-anaesthesia care unit (PACU) and ask the nurse caring for Sally what the surgery and diagnosis were. The recovery room nurse informs you that Sally had a stereotactic biopsy for a glioblastoma multiforme (a malignant brain tumour). You prepare the bed for the arrival of Sally, as well as informing the charge nurse about the discussion with her parents regarding her diagnosis and treatment plan. The nurse manager confirms that her parents are in charge of making decisions for Sally as she is only 15 years of age. Sally arrives on your unit 30 minutes later. While you are settling her into the unit she begins to ask what they found in surgery. You respond by telling her that you are not sure as the results are not back yet. Sally replies, 'What are you hiding? The doctor told me he would have the results before I wake up.' Sally begins to get upset thinking you are keeping information from her. You try to calm down Sally, explaining that you will get her parents now that she is settled. Sally tells you that she does not want to see her parents until she is told what is wrong with her.

Using the decision-making framework:

1. What strategies could you use to support the parents while they work through this phase of Sally's diagnosis?
2. What strategies could you use to support Sally until her parents communicate with her about her diagnosis and treatment plans?
3. Which allied health services could you suggest for both Sally and her parents?

## Review Questions

1. How would you plan and implement the care for the individual who requires admission, transfer or discharge?
2. How can you ensure a successful paediatric admission?
3. What are the responsibilities of the nurse in relation to assessment and observation of children?
4. What are the key elements of discharge planning?
5. How can the nurse avert some of the problems regarding risk factors for discharge?
6. What safety considerations must be addressed when admitting the individual to a mental health unit?
7. Discuss the effects of hospitalisation in relation to individuals and stress.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australian Commission on Safety and Quality in Health Care (ACSQHC): http://www.safetyandquality.gov.au/our-work/accreditation-and-the-nsqhs-standards/resources-to-implement-the-nsqhs-standards/.

Diabetes Australia: https://www.diabetesaustralia.com.au/.

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UNIT
7

# Basic healthcare needs

CHAPTER 22
Infection prevention and control

CHAPTER 23
Maintenance of health: hygiene and comfort care

CHAPTER 24
Medication administration and monitoring

CHAPTER 22

# Infection prevention and control

*Teresa Lewis*

## KEY TERMS

alcohol-based hand rub
antibiogram
antibiotic
antigen
asepsis
aseptic fields
aseptic technique
asymptomatic
Australian Commission on Safety and Quality in Healthcare (ACSQHC)
Australasian College for Infection Prevention and Control (ACIPC)
Australian Infection Control Association
bacteraemia
bacteria
bactericidal
bacteriostatic
chain of infection
clean
colonisation
communicable disease
Communicable Disease Network Australia (CDNA)
critical aseptic field
cross-infection
direct transmission
disinfection
endogenous
environmental risks
exogenous
fomites
fungi
general aseptic field
healthcare-associated infections (HAIs)
helminths
iatrogenic
immunity
immunocompromised
indirect transmission
infection
inflammation
key-parts
key-sites
Micro-Critical Aseptic Field
microorganism
non-pathogenic
normal flora
nosocomial
nosocomial infection
opportunistic pathogen
outbreak
parasites
pathogen
pathogenicity
Protozoa
reservoir
risk assessment
sepsis
standard aseptic non-touch technique
sterile
sterilisation
surgical aseptic non-touch technique
susceptibility
symptomatic
vector
virulence
virus
World Health Organization (WHO)

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define and explain the key terms
- Discuss the nature of infection
- Explain the links in the chain of infection
- Describe the body's normal defences against infection
- Identify factors that increase susceptibility to infection
- Differentiate between and discuss standard and transmission-based precautions
- Explain nursing responsibilities in relation to preventing transmission of infection
- Identify interventions to reduce risks for infection
- Name the sequence for donning and doffing PPE
- Identify measures that break the chain of infection
- Explain the National Hand Hygiene Initiative 'The 5 Moments for Hand Hygiene'
- Explain and/or demonstrate the principles of aseptic technique
- Define the concepts of standard and surgical aseptic non-touch technique
- Demonstrate recommended and approved infection control techniques when carrying out nursing activities
- Describe the steps to take in the event of a blood-borne pathogen exposure
- Describe the role of the infection control nurse

## CHAPTER FOCUS

Effective infection prevention and control is essential to providing high-quality healthcare for individuals and a safe working environment for those who work in and visit the healthcare setting. Infection prevention and control is everybody's business. Knowledge and understanding of the modes of transmission of infectious organisms and when to apply the basic principles of infection prevention and control is critical to the success of any evidence-based infection control program.

Infectious diseases have not disappeared with advances in drug and medical therapy, and in some cases microorganisms have developed drug-resistant strains. It is essential that healthcare workers (HCW) receive education and develop their knowledge about microorganisms, the infectious process and the application of infection control principles into their daily activities to prevent the spread of microorganisms and transmission of infection. This chapter is intended to further your knowledge which will help to minimise the incidence of healthcare-associated infections (HAIs); the spread of infection between individuals and protect the individual HCW and other healthcare workers from contact with infectious material or exposure to communicable diseases. Nurses are also in a prime position to educate individuals about activities that increase personal resistance to infection, modes of transmission and prevention methods to assist in controlling the spread of infection in the home as well as in the healthcare facility.

Individuals in healthcare settings are at risk of acquiring infections because of lowered resistance and increased exposure to disease-causing microorganisms, and invasive procedures. Sources of infecting microorganisms can be people or environmental objects, such as medical or nursing equipment that has become contaminated.

## LIVED EXPERIENCE

Recently during a hand hygiene education session I was shocked to see how badly I had washed my hands. I was asked to rub a special cream into my hands; once it was all soaked in, I was then asked to wash my hands with soap and water using the same technique that I would use for a social hand wash. On completion of this task my hands were looked at under a black light. I was shocked to see that all around my nails, the outside of my thumb and the backs of my fingers were glowing white. I bite my nails and I was able to actually see potentially how dirty my fingers and nails are when I put them in my mouth after having washed them. The black light also showed up how dry my hands were. I am going to try to never bite my nails again, and I am now aware of the improved technique I should use to wash my hands, especially the tips of my fingers, my thumb and back of fingers which I seemed to omit in my old washing technique. I've also learnt how important it is to use the moisturiser provided by my employer at least 2–3 times a shift. Now I see why hand hygiene technique is so important and why it is necessary to have an audit or assessment process in place.

**Stephanie, Registered Nurse**

## HEALTHCARE-ASSOCIATED INFECTION IS PREVENTABLE

There are approximately 200 000 healthcare-associated infections (HAIs) affecting individuals in Australian acute healthcare facilities each year (Cruickshank & Ferguson 2008). Healthcare-associated ('**nosocomial**') infections are classified as infections that are associated with the delivery of healthcare services in a healthcare facility or healthcare interventions ('iatrogenic'). The infection can occur during admission or may manifest after discharge. As well as causing unnecessary pain and suffering to individuals and their families, these adverse events increase the risk of death, prolong hospital stays and are costly to the health system. The most common settings where HAIs develop are hospital surgical or medical intensive care units. However, HAIs can occur in any healthcare facility and all healthcare workers have a duty of care to take all reasonable steps to safeguard individuals, staff and the general public from infection. The microorganisms that cause hospital-acquired infections can originate from the person themselves (an endogenous infection) or from the hospital environment, personnel or from other individuals via the hands of healthcare workers (exogenous infection).

## IMPROVING HEALTHCARE IN AUSTRALIA

The **Australian Commission on Safety and Quality in Health Care (ACSQHC)** developed the National Safety and Quality Health Service Standards (NSQHS) to encourage and drive the implementation of safety and quality systems and improve the quality of healthcare in Australia. The NSQHS Standards provide a consistent statement about the level of care Australian consumers can expect from any healthcare organisation nationwide. These Standards were developed following consultation and collaboration with a wide range of stakeholders including consumers.

The NSQHS Standards and a national accreditation scheme were endorsed by the Health Ministers in September 2011 and revised in 2015. This has created a national safety

and quality accreditation scheme for healthcare facilities. Infection prevention and control was Standard 3 of the 2012 NSQHS Standards and renamed Standard IP in the Consultation Draft Version 2 (2015).

The intent is to prevent individuals from acquiring preventable HAIs and effectively manage infections when they occur by using evidence-based strategies and antimicrobial stewardship (ACSQHC 2012; 2015a).

## NATURE OF INFECTION

An **infection** is a state that exists when microorganisms have gained entry and have multiplied in the tissues of a host, causing damage to cells or tissues, resulting in either localised or systemic injury. The microorganisms that are capable of causing disease are referred to as **pathogens**. The presence of a pathogen does not always result in an infection (NHMRC 2010).

If the infectious agent fails to cause injury and the person has no signs and symptoms of infection the infection is said to be **asymptomatic**. If the pathogens multiply and cause clinical signs and symptoms, such as pain, high temperature or lethargy, the infection is said to be **symptomatic**. If the infectious pathogen can be transmitted to an individual by direct or indirect contact or as an airborne infection, the resulting condition is known as a **communicable disease**. **Virulence** is a term used to describe the **pathogenicity** of an organism or, in other words, the extent to which it is capable of causing disease. The potential for microorganisms to cause disease depends on **virulence**, a sufficient number of organisms being present and their ability to enter and survive in the host. An opportunistic pathogen causes disease only in a susceptible individual. Infectious diseases are a major cause of death worldwide. The **World Health Organization (WHO)** is the major regulatory body at an international level. In Australia, the **Communicable Disease Network Australia (CDNA)** provides national public health leadership and coordination on communicable disease surveillance, prevention and control. It also provides strategic advice to government and other key bodies on public health actions. The **Australasian College for Infection Prevention and Control (ACIPC)** is the peak body for infection prevention and control professionals in the Australasian region.

## MICROOGANISMS

**Microorganisms** are forms of animal or plant life too small to be seen without the aid of a microscope. One of three events occurs when microorganisms invade the body. They are destroyed by the body's immune defence mechanisms, they stay within the body without causing disease or they cause infection or infectious disease.

### Distribution of microorganisms

Microorganisms are found in every situation where it is possible for life to exist. Microorganisms are present in air, water, soil, dust, in and on food, on every surface and in and on the bodies of living organisms, including human beings. Microorganisms may be pathogenic or **non-pathogenic**. Non-pathogenic microorganisms do not cause disease under normal circumstances or when in their normal environment. Those that normally reside on or in the human body and cause no harm are termed the body's **normal flora**. Normal flora defends the body by curbing invasion by pathogenic microorganisms. If a microorganism is transferred to another area of the body, for example from the normal flora of the gastrointestinal system to the renal system, it could cause an *Escherichia coli* urinary tract or kidney infection.

Normal flora is found on the skin, on the mucous membranes of the upper respiratory tract, in the intestines and in the vagina. For example, *Clostridium difficile* is a bacterium found in people's intestines ('digestive tract' or 'gut'). The bacteria do not cause infection or disease by their presence alone and can be found in healthy people. When the normal balance of bacteria in the gut is disturbed *Clostridium difficile* can multiply to levels where the toxins they produce cause illness such as diarrhoea and severe inflammation of the bowel. This is when an individual is said to have a *Clostridium difficile* infection. During this time the individual is classified as contagious to others and requires additional precautions. In cases where people are more vulnerable (i.e. those whose normal gut bacteria have been disrupted by antibiotic treatment or by other medications), *Clostridium difficile* may be able to multiply in the gut and go on to cause disease. Infective pathogens are the organisms that are able to overcome the normal defences of the body, invade the tissues, multiply and produce poisonous substances such as toxins that damage the tissues and cause disease (see Table 22.1).

#### CRITICAL THINKING EXERCISE 22.1

Mrs Blake is currently being treated with chemotherapy. She has had two previous short admissions with diarrhoea and vomiting. During her last admission 3 weeks ago she was treated with antibiotics for an *Escherichia coli* urinary tract infection.

*Escherichia coli* are considered normal flora in which system of the human body? Are *Escherichia coli* considered normal flora in the urinary tract? How could *Escherichia coli* be introduced into the urinary tract?

On this admission to your healthcare facility Mrs Blake has abdominal cramping, a temperature and watery diarrhoea.

What infection control measures should be considered on her admission? What, if any, investigations or precautions should be implemented? What has happened to her natural defence systems for this to happen?

### Types of infection

Infections can be localised or systemic. A local infection is limited to a specific part of the body where the microorganisms remain. If and when the microorganisms spread and damage other parts of the body it is known as a systemic infection. A **bacteraemia** occurs when a blood culture reveals the presence of a microorganism in the blood. When a

**TABLE 22.1 | Distribution of common residual microorganisms (flora)**

| Body areas | Microorganisms | |
|---|---|---|
| Skin | *Staphylococcus aureus*<br>*Staphylococcus epidermidis* | *Propionibacterium acnes*<br>*Corynebacteria* |
| Nasal passages | *Staphylococcus aureus*<br>*Staphylococcus epidermidis* | *Corynebacteria* |
| Pharynx | *Streptococcus epidermidis*<br>*Streptococcus salivarius* | |
| Mouth | *Streptococcus mutans*<br>*Lactobacillus* | *Staphylococcus epidermidis*<br>*Streptococcus salivarius* |
| Lower gastrointestinal tract<br>Intestine | *Escherichia coli*<br>*Enterococcus faecalis*<br>*Clostridium* sp.<br>*Staphylococcus aureus* | *Bacteroides* sp.<br>*Lactobacillus* sp.<br>*Enterobacteriaceae* |

*(Adapted from Lee & Bishop 2013)*

bacteraemia results in systemic infection, it is referred to as **sepsis** (Berman et al 2015).

There are also acute and chronic infections. Acute infections generally appear suddenly or last a short time, whereas a chronic infection may occur slowly, over a long period of time, and may last months or years.

**Colonisation** is the process whereby the microorganisms become resident flora. In this state, the microorganisms may grow and multiply but do not cause any harm or disease to the person. For example, an individual can be colonised with methicillin-resistant *Staphylococcus aureus* (MRSA) and show no signs of infection or ill health. Infection or disease occurs when the micro-organisms invade parts of the host's body where the defence mechanisms are ineffective and cause tissue damage.

## Risk of contracting infection

Infectious agents (also known as pathogens) are agents that cause disease or illness to their hosts. There are many infectious agents present in all healthcare facilities and there is a very real risk to the individual of both infection and colonisation within a healthcare facility. While the specific risks may differ between healthcare facilities, the basic principles of infection prevention and control apply regardless of the facility (NHMRC 2010).

Transmission of infectious agents within a healthcare setting requires the presence of the following elements:

- A source or reservoir of pathogenic organisms in sufficient numbers (causative/infectious agent)
- A mode of transmission (vehicle to transport an infectious agent to a new destination)
- A susceptible new host.

Transmission occurs when the agent leaves its reservoir or host through a portal of exit, is conveyed by some mode of transmission and enters through an appropriate portal of entry to infect a susceptible host. This sequence of events is sometimes called the **chain of infection**. (See Figure 22.1 and Table 22.2.)

## Types of microorganisms/causative pathogenic agent

The major groups of microorganisms are classified according to size, structure and method of reproduction. Microorganisms include bacteria, viruses, fungi and parasites. **Bacteria** are by far the most common infection-causing microorganism (Berman et al 2015). They are single-celled microscopic organisms without a nucleus that have the capacity to reproduce rapidly. Bacteria make up the largest group of pathogens and are often treated with **antibiotics**. The advent of antibiotics in the 1940s provided a powerful weapon to treat bacterial infections; however, because bacteria continually mutate as they divide, some had natural resistance to the effects of antibiotics and have developed into resistant strains. These pathogens may include methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococcus* (VRE) and multi-resistant gram-negative (MRGN) microorganisms, such as *Acinetobacter* species. Enterococci are bacteria (or germs) that live in most people's gut and urinary system and usually do not cause illness. However, like many organisms, enterococci can sometimes invade other parts of the body and cause infection. Vancomycin is a very strong antibiotic often used to treat complicated infections when other antibiotics do not work. When enterococci are exposed to vancomycin, they sometimes develop ways to stop the antibiotic working by developing a resistance to the antibiotic, and this has led to the development of 'vancomycin-resistant enterococci' (VRE).

These multi-drug-resistant organisms are dangerous threats, and emphasise the need for nurses and all healthcare workers to practise effective infection prevention and control measures, and for every healthcare facility to optimise antimicrobial use among individuals in order to reduce antibiotic resistance (NHMRC 2010). (Refer to Decision-making Framework Exercise 22.1 and Figure 22.2.)

**Viruses** are specialised microorganisms with a number of distinctive characteristics:

- Most are ultramicroscopic, meaning that they are too small to be seen with a light microscope and can be viewed only with an electron microscope
- They have no cell structure and they lack a rigid cell wall
- They are intracellular parasites, meaning that they can grow and reproduce only when living within a host cell, and cannot be cultured on dead or artificial media.

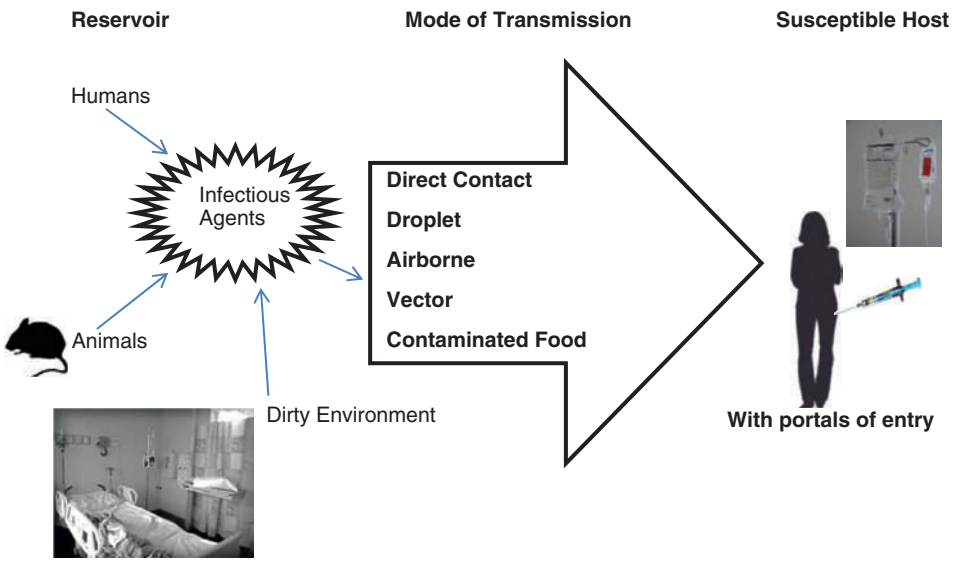


**Figure 22.1** The chain of infection

All infection prevention and control principles and activities are directed towards breaking or controlling the transmission of infectious agents in the chain of infection

*(Courtesy of Teresa Lewis)*

## DECISION-MAKING FRAMEWORK EXERCISE 22.1

You have been employed at a healthcare service as an Enrolled Nurse. The rehabilitation ward you have been assigned to uses a total patient care model of nursing care. On this particular shift there are three (3) Registered Nurses (RNs), two (2) Enrolled Nurses (ENs) and one (1) Assistant in Nursing (AIN). You have been allocated six people to care for. All individuals are in twin share rooms. At handover and upon reading the progress notes you note that one individual has a leg ulcer which has been worsening. Documentation notes that the area is reddened, swollen and tender, and a purulent discharge has been noted over the last three (3) days. One of your colleagues undertook a wound swab for culture and sensitivity two (2) days ago. The other individual sharing the room is five (5) days post total knee replacement.

Three hours into the shift you are notified by the RN in charge that the pathology results have returned and that the patient with the leg ulcer has methicillin-resistant *Staphylococcus aureus* (MRSA) bacteria growing in the wound. You are informed that you need to move the individual to the available single room and implement transmission-based precautions. You need to set up the PPE station outside the room and organise the signage.

Using the decision-making framework:

1. Do you continue to accept all the individuals given to you as part of your allocation?
2. With your knowledge and level of expertise do you undertake this care autonomously as well as the care of the other individual sharing the room?
3. Would you consider undertaking this care upon asking for assistance from someone at your facility who can help with the health education and/or supervision of your care? Perhaps there are processes in place whereby the individuals can receive an educational pamphlet on the subject?
4. Are there processes/policies in place that may help you with undertaking this care?
5. With your knowledge and level of expertise are you able to identify the potential risks and implement the correct strategies to avoid or minimise these risks?
6. Should you consider notifying other relevant departments in your facility to help with some of the infection prevention strategies that may be required?
7. Do you with your level of knowledge understand your accountability and reporting responsibilities in performing this care?
8. Have all these above factors been considered when making the allocation or is it expected that you continue with the care as per your instructions? Considering the staff on this shift, is the model of nursing care appropriate?
9. If the model of care is not appropriate, what model would you suggest would work?

**TABLE 22.2 | Interrupting the chain of infection**

| Link in the chain | Objective | Infection control nursing interventions |
|---|---|---|
| Causative agent (microorganism) | Minimise the number of microorganisms | Ensure all reusable medical devices/equipment is cleaned and disinfected or sterilised in the correct manner before reuse.<br>Education and support of all individuals involved in cleaning, disinfecting and sterilising reusable devices and equipment to reduce the numbers of microorganisms present |
| Reservoir/source<br>• Infected person<br>• Vector<br>• Contaminated object<br>Dirty environment | Eliminate conditions that favour growth of microorganisms<br>Prevent transmission of microorganisms | Correct hand hygiene technique<br>Use of disposable gloves<br>Standard precautions: handling, cleaning/disinfecting/sterilising/disposing of contaminated articles<br>Correct environmental cleaning procedures<br>Correct standard or surgical aseptic technique<br>Additional barriers/isolation precautions as indicated |
| Portal of exit—body fluids, excreta or other secretions | Prevent contamination | Correct hand hygiene technique especially after going to the toilet<br>Use of disposable gloves<br>Use of standard precautions<br>Never recap needles; correct handling of all body fluids/sharps/other equipment<br>Correct standard or surgical aseptic technique<br>Educate individuals/others regarding measures to prevent transmission |
| Route/methods of transmission:<br>• Hands<br>• Mouth/nose<br>• Infected lesions/body fluids<br>• Contaminated food/water<br>• Contaminated objects | Prevent cross-contamination; eliminate vectors | Correct hand hygiene technique<br>Correct cough etiquette<br>Use of disposable gloves<br>Correct use of all PPE<br>Correct handling of all waste<br>Use of standard/transmission-based precautions<br>Correct storage/preparation of consumables<br>Correct standard or surgical aseptic technique<br>Isolation precautions<br>Effective pest control |
| Portal of entry into the susceptible host:<br>• Mouth/nose<br>• Body orifices<br>• Openings in skin/mucous membranes | Prevent entry of microorganisms into a host | Use of standard/additional precautions<br>Use of mask, face shield, goggles, gloves, gown<br>Avoid putting contaminated hands/objects near mouth<br>Correct use of aseptic technique for any invasive procedures<br>Correct standard or surgical aseptic technique<br>Waterproof occlusive covering to protect skin breaks<br>Effective skin and oral hygiene |
| Susceptible host | Improve individual resistance to infection; prevent infection | Assess potential for infection<br>All above precautions<br>Protective isolation if indicated<br>Provide healthy nutrition/sound rest and sleep. Encourage exercise as able<br>Protective skin care, aids as needed (e.g. sheepskin elbow/knee pads, air mattress)<br>Positioning to promote lung expansion<br>Correct aseptic non-touch technique |

*(Modified from deWit & O'Neill 2014)*

Some of the common viral diseases of concern within the healthcare setting are herpes simplex, hepatitis (A, B and C viruses), influenza and human immunodeficiency virus (HIV).

**Fungi** are tiny organisms such as moulds and yeasts that belong to the world of plants but contain no chlorophyll. Fungi are present in the soil, air and water and they multiply by producing various kinds of spores. *Candida albicans* is considered normal flora in the human vagina.

**Parasites** live on other living organisms. They include **Protozoa**, which are single-cell organisms of the animal kingdom. The route of entry is usually by ingestion of

| **Patient ID Label (if available)** | **Facility:** |
|---|---|
| **Name:** | **Ward:** |
| **Date Of Birth:** | **Date Admitted:** |
| **UR Number:**<br>**Address:** | **HCW Completing Form:**<br>**Name:**<br>**Date:** |
| ***DATE PRECAUTIONS COMMENCED*:** | ***PRECAUTIONS IMPLEMENTED UNTIL:*** |
| ***TYPE OF TRANSMISSION-BASED PRECAUTION:***<br>☐Contact<br>☐Droplet<br>☐Airborne<br><br>***ACCOMMODATION*:**<br>☐Single room<br>☐Dedicated toilet—clean prior to reuse<br>☐Single room with ensuite<br>☐Isolation—Class N room (Negative Pressure Room)<br>☐Shared accommodation (see *Cohort Instruction above)<br>☐Healthcare records to remain outside room<br><br>***PERSONAL PROTECTIVE EQUIPMENT (PPE):***<br>**HCWs**<br>☐On entry to room<br>☐For individual and bedding contact<br>☐Prior to performing procedures risk of Blood/Body fluid exposure<br>☐Gloves<br>☐Disposable long impervious sleeved gown<br>☐Fluid repellent mask<br>☐Particulate filter mask N95(P2)<br>**VISITORS**<br>☐On entry to room<br>☐Hand hygiene<br>☐Gloves<br>☐Disposable long-sleeved impervious gown<br>☐Fluid repellent mask<br>☐Particulate filter mask N95(P2)<br>**PATIENTS**<br>☐When leaving room<br>☐Fluid-resistant mask<br>☐Hand hygeine<br><br>***HCW AND VISITOR ENTRY RESTRICTION:***<br>*Those meeting any of the following entry criteria should NOT enter this room:*<br><br>☐Those not immune to: _____<br>☐Those with skin conditions (e.g. dermatitis or eczema)<br>☐Pregnant<br>☐Immunosuppressed<br>☐Children: (check the facility's Transmissible Diseases Exposure Management Plan/Policy). | ***COHORT INSTRUCTION*: *NB. HCWs should discuss these requirements with IPC coordinator **BEFORE** considering cohorting individuals*** (Same infectious agent and antibiogram required).<br>☐Cohort individuals identified with same organism.<br>☐Cohort asymptomatic contacts from multiple bed rooms (i.e. were exposed to symptomatic individual).<br><br>***HAND HYGIENE:***<br>***(As per 5 Moments for Hand Hygiene)***<br>All persons entering the room should:<br>☐Use alcohol-based hand rub (ABHR) routinely before entry and after leaving the room.<br>☐Wash hands using handwash if hands visibly soiled or known *Clostridium Difficile*/norovirus<br>☐Perform hand hygiene after removing PPE.<br>☐Wash hands using antiseptic handwash.<br><br>***WASTE AND LINEN MANAGEMENT:***<br>Waste—as per standard precautions<br>Linen—as per standard precautions<br><br>***EQUIPMENT/ENVIRONMENT MANAGEMENT:***<br>☐Single use/dedicated equipment where possible.<br>☐Clean all equipment upon removal from room with detergent wipes/disinfectant.<br>☐Soft furnishings and carpet—clean upon discharge if soiled.<br>☐Bed screen and shower curtains—replace upon discharge, or when soiled—whichever is the sooner.<br>☐Disposable items—discard on discharge (e.g. toilet paper, paper hand towel).<br>☐High-touch surfaces—twice daily clean.<br>☐On discharge—clean room and equipment with TGA-approved disinfectant (e.g. sodium hypochlorite (chlorine) as per state Health Dept. Guidelines (e.g. Gastro/VRE/MRSA ).<br>☐Environmental services/food services—notify requirements (copy IPC care plan and forward to dep't).<br><br>***TRANSFER AND TRANSPORT MANAGEMENT:***<br>☐Booking coordinator notified of admission and transfer.<br>☐Receiving department/facility notified of reason for transmission-based precautions required prior to transfer.<br>☐Community health centre/aged care facility/GP notified upon discharge where necessary. |

**Figure 22.2** Nursing care plan for infection prevention and control precautions

To be completed by HCW caring for the individual in consultation with infection prevention and control (IPC) practitioner on diagnosis or suspicion of infection. Tick the box that applies to the individual transmission-based precautions required. Review daily or when any changes to current diagnosis, laboratory testing or results become available.

*(ACSQHC 2015b)*

contaminated water or food, which commonly results in severe diarrhoea. Some protozoans are transmitted by insects (**vectors**) to humans; for example, the plasmodium species, which is carried by mosquitoes and causes malaria. **Helminths** are parasitic worms or flukes—multicellular animals that are pathogenic to humans. They are not common in Australia.

## Reservoirs (sources) of infection

A **reservoir** is a place where a pathogen can survive and may or may not multiply. Common reservoirs of pathogenic microorganisms are other humans, the individual's own microorganisms, animal or inanimate sources. The presence of microorganisms does not always cause a person to be ill. In humans, microorganisms can thrive in reservoirs such as open wounds, blood, nasal passages and skin crevices.

Most organisms that infect humans are acquired from human sources. The entrance of a foreign object or organism into a sterile site leads to a high risk of infection. **Endogenous** infection occurs when normal flora cause infection by being transferred from their normal place of residence to a different site in the same host. **Cross-infection** may occur when organisms from one person are transferred to another person; for example, when organisms on a nurse's hands are transferred to a person's wound.

## Portals of exit from reservoir

If microorganisms from the human body are to enter another host and cause disease, they must first find a portal of exit, and then a new site in which to reside. When the human body provides the reservoir, microorganisms can exit through a variety of sites (see Table 22.3).

## Modes of transmission

Microorganisms move from a reservoir to a new host in a variety of ways. Each disease has transmission characteristics based on the nature of the microorganism that causes it. Knowing the method of transmission is important in implementing infection prevention and control measures. In a healthcare setting, the main modes of transmission of infectious agents are *contact* (including blood-borne), *droplet* and *airborne*. In some cases the same organisms can be transmitted by more than one route or a combination of modes (NHMRC 2010).

*Clinical note*: The varicella zoster virus, which causes chickenpox, can be acquired through inhalation of infected airborne particles (airborne transmission) as well as through contact (contact transmission) with infected fluid leaking from skin lesions.

### Contact transmission

Contact is the most common mode of transmission; it may be direct or indirect. This form of transmission requires the implementation of the transmission-based precaution tier 2 contact precautions in addition to standard precautions when caring for such a person (see later in chapter for further explanation).

**Direct transmission** occurs when there is transfer of the infectious agent from one person to another; for example, a person's blood entering the healthcare worker's body through a needlestick injury.

*Clinical note:* The worst epidemic in the history of the Ebola virus occurred in 2014, from Guinea's forests to Liberia and Sierra Leone in West Africa. The Ebola virus is transmitted through direct contact with blood or body fluids

**TABLE 22.3 | Common infectious microorganisms and their portals of exit**

| Body area/reservoir | Examples of common infectious organisms/ infection/diseases | Portals of exit |
|---|---|---|
| Skin or tissue | *Staphylococcus aureus*<br>*Staphylococcus epidermidis*<br>Wound infection | Drainage from wound or cut/break in skin |
| Blood | Hepatitis B virus<br>Hepatitis C virus<br>Human immunodeficiency virus (HIV) | Needle puncture sites, open wounds, non-intact skin or mucous membrane surfaces |
| Respiratory tract | *Mycobacterium tuberculosis*<br>Parainfluenza virus | Nose or mouth through breathing, coughing, laughing, sneezing or talking |
| Gastrointestinal tract | *Escherichia coli*<br>*Clostridium difficile*<br>Hepatitis A<br>*Salmonella* species | Anus: colostomies, or faeces<br>Mouth: saliva and vomitus |
| Urinary tract | *Pseudomonas aeruginosa*<br>*Escherichia coli*<br>Enterococci-urinary tract infection | Urethral meatus |

*(Modified from Lee & Bishop 2013; Berman et al 2015)*

of a person who is sick with Ebola; the virus is not transmitted through the air (like the measles virus). However, droplets (e.g. splashes or sprays) of respiratory or other secretions from a person who is sick with Ebola could be infectious, and therefore certain precautions (standard, contact and droplet precautions) are recommended for use in healthcare settings to prevent the transmission of Ebola virus from sick individuals to healthcare staff and other individuals or family members.

**Indirect transmission** involves the transfer of the infectious agent through a contaminated object or person; for example, a healthcare worker's hands touching an infected body site on one individual and the worker not performing hand hygiene before touching the bedrail of another person's bed. This may then be touched by another staff member who touches another individual's intravenous site. Indirect transmission may also occur when a healthcare worker comes in contact with **fomites** (e.g. bedding of an individual with scabies).

*Clinical note*: Some examples of infectious agents transmitted by the contact mode include multi-resistant organisms (MROs), norovirus, *Clostridium difficile* and highly contagious skin infections such as impetigo and scabies. (Refer to Case Study 22.1, Figure 22.2 and the Decision-making Framework Exercise 22.1.)

## Droplet transmission

Droplet transmission occurs when the infected person coughs, talks, sneezes or laughs, or during certain procedures. Droplet particles are larger than 5 microns in size. Distribution is limited by the force of expulsion from the infected person and is usually 1 metre (NHMRC 2010). The droplet particles transmit infection when they travel directly from the infected person to a susceptible mucosal surface (nasal, conjunctivae or oral) of another person. However, droplets can be transmitted indirectly to mucosal surfaces (e.g. contaminated hands rubbing eyes or inserted into a mouth). This form of transmission requires the implementation of the transmission-based precaution tier 2 droplet precautions in addition to standard precautions when caring for such a person (see later in chapter for further explanation).

*Clinical note*: Some examples of infectious agents that are transmitted via the droplet mode include influenza virus, severe acute respiratory syndrome (SARS), pertussis and *Neisseria meningitides,* often referred to as *meningococcus.*

## Airborne transmission

Airborne dissemination may occur via tiny particle aerosols created during breathing, coughing, talking or sneezing containing infectious agents that remain infective over time and distance. Certain procedures, such as airway suctioning, endotracheal intubation, diagnostic sputum induction, positive pressure ventilation via face mask and bronchoscopy, can promote airborne transmission. The infective aerosols can be dispersed over long distances by air currents (e.g. ventilation or air-conditioning systems) and inhaled by susceptible individuals who have had no contact at all with the infectious person. This form of transmission requires the implementation of the transmission-based precaution tier 2 airborne precautions in addition to standard precautions when caring for such a person (see later in chapter for further explanation).

*Clinical note*: Some infectious agents that are transmitted via the airborne mode include varicella virus (chickenpox), *Mycobacterium tuberculosis* and measles (rubeola).

### CASE STUDY 22.1

Recently a person was transferred from another facility into the rehabilitation ward. The person had a severe case of dermatitis. His skin was very itchy, and his body was covered in a raised, reddened rash, with areas of broken skin where he had scratched so much the skin was no longer intact. The person was nursed for 3 weeks in the rehabilitation ward before he was diagnosed with a Norwegian scabies infestation. As soon as the diagnosis was made transmission-based precautions (contact precautions) were implemented and the person was cared for with the appropriate medication treatment.

During the first 3 weeks of his admission standard precautions should have been used at all times, particularly when applying the various lotions and creams that he was being treated with, and also when dealing with his linen. However, in the ensuing 2 to 3 weeks several staff members acquired the scabies infestation along with a couple of other inpatients.

*Upon reflection:* Transmission occurred because it was noted that on several occasions staff did not wear PPE (gloves or aprons) when in contact with his non-intact skin, staff did sit on the person's bed and on many occasions staff carried his used linen up against their bodies and uniforms before depositing the linen in the linen receptacle. This showed there was a breakdown of the minimum standard of infection prevention and control.

*Outcome:* What ensued was the closure of that rehabilitation ward, the treatment of every staff member, every person and every family member that had been in contact with the individuals in that particular ward, the steam cleaning of the carpet in that department, the removal and laundering of every individual privacy curtain as well as the laundering of every piece of clothing that the individuals had in their rooms. This was at a very large cost to the facility: a cost that was preventable if the correct infection control and prevention strategies had been used when applicable.

1. What infection prevention and control strategy should have been implemented on this person's admission?
2. What is considered best practice when handling used linen?
3. How would you describe the mode of transmission of scabies to other individuals including staff within the facility?

### Other modes of transmission

Transmission of infection can also occur via ingestion of contaminated food, water, medications or other common sources such as contaminated devices or equipment.

*Clinical note*: It is of great importance that nursing staff be aware of food being brought into healthcare settings for individuals by friends and family. If foods are not maintained at the correct temperature, the risk of food poisoning is very high. Foods of high risk include seafood, shellfish, soft cheeses and meat dishes. The Australian Food Safety Information Council (nd) has fact sheets available to the public on aspects of food safety. Facilities should have policies in place to help manage this (see Clinical Interest Box 22.1).

Variant Creutzfeldt-Jakob Disease (vCJD) is a disease that emerged in the UK in the 1990s. vCJD is linked to the consumption of meat products from cattle infected with bovine spongiform encephalopathy (BSE or 'mad cow disease'). vCJD is a separate disease to classical Creutzfeldt-Jacob disease (CJD) although some of the symptoms are similar. vCJD typically affects people at about age 30. The link between vCJD and ingestion of infected meat was discovered when 23 people living in Britain contracted CJD in the mid-1990s, about 10 years after the epidemic of bovine spongiform encephalopathy that occurred in the country from 1984–86. No cases of variant CJD have been identified in Australia to date and Australian cattle remain free of BSE (CJD Support Group Network 2010).

**Vector**-borne transmission (via mosquitoes, flies, rats and other animals) as a health concern is not as significant in Australia as it is in other parts of the world. However, in recent times there has been some increase in concern about transmission of Murray Valley encephalitis (MVE) in 2013 and dengue fever, Ross River virus and Barmah Forest virus in Victoria, New South Wales and Far North Queensland in 2014–15. Examples of microorganisms spread by this mode in other parts of the world are *Plasmodium falciparum* (malaria) and *Yersinia pestis* (plague).

## Portals of entry

Before a person can become infected, microorganisms must enter the body. Microorganisms can enter the body through the same routes they use for exiting:

- Inhalation into the respiratory tract
- Ingestion through the mouth into the alimentary canal
- Inoculation through the skin or mucous membrane, which can occur when the skin becomes cracked or when tissue integrity is disturbed during injury, surgical procedures, injections, bites or stings
- Transplacental entry occurs when organisms from a pregnant woman cross the placenta to enter the fetal circulation (e.g. toxoplasmosis).

*Clinical note*: Measures that control the exit of microorganisms also control the entrance of pathogens, for example:

- Maintaining skin and mucous membrane integrity
- Correct handling of urinary catheters and drainage sets
- Cleansing the genital area in a direction away from the urinary meatus to the rectum
- Implementing aseptic techniques, using sterile equipment during invasive procedures
- Cleansing wounds outwards from the wound site to prevent the entrance of microorganisms.

## Host susceptibility

**Susceptibility** is the degree of resistance an individual has to invading pathogens. Whether a person acquires an infection depends on their susceptibility to the infectious agent. A susceptible host is the last link in the chain of infection.

*Clinical note*: Factors that increase susceptibility of a person to infection are age (the very young or old), individuals receiving immunosuppressive treatment for cancer, chronic illness or following an organ transplant and those with immune deficiency conditions (Berman et al 2015). Susceptibility to infection can be reduced by lifestyle practices that boost resistance, such as healthy nutrition, adequate exercise, rest and sleep, stress-management activities and effective hygiene practices (see Clinical Interest Box 22.2).

### Resistance to infection

The body has certain natural resources that give a degree of resistance against infection. It has two main lines of resistance to infection: non-specific defences and a specific immune response. Non-specific defences are those that defend naturally against any invading organism or foreign matter. Such defence is also known as innate immunity, present at birth. It does not recognise specific microbes; it fights off all invading organisms in the same way. It provides us with rapid responses to protect against disease. These defences can be divided into two categories: external and internal. External physical barriers include intact skin, mucous membranes, normal body flora and some body secretions; for example, sweat, sebum, saliva and tears. Internal defences are the automatic protective actions of the inflammatory process, phagocytic cells, 'natural killer' cells and protective proteins. **Inflammation** is a localised and non-specific response of the tissues to an injury or infectious agent. It helps prevent further spread of injury, dilutes or destroys the injuring agent and promotes healing and repair of the injured tissues. It is characterised by five signs: pain, swelling, redness, heat and impaired function of the body part if injury is severe (Berman et al 2015).

Specific defences defend against specific foreign agents or antigens, such as a specific bacterium, virus, pollen or toxin, once it has broken through the innate immunity defences. This defence is also known as adaptive (acquired) immunity (see Table 22.4). Having **immunity** means being resistant to or being unaffected by a particular infectious disease. It means that a specific antibody has been produced to defend the body against a specific pathogen or the toxin it produces (the **antigen**). The body's immune responses are under the control of the lymphatic system. It is a highly efficient system that responds very specifically to the threat of infection. It is made up of lymph, lymphatic vessels, lymph nodes, red bone marrow, the thymus gland, spleen and tonsils.

## CLINICAL INTEREST BOX 22.1 Bringing food in for individuals

Families and friends sometimes bring in food for individuals. There can be a risk of food poisoning when food is not properly prepared, transported or stored. This can have serious consequences for the person.

### Foods that are safe to bring in to individuals

Dry biscuits (Salada, savoy, rice crackers, water crackers)
Sweet biscuits (Scotch finger, butternut, fruit biscuits)
Pretzels, potato chips
Muesli bars
Fresh and dried fruit
Baked products (bread, muffins, bagels, scones, plain cakes)
Boiled lollies, liquorice and mints

### Foods that are extremely unsafe and therefore are NOT recommended to bring in for individuals. Any foods that can spoil if not refrigerated

Meat and poultry
Cooked or raw fish, shellfish, oysters
Rice and pasta dishes
Soft cheeses, deli meats and pâtés
Salads and other items containing dairy products or creamy dressings (e.g. coleslaw, potato salad)
Sweet dishes and cakes which contain custard cream or are made from uncooked eggs
Casseroles, soups and sauces
Sandwiches with potentially hazardous food fillings (meat, fish, poultry, cheese)
Pizza and take-away foods

*If you are unsure about what food is safe or wish to bring in any of the listed items, please speak to the nursing staff or contact the food services department.*

### Safe food guidelines

#### Transport

All potentially unsafe food must be properly transported during the journey to protect from contamination. If the food is served chilled or is to be reheated it should be kept cold during transport in an esky or other cooler-type container.

If the food is being transported hot, you must ensure that it is kept hot. Hot food is difficult to keep hot and is best avoided if you are travelling long distances. It is best to chill the food overnight and reheat before eating.

Nursing staff must be informed of any food brought in for individual consumption.

#### Storage

Any food that is not going to be consumed immediately must be covered, labelled with the individual's name, room number, date and time the food was brought into the hospital and refrigerated within 15 minutes of arriving onto the ward.

Hospital staff will discard all potentially unsafe food that is stored in the fridge and not consumed within 24 hours of being brought into the hospital.

#### Special dietary requirements

It is essential that persons who are on special diets are not provided with food that has not been approved by the dietitian, nursing or food service management.

#### Preparation and reheating

Always wash hands thoroughly before preparation and prior to handling food.

Reheat food until it is steaming hot throughout.

Food reheated to above 75°C for 2 minutes will kill most foodborne bacteria or viruses that can cause illness.

Never reheat food that has been reheated previously.

Please do not offer to share food with other persons.

I have read, understood and accept the risk associated with consuming food brought into this hospital from an external source.

Name:_____
Signature:_____
Date:_____

*(NSW Food Authority http://www.foodauthority.nsw.gov.au)*

Lymphocytes are the most significant cells in the body's immune responses. There are two categories of lymphocytes involved in the specific immune response: T-lymphocytes (T-cells) and B-lymphocytes (B-cells).

To function effectively in defending the body from invading organisms, these defence responses must be able to distinguish between the body's own cells and foreign agents. Malfunction of a person's immune system can cause a failure to recognise cells that belong to the self. This results in damage or destruction of 'self' cells. An attack on the body's own cells is the basis of autoimmune disorders such as rheumatoid arthritis, juvenile-onset (type 1) diabetes mellitus, pernicious anaemia, multiple sclerosis and systemic lupus erythematosus.

## CLINICAL INTEREST BOX 22.2 General factors increasing susceptibility to infection

- Compromised skin integrity or mucous membranes
- Decreased mobility
- Very young or advanced age
- Malnutrition
- Alcoholism or other drug addiction
- Decreased cough reflex
- Decreased blood circulation
- Immunosuppressive therapy (e.g. chemotherapy, corticosteroid medication)
- Pregnancy
- Prematurity in infants
- Suppressed inflammatory response
- Chronic underlying illness or chronic stress
- Suppression or insufficient number of white blood cells
- Indwelling tubes (urinary catheter, IV line)
- Virulence of the infectious agent and individual resistance to the infectious agent

*(Modified from Crisp et al 2013)*

## Factors influencing susceptibility to infection

In a healthcare setting there are several factors that influence the individual's outcome after exposure to a pathogenic organism:

- Their immune status at time of exposure
- Age (neonates and the elderly are more susceptible) (see Table 22.5 and Clinical Interest Box 22.3) (*Clinical note*: First-line defence consists of intact skin, mucous membranes and their secretions. Skin becomes very fragile with age; care must be taken to protect the aged person. Naturally acquired passive immunity involves the natural transfer of antibodies from a mother to her baby. These antibodies are transferred via the placenta or the mother's milk, especially the first milk, called colostrum. This immunity lasts only a few weeks or months, covering the baby until its immune system matures. An example of this is if the mother is immune to polio or rubella the baby is also. Care must be taken to protect the neonate from exposure to infection.)
- Health status, history or comorbidities (*Clinical note*: Diabetes can slow the body's ability to fight infection.)
- The virulence of the agent
- Nutritional status (poor nutrition can slow the body's ability to fight infection)
- Wounds, indwelling devices and length of stay in healthcare facility
- Level of stress and coping strategies.

An important component of nursing practice is assessing every individual for existing infection or the potential for contracting an infection. There are some medical and drug therapies, such as corticosteroid medications or chemotherapy, which compromise immunity to infection. Nursing assessment of the individual's history to determine if there is an increased susceptibility to infection related to any

**TABLE 22.4 | Types of acquired (specific) immunity**

| | Type | Antigen or antibody source | Duration of immunity |
|---|---|---|---|
| 1 | Active: self-produced immunity | Antibodies are produced by the body in response to an antigen | Long |
| | a. Natural | Antibodies are formed in the presence of active infection in body; exposure to antigen | Lifelong |
| | b. Artificial | Antigens (vaccines or toxoids) are administered to stimulate antibody production; through vaccination. | Many years but may need to be boosted |
| 2 | Passive: transferred immunity | Antibodies are produced by another source, animal or human | Short |
| | a. Natural | Antibodies transferred naturally from an immune mother to baby (via placenta, breast milk) | 6–12 months |
| | b. Artificial | Injection of immune serum/globulin/antibody from another animal or human. | 2–3 weeks |

*(Modified from Berman et al 2015; Lee & Bishop 2013)*

## TABLE 22.5 | Factors that increase susceptibility to infection in older adults

The normal changes of ageing mean that older adults are at higher risk of infection than younger adults. Any illness experienced by an older adult increases the risk because it places increased demands on the body and a strain on its natural defence mechanisms. Nursing interventions aim to decrease this risk.

| Body area | Effect of ageing process | Nursing interventions |
|---|---|---|
| Skin | Loses resilience because of reduced tissue elasticity and increased dryness, making the skin more susceptible to damage and slower to repair<br>Any opening in the skin provides a portal of entry for microorganisms | Gentle handling during bathing, moving, lifting and other procedures<br>Careful observation of skin for signs of pressure or tears at least once each shift<br>Use of protective aids such as sheepskins<br>Use of skin moisturiser |
| Respiratory system | Decreased number of cilia lining the trachea reduces ability to move mucus, debris and dust into the pharynx<br>Lung elasticity declines and thoracic muscle strength diminishes, making it more difficult to cough effectively so as to expel accumulated material from the airway | Increase fluid intake to thin mucous secretions<br>Deep breathing and coughing exercises to expand the lungs and aid movement of material towards the pharynx to be expelled<br>Effective oral hygiene to reduce potential for microorganisms to invade the trachea/lungs<br>Mobilise as soon as possible<br>Maintain postsurgical individuals (unless contraindicated) in a semi-Fowler's (semi-upright) position to promote lung expansion<br>Motivate/support a person who smokes to reduce/break the habit |
| Immune system | Strength of immune responses decreases<br>Decreased T-cell function due to decreases in cell-mediated and humoral immunity | Recommend annual immunisation against influenza<br>Implement all standard precautions to minimise risk of exposure to pathogens<br>Promote exercise and healthy diet and facilitate regular rest and sleep to strengthen natural defences |
| Gastrointestinal system | Loss of smooth muscle in stomach and decreased peristalsis in intestine leads to slower emptying of contents and any ingested microorganisms, increasing potential for colonisation<br>Alteration to secretions of stomach acid and pepsin lead to a change in pH that interferes with ability to protect against ingested pathogens | Educate about hygienic preparation, storage and cooking of food for consumption<br>Educate regarding handwashing and other hygiene measures to reduce potential for transference of microorganisms into the gastrointestinal tract<br>Promote effective oral hygiene to minimise potential for microorganisms to enter the gastrointestinal tract |
| Urinary/renal system | Structural changes in kidney and renal vessels reduce renal blood flow. Together with general loss of functioning of body cells this results in the body, under the stress of infection, being less able to maintain adequate fluid homeostasis<br>Hypertrophy of prostate gland in males, cystocele or rectocele and degeneration of nerves to bladder causes inadequate emptying of bladder and urine stasis. Stasis predisposes to urinary tract infection | Monitor fluid intake/output<br>Observe and report signs of dehydration/fluid overload<br>Implement all standard precautions to minimise exposure to pathogens<br>Promote intake of sufficient fluid to flush urinary system with dilute urine<br>Encourage person to take sufficient time to empty bladder fully |

*(Modified from Victorian Government Health information: Best Care for older people everywhere—The Toolkit 2014; Berman et al 2015)*

## CLINICAL INTEREST BOX 22.3 Older adults and infection

- Older adults should be immunised annually against influenza
- Circulatory changes related to congestive heart failure and calcified mitral and aortic valves mean that older adults with these conditions are prone to pneumonia and bacterial endocarditis
- Older adults or other persons who are cognitively impaired often need special help with infection control measures (e.g. prompting to wash their hands at appropriate times)
- Symptoms of infections in older adults are often manifested as increased confusion or other changes in behaviour such as tearfulness or irritability. They may no longer have the ability to communicate their discomfort or to tell you about their symptoms verbally

*(Modified from Crisp et al 2013)*

## CLINICAL INTEREST BOX 22.4 Nursing assessment of the individual on admission

- What infections have you had in the past and how were they treated?
- Have any of these infections reoccurred?
- Are you currently taking or have you recently taken any antibiotics, anti-inflammatory, anti-coagulant medications?
- What past surgeries have you had?
- Did you have any complications following your last surgery?
- How would you describe your eating habits?
- Do you have any wounds or broken skin?
- Have you had any recent diagnostic procedures or therapy through your skin or a body cavity?
- Have you had any recent admissions in a healthcare facility and how long were you in hospital?
- Have you recently experienced any loss of energy, loss of appetite, nausea or vomiting?
- Do you take any vitamin supplements?

*(Modified from Victorian Government Health information: Best Care for older people everywhere—The Toolkit 2014 & Royal Children's Hospital Melbourne 2014)*

medications or treatments is important. Clinical Interest Box 22.4 illustrates several questions that could be considered.

Another component of nursing practice is to ensure individuals under your care are given as much information as they require, assisting them in keeping themselves infection free while within a healthcare facility. There are many fact sheets available to the public. The ACIPC Member Services Committee has developed some excellent resources for consumers that can be found on this online link: http://interactivejam.com.au/ACIPC-Consumer-minisite-v2/.

### Infection prevention and control through work health and safety

Not only do we concern ourselves with minimising the risk of acquiring infection for individuals under our care we must also protect the staff. In the course of their duties, healthcare workers can be exposed to infectious agents (through direct contact with infectious individuals, visitors or colleagues, or indirectly with contaminated surfaces and equipment, as well as through the result of a sharps injury). Healthcare workers can also place individuals at risk of transmission of infection if they have an infectious condition that is capable of being transmitted to the person as they perform their duties.

All employers and employees have a responsibility in relation to infection prevention and control and work health and safety. While the organisation has a duty of care to healthcare workers, staff members also have a responsibility to protect themselves and to not put others at risk.

As part of the infection control and prevention program each facility should develop, implement and document effective policies and procedures related to staff health and safety, including strategies to prevent occupational exposures to infectious hazards, chemical safety and staff immunisation programs. Employers should take all reasonable steps to ensure that staff are protected against vaccine-preventable diseases (NHMRC 2010). The most recent edition of *The Australian Immunisation Handbook* (Australian Government, Department of Health 2015) provides detailed information on immunisation schedules and vaccines. Table 22.6 gives the recommended vaccinations for healthcare workers.

## INFECTION PREVENTION AND CONTROL IN PRACTICE

The risk of transmitting healthcare-associated infections (HAIs) or infectious disease among individuals is high. When a person has a suspected or known infection, healthcare workers follow infection control practices (Crisp et al 2013). However, there are many situations where the healthcare worker is not aware that individuals have infections, as the majority of HAIs are found in the colonised blood and body fluids of individuals.

In 1996, the Infection Control Working Party of the National Health and Medical Research Council (NHMRC) in Australia recommended adoption of the term 'standard precautions' as the minimum requirement in work practices to promote infection control and prevention. 'Additional precautions', now known as 'transmission-based precautions', are advised where standard precautions are not sufficient on their own to prevent transmission of infection. This two-tiered approach reflects disease transmission and is how infection prevention and control principles should be viewed (see Table 22.7).

## TABLE 22.6 | Recommended vaccination for all healthcare workers

| | |
|---|---|
| All healthcare workers directly involved in individual care or the handling of human tissues | Hepatitis B<br>Influenza<br>Pertussis (dTpa), tetanus and diphtheria<br>MMR (measles, mumps, rubella—if not immune)<br>Varicella (chickenpox—if not immune) |
| All healthcare workers who work with remote Indigenous communities in NT, QLD, SA and WA; medical, dental and nursing undergraduates (in some jurisdictions) | All of the above +<br>Hepatitis A |
| Healthcare workers who may be at high risk of exposure to drug-resistant cases of tuberculosis | All of the above +<br>BCG |

*(Australian Government, Department of Health 2015. © Commonwealth of Australia 2015)*

## TABLE 22.7 | Standard and transmission-based precautions for infection control: main points

**Standard precautions**

Routine personal hygiene practices to be observed
Hand hygiene must be performed before and after all significant individual contacts, before and after a procedure and after touching the person's environment
Gloves to be worn when touching blood, all body fluids, secretions and excretions, non-intact skin and mucous membranes. Hand hygiene must be performed before putting gloves on and after removal of gloves
Personal protective equipment such as masks or face shields and eye protection to be worn when care activities may generate splashes or sprays of blood, body fluids, secretions or excretions
Impermeable gowns to be worn if clothes are likely to be soiled with blood or body fluid. Hand hygiene must be performed immediately upon gown removal
Use of standard aseptic technique for a simple wound dressing, peripheral intravenous cannulation, blood collection and intravenous drug administration
Use of surgical aseptic technique for large wound dressings, insertion of indwelling catheter and insertion of central intravenous line or portacath
Protocols for handling and disposal of sharps and other clinical wastes to be followed at all times
Environmental control policies to be adhered to (e.g. cleaning, disposal of linen and rubbish, disinfection, sterilisation and spills management)
Care equipment to be cleaned and reprocessed according to protocols or policies
Private room not necessary unless person unable to maintain hygiene practices in accordance with prevention and control strategies

**Transmission-based precautions**

| Type of transmission | Protection | Example |
|---|---|---|
| Airborne | Negative pressure room or private room with door closed; use of P2 or N95 mask, surgical mask for the individual if transported/transfer is required. Gloves and gowns as per standard precautions. Restrict visitor numbers and precautions are as for staff. | Varicella (chickenpox), measles, TB, SARS |
| Droplet | Private room or cohort (same infectious agent and antibiogram); use of surgical mask and goggles/face shield; mask for individual if transported. Gloves and gowns as per standard precautions. | Influenza, rubella, pertussis, mumps, norovirus, meningococcus, respiratory syncytial virus |
| Contact | Private room or cohort (same infectious agent and antibiogram); gloves for direct patient or environmental contact; gowns for direct contact or splashing. Surgical mask required if infectious agent is isolated in sputum. Eye protection as required per standard precautions | MROs, *Clostridium difficile*, *Shigella*, acute diarrhoea, scabies, highly contagious skin infections |

*(National Health and Medical Research Council 2010)*

## Standard precautions and transmission-based precautions

The *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (NHMRC 2010) are the national guidelines for infection control and prevention for healthcare settings. Standard precautions are the basic recommended work practices to be implemented in the treatment and care of all individuals regardless of diagnosis or perceived infectious risk. Standard precautions are the first tier in a two-tiered approach to infection prevention and control. It is a first-line approach, a primary strategy that minimises the risk of transmission of infectious agents from person to person, even in high-risk situations.

## Tier 1: standard precautions

Standard precautions relate to:

- Personal hygiene practices, particularly effective hand hygiene, before and after every episode of individual contact
- Use of personal protective equipment (PPE) such as gloves, gowns, plastic aprons, masks/face-shields or eye protection when appropriate
- Appropriate handling and disposal of sharps
- Implementation of environmental controls including cleaning and spills management
- Appropriate reprocessing of reusable equipment and instruments
- Aseptic non-touch technique
- Appropriate handling of waste and linen
- Practising respiratory hygiene and cough etiquette (NHMRC 2010).

Standard precautions should be used in the safe handling of blood (including dried blood) and all other body substances, secretions and excretions (excluding sweat) regardless of whether or not they contain visible blood, and the safe handling of non-intact skin and mucous membranes.

Standard precautions are all that is required for persons with blood-borne viruses such as HIV, hepatitis B or hepatitis C unless other factors indicate it necessary, such as the presence of an additional highly transmissible disorder; for example, pulmonary tuberculosis (TB).

### CRITICAL THINKING EXERCISE 22.2

Mr Andrews is in hospital following a motor vehicle accident. He is an insulin-dependent diabetic. He has a fractured pelvis, fractured right arm and severe grazes to his left arm and leg. He is confined to bed and has a urinary catheter in situ. He needs assistance with all activities of daily living. His medical notes state he is hepatitis B positive. What infection control measures are appropriate when caring for Mr Andrews to prevent transmission of hepatitis B?

## Implementing standard precautions

In applying standard and transmission-based precautions as part of day-to-day practice, healthcare workers should ensure that their individuals understand why certain practices are being undertaken, and that these practices are in place to protect everyone from the risk of infection. Individuals under their care and visitors should also be aware of their role in minimising risks by following basic hand hygiene, cough etiquette and respiratory hygiene, and informing staff about aspects of their medical history if necessary (e.g. known MRSA colonisation).

Standard precautions involve evidence-based activities aimed at interrupting the chain of infection. These include hand hygiene measures and use of a range of protective devices.

## Standard precautions: hand hygiene

Handwashing with soap and water has been used to improve personal hygiene for centuries; however, the link between handwashing and the spread of disease was only established in the mid-nineteenth century. An Austrian medical officer, Ignaz Semmelweis, is considered to be the first person who recognised that hospital-acquired infection was directly transmitted via the hands of healthcare workers. Since then many further investigations have confirmed the important role that contaminated hands play in the transmission of healthcare-associated pathogens. Hand hygiene remains the cornerstone of infection prevention and control. Yet, even though we know that proper use of hand hygiene is critical to the prevention of infection, compliance among healthcare workers has historically been at 40% (Erasmus et al 2010).

Therefore, poor hand hygiene practice among healthcare workers is strongly linked with healthcare-associated infection transmission and is a major factor in the spread of antibiotic-resistant pathogens within healthcare facilities. Despite this, efforts to improve the rate of hand hygiene compliance have historically been ineffective or poorly sustained. Numerous barriers to appropriate hand hygiene compliance have been reported (Grayson et al 2013) including:

- Hand hygiene products cause skin irritation and dryness
- Individual needs perceived to take priority over hand hygiene
- Handwashing sinks/basins inconveniently located and/or not available
- The perception that glove use dispenses with the need for hand hygiene
- Insufficient time for hand hygiene, due to high workload and understaffing
- Poor knowledge of guidelines or protocols for hand hygiene
- Lack of positive role models
- Lack of recognition or understanding of the risk of cross-transmission of microbial pathogens
- Until recently, the lack of scientific information showing the definitive impact of improved hand hygiene on lowering healthcare-associated infection rates.

The introduction of the **alcohol-based hand rub** has assisted in the improvement of hand hygiene compliance among HCWs as well as a reduction in healthcare-associated

infection (HAI), as shown in recent hospital-based studies. A study by Song and colleagues showed that when hand hygiene compliance increased from poor (<60%) to excellent (90%), each level of improvement was associated with a 24% reduction in the risk of MRSA acquisition. This risk decreased significantly (by 48%) with hand hygiene compliance levels above 80% (WHO 2014).

Hand Hygiene Australia publishes the results of hand hygiene auditing within Australian healthcare facilities on its website. Overall national hand hygiene compliance in October 2014 was 81.9% (HHA 2015). There is convincing evidence that improved hand hygiene can reduce infection rates. More than 20 hospital-based studies (including systematic reviews) of the impact of hand hygiene on the risk of HAI have been published between 1977 and 2014. Despite study limitations almost all reports showed an association between improved hand hygiene practices and reduced infection and cross-transmission rates (CHRISP 2013). The World Health Organisation (WHO) has published an information sheet based on a literature review from January 1980 to December 2013 on the available evidence on the impact of hand hygiene in reducing transmission and infections by multidrug-resistant organisms in healthcare settings (WHO 2014).

Since 2002, the Healthcare Infection Control Practices Advisory Committee (HICPAC) guidelines have defined alcohol-based hand rub, where available, as the standard of care for hand hygiene practices in healthcare settings, whereas handwashing is reserved for particular situations only (e.g. caring for an individual with *Clostridium difficile* or norovirus infection, and/or if the hands are visibly dirty). WHO (2009) developed a culture-change program to improve hand hygiene compliance by all healthcare workers. It is known as 'The 5 Moments for Hand Hygiene'.

## National hand hygiene initiative

The ACSQHC has instigated the National Hand Hygiene Initiative (NHHI) and assigned the responsibility of its delivery and rollout to Hand Hygiene Australia (HHA). The key aim of the national initiative is to improve hand hygiene compliance among healthcare workers, and to reduce the transmission of infection in healthcare services throughout Australia. This involves a multifaceted culture-change program to improve hand hygiene compliance through the increased use of alcohol-based hand rubs.

'The 5 Moments for Hand Hygiene' (see Figure 22.3) developed by WHO (2009) and adopted by Hand Hygiene Australia (Grayson et al 2013):

- Protects individuals against acquiring infections from the hands of the healthcare workers

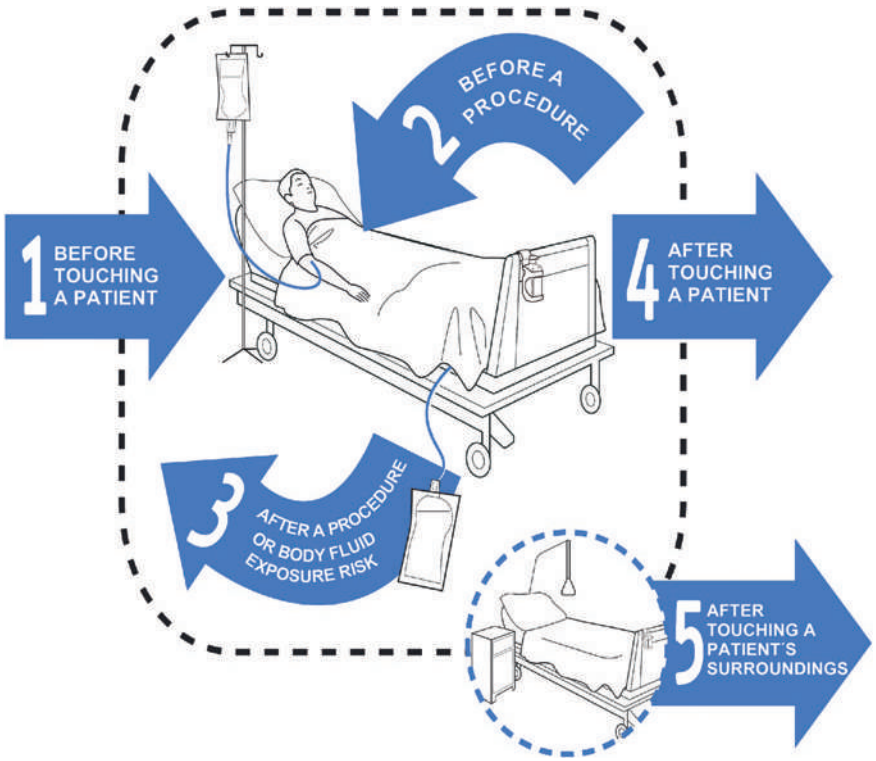


**Figure 22.3** The '5 Moments for Hand Hygiene' tool is based on evidence

It identifies when hand hygiene should be performed. That is, hand hygiene should be practised before every episode of individual contact, including between different individuals and between different care activities for the same person, and after any individual activity or contact. The message for every healthcare worker is, perform hand hygiene before and after contact with each individual or contact with the individual's environment

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- Helps to protect individuals from infectious agents (including their own) entering their bodies during procedures
- Protects healthcare workers and the healthcare environment from acquiring individuals' infectious agents

## The 5 moments for hand hygiene

**Moment 1**: Hand hygiene must be performed before touching an individual.
**Moment 2**: Hand hygiene must be performed immediately before a procedure.
**Moment 3**: Hand hygiene must be performed following a procedure or potential body fluid exposure.
**Moment 4**: Hand hygiene must be performed after touching an individual.
**Moment 5**: Hand hygiene must be performed after touching the individual's environment, without touching the individual.

For 'The 5 Moments for Hand Hygiene' initiative to be effective, alcohol-based hand rub needs to be situated at point of use; for example, the end of the bed. Sustained, successful implementation of the initiative within the healthcare facility requires commitment and understanding from management, committed role models and champions throughout the facility, a team approach which should include not only the nursing sector but the medical practitioners as well and, most importantly, it requires understanding of the reason for the initiative and ownership of prevention of transmission of HAIs by each stakeholder (see Figure 22.4).

### CRITICAL THINKING EXERCISE 22.3

Nurse Nguyen enters a person's room, assists the person out of bed, helps the person put on their slippers and dressing gown, and helps the person to the lounge chair, then makes the bed, then leaves the room. How many times should Nurse Nguyen have performed hand hygiene?

## Technique: is it important?

There are two recognised techniques for performing hand hygiene: hand hygiene with an alcohol-based hand rub and handwashing with soap and water (see Figures 22.5 and 22.6 and Clinical Skill 22.1).

*Clinical note*: Effective hand hygiene relies on appropriate technique as much as on the selection of the correct product. If the technique is not appropriate this leads to failure of hand hygiene removing or killing microorganisms on the hands, despite the appearance of having complied with hand hygiene requirements.

## Which product should be used?

Existing guidelines agree that hand hygiene using alcohol-based hand rubs is more effective against the majority of common infectious agents on hands than hand hygiene using plain or antiseptic soap and water. Alcohol-based hand rubs are the products of choice unless the hands are visibly soiled or the HCW is caring for an individual with a *Clostridium difficile* or norovirus infection; in this case handwashing with antiseptic soap and water is required before and after care of the individual and use of personal protection equipment (PPE). Such rubs can also be placed at point of use, are faster to use and the evidence shows they have better skin tolerability. The alcohol-based hand rub product must have Therapeutic Goods Administration (TGA) approval for skin antisepsis and meet the requirements of EN 1500 testing standard for bactericidal effect.

Placement of the hand hygiene product may also play a very important part in the success of the program. In Australia a draft Australian standard titled AS 1071—Placement and presentation of hand hygiene materials in healthcare settings (2015) was released with the intention to standardise the placement of hand care products nationally and to eliminate the possibility of using the wrong product to perform hand hygiene; for example, moisturiser instead of soap. This draft Standard is based on the fact that in 2009 Queensland Emergency Medicine Research Foundation funded a research study that demonstrated that compliance with hand hygiene is directly proportional to the accessibility and availability of products to decontaminate hands. The study also showed that there was no consistency in the positioning of hand hygiene solutions relative to the sink in any healthcare setting. As a result, staff reported the widespread and frequent use of moisturiser instead of handwash to decontaminate their hands, and have self-reported the need to standardise the placement of solutions. This Standard is currently open to review and comment by infection prevention and control professionals throughout Australia.

## Does improved hand hygiene make any difference?

Recent evidence of improved hand hygiene has been associated with:

- Sustained decreases in the incidence of infection caused by MRSA and VRE (Pittet & Boyce 2001)
- Reduction in healthcare-associated infections of up to 45% in a range of healthcare settings (Fendler et al 2002)
- Greater than 50% reduction in the rates of nosocomial disease associated with MRSA and other multi-resistant organisms after 1–2 years (Grayson et al 2013)
- 8.9% reduction in HAIs and decline in the bloodstream infections caused by MRSA and extensively drug-resistant *Acinetobacter baumannii* (Chen et al 2011)
- Significant reduction of MRSA infections/colonisation/10 000 patient days (Mestre et al 2012)
- Reduction in infection rates in four of the six Australian states studied. Two states showed an immediate reduction in rates of 17% and 28%, two states showed a linear decrease in rates of 8% and 11% per year, and two showed no change in infection rates (Barnett et al 2014).

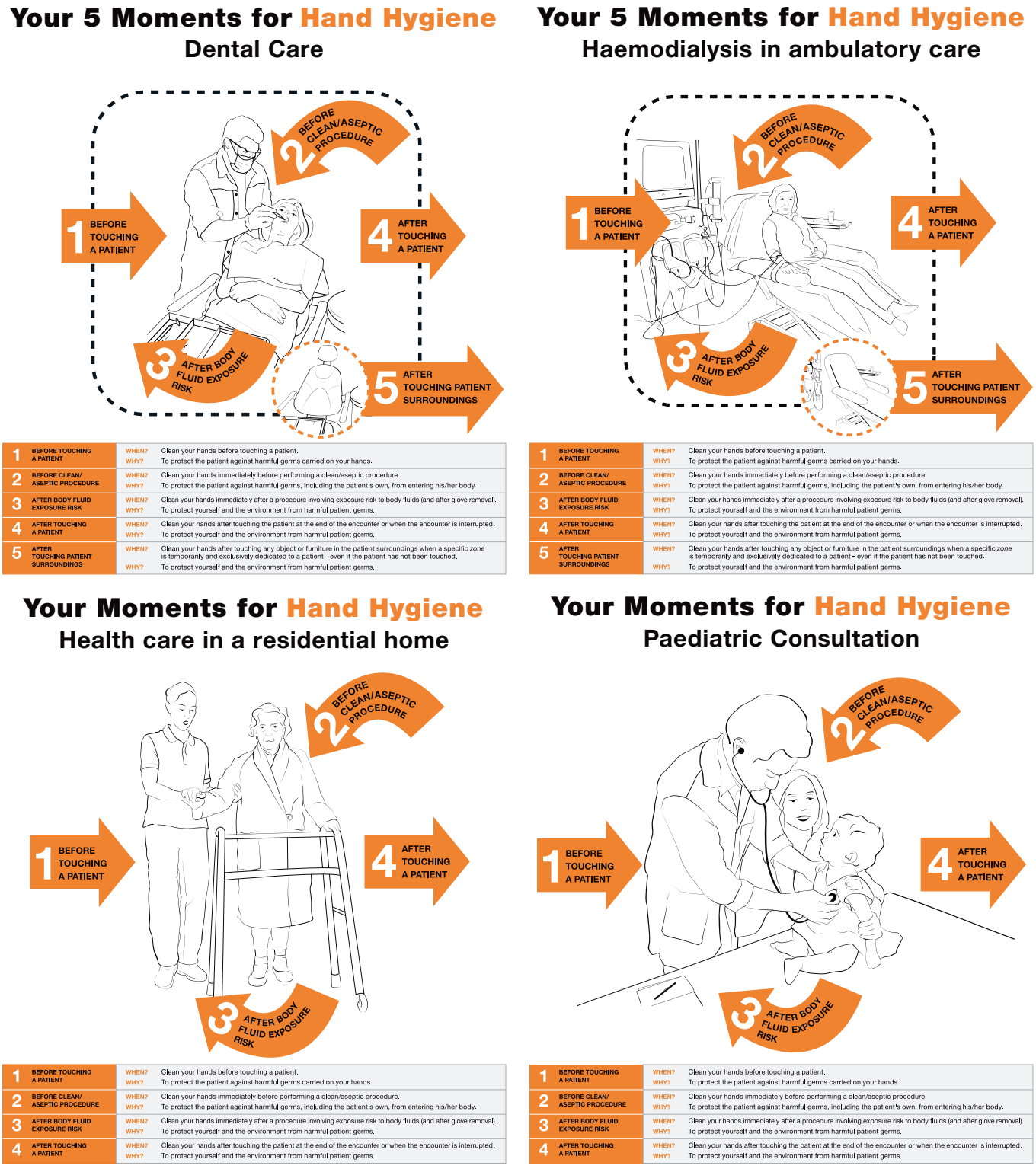


**Figure 22.4** The 5 Moments for Hand Hygiene

These can be applied in any healthcare setting, including the acute, day only, dental surgery, dialysis unit, nursery and clinic setting. The key emphasis is to perform hand hygiene before and after every episode of contact, before and after any procedure and also after contact with the environment. Hand hygiene must also be performed after the removal of gloves

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**Figure 22.5** How to use alcohol-based hand rub

1 Apply the amount recommended by the manufacturer onto dry hands 2 Rub hands together so that the solution comes in contact with all surfaces of the hand, paying attention to the tips of the fingers, the thumbs and the webbing between the fingers 3 Continue rubbing until the solution has evaporated and the hands are dry. *Clinical note*: This is of great importance when then donning gloves, because if hands are not dry, manipulation of gloves is very difficult and it may cause reactive dermatitis

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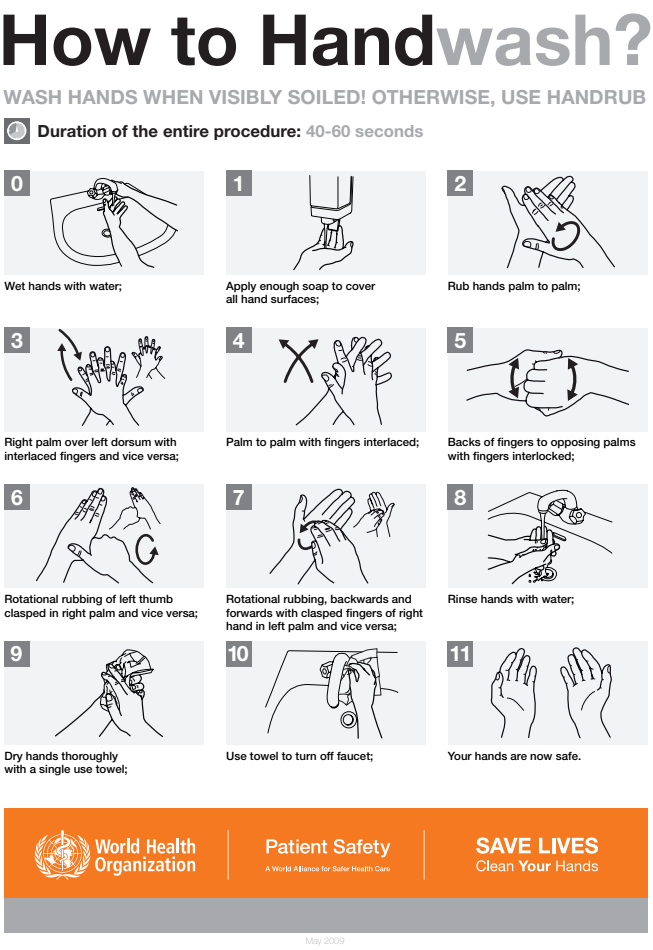


**Figure 22.6** How to handwash using soap (including antimicrobial soap) and water

1 Wet hands under running water and apply the recommended amount of liquid soap 2 Rub hands together for a minimum of 15 seconds so that the solution comes in contact with all surfaces of the hand, paying attention to the tips of the fingers, the thumbs and the webbing between the fingers (these areas are often missed during hand hygiene) 3 Rinse hands thoroughly under running water, and then pat dry with single-use towels. Moist skin becomes chapped readily

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Hand hygiene practice alone is not sufficient to prevent and control infection and needs to be part of a multifaceted model of infection prevention and control. Figure 22.7 identifies the areas of the hands most often neglected during washing.

To complement the 5 Moments for Hand Hygiene some healthcare facilities have introduced a Bare Below the Elbow Initiative which adds the need to have long sleeved clothing rolled up above the elbow so as not to interfere with effective hand hygiene practice. Long ties and lanyards are also not recommended (Crisp et al 2013). Retractable (or similar) ID card holders are recommended in place of lanyards and should be cleaned regularly. If ties are worn they should be tucked in or secured.

## Other aspects of hand hygiene

As intact skin is the first line of defence against infection, cuts and abrasions are a possible source of entry for infectious agents and reduce the effectiveness of hand hygiene practices. To reduce the risk of cross-transmission of infectious agents, cuts and abrasions should be covered with waterproof dressings.

An emollient hand cream provided for use at the healthcare facility should be used regularly, such as after performing hand hygiene before a break or going off duty. This assists in maintaining skin integrity. The products supplied by your healthcare facility have been chosen for their compatibility with the alcohol-based hand rubs and antiseptic hand

## CLINICAL SKILL 22.1 Handwashing/hand hygiene

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Accessible sink with warm running water<br>Antimicrobial/regular soap solution or alcohol-based hand rub (ABHR)<br>Paper towel<br>Waste bin/receptacle |
| **Skill activity** | **Rationale** |
| Inspect surface of hands for breaks or cuts in skin or cuticles. Cover lesions with a waterproof dressing before providing care<br>Inspect hands for heavy soiling<br>Ensure nails are short and free of nail polish and/or artificial nails<br>Remove all jewellery including wristwatch, rings and bracelets | Open cuts or wounds can harbour high concentrations of microorganisms<br>Soiled hands may require a more lengthy hand wash<br>Most microbes on hands come from beneath the fingernails<br>Artificial nails can harbour four times the microorganisms than non-artificial<br>Jewellery can harbour microbes and rub against skin causing shedding of skin cells |
| **Handwash**<br>Wash hands when visibly soiled. Otherwise use hand rub<br>Duration of entire procedure: 40–60 seconds<br>Stand in front of sink, keeping hands and uniform away from sink surface (if hands touch sink during handwashing, repeat) | The inside of the sink is considered a contaminated area. Reaching over the sink increases the risk of touching the edge, which is contaminated |
| Turn on water, regulate flow and temperature so that the temperature is warm<br>Avoid splashing water against uniform | Warm water is more comfortable and it removes less of the skin's protective oils than hot water.<br>Microorganisms multiply in moisture and travel |
| Wet hands and wrists thoroughly under running water. Keep hands and forearms higher than elbows during washing<br>Apply the recommended amount of liquid soap or antimicrobial solution | Keeping hands elevated allows water to flow from least to most contaminated areas<br>The amount applied should be as per the manufacturer's instructions |
| Wash hands using plenty of lather and friction for at least 15 seconds<br>Interlace fingers and rub palms, sides and back of hands paying attention to the tips of the fingers, thumbs and the webbing between the fingers | Soap cleans by emulsifying fat and oils. Friction and rubbing mechanically will loosen and remove debris and transient bacteria. Interlacing the fingers and thumbs helps to ensure all surfaces are cleaned |
| Rinse hands and wrists thoroughly | Rinsing mechanically washes away debris and microorganisms<br>Rinse well to prevent residual soap from irritating skin |
| Gently pat hands dry with paper towel<br>Dry from fingers to wrists and forearms | Drying from cleanest (fingertips) to the least clean (forearms) areas avoids contamination<br>Gently patting hands dry helps prevent chapping and roughened skin |
| Discard paper towel into the correct receptacle | Prevents transfer of microorganisms |
| Turn off water<br>(Use clean, dry paper towel if using a hand-operated tap; avoid touching handles with hands) | Minimises contamination of hands |
| If hands are dry or chapped, a small amount of lotion or barrier cream can be applied | Chapped skin becomes a reservoir for microorganisms |
| Inspect hands for obvious signs of debris and contamination | If found, indicates poor techniques. Hand washing should be repeated |

| CLINICAL SKILL 22.1 Handwashing/hand hygiene—cont'd | |
|---|---|
| Inspect hands for dermatitis or cracked skin as this may indicate complications from excessive handwashing or an allergic reaction to the antimicrobial or soap solution | Seek advice from infection-control professional. Note: Use small, single-use containers of barrier cream as large, refillable containers have been associated with nosocomial infections |
| **Alcohol-based hand rub**<br>Alcohol-based hand rub can be used if hands are visibly clean and dry<br>Duration of the entire procedure: 20–30 seconds | Alcohol-based hand rub has been demonstrated to reduce microbial load on hand when solution is vigorously rubbed over all hands and finger surfaces |
| Apply the amount recommended by the manufacturer onto dry hands (usually 15–30 mL) | Minimises wastage<br>Cost efficient |
| Rub your hands together ensuring that the solution comes into contact with all the surfaces of the hand. Interlace fingers and rub palms, sides and back of hands paying attention to the tips of the fingers, thumbs and the webbing between the fingers | Reduces microorganisms |
| Continue rubbing until the solution has evaporated and the hands are dry (usually 10–15 seconds) | This is of great importance when donning gloves, because if hands are not dry, manipulation of gloves is very difficult and it may cause reactive dermatitis |
| *(NHMRC 2010; Berman et al 2015; Rebeiro et al 2013; Tollefson 2016; World Health Organization 2009)* | |

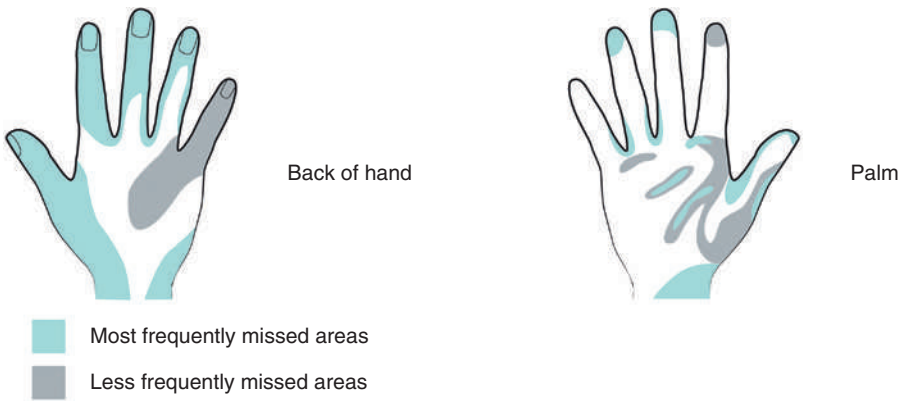


**Figure 22.7** Areas most neglected when handwashing

cleansers provided. A pump pack should be used for dispensing moisturising creams or lotions. If a cream or lotion cannot be dispensed by a measured dose pump dispenser, then a single use applicator or single use spatula should be used.

The effectiveness of hand hygiene can be impacted by the type and length of fingernails (Boyce & Pittet 2002; Lin et al 2003). Artificial nails have been associated with higher levels of microorganisms, especially Gram-negative bacilli and yeasts, than natural nails (Boszczowski et al 2005; Gupta et al 2004; Moolenaar et al 2000). It is recommended, therefore, that fingernails should be kept short (i.e. the length of the finger pad) and dirt free, and artificial nails should not be worn. In a 2008 study by Rupp et al (2008) investigators found that fingernail length greater than 2 mm was associated with increased microbial carriage on hands, suggesting that transmission is less likely with shorter nails. Studies have shown that chipped nail polish may support the growth of organisms on the fingernails (Grayson et al 2013); it is therefore good practice not to wear nail polish.

Although there is less evidence involving the impact of jewellery on the effectiveness of hand hygiene, rings can interfere with the technique used to perform hand hygiene, resulting in higher total bacterial counts (Boyce & Pittet

2002). Hand contamination with infectious agents is increased with ring wearing (Trick et al 2003). The consensus is to discourage the wearing of watches, rings or other jewellery during clinical care.

The *Australian Guidelines for the Prevention and Control of Infection in Health Care* (NHMRC 2010) suggest that each healthcare facility should develop policies about the wearing of jewellery (including body piercings), artificial nails or nail polish by employees. It is recommended that policies take into account the risks of transmission of infection to individuals and healthcare workers, rather than cultural preferences.

Healthcare workers must also involve all individuals and visitors to the healthcare facility in hand hygiene. It is important that the individual's hands as well as the nurses' hands be cleansed before eating, after using the bedpan or toilet and after the hands have come into contact with body substances, such as sputum or drainage from a wound. Strategically placed alcohol-based hand rub will assist with this.

**CRITICAL THINKING EXERCISE 22.4**

You notice one of your colleagues wears multiple rings on each hand, bracelets and a large wrist watch which is not removed for hand hygiene. You also note that recently your colleague has long artificial nails and is using hand moisturiser brought in from home. Is this considered best practice? What can you do to help your colleague understand what is best practice?

## Standard precautions: use of personal protective equipment

Any infectious agent transmitted by the contact or droplet route can potentially be transmitted by contamination of healthcare workers' hands, skin or clothing. Personal protective equipment (PPE) is used to protect mucous membranes, airways, skin and clothing. PPE used as part of standard precautions includes gloves, gowns, aprons, surgical masks, protective eyewear or face shields and, in some circumstances, foot and hair coverings.

In determining the type of PPE to use, the nurse should consider the probability of exposure to blood and body substances, the type of individual interaction and the likely route of transmission. Generally, the selection of PPE for any infection follows a risk-based approach, including factors such as the type of planned interventions, the individual's degree of infectivity and the workplace environment. All PPE must meet the relevant TGA criteria for listing on the Australian Therapeutic Goods Administration (ATGA) and should be used in accordance with manufacturer's guidelines (NHMRC 2010).

### Aprons and gowns

International guidelines recommend that protective clothing (apron/gown) be worn by healthcare workers when:

- Close contact with the individual, materials or equipment may lead to contamination of skin, uniforms or other clothing with infectious agents
- There is a risk of contamination with blood, body substances, secretions or excretion (except sweat) (Pratt et al 2007).

Clean, single-use, impervious, non-sterile, sterile, disposable, long or short sleeved? The type of gown or apron needed depends on the degree of risk and must be changed between individuals.

*Clinical note*: Aprons and gowns must be removed before leaving the care area to prevent contamination of the environment outside the individual's room. Uniforms should be washed daily, even if aprons and gowns have been used.

### Face and eye protection

As discussed earlier, the mucous membranes of the mouth, nose and eyes are portals of entry for infectious agents. Face and eye protection reduces the risk of exposure of healthcare workers to splashes or sprays of blood and body substances and is an important part of standard precautions.

Surgical masks are loose fitting, single-use items that cover the mouth and nose. They protect the person wearing them from splashes or sprays reaching the nose and mouth. Goggles provide reliable eye protection from splashes, sprays and respiratory droplets from multiple angles. Face shields provide protection to other parts of the face as well as the eyes.

P2 masks (N95)/respirators prevent the inhalation by healthcare workers (HCW) of small particles that may contain infectious agents transmitted via the airborne route. In order for the P2 respirator to offer the maximum protection to the HCW the wearer must be properly fit tested and be proficient at donning and performing a fit check prior to entering an infectious room. A fit check is a quick check to ensure that a respirator mask is fitting correctly each time it is applied. The manufacturer's instructions for fit checking of individual brands and types of P2/N95 respirators should be referred to at all times. Correct removal of mask is just as important as correct donning as there is risk of contamination to self if not proficient with this task (Qld Health 2012).

*Clinical note*: Personal prescription glasses and contact lenses are not considered adequate eye protection. Newer styles of goggles are now available, that fit adequately over prescription glasses with minimal gaps.

### Gloves

Gloves can protect both individuals and healthcare workers from exposure to infectious agents that may be carried on hands. Hand hygiene should be performed before putting on gloves and after removal of gloves. Gloves are single-use items and should not be washed, but discarded. Gloves must be changed between individuals and after every episode in individual care. They should be put on immediately before a procedure and removed as soon as the procedure is completed. When removing gloves, care should be taken not to contaminate the hands. Gloves should be worn for each invasive procedure, for contact with sterile sites and non-intact skin or mucous membrane and for any activity that has been assessed as carrying a risk of exposure to blood, body

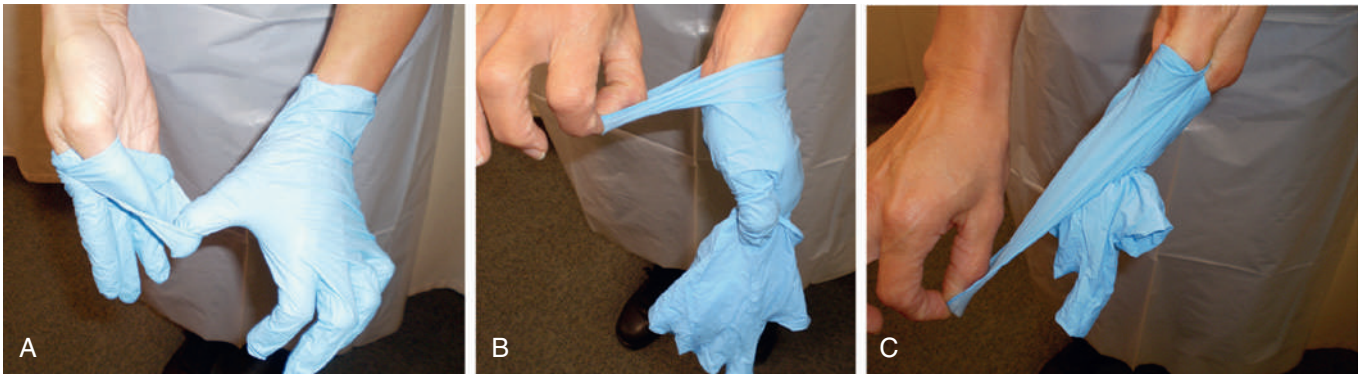


**Figure 22.8** Removing contaminated gloves

A: Removing the right glove. Take hold of the cuff on the glove on the right hand and slide it from the hand, folding the inside of the glove over the outside. This encloses the contaminated outside area. Avoid touching the skin of the right wrist or hand with the fingers of the contaminated glove on the left hand, as to do so would enable microorganisms to be transferred. B: Removing the left glove. Grasp the glove that has been removed from the right hand in the palm of the left gloved hand. Slip two fingers from the ungloved right hand under the band of the second glove at the wrist. Roll the glove off, turning it inside out, over the first glove. This action ensures that exposure of the contaminated surfaces on both gloves is minimal, reducing the risk of transferring microorganisms. C: Safe method of holding contaminated gloves. Ensuring that you hold and touch only the inside surface of the left-hand glove, drop the rolled up gloves into the appropriate receptacle for rubbish. The gloves should be disposed of in this way immediately after removal. This reduces the risk of spreading infection. Wash your hands promptly because there is no guarantee that gloves provide 100% protection. This also reduces the risk of developing an allergy to the latex in the gloves. Nurses who are left-handed may prefer to reverse this process.

*(Courtesy of Teresa Lewis)*

substances, secretions and excretions. Glove use does not replace hand hygiene. Hand hygiene must always be performed after removal of gloves because gloves may have tiny defects and because hand contamination may take place during removal. Hands should be dry before donning gloves as skin reactions have been known to occur if hands are not dry under gloves.

*Clinical note*: Consideration of the task at hand and whether glove use is required is important, as latex sensitisation of healthcare workers is a risk. General research studies show a prevalence of 8–30% latex allergy among healthcare personnel worldwide (Manori et al 2010). Use of unpowdered latex gloves or latex-free gloves may reduce the risk of increasing latex sensitisation. Figure 22.8 illustrates the correct method of removing contaminated gloves.

### Hair covers

An elasticised paper cap is the most common hair covering. It is used whenever there is a risk of the hair becoming contaminated or if microorganisms from the hair might endanger the person. Hair covers are often used as part of a bundle care plan when inserting central lines (NSW Health 2011; ACSQHC/ANZICS 2012). Nurses wear caps in the operating room environment and kitchen staff wear hair nets to prevent contamination of food.

### Shoe covers

Disposable paper covers are worn over shoes whenever there is a risk of body substances splashing onto shoes during procedures. The covers are removed before leaving the room to prevent pathogens being carried away from the area. Overshoe cloth or paper covers are used in the operating room environment to contain any microorganisms that might be on the shoes of operating room staff.

To reduce the risk of transmission of infectious agents or contamination of self, PPE must be used appropriately. The sequence for putting on and taking off PPE (see Clinical Skill 22.2) is:

- Donning PPE (putting on)
  - Gown
  - Mask
  - Protective eyewear or face shield
  - Gloves
- Doffing PPE (taking off) (see Figure 22.9)
  - Gloves
  - Eyewear or face shield
  - Gown
  - Mask.

  (NHMRC 2010)

## Standard precautions: safe handling and disposal of sharps

Sharp instruments represent the major cause of accidents involving potential exposure to blood-borne disease. Sharps must not be passed by hand between workers and handling should be kept to a minimum. Needles or any other sharp implement should not be recapped, bent or disconnected from syringes but instead disposed of intact. All sharp instruments and needles must be disposed of immediately after use by placing them into a special puncture-proof sharps container which conforms to Australian Standards AS 4031 or AS/NZ 4261. The container should be available as close as practicable to the place the sharp is used. The person using

## CLINICAL SKILL 22.2 Donning and doffing PPE (gloves, gown, mask, eyewear)

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Gown<br>Mask<br>Eyewear<br>Disposable gloves<br>Face shield |
| **Skill activity** | **Rationale** |
| **Donning PPE** | |
| Determine which equipment/supplies you may need to take into room based on type of precautions in place, activity to be performed | Ensures efficiency<br>Reduces contamination<br>Some PPE needs to be put on before entering room |
| Perform hand hygiene | Removes bacteria from skin surfaces and reduces transmission of infection |
| **Gown**<br>Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back<br>Fasten at the back of neck and waist | Fastening the gown will keep it from falling away from the body and prevent contamination of clothing |
| **Mask**<br>Secure ties or elastic bands at middle of head and neck | The mask must cover the nose and mouth to be effective as air moves in and out of both |
| **Protective eyewear or face shield**<br>Place over face and eyes and adjust to fit | Prevents infection<br>Ensures comfort |
| **Gloves**<br>Extend to cover wrist of isolation gown | Maintains sterility |
| **Doffing/removing PPE** | |
| **Gloves**<br>Outside of gloves is contaminated<br>Grasp outside of glove with opposite gloved hand; peel off<br>Hold removed glove in gloved hand<br>Slide fingers of ungloved hand under remaining glove at wrist<br>Peel glove off over first glove<br>Discard gloves in waste container | Remove gloves first as they are the most contaminated<br>Reduces the risk of spreading infection<br>Encloses the contaminated outside area<br>Used gloves are contaminated with the microbes of the wearer and handled contaminants |
| Perform hand hygiene | Microorganisms multiply in dark, moist, warm conditions (e.g. on hands when gloves are worn)<br>Gloves may contain microscopic perforations permitting the entry of microbes, which can proliferate on the wearer's hands |
| **Protective eyewear or face shield**<br>Outside of eye protection or face shield is contaminated<br>To remove, handle by head band or ear pieces<br>Place in designated receptacle for reprocessing or in waste container | Reduces the risk of spreading infection |
| **Gown**<br>Gown front and sleeves are contaminated<br>Unfasten ties<br>Pull away from neck and shoulders, touching inside of gown only<br>Turn gown inside out<br>Fold or roll into a bundle and discard | Reduces the risk of spreading infection |

## CLINICAL SKILL 22.2 Donning and doffing PPE (gloves, gown, mask, eyewear)—cont'd

| | |
|---|---|
| **Mask**<br>Front of mask is contaminated—DO NOT TOUCH<br>Grasp bottom, then top ties or elastics and remove<br>Discard in infectious waste container<br>Surgical masks can be removed at the point of care. To remove a P2 respirator, perform hand hygiene and step outside the room or into an anteroom before removing and disposing of the respirator in a closed container and performing hand hygiene again. | Reduces the risk of spreading infection |
| Perform hand hygiene immediately after removing all PPE | Gloves do not provide 100% protection.<br>Reduces the risk of developing an allergy to the latex in the gloves |
| *(NHMRC 2010; Berman et al 2015; Rebeiro et al 2013; Tollefson 2016)* | |

**Figure 22.9** Sequence for removing PPE following airborne precautions

1: Remove gloves (A & B) 2: Perform hand hygiene (C) 3: Remove eye protection (D) 4: Perform hand hygiene (E) 5: Remove long-sleeved gown, being careful not to contaminate uniform (F, G, H, I) 6: Dispose of gown (J) 7: Perform hand hygiene (K) 8: Step outside room and close door. Gently and carefully remove N95 mask (duck-bill mask) 9: Dispose of mask appropriately as in (J) 10: Perform hand hygiene (M)

*(Courtesy of Teresa Lewis)*

the sharp should be the person to dispose of it into the container. If a sharp is dropped onto the floor or bed it should be picked up and placed into the container using forceps. Sharp containers must not be filled above the mark that indicates the bin is three-quarters full.

Healthcare workers face the risk of injury and potential exposure to blood-borne infectious agents, including hepatitis B and C virus, and human immunodeficiency virus (HIV) from needles and other sharp instruments during many routine procedures. Hollow-bore needles are of particular concern, especially those used for blood collection or intravascular catheter insertion. This is because they are likely to contain residual blood and are associated with increased risk for blood-borne virus transmission. Training and education in the risks associated with procedures and the use of equipment used in the facility, safe working practices and correct handling and disposal procedures, including not overfilling containers, should be mandatory.

### Sharps injury

If a sharps injury is sustained, how do you reduce the risk?

- Seek care or first aid if an injury is sustained
- If the skin has been penetrated, wash the affected area immediately with soap and water
- Alcohol-based hand rub can be utilised if soap and water is not available
- Do not squeeze the affected area
- Report the incident to your supervisor immediately
- Complete an incident or accident report; include date and time of exposure, how the incident happened and the name of the source (if known)
- Obtain informed consent from source if possible (if known) for serology to check for hepatitis B and C virus and human immunodeficiency virus
- Seek counselling. Ask about follow-up care, including post-exposure prophylaxis (which is most effective if given soon after the exposure). Knowing your immune status to at least hepatitis B will help alleviate some anxiety.

If a sharps injury happens to you, you can be reassured that only a small proportion of accidental exposures result in infection. Taking immediate action will lower the risks even further (Crisp et al 2013).

*Clinical note*: Individual insulin pens brought into the healthcare facility pose a great risk to staff. Where possible, the individual should self-administer their own insulin and remove and discard the used needle. If this is not possible, the facility should have policies in place which state the staff should administer the insulin from an insulin vial using a single-use disposable insulin syringe instead of the insulin pen. (There are tools on the market which are designed to assist the individual to remove the needle from the pen; however, they are not designed as a risk-reducing tool for staff use.) There have also been many reported incidents of injury to staff when retrieving the insulin pen from the bedside drawer, due to the insulin pen being placed back in the drawer with used exposed needle still in situ.

## Standard precautions: implementing environmental controls

Infectious agents can be widely found in healthcare settings and there is clinical evidence suggesting a connection between poor environmental hygiene and the transmission of infectious agents in healthcare settings (Dancer 1999; NHMRC 2010).

General surfaces can be divided into two groups: those with minimal hand contact (e.g. floors and ceilings) and those with frequent skin contact (e.g. frequently touched surfaces such as doorknobs, light switches and bedrails etc). The recommendation for cleaning should be based on the risk of transmission of infection within a particular healthcare facility. All organisations should have a documented cleaning schedule that outlines clear responsibilities of staff, a roster of duties, the frequency of cleaning and the products required to clean specific areas (NHMRC 2010).

A detergent solution designed for general purpose cleaning is adequate for cleaning general surfaces as well as surfaces in close proximity to the individual, unless there is uncertainty about the nature of the soiling on the surface, or there is presence of a multi-resistant organism or other infectious agent requiring transmission-based precautions. Many facilities have introduced detergent-impregnated wipes which may be used to clean equipment in between individual use and small surface areas.

Floors are generally damp mopped in preference to dry mopping. Carpets in public areas and in general clinical-care areas should be vacuumed daily with well-maintained equipment fitted with high efficiency particulate air (HEPA) filters to prevent dust being released into the air. In the case of a spill, clean up the excess as much as possible then the carpet should be cleaned using the hot water extraction method which is recognised by AS/NZ 3733:1995, to minimise chemical and soil residue.

Spillages of blood or any other body fluid in general areas should be contained and confined. Remove visible organic matter with absorbent material such as disposable paper towels, remove any broken glass or sharp material with forceps and soak up excess fluid using an absorbent clumping agent. The area should then be cleaned with a detergent solution, followed by a hypochlorite solution or a hospital-grade chemical disinfectant in accordance with the routine infection control policies and practices of the healthcare facility. A spill kit should be available in all clinical areas. It should contain a scoop and scraper, single-use gloves, protective apron, surgical mask and eye protection, absorbent agent, clinical waste bags and ties and detergent. All components should be disposable to prevent cross-contamination. Cleaning is generally a non-nursing duty, but nurses have a responsibility to ensure that cleaning is carried out effectively and in line with infection control policies. Healthcare facilities use a variety of systems to ensure that cleaning standards are met. These include checklists, colour coding of cleaning equipment to reduce the risk of cross-infection, cleaning manuals, infection control guidance and monitoring strategies such as audits.

Auditing is mostly done through visual checking; however, just because it looks clean does not necessarily mean it is free of infectious agents.

*Clinical note*: At the time of writing, more objective methods of assessing cleanliness and benchmarking (such as black spot auditing, fluorescent markers and detection of bacterial load using adenosine triphosphate (ATP) bioluminescence tests) are being investigated and trialled (TIPCU 2012).

Nurses also have a responsibility to ensure that linen is handled carefully; for example, bedclothes should not be carried up against the healthcare worker's uniform, flicked or shaken, as these actions liberate dust and microorganisms which contaminate the uniform and the environment. Soiled linen should be rolled up or folded and placed immediately into the appropriate receptacle. All healthcare workers should wear clean washable clothing that is changed daily. If linen is heavily soiled with blood or other body substances, the linen should be placed into a leakproof bag before placing it into the appropriate receptacle.

Actions should be taken to keep all areas free from the possibility of vector transmission (flies, other insects and animals) by placing rubbish and soiled linen immediately into the appropriate containers, by disposing of food scraps correctly, by keeping any food or fluid covered and by emptying toilet utensils (bedpans and urinals) immediately.

Rubbish containers should be equipped with close-fitting lids and must be emptied frequently and never left with material overflowing from them.

## Standard precautions: reprocessing of reusable instruments and equipment

Disposable single-use equipment must be disposed of immediately after use and should not be reprocessed. How do you know if a device is for single use only? It will have a symbol on the packaging. Non-disposable instruments and equipment must be reprocessed according to their intended use and manufacturers' guidelines and instructions for use. Reprocessing protocols are implemented in order to reduce or eliminate microorganisms. Reprocessing of instruments and equipment includes general cleaning, disinfection (by heat and water, or chemical disinfectants) and/or sterilisation. The level of reprocessing that is necessary depends on the body site where specific items are used and, therefore, the level of contamination risk involved. The Spaulding system was devised over 30 years ago; it has been retained and refined and is still widely used by infection control professionals and others when planning methods for disinfection or sterilisation (Rutala et al 2008). The levels of risk are:

- *Critical*: the instruments are used to enter or penetrate into sterile tissue or body cavities or into the blood stream. These items must be cleaned thoroughly as soon as possible after using and then sterilised
- *Semi-critical*: these items come into contact with mucous membranes or non-intact skin. These items must be cleaned thoroughly as soon as possible after using and then undergo steam sterilisation. If the item will not tolerate steam, high-level chemical or thermal disinfection is required
- *Non-critical*: these items come into contact with intact skin. Thorough cleaning with a detergent solution is required. In the case where the item has been used on a person requiring transmission-based precautions decontamination may be necessary using a low or intermediate level TGA-registered disinfectant after cleaning. Recent revision of AS/NZS 4187:2014 Reprocessing of Reusable Medical Devices in Health Service Organisations was made available December 2014. This document replaces and overrides AS/NZS 4187:2003. The new document states that it is mandatory for all healthcare facilities that reprocess reusable medical devices (this is all reusable medical devices including endoscopes) to formulate policies and procedures and an auditing process to satisfy this new standard. This is in progress at time of publication.

## Routine cleaning of instruments

Cleaning is an essential factor in preventing cross-infection. Cleaning is the removal from items of all foreign material, such as soil and organic material. Detergent and water is generally sufficient for routine cleaning. All reusable instruments and equipment should be cleaned as soon as possible after use, regardless of risk level and any other infection control measures required. If items are not thoroughly cleaned they cannot later be effectively disinfected or sterilised. If an item cannot be cleaned it cannot be disinfected or sterilised (NHMRC 2010). A plastic apron, general purpose utility gloves and protective face and eyewear should be worn when cleaning equipment that may be contaminated with material such as blood, mucus, pus, sputum or faeces. For checking effectiveness of cleaning, Australian Standard (AS 2945:2002) outlines specific test methods to verify manual and automated processes.

### Disinfection

The first links in the chain of infection, the infectious agent and the reservoir, are interrupted by the use of antiseptics and disinfectants. **Disinfection** is not a sterilising process. It is a process intended to destroy pathogenic microorganisms (with the exception of spores) or render them inert, using either thermal (using heat and water, at temperatures that destroy infectious agents) or chemical means. Examples of disinfectants are alcohols, chlorine and chlorine compounds, formaldehyde, hydrogen peroxide, phenolics and quaternary ammonium compounds; they are used on inanimate objects. Disinfectants can be caustic and toxic to tissues. An antiseptic is a chemical preparation used on skin or tissue. Both disinfectants and antiseptics are said to have bactericidal or bacteriostatic properties. A **bactericidal** preparation destroys bacteria, whereas a **bacteriostatic** preparation prevents the growth and reproduction of bacteria. Different grades of disinfectants are used for different purposes. Spore-forming bacteria such as *Clostridium difficile* may be inhibited by only a

few of the agents normally effective against other forms of bacteria. Each healthcare institution should have its own policy in relation to disinfection techniques.

### Sterilisation

**Sterilisation** is a process that is intended to destroy all types of microorganisms, including bacterial spores and viruses. Four commonly used methods of sterilisation are moist heat, gas, boiling water and radiation. A sterile article is one that is totally free from all microorganisms. Sterility is an all-or-none state, because a single living cell renders an article unsterile.

Records of sterilisation must be kept to verify that an appropriate reprocessing system is in place according to state and federal legislation. Details of documentation required can be found in Australia Standards AS/NZ 4187:2014 and AS/NZ 4815.

### Storage and maintenance of sterile items

All sterile or high-level disinfected items must be stored in a way that maintains their level of reprocessing. Dry, sterile, packaged instruments and equipment should be stored in a clean, dry environment and protected from sharp objects that may damage the packaging. It is the nurse's responsibility to check that the packaging of the sterile item about to be used has not been compromised (NHMRC 2010).

## Standard precautions: asepsis and aseptic technique

The basic principles employed in preventing the spread of infection are the same in all situations, regardless of whether persons are cared for in the community, in aged-care facilities, in day clinics or in hospitals. Aseptic techniques and all infection prevention and control activities are directed towards breaking the chain of infection.

### Principles of Aseptic Non-Touch Technique (ANTT®)

Aseptic non-touch technique (ANTT) is a framework for safe aseptic technique originated by Rowley (2001). ANTT® is used in conjunction with standard precautions and the 5 Moments for Hand Hygiene. It is based upon a concept termed Key-Part and Key-Site Protection used to maintain the asepsis of Key-Parts and Key-Sites when performing invasive clinical procedures. Based upon the technical difficulty of achieving asepsis, the ANTT risk assessment selects either Surgical-ANTT or Standard-ANTT. ANTT® is included in the NSQHS Standards, and therefore is core business for every healthcare facility in Australia. The ANTT® framework is being researched, taught, trained, learnt and assessed within every healthcare facility. The introduction of ANTT is based on the resources provided by the Association for Safe Aseptic Practice (ASAP) UK which oversees the ANTT project (http://www.antt.org) (see also Chapter 29).

Australian facilities using these resources are asked to make no changes so as to maintain the integrity of the ANTT Practice Framework and thus a standard and meaningful practice language for safe aseptic technique. The information below explaining ANTT is from the ANTT Practice Framework and used with permission from www.antt.org.

Terminology for aseptic technique historically has generated an inaccurate and confusing paradigm loosely based on the terms sterile, aseptic and clean techniques.

**Clean**: 'Free from dirt, marks or stains' (McLeod 1991). The ANTT Practice Framework does not use the term 'clean' because a visible standard is of no use for controlling invisible microorganisms.

**Sterile**: 'Free from micro-organisms' (Weller 1997).

Due to the large number of organisms in the atmosphere it is not possible to achieve a sterile technique in a typical healthcare setting. Near-sterile techniques can only be achieved in controlled environments such as laminar air-flow cabinets or theatres. The commonly used term 'sterile technique' (the instruction to maintain sterility of equipment exposed to air) is not possible and is often applied incorrectly.

**Asepsis**: 'Freedom from infection or infectious (pathogenic) material' (Weller 1997). It is defined as the absence of infectious agents that may produce disease (NHMRC 2010).

**Aseptic technique** refers to practices used by healthcare workers to reduce the number of infectious agents; prevent or reduce the likelihood of transmission of infectious agents from one person or place to another; and render and maintain objects and areas as free as possible from infectious agents. It protects persons during invasive clinical procedures (ANTT Project 2012).

An ANTT **risk assessment** is performed prior to undertaking a clinical procedure. This is done to decide which level of practice/technique must be used; that is, either Standard-ANTT or Surgical-ANTT (Rowley et al 2010; ANTT Project 2012). This risk assessment is based on a number of variables that determine the technical difficulty of maintaining asepsis (e.g. the complexity of the procedure, the competency and confidence level of the healthcare worker and the number and size of Key-Parts and Key-Sites.

Asepsis in ANTT is maintained and/or ensured by the use of six core infection prevention and control components:

1. Key-Part and Key-Site identification and protection
2. Hand hygiene
3. Glove use and a non-touch technique
4. Aseptic fields to promote and ensure asepsis
5. Environmental controls
6. Sequencing of procedures.

These are discussed in detail below:

1. A **Key-Part** is the part of the equipment that must remain aseptic, such as the syringe hub, and must only make contact with other Key-Parts or Key-Sites (ANTT Project 2012). A **Key-Site** is the area on the person such as a wound or intravenous insertion site that must be protected from microorganisms. After standard precautions Key-Sites are protected by non-touch techniques and effective usage of aseptic fields (ANTT Project 2012).
2. Hand hygiene involves using alcohol-based hand rub or soap and water using correct technique and performed at the correct time in the sequence for the procedure.

3. Glove use and non-touch technique reduces the risk of contamination for the individual and carer during contact with the procedural equipment.
4. **Aseptic fields** help to provide a controlled aseptic working space to help promote or ensure the integrity of asepsis during clinical procedures. There are two main types of aseptic fields used in ANTT, depending on whether a Standard-ANTT or Surgical-ANTT approach is being utilised:
   i. A **Critical Aseptic Field** (typically sterile drapes) is used for Surgical-ANTT. This is used when open or invasive procedures demand large aseptic working areas for long durations, such as in the operating room. Only equipment that has been sterilised can come into contact with the field. Such a Critical Aseptic Field requires the use of sterile gloves.
   ii. A **General Aseptic Field** (typically a plastic tray) is used for Standard-ANTT. Key-Parts are optimally protected by **Micro-Critical Aseptic Field** and a non-touch technique. The main General Aseptic Field does not have to be managed critically as it is essentially promoting rather than ensuring asepsis. Although the aim is still asepsis, Standard-ANTT is subsequently simplified and involves the use of non-sterile gloves (ANTT Project 2012). Micro-Critical Aseptic Fields protect Key-Parts individually, such as covers or caps that help to protect the Key-Parts (e.g. syringe caps, sheathed needles, covers or packaging). The inside of these caps and covers have been sterilised and therefore provide an optimum aseptic field for Key-Parts (ANTT Project 2012). (See Figure 22.10.)
5. Prior to an aseptic procedure, healthcare workers must ensure that there are no avoidable nearby **environmental risks**, such as bed making, individuals using a commode, or visitors within close proximity. In the home environment uncontrolled pets can pose a risk.
6. ANTT Procedure Guidelines sequence practice to ensure an efficient, safe and logical order for the procedure, such as performing hand hygiene before gathering equipment required for the ANTT procedure about to be performed, decontamination of the IV bung before connecting an IV giving set and disposing of used equipment appropriately when procedure is complete. See Figure 22.11.

The ANTT practices are classified as follows. It is important to note that the aim of Standard-ANTT and Surgical-ANTT is asepsis. However, their approaches are different.

Standard-ANTT is based on an approach that identifies and protects all the procedure Key-Parts and Key-Sites individually. This is achieved by standard precautions such as hand hygiene and PPE use followed by the use of a General Aseptic Field and Micro-Critical Aseptic Fields integrated with non-touch technique and wearing non-sterile gloves. Procedures requiring Standard-ANTT will characteristically be technically simple and short in duration (usually less than 20 minutes). Procedure examples include simple wound dressings, insertion of a peripheral intravenous cannula, administering an intravenous drug and removing an endotracheal tube, sutures or drains. Figure 22.12 illustrates how to establish an aseptic field.

The components of Standard Aseptic Technique (ANTT Project 2012) are:

- General Aseptic Field
- Micro-Critical Aseptic Fields are essential
- Non-sterile gloves or sterile gloves where Key-Parts or Key-Sites require touching
- Hand hygiene
- Standard precautions
- Non-touch technique is essential (ANTT Project 2012). See Figure 22.13.

Surgical-ANTT is based on an approach that identifies and protects all the procedure Key-Parts and Key-Sites in one main Critical Aseptic Field. It is designed to establish and maintain the asepsis of surgical incisions, tissues or wounds or patient orifices. Procedures requiring Surgical-ANTT are typically technically complex to achieve asepsis and involve extended periods of time. They are most often (but not always) practised in the operating room, obstetric areas and major diagnostic or special treatment areas such as a burns unit or an intensive care unit. In the operating room, nurses follow a process to ensure that asepsis is maintained. Surgical-ANTT may also be used by the nurse in a general medical or surgical unit or in a person's home; for example, when performing a urinary catheterisation or redressing large wounds.

**Figure 22.10** Micro-Critical Aseptic Field on a General Aseptic Field
*(ASAP 2012)*

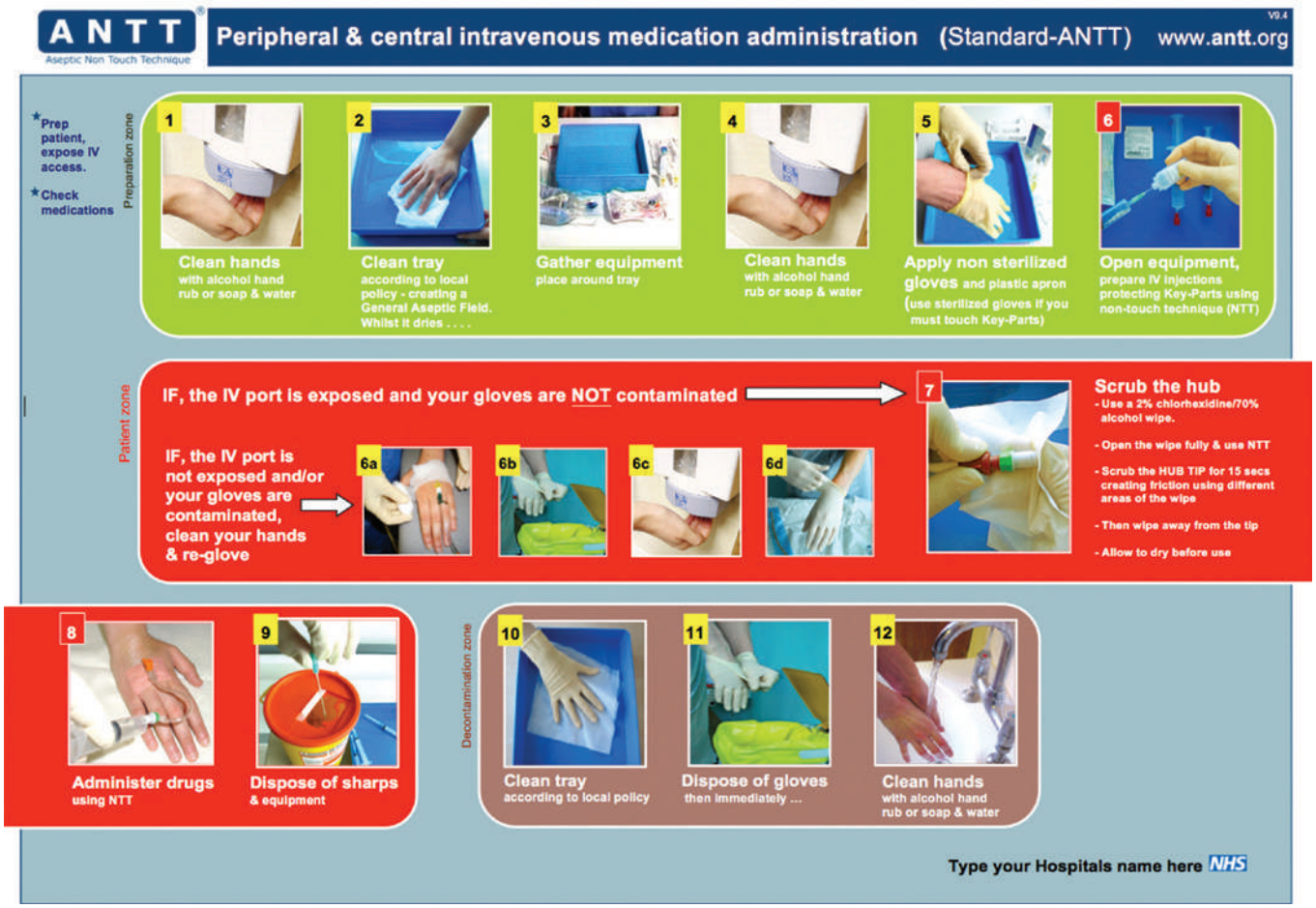


**Figure 22.11** Peripheral and central intravenous medication administration—Standard-ANTT
*(ASAP 2012. www.antt.org.uk, enquiries@antt.org)*

In such procedures the amount of sterilised equipment such as sterile drapes and personal full-barrier precautions will be fewer but the principle approach of Surgical-ANTT will be the same.

The components of Surgical-ANTT are:

- Standard precautions to full precautions (sterile gown, sterile gloves, hair cover and mask)
- Critical Aseptic Fields
- Micro-Critical Aseptic Fields are desirable where practical but not essential
- Sterile gloves are essential
- Hand hygiene
- Non-touch technique is desirable where practical (ANTT Project 2012).

See Figure 22.14.

## Principles of Surgical-ANTT

Principles of Surgical-ANTT are applied when nurses create a Critical Aseptic Field, add supplies or liquids to this field and don sterile gloves. The principles of Surgical-ANTT are that:

- Asepsis is preserved by touching an aseptic Key-Part with only another Key-Part that is aseptic (e.g. picking up a sterilised dressing with sterilised forceps or sterilised gloves)
- Only aseptic objects may be placed on a Critical Aseptic Field
- Once an aseptic item touches something that is not aseptic it is contaminated (e.g. if the nurse touches a sterilised dressing with an ungloved hand)
- If a Critical Aseptic Field becomes wet it is considered contaminated
- Whenever there is the slightest doubt about an article being aseptic it is considered contaminated and discarded.

## Establishing and managing an Aseptic Field for either Standard-ANTT or Surgical-ANTT

Prior to commencing a procedure the nurse must determine what aseptic field is required and how that field will need to be managed. This is important because Standard-ANTT and Surgical-ANTT utilise different types of aseptic fields. Surgical-ANTT involves managing all of the procedure Key-Parts on one main Critical Aseptic Field—a sterile drape. This involves protecting all of the procedure Key-Parts individually

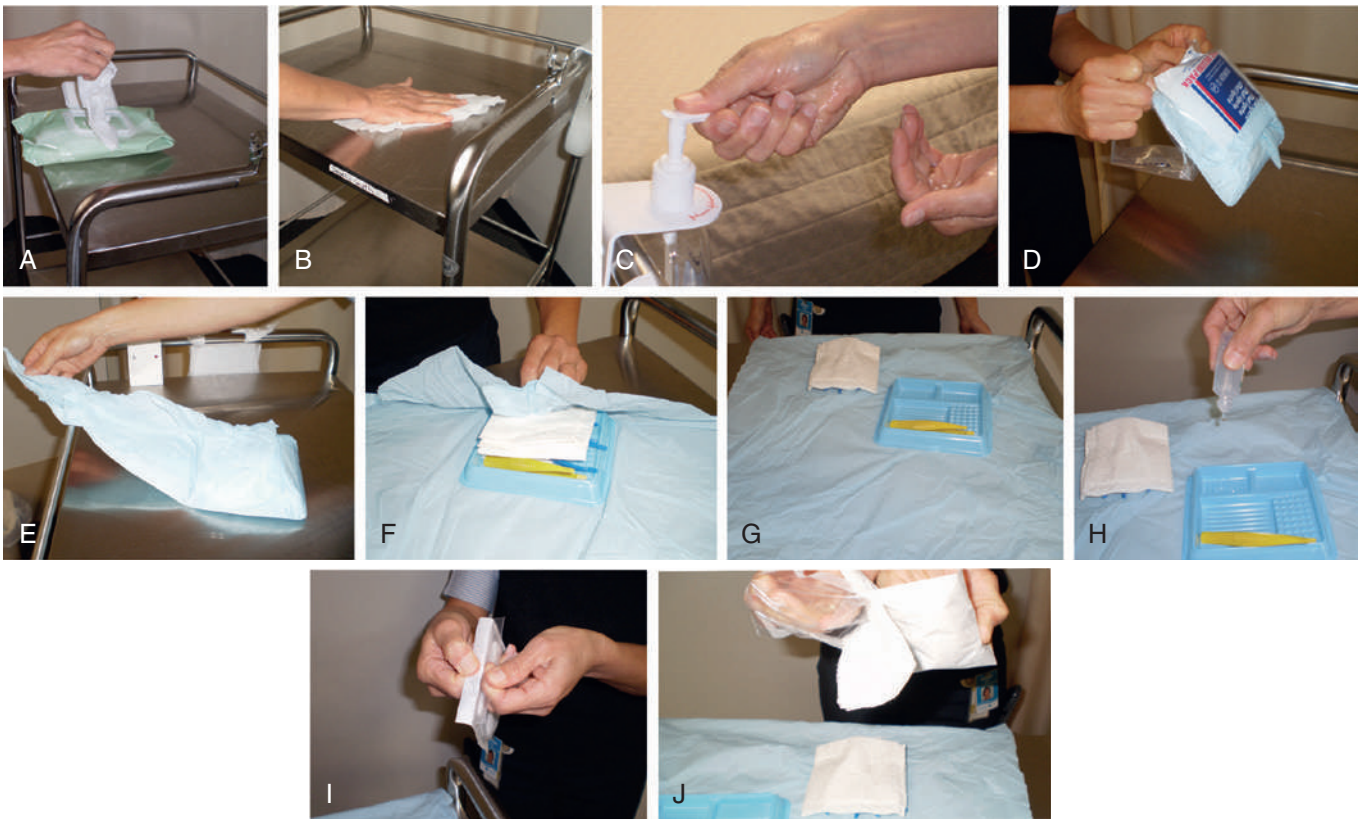


**Figure 22.12** Establishing a Critical Aseptic Field for Surgical-ANTT

To be used for a simple dressing. Review and carry out the standard steps for all nursing procedures/interventions that require standard aseptic technique. 1: Using neutral detergent: wipe down the dressing trolley/flat surface used to set up the aseptic dressing field (A & B) 2: Perform hand hygiene (C) 3: Open up commercially packaged sterile dressing pack (D) 4: Open the outer flap of the sterile package away from you (E) 5: Open the side flaps, one at a time, followed by the flap closest to you. Using this last flap gently manipulate the sterile tray and empty contents onto the field (F, G) 6: Add sterile solutions to the aseptic field. Lean across the field over the shortest distance. Hold the container at a height to prevent splashing. Pour/squeeze from a single patient use container; discard any unused solution to prevent cross infection (H) 7: Open a commercially prepared sterile package (e.g. gauze). Hold the outer wrapping tightly, empty contents onto the sterile field. Take care not to contaminate the contents or aseptic field (I, J)

*(Courtesy of Teresa Lewis)*

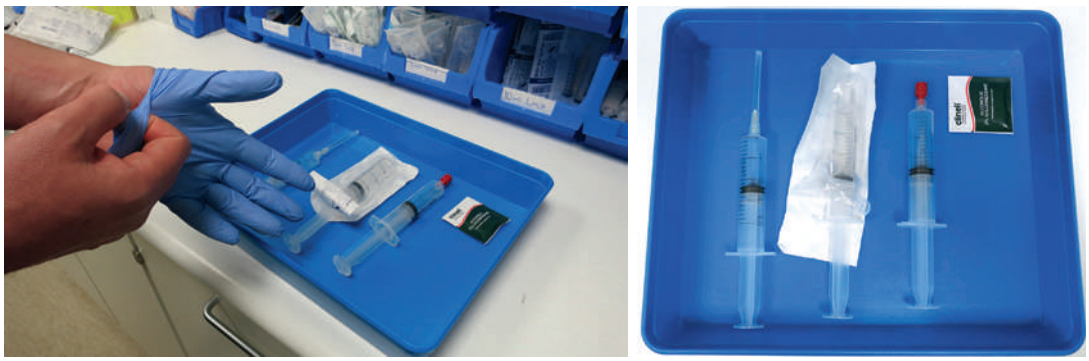

**Figure 22.13** Standard-ANTT—All Key-Parts are protected individually with Micro Critical Aseptic Fields (Caps and covers)

*(ASAP 2012)*

with Micro-Critical Aseptic Fields (caps, covers and inside of sterilised packaging). This individually protected equipment is then typically placed on a plastic or disposable tray which is not considered aseptic. The tray is subsequently termed a General Aseptic Field.

## Preparing a main Critical Aseptic Field (Surgical-ANTT)

Preparing and managing a main Critical Aseptic Field requires thoughtful handling. It should be prepared as close as possible to the time of actual use.

**Figure 22.14** Surgical-ANTT
*(ASAP 2012)*

- Remove unnecessary objects from the area to be used
- Assemble all equipment needed
- Perform hand hygiene
- Check the date or sterilisation indicator tape on all sterile packages to be used.

Sterilised items that have been packaged commercially are generally designed so that the outer paper or plastic wrapper can be torn away simply without contaminating the inner contents. The outer wrapper should be removed by tearing away from the body. Items sterilised within the facility may have an outer wrapper of thick strong paper or cloth. To open these items the nurse follows this procedure:

- Place the package in the centre of a flat surface at or above waist level
- Remove tape that seals the item
- Position the package so that the outermost (distal) triangular flap can be moved away from the front of the body
- Care is taken to only touch the outside corners so that the inside remains an aseptic field (any area touched needs to be considered contaminated)
- Smoothly open the first triangular side flaps, keeping the arms flat and away from the inner sterilised area. Ensure the opened flap lies flat on the working surface
- Standing away from the package, take hold of the outside surface of the last flap, pull the flap back towards the body, allowing it to fall flat on the working surface
- The aseptic field may also need to be extended by draping the individual using a sterilised drape. This sterilised drape provides additional workspace where sterilised equipment may be placed as well as protecting the Key-Site from contamination.

### Adding sterilised items to a Critical Aseptic Field (Surgical-ANTT)

Sterilised items can be added directly from their packaging onto the aseptic field or by transferring them with sterilised gloves or forceps. A packet containing a sterile item must be opened in such a way that the sterilised item does not come into contact with the non-sterile outer wrapper. The item may be gently allowed to fall onto a main Critical Aseptic Field with care taken not to contaminate the aseptic field with the wrapper, or it may be retrieved directly from its packaging by a person holding sterilised gloves or forceps. Figure 22.15 and Clinical Skill 22.3 illustrate the procedure for open gloving. (Closed gloving is the method used when sterile gloves are worn in conjunction with sterile gowns.)

- The procedure should be performed ensuring all Key-Parts/components are protected at all times
- Only sterilised items may come into contact with Key-Sites and sterilised items must not come into contact with non-sterilised items.

### Adding sterilised solutions to a Critical Aseptic Field (Surgical-ANTT) or a General Aseptic Field (Standard-ANTT)

Use of 'once-only' solutions is best practice. Pour the required amount onto the Critical Aseptic Field in a manner that prevents splashing. Discard unused solution to prevent cross-infection. If using Standard-ANTT the solution would be added to a sterilised pot acting as a Micro-Critical Aseptic Field within a General Aseptic Field.

**CRITICAL THINKING EXERCISE 22.5**

Mrs Adams has a venous ulcer on her left leg. The dressing on the ulcer is wet, contaminated with blood-stained bodily fluids and requires replacement. How do you decide what level of ANTT is required?

## Standard precautions: appropriate handling of waste and linen

There is potential for contamination from blood or body secretions when handling soiled linen, pathology specimens, equipment or waste. Waste includes sharps, clinical and cytotoxic waste, human tissues and general, recycling and radioactive waste. When handling waste apply standard precautions to protect against exposure to blood and body substances; perform hand hygiene following procedure. Gowns and gloves, for example, should be worn by anyone handling clinical waste, and linen soiled with blood or body substances should be placed and transported in an impermeable (leakproof ) bag. Waste should be segregated at point of generation and disposed of according to type of waste (as discussed above) and the facility waste management program. It should be contained in the appropriate receptacle, identified by colour and label. All healthcare workers should be trained in the correct procedures for waste handling. Healthcare facilities should refer to the current Australian Standard AS/NZS 3816 and the *Waste Management Association of Australia Industry Code of Practice for the Management of Clinical and Related Wastes* (2010).

Healthcare facilities must have documented policies on the collection, transport and storage of linen. Those organisations that process or launder linen must have documented policies consistent with AS/NZ 4146. All used linen should be handled with care to avoid dispersion of microorganisms into the environment and to avoid contact with staff clothing.

**Figure 22.15** Donning sterile gloves

Review and carry out the standard steps for all nursing procedures/interventions that require surgical aseptic technique. 1: Perform hand hygiene (A) 2: Remove outer glove bag by peeling sides away. Slide correct-size gloves, covered by inner paper wrapper, onto a clean dry flat surface above waist level 3: Perform procedural hand hygiene 4: Carefully move inner wrapper away to expose sterile gloves. Keep gloves on inside surface of the inner wrapper. Position gloves with wrist opening nearest to the body (B) 5: Identify the right and left gloves. Prepare to glove dominant hand first 6: Use thumb and first two fingers of non-dominant hand to pick up first glove. Lift at least 12 cm off wrapper (C) 7: Grasp the folded-over part of the cuff (each glove has a cuff about 5 cm wide that is folded back to reveal inside of glove). Take care to touch only the inside surface of the glove 8: Insert fingers of other hand into the held glove and pull the glove up over the dominant hand without touching the outer surface of the glove (D) 9: With gloved hand slide fingers underneath the cuff of the second glove (E) 10: Ease second glove up over non-dominant hand. Be careful not to touch outside of glove or other gloved hand with bare skin. Keep thumb of dominant hand abducted back. Once hand is settled in glove, slide cuff carefully up over the wrist, being careful to touch only the sterile sides (F) 11: Adjust fingers in gloves by pulling glove fingers out with the opposite hand to straighten and adjust until fitted neatly. Hands can be interlocked to help ease gloves into correct position (G)

*(Courtesy of Teresa Lewis)*

The following infection control principles apply whether or not the person requires transmission-based precautions. (See Case Study 22.1.)

Appropriate PPE must be worn during handling of soiled linen to prevent skin, uniform or mucous membrane exposure to blood or bodily substances. Used linen is 'bagged' into an appropriate laundry container at the location of use (i.e. linen should not be carried under the arm of the staff member down the corridor of the healthcare facility looking for the receptacle).

Used linen must not be sorted, rinsed or washed in domestic washing machines in clinical-care areas. Linen

## CLINICAL SKILL 22.3 Open gloving (donning and removing sterile gloves)

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile gloves of appropriate size<br>A clean work surface on which to open the gloves |
| **Skill activity** | **Rationale** |
| Perform hand hygiene | Removes bacteria from skin and reduces transmission of microorganisms |
| Remove gloves from outer packaging and place gloves in the inner wrapper on a clean, dry surface above waist level | Maintains integrity of the gloves, any moisture on the surface contaminates the gloves |
| Carefully remove inner wrapper to expose sterile gloves<br>Keep gloves on inner surface of the inside wrapper<br>Position gloves with wrist opening nearest to the body | The inner packaging must remain sterile |
| Identify the right and left gloves. Prepare to glove dominant hand first | Correct identification helps with correct gloving<br>Gloving the dominant hand first helps with dexterity |
| Use thumb and first two fingers of non-dominant hand to pick up first glove. Lift at least 12 cm off wrapper | Prevents accidental contamination |
| Grasp the folded-over part of the cuff (each glove has a cuff about 5 cm wide that is folded back to reveal inside of glove). Take care to touch only the inside surface of the glove | The hands are not sterile, so by only touching the inside of the glove contamination is avoided |
| Insert fingers of other hand into the held glove and pull the glove up over the dominant hand without touching the outer surface of the glove | |
| With gloved hand slide fingers underneath the cuff of the second glove<br>Ease second glove up over non-dominant hand. Be careful not to touch outside of glove or other gloved hand with bare skin. Keep thumb of dominant hand abducted back. Once hand is settled in glove, slide cuff carefully up over the wrist, being careful to touch only the sterile sides | This helps to prevent accidental contamination |
| Adjust fingers in gloves by pulling glove fingers out with the opposite hand to straighten and adjust until fitted neatly. Hands can be interlocked to help ease gloves into correct position | Ensures a smooth fit |
| **Removing gloves**<br>Grasp the outside of one cuff with the other gloved hand. Pull glove off, turning inside out. Hold removed glove in your gloved hand, then use the fingers of your bare hand to pull the remaining glove from the cuff over the hand<br>Discard in appropriate waste receptacle<br>Perform hand hygiene | Minimises contamination of underlying skin<br>Contains contaminated gloves |

*(NHMRC 2010; Berman et al 2015; Rebeiro et al 2013; Tollefson 2016)*

soiled with blood or body substances should be placed into a leakproof bag before being placed into the laundry receptacle (this is to ensure safe handling and transport).

Hand hygiene must be performed after handling used linen and before touching other surfaces. Individual personal items may be washed in a domestic washing machine, but only if hot water and an appropriate detergent are used. If these are not available, only individual person loads can be washed at one time.

Double-bagging is not performed routinely but this is necessary when the outside of a bag is visibly contaminated. Linen bags and rubbish bags should never be overfilled and should be tied securely before being transported.

*Clinical note*: Care must be taken not to overfill linen and rubbish bags as many manual handling staff injuries occur each year in Australia.

### Specimen collection and transport

Standard precautions should be followed when handling laboratory specimens. If additional precautions are needed (e.g. if the specimen is from a person diagnosed with a particularly virulent, unusual or epidemiologically important pathogen, such as Creutzfeldt-Jakob disease (CJD)) advice should be sought from an expert in the pathology laboratory. The nurse should wear gloves when collecting specimens. Enrolled Nurses (ENs) may be required to obtain specimens such as a midstream specimen of urine (MSU), wound swab or a stool (faecal) specimen. Other specimens that may be requested include swabs from wounds or body orifices such as the nose, throat or vagina. Personnel from a pathology department often obtain these or blood specimens from individuals. ENs are advised to check their code of practice and the policies of the employing agency or healthcare facility with regard to collecting pathology specimens from individuals. All specimen containers should be sealed tightly to prevent spillage and contamination of the outside of the container. The individual's details should be written on the container label. The container should be placed in a sealed plastic bag, also clearly labelled, and taken as soon as possible to the pathology department. Hand hygiene must be performed upon removing PPE (see Figure 22.16 and Clinical Skill 22.1).

## Standard precautions: respiratory hygiene and cough etiquette

Standard precautions incorporate respiratory hygiene and cough etiquette at all times. Covering sneezes and coughs helps prevent infected persons from dispersing potentially infectious respiratory secretions into the air. When coughing or sneezing, use a tissue to cover the nose and the mouth, this tissue should be disposed of immediately afterwards and if a tissue is not at hand, cough or sneeze into the elbow. Hands must be washed with soap and water after coughing, sneezing, using tissues or after any contact with respiratory secretions or objects contaminated with these secretions (such as picking up and disposing of a used tissue) (NHMRC 2010).

Healthcare workers must assist elderly or very young persons who need assistance with containment of respiratory secretions. Those who are immobile will need a receptacle readily at hand for the disposal of contaminated tissues (e.g. plastic bag or rigid container lined with plastic bag) and hand hygiene facilities should be offered (e.g. moistened single-use face and hand wipes or alcohol hand rub if the person is deemed capable of using the product safely). All individuals should be screened on admission for signs and symptoms of acute respiratory infection. Anyone displaying signs and symptoms of respiratory infection, regardless of cause, should be instructed on how to follow respiratory hygiene and cough etiquette and possibly be asked to wear a surgical mask (see Clinical Interest Box 22.5).

*Clinical note*: This is extremely important for individuals on droplet transmission-based precautions.

### CLINICAL INTEREST BOX 22.5 Cough etiquette

- Cover the nose/mouth with a disposable single-use tissue when coughing, sneezing, wiping and blowing the nose
- Use tissues to contain secretions
- Dispose of tissues in the nearest waste bin after use
- If no tissues are available, coughing or sneezing into the inner elbow rather than the hand is acceptable
- Hand hygiene must be practised after contact with any respiratory secretions, objects or material contaminated with respiratory secretions
- Keep contaminated hands away from the mucous membranes of the eyes and nose

*(NHMRC 2010; NSW Government Health 2014)*

## Tier 2: Transmission-based precautions applied in addition to standard precautions

### When are transmission-based precautions applied?

Transmission-based precautions are applied to persons in the presence of known or suspected infectious agents that are spread by direct or indirect contact, droplet or airborne routes. Whether used singly or in combination, transmission-based precautions are always applied in addition to standard precautions (NHMRC 2010). For an example of an entry into progress notes see Progress Notes Example 22.1.

*Indirect or direct contact transmission* occurs when healthcare worker hands or clothing become contaminated, care devices are shared between persons, infectious persons have contact with other individuals or environmental surfaces are not regularly decontaminated.

*Droplet transmission* occurs when healthcare workers' hands become contaminated with respiratory droplets and are transferred to susceptible mucosal surfaces such as the eyes, when infectious respiratory droplets are expelled by

**Figure 22.16** Collecting wound swab

Review and carry out the standard steps for all nursing procedures/interventions. 1: Perform hand hygiene (A) 2: Don PPE (B, C) 3: Open commercially packaged bacterial swabs (D) 4: Remove cap of transport medium container (E) 5: Carefully insert bacterial swab into the transport medium to pre-moisten swab (taking care not to contaminate swab) (F, G) 6: Remove swab from transport medium and gently roll over wound to be swabbed (H, I) 7: Gently insert the swab stick back into the transport medium (J, K) 8: Remove PPE (L, M, N) 9: Perform hand hygiene (O) 10: Write on outside of transport medium container (P) 11: Place inside pathology specimen bag (Q, R) 12: Perform hand hygiene (S)

*(Courtesy of Teresa Lewis)*

coughing, sneezing or talking, and come into contact with another's mucosa (eyes, nose or mouth), either directly into or via contaminated hands.

*Airborne transmission* occurs when healthcare workers or others inhale small particles that contain infectious agents.

Extra precautions are implemented to interrupt transmission of highly contagious or epidemiologically important pathogens that are transmitted via the respiratory droplet or airborne mode, direct or indirect contact mode or via any combination of these routes. For example, a person with influenza, active pulmonary TB, measles, Ebola,

## PROGRESS NOTES EXAMPLE 22.1

| | |
|---|---|
| 17/03/2015 1200 hrs | Nursing: Mary has experienced several episodes of loose, watery diarrhoea this morning. She describes a loss of appetite and some nausea with slight abdominal tenderness. Observations: T 38, P 88, R 26, BP 160/85. Mary has not received any aperients in the last two days. A stool sample has been collected for culture and sensitivity at 1100 hrs today. On consultation with the infection prevention and control practitioner transmission-based precautions have been implemented today at 1130 hrs due to high risk of possible norovirus or *Clostridium difficile* infection. Infection prevention and control care plan has been completed, to be reviewed daily. Information sheet has been given to Mary and her questions answered. She voiced concerns re her grandchildren visiting and she was advised that it would be best for them not to visit while she is feeling so unwell. Her family have been notified.<br>***J. Lewis* (Lewis) EN** |

Creutzfeldt-Jakob disease, vancomycin-resistant *Enterococci* or methicillin-resistant *Staphylococcus aureus* would be in this category.

Transmission-based precautions are also used in the event of an outbreak (e.g. gastroenteritis, whooping cough) or pandemic to assist in containing the outbreak, contact tracing in the event of a pandemic and preventing further infection. Transmission-based precautions are tailored to the specific infectious agent concerned and its mode of transmission and may include any combination of the following practices:

- Nursing the individual in a single room with closing door (isolation)
- Screening of individuals on admission, especially for acute respiratory infection (see Clinical Interest Box 22.6)
- Placing individuals colonised or infected with the same infectious agent and **antibiogram** (result of laboratory testing for the sensitivity of an isolated bacterial strain to different antibiotics) in a room together (cohorting)
- Wearing specific personal protective equipment (PPE)
- Providing dedicated equipment
- Special room ventilation systems to maintain the room air at negative pressure. Negative pressure rooms are used for individuals requiring airborne droplet nuclei isolation. Individuals are placed in negative pressure rooms to reduce transmission of disease via the airborne route. Class N or negative pressure rooms are also known as 'airborne infection isolation' and 'infectious isolation units'

## CLINICAL INTEREST BOX 22.6 Admission screening questionnaire: acute respiratory infection (season/pandemic)

URN:
Family name:
Given names:
Address:
Date of Birth: Sex: ☐ M ☐ F

Vigilance regarding the management of acute respiratory infections (seasonal or pandemic) is a recommendation of the Australian Government Department of Health and Ageing and state Health Departments. Therefore, this screening procedure has been developed to assist with contact tracing should a person subsequently be diagnosed with acute respiratory infections and/or a pandemic influenza occurs.

The following admission screening questionnaire should be routinely completed prior to or on admission to determine any at-risk persons (i.e. those who show signs and symptoms of an acute respiratory illness, have a history of recent travel to areas of high prevalence (either overseas or in Australia), had contact with confirmed/probable cases within 7 days prior to onset, have an existing illness or are pregnant), in order to ensure the safety of all HCWs, individuals and consumers, and assist with follow-up if required.

1. Do you have a fever and respiratory symptoms e.g. cough, sore throat, runny nose? ☐ Y ☐ N
   AND EITHER
2. Have you had recent contact with people diagnosed with acute respiratory infections or acute respiratory illness (seasonal or pandemic) in the last 7 days (refer to any circulating pandemic/seasonal definitions) ☐ Y ☐ N
   OR
   Have you travelled to areas of high prevalence for acute respiratory infections (seasonal or pandemic), either overseas or in Australia, within 7 days of onset of symptoms? ☐ Y ☐ N
   (NB: For further information on affected countries refer to:
   > The Australian Government Department of Health and Ageing (DoHA) www.health.gov.au
   > World Health Organisation (WHO) www.who.int/en
3. Do you have any other medical or chronic illnesses, or are you pregnant? ☐ Y ☐ N

If individual answers YES to at least questions 1 and 2 please contact the relevant person immediately as per your infection prevention and control policy, as transmission-based precautions may be necessary.

*(Modified from The Department of Health Influenza Infection CDNA National Guidelines for Public Health Units & Guidelines for Minimising Transmission of Influenza in Healthcare Facilities 2010 Influenza Season)*

- Using TGA-registered disinfectant with label claims specifying its effectiveness against specific infectious organisms (NHMRC 2010)
- Restricting movement of both individuals and HCWs.

**CRITICAL THINKING EXERCISE 22.6**

Mrs Farah has been admitted with the diagnosis of tuberculosis for investigation. You have been asked to check her blood pressure. You can only find a surgical mask outside her room. What transmission-based precautions should be implemented? Would you enter her room wearing the surgical mask?

## Contact precautions

Contact precautions consist of:

- Single room or cohort with same infectious agent and antibiogram
- Gloves
- Gowns
- Surgical mask if the infectious agent is isolated in the sputum or as per standard precautions
- Eye protection as required, depending on task performed or as per standard precautions
- Single-use equipment or reprocess equipment before reuse on next person.
- Signage of room. Refer to the standardised infection prevention and control signs available on the ACSQHC website (http://www.safetyandquality.gov.au/our-work/healthcare-associated-infection/national-infection-control-guidelines/).

## Droplet precautions

Droplet precautions consist of:

- Single room or cohort with same infectious agent and antibiogram. Refer to the infection prevention and control precautions in Figure 22.2
- Gloves to be worn whenever there is potential of direct or indirect contact with blood or body fluids
- Gowns to be worn whenever there is potential of direct or indirect contact with blood or body fluids
- Surgical mask
- Eye protection to be worn whenever there is potential of exposure to splashes or sprays to mucosa
- Single-use equipment or reprocess equipment before reuse on next person
- Restrict visitor numbers and implement precautions as for staff.
- Signage of room (see above for website link to access standardised signage).

## Airborne precautions

Airborne precautions consist of:

- Single negative pressure room (if not available, a single room with door closed)

**CLINICAL INTEREST BOX 22.7**
**Transmission-based precautions**

In our ward we have patients who are colonised with methicillin-resistant *Staphylococcus aureus* (MRSA) and they appear in good health with no signs of infection or inflammation. It is present in their nose and on their skin. If these colonised individuals are identified prior to admission, they undergo a de-colonisation program prior to their surgery. Two months ago we also had a patient who developed an MRSA infection in their wound postoperatively. It was deduced that poor hand hygiene caused transmission of this microorganism from the colonised patient in the ward at the time to the susceptible postoperative patient. This resulted in a longer hospital stay for that patient, but thankfully he did recover and we managed to clear his wound infection sufficiently for discharge.

**Kathryn, NUM surgical ward**

- Gloves to be worn whenever there is potential of direct or indirect contact with blood or body fluids as per standard precautions
- Gowns to be worn whenever there is potential of direct or indirect contact with blood or body fluids as per standard precautions
- P2 (N95) respirator/mask
- Single-use equipment or reprocess equipment before reuse on next person
- Restrict visitor numbers and implement transmission-based precautions as for the staff.
- Signage of room (see above for website link to access standardised signage).

The aim of implementing transmission-based precautions early is to reduce further transmission opportunities that may arise due to the specific route of transmission of the particular pathogen. While it is not possible to identify all persons needing transmission-based precautions on admission, at times when an increased risk is recognised (such as in the acute respiratory infection questionnaire in Clinical Interest Box 22.6) their use is warranted while confirmation is pending. When transmission-based precautions are implemented the infection prevention and control practitioner should be consulted and a care plan completed (see Figure 22.2 and Clinical Interest Box 22.7) by the HCW and then reviewed on a daily basis or when any changes to the individual's current diagnosis, laboratory testing or results become available. When implementing transmission-based precautions the nurse must recognise there is potential for adverse effects such as anxiety, mood disturbances and perceptions of stigma and reduced contact with clinical staff. Clearly explaining to individuals why these precautions are necessary may help to alleviate these effects. Individuals and their carers should be offered clear, consistent information and advice through all stages of their care (NHMRC 2010).

**CRITICAL THINKING EXERCISE 22.7**

Mrs Smith is 68 years old and has been admitted to hospital with a temperature, history of rigors, a moist cough which has been troubling her for the past 4 days, headache and myalgia. She has a recent history of overseas travel. What infection control and prevention activity should take place upon Mrs Smith entering the facility? What are the nursing interventions necessary to control transmission of the infection? What other education should take place to assist in prevention of cross-transmission?

## Isolation precautions

A person requiring transmission-based precautions is usually nursed using isolation precautions. Although healthcare facilities develop and implement their own isolation policies, isolation precautions are based on the following general principles:

- Each step in the care plan is carefully devised to minimise the risk of cross-infection, as one act of carelessness can result in a spread of infection. Before any nursing activity is performed, the technique to be used should be planned carefully so that the risk of cross-infection is minimised. Once the nurse's hands have become contaminated, possessions such as watches, pens, scissors or any part of the uniform must not be handled. To reduce the risk of acts of carelessness, items such as pens and scissors should be kept in the person's room. To avoid the need to use personal watches for measuring the individual's vital signs, the room should be equipped with a wall clock that has a second hand
- People should avoid touching their hair, nose, mouth or eyes while caring for a person in isolation
- Protective clothing such as gowns, masks and gloves are put on before entering or immediately on entering the room. Disposable single-use impervious gowns are preferred
- Hand hygiene should take place on entering the room, before donning gloves, after contact with the person or contaminated articles, upon removing gloves and other PPE and before leaving the room and as per the 5 Moments for Hand Hygiene while caring for the person in isolation
- Items used during care of the person should be disposable when possible. Reusable items should be kept in the room and, when they are removed for decontamination and reprocessing, should be bagged. When articles need to be removed from the room two people are required. The nurse inside the person's room places the contaminated articles into a bag held by the staff member outside the room and the bag is sealed securely. If the items inside the bag cannot be processed immediately by the person handling the bag, a label is placed on the outside of the bag to signify that the contents are contaminated. Both persons wash and dry their hands after handling the bag(s) (NHMRC 2010).

***Protective isolation*** In some isolated cases, extremely **immunocompromised** individuals may need to be protected from contracting infections and, therefore, must be protected from microorganisms carried into the room by those who enter. No one with an active infection such as a common cold is allowed in the room. Anyone who does enter is required to wear gown, mask, gloves and disposable coverings on the head and feet. When possible the person is nursed in a room with its own ventilation system. This would be implemented with the advice and attention of the infection control practitioner, as well as the medical officer caring for the person. Each healthcare facility will differ, but should have a policy and procedure in regards to which individual protective isolation would apply to upon admission.

***Preparation of individual and family for isolation*** Before isolation precautions are implemented, the individual and significant others require thorough explanations about the precautions and the reasons for them. Healthcare workers should ensure that individuals under their care understand why certain practices are being undertaken, and that these practices are in place to protect everyone from infection. Individuals under their care and visitors should also be aware of their role in minimising risks by following basic hand hygiene (see Figure 22.4) and respiratory hygiene and cough etiquette (Clinical Interest Box 22.5) and informing staff about aspects of their care or services if necessary. The information provided must be clear and comprehensive to prevent spread of infection through ignorance or carelessness. The information should be provided sensitively to reduce any feelings of embarrassment, resentment or apprehension that the person may experience. Individuals should be given the opportunity to ask questions and have them answered in a clear and sensitive manner. Persons nursed in isolation may feel that they are a nuisance, are unclean or are afflicted with some disease that makes them unacceptable to others. Such individuals may also be anxious that no one will come into their room to care for or visit them.

Because isolation may lead to withdrawal or sensory deprivation, the individual is reassured that measures will be implemented to provide adequate stimulation. The person should be provided with any means of diversion or intellectual stimulation that they need, such as a television set, telephone, books and magazines, craft projects or other forms of activity that may be of interest. Ideally the room should have an outside view as a means of reducing the individual's feeling of being isolated.

The person's room should be set up with equipment that will remain in that room; for example, there should be a thermometer, stethoscope and sphygmomanometer that will be used only for that person. These items must remain in the room, and used only with the individual being nursed in that room. Lined rubbish containers with lids and a soiled linen receiver are also placed in the room. Signage of transmission-based precautions must also be displayed. The ACSQHC has tools and resources available to all healthcare facilities in Australia and standardised infection control and

prevention signs are available from the website; see above for details.

## Transporting individuals requiring transmission-based precautions

It may be necessary to transport individuals with infections to surgery or centres for diagnostic tests. Individuals infected with microorganisms transmitted by the airborne route should only leave their rooms if it is essential to do so. Respiratory secretions should be contained by asking the person to wear a mask. The individual should also be provided with tissues and a bag in which to seal them if necessary. The person transporting any individual who is infectious should wear appropriate barrier protection. The nurse needs to take precautions to prevent and contain, or be ready to clean or cover, any leakage of body excreta (e.g. faeces, vomitus, sputum and urine), blood and other body fluids and exudates from infected wounds or skin lesions. The nurse provides the person with a clean (non-colonised) gown to wear as a robe en route and explains as sensitively as possible how the individual can assist with preventing transmission of infection during the transfer and throughout any procedure. The individual may be transported in a wheelchair or on a stretcher or hospital trolley. These may be protected with extra layers of linen or disposable protectors. Any person in another area who is to be in contact with the infectious individual, such as ambulance officers and surgical staff, should be informed of the precautions necessary before the transfer. Information concerning the isolation precautions should also be clearly documented on the person's chart. Equipment used should be cleaned according to infection control guidelines after use. While it is necessary to inform other care givers of the transmission-based precautions that are required, it is to be done with individual confidentiality in mind.

## Transmission-based precautions and multi-resistant organisms in outbreak situations

The application of transmission-based precautions is particularly important in containing MROs such as methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant *Enterococci* (VRE) and multi-resistant gram-negative bacteria (MRGN) and is also an integral part of outbreak management. (Refer to Decision-making Framework Exercise 22.1 and the infection prevention and control precautions care plan in Figure 22.2.)

An outbreak may be identified by a healthcare worker, laboratory personnel or health authorities conducting routine surveillance. An **outbreak** may be defined as an occurrence of more cases of disease than expected in a given area, among a specific group of people, over a particular period of time, or two or more linked cases of the same illness. Commonly detected outbreaks are diarrhoeal pathogens (norovirus, *Salmonella, Clostridium difficile*), respiratory pathogens (influenza), MRSA, Legionnaires' disease, chickenpox (varicella) and measles (rubeola).

Upon suspicion of an outbreak a quick infection control response is directly related to minimising cross-infection. Infection control strategies may differ according to the nature of the disease, the virulence of the organism and the vulnerability of the individuals concerned (NHMRC 2010).

*Clinical note*: Communication with the persons and their family or carers will alleviate anxiety and uncertainty. Clear and concise information highlighting the specific transmission-based precautions required to minimise cross-infection will allay fears. All facilities must have policies or guidelines in place for management of an outbreak.

Case Study 22.1 illustrates an example of the spread of infection/infestation due to inadequate adoption of standard precautions on admission of a person to a healthcare facility.

**CRITICAL THINKING EXERCISE 22.8**

Explain what you understand by the terms 'standard precautions' and 'transmission-based precautions'.

## Preparation for discharge to the home environment

When individuals are discharged from a healthcare setting the nurse has a responsibility to ensure that the person and family members have the knowledge and ability to control and prevent the onset or the spread of infection at home. Several social, demographic and cultural factors influence this knowledge and ability.

***Factors affecting knowledge and ability to prevent and control infection*** Factors that influence the ability of individuals to absorb and retain information imparted to them include their age, educational level, language and cognitive abilities. Factors that influence a person's ability to perform the infection prevention and control measures include their physical abilities, financial status and living conditions. Additionally a person's cultural beliefs may impact on perceptions concerning the cause of infection and the need to comply with the recommended control measures. Assessing all these factors is essential when the nurse prepares an individual for discharge home.

***Living conditions and financial situation*** Individuals live in a range of different environments: some live in poverty—being homeless, or living in extremely poor conditions. Some of the most disadvantaged persons the nurse will encounter are Indigenous people, many of whom live in rural and remote areas where housing is inadequate and there is a lack of clean water because there is no mains water supply. Some live in overcrowded and unsanitary conditions where leakages of sewage are common (Human Rights and Equal Opportunities Commission 2006).

The lack of water and the lack of money impact on the ability of these people to:

- Maintain bodily hygiene
- Keep the home clean, wash clothes and bed linen
- Purchase medications, equipment, linen or other essential items
- Purchase and safely prepare nutritious food.

See Chapter 11 for more information on issues that impact on health risks for Indigenous people.

***Cultural beliefs*** One of the most significant issues in infection control is an understanding of bacteria and viruses, how they spread and how they cause illness. This understanding of the cause of illness is widely accepted and understood in western cultures, but other cultures may have quite different perceptions. According to a person's cultural beliefs, illness may be perceived as being a natural punishment for wrongdoing, caused by God's will or by magical, mystical or spiritual intervention. Without the belief and understanding that illness is the result of bacterial or viral invasion there is little incentive for compliance with infection control measures dictated by western understandings. The nurse who tries to explain western perceptions to persons from other cultures may find language and cultural barriers difficult to overcome, and the help of an interpreter familiar with the culture and language of the individual is strongly recommended.

***Going home with an infection*** The advantage of the home environment is usually that there is less exposure to the organisms that cause HAIs and therefore, when poverty and clean water are not primary issues, the home usually presents less risk of infection than a hospital and it provides a healing environment. Before being discharged home, the individual should be provided with the necessary education verbally and in written form. Some general points for healthcare education in relation to preventing infection are identified in Clinical Interest Box 22.8.

If a person goes home with an infection, health education appropriate to the specific type of microorganism and mode of transmission of the infection is essential. Education might need to include advising the person to:

- Launder the clothes, towels and bed linen of the person with the infection separately to those of the rest of the household.
- Use a solution of chlorine bleach and hot water for laundering, as this will destroy most organisms. If possible, hang laundered items in the fresh air and sunshine to dry, or dry in a dryer at the highest possible temperature, as most organisms do not survive in hot dry conditions.
- Use a 1:10 solution of chlorine bleach and water for cleaning the bathroom and toilet facilities, kitchen surfaces or equipment used by the person with the infection (e.g. wheelchair, commode, bedpan or urinal).
- If the person is on antibiotics, they must be instructed to complete the course.
- The person should be instructed to perform hand hygiene before touching any wound or indwelling devices.
- Wash dishes on the strongest cleaning cycle of the dishwasher. If there is no dishwasher, soak dishes in scalding water after washing them with gloves on, then allow them to air-dry.
- Tie up soiled dressings or other contaminated materials in plastic bags and mark with a biohazard sign. Contact the local hospital, council or community health nurse for advice on safe disposal.
- Use a heavy plastic container with a secure lid for the disposal of needles, syringes or other sharp objects used in caring for the person with the infection.
- Use clean disposable gloves for wound care. (The nurse must educate the person about correct hand hygiene techniques, use of gloves and aseptic technique before discharge.) Education must include the importance of hand hygiene prior to donning gloves and after the removal of gloves. The person and their family should be encouraged to purchase some alcohol-based hand rub and be instructed on how to use it. The discharge

## CLINICAL INTEREST BOX 22.8 Preventing infections in the home: general discharge education

**Nursing assessment**

- Knowledge deficit relating to transmission of microorganisms and causes of infection

**Objectives**

- Individual will be aware of and implement ways to prevent occurrence or transmission of infection at home
- Individual will demonstrate correct hand hygiene technique

**Nursing interventions: health education**

- Reinforce need for daily personal hygiene, including mouth care
- Advise the individual to keep the home environment as clean and uncluttered as possible, using household bleach (1:10 solution) as a disinfectant
- Advise that fresh air should be allowed to circulate in the home regularly
- Advise that frequent damp dusting and vacuuming reduces the number of microorganisms in the environment
- Advise person to perform frequent handwashing, especially before preparing food, eating and after visits to the toilet or contact with body fluids
- Advise person to avoid sharing personal care items such as towels, razors, cups and toothbrushes
- Ensure that individual understands the need to keep food refrigerated until use, to discard food that is beyond the use-by date and to cook food thoroughly
- Educate person on preventive healthcare (e.g. immunisations, nutrition, exercise, relaxation and stress management techniques)

**Evaluation**

- Individual will be asked to describe techniques that will reduce risk of infection
- Individual's handwashing technique will be observed

*(Modified from Crisp et al 2013)*

plan may need to include arranging for the district or community health nurse to conduct a follow-up visit.
- Dedicate a separate area in the home for all 'clean' items. Ensure no contaminated item enters this 'clean zone'.

Nurses frequently visit persons in their own home and often need to perform aseptic procedures such as wound dressing and catheterisation. Nurses may find it challenging in some homes to conduct such procedures without the advantages that the hospital provides, but the principles of asepsis must always be followed.

## Infection prevention and control for healthcare workers

Australia has legislation relating to the transmission of infection. All the legislation relates to common goals and principles and contains the following elements in some form:
- Work health and safety plan. These are designed to minimise or eliminate employee exposure. The plan describes how to avoid exposure to infectious agents, such as when to use protective equipment, and what should be done in the event of an exposure occurring; for example, exposure to hepatitis virus or HIV via a needle-stick injury. In Australia, influenza vaccination should be offered to healthcare workers in accordance with *Australian Immunisation Handbook* (Australian Government, Department of Health 2015).
- Compliance with standard precautions. Personal protective clothing and equipment must be provided at no cost to employees and should be readily available.
- High-risk exposure. Needlestick or mucous membrane exposure to blood or infectious body fluids must be reported immediately. Appropriate prophylactic treatment for HIV and hepatitis viruses must be put in place as soon as practicable after the exposure or suspected exposure. Most Australian healthcare facilities utilise safety needles and needleless systems to help in the prevention of blood and body fluid exposure risk.
- Housekeeping. Routine schedules for cleaning and decontamination procedures must be established in all facilities. Regular audits will determine if cleaning is being carried out as it should be.
- Education. Education programs, written policies and guidelines must be provided for all personnel in relation to infection prevention and control activities relevant to their facility for their own and individual safety (NHMRC 2010). This could be in the format of self-directed learning packages, online education packages or lectures.

## Role of the infection control and prevention nurse

### Responsibilities

Many healthcare facilities employ one or more members of staff to be responsible for the area of infection prevention and control. In a hospital a committee is often responsible. Individual nurses may be members of the committee, as may be representatives from the laboratory, housekeeping, maintenance, food services and laundry (if applicable). An important member of this committee is the infection control and prevention nurse. This nurse is specially trained to be knowledgeable about the latest research and practices in preventing, detecting and treating infections.

In Australia the nurse should be a member of the Australasian College for Infection Prevention and Control (ACIPC); it is the peak national body representing the interests of the specialist practice of infection prevention and control within Australia. The College commenced in January 2012 bringing together the various state and territory infection control associations that were formerly in AICA (the **Australian Infection Control Association**) to support and encourage collaboration across Australasia using a corporate model. There is also a move to have all Australian infection control and prevention practitioners credentialled (with ACIPC or the Certification Board of Infection Control and Epidemiology (CBIC)). The role of the infection prevention and control committee is to maintain surveillance of HAIs throughout the hospital. All infections are reported to the infection control and prevention nurse in a manner that allows for recording and analysing statistics that can assist in improving infection control practices at the healthcare facility. The facility may have an infection control surveillance form in use, which will allow all nurses to highlight any possible infections to the infection control nurse (see Clinical Interest Box 22.9).

The infection prevention and control nurse's role is to facilitate the implementation of policies established by the committee. The combined roles of the nurse and the committee include:
- Monitoring for outbreaks of infection within the facility
- Monitoring antibiotic-resistant organisms
- Ensuring that staff are advised on all aspects of safe aseptic practice
- Implementation of a method that assesses staff for competency in aseptic technique
- Ensuring that the Infection Prevention Standard of the NSQHS Standards is fulfilled for accreditation purposes
- Educating staff and individuals on infection prevention and control policies and procedures
- Reviewing infection control policies and procedures
- Recommending appropriate isolation procedures and transmission-based precautions
- Researching laboratory reports and records for incidence of infections and establishing a close working relationship with the hospital microbiologist and all departments to investigate unusual events
- Identifying and rectifying infection control problems (equipment and procedures)
- Reviewing individual records for community-acquired infections that may be reportable to the health department

## CLINICAL INTEREST BOX 22.9
## Infection control surveillance form

**Site of infection**
Please tick appropriate box.
Please circle relevant symptoms.
State right or left leg, abdominal wound, if applicable.
Include any individual who shows signs of infection (pain, heat, redness, swelling, wound discharge) as well as any person who is being treated for an infection with antibiotics.
**Has this infection occurred within 30 days after the operative procedure? Y ☐ N ☐**
**Wound** (location) ☐

_____
(Inflammation, pain, swelling, purulent discharge, temperature > 38°C)
**Urinary tract** ☐
(Pain, frequency, temperature, MSU taken)
**Phlebitis** ☐

_____
(Pain, swelling, purulent ooze at IV site)
**Bacteraemia** ☐ (PICC/CVC in situ Y ☐ or N ☐)

_____
PICC/CVC insertion date: _____
(Temperature >38°C, blood cultures taken)
**Neonatal infection** ☐
**Gastroenteritis** ☐

_____
(If you have 2 or more persons with symptoms notify infection control manager immediately)
***Ensure individuals have not had aperients***
(Onset of vomiting, diarrhoea, cramping)
**Multi-resistant organism** (identified) ☐
MRSA ☐
VRE ☐
*Clostridium difficile* ☐
ESBL ☐
Other ☐
Colonised ☐
Infected ☐
**Other type of infection** ☐
**Reported by:** _____ **Date:** _____

*(Modified from NHMRC 2010)*

- Gathering statistics regarding the epidemiology of iatrogenic infections
- Coordinating immunisation programs for staff and maintaining health-screening records
- Conferring with support services such as the housekeeping department within the facility.

The infection prevention and control nurse is responsible for reviewing laboratory and radiology reports, case notes, autopsy reports and documentation of staff infections, and for reporting all relevant information to the infection prevention and control committee. The committee authorises the distribution of data to relevant people within the establishment.

### Evaluating the efficacy of nursing measures

The infection control nurse and the committee perform an important role in surveillance and monitoring of infections in healthcare settings but it is the role of every nurse to ensure infection rates are kept to a minimum. Continuous evaluation determines the efficacy of nursing work and identifies if and when infection prevention and control strategies need to be increased or modified. The success of the infection control program is determined by whether or not the goals for reducing or preventing infection have been met by the nursing interventions implemented. Signs that indicate success include:

- No local signs of infection around portals of entry (e.g. wounds, IV or wound-drain insertion sites, gastrostomy or jejunostomy feeding tubes)
- Susceptible individuals do not develop signs or symptoms of respiratory, blood stream, urinary tract or other infections (e.g. individuals who have had surgery recover and are discharged without contracting healthcare-associated infections)
- Signs of infection are detected at a very early stage, indicating that nurses are efficient in assessing and monitoring individuals under their care
- Outbreaks of infection in a healthcare setting are identified at a very early stage, indicating that nursing documentation and reporting of signs and symptoms of all infections is prompt, clear and there is minimal to no cross-transmission of infection and outbreaks are contained.

## Summary

This chapter provides information about the chain of infection, the way infections develop and are transmitted, the ways the body defends against them and why some individuals are more susceptible to infection than others. It provides the EN with information about how to practise nursing in a way that incorporates standard and transmission-based precautions and the prevention and control strategies recommended by the NHMRC, the *Australian Guidelines for the Prevention and Control of Infection in Healthcare* (2010). Infection prevention and control principles are applicable to every area of nursing practice and is everybody's responsibility. The principles and practices covered in this chapter provide nurses with the essential information to ensure that they protect themselves, individuals under their care and other healthcare workers from pathogenic microorganisms.

## Review Questions

1. Provide six (6) examples or occasions when healthcare workers and allied healthcare workers must perform hand hygiene to prevent cross-infection.
2. Describe the body's natural defences against infection.
3. What is meant by 'normal flora'?
4. Identify the differences between inflammation and infection.
5. Provide three (3) examples of how pathogens are transmitted.
6. Explain the difference between non-specific and specific immunity.
7. List five (5) factors that influence susceptibility to infection in a person.
8. What is meant by the terms 'healthcare-associated infection (HAI)' and 'iatrogenic infection'?
9. Can a reusable medical device or monitoring equipment be disinfected or sterilised for use on another person if not cleaned first? Explain the difference between disinfection and sterilisation.
10. How would you explain the terms 'standard precautions' and 'transmission-based precautions'?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australian Commission on Safety and Quality in Health Care (ACSQHC): www.safetyandquality.gov.au

Centers for Disease Control and Prevention. *Ebola Virus Questions and Answers*. Online Available (cited 2015): http://www.cdc.gov/vhf/ebola/transmission/qas.html

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National Health and Medical Research Council: www.nhmrc.gov.au

New South Wales Food Authority: http://www.foodauthority.nsw.gov.au

New South Wales Health: http://www.health.nsw.gov.au

US Department of Health and Training: www.hhs.gov

World Health Organization: www.who.int

# Maintenance of health: hygiene and comfort care

*Lindsay Bava*

CHAPTER 23

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- State the significance of personal hygiene to the maintenance of health
- Identify factors that influence hygiene practices
- Identify complications that may result if personal hygiene is neglected
- Perform nursing procedures for individual hygiene accurately and safely
- Identify the factors that may interfere with individual comfort
- Identify the importance of a well-made bed and comfortable positioning of individuals to the promotion of health and wellbeing
- Apply appropriate principles to select supplementary equipment used in conjunction with bed making
- Apply appropriate principles when planning and implementing measures to promote comfort
- Describe the positions that individuals may be required to assume in bed
- Apply decision-making frameworks when determining hygiene and comfort care for individuals

## KEY TERMS

alopecia
gingivitis
halitosis
making an occupied bed
operation bed
pediculosis
personal hygiene
supplementary equipment
surgical/post-anaesthetic bed
unoccupied bed

## CHAPTER FOCUS

Hygiene is the science of health. It has also been described as the self-care by which people maintain cleanliness that is conducive to the preservation of health. Personal hygiene includes activities such as bathing, toileting, general body hygiene and grooming (Parker 2012). Hygiene helps the individual to maintain a positive body image and helps protect the body against disease such as infection.

Comfort is often associated with compassionate care and many nursing interventions are implemented to provide comfort (Bourgeois & Van der Riet 2012). Comfort is subjective and may also be described as a feeling of ease or well-being; for people to feel comfortable their physiological, psychological and spiritual needs must be met. This chapter introduces the nurse to the knowledge and skills required to assist an individual with their hygiene and physical comfort needs.

## LIVED EXPERIENCE

Joan remembers a time she was recovering from a serious anaphylactic reaction to penicillin in hospital. A nurse was caring for her and moved to rearrange her pillows and change her linen that was soiled. Softly, and while still listening to Joan's feelings of discomfort, the nurse took the pillow, changed the linen, fluffed it up and gently replaced it. Joan instantly felt more comfortable. When thanked, the nurse dismissed it as being nothing extraordinary. Nonetheless, those simple duties, such as bed making, listening, shifting an individual in bed, realigning pillows and touching an individual's hand brought a profound change in Joan's comfort levels when she was so unwell.

**Joan aged 68 years, day 2 following a serious anaphylactic reaction to penicillin**

Many factors influence whether or not an individual is comfortable; they relate to physical, emotional and spiritual needs being met. To most people, physical comfort means being clean, dry, warm and free of hunger and pain. Emotional comfort relates more to being relatively free from stress and feeling satisfied with interpersonal relationships; in particular, people are more likely to be emotionally content when they feel loved and are able to love others. Spiritual comfort is connected to a sense of purpose and satisfaction in life that may or may not be entwined with religious meaning. The nurse considers all these interrelated elements when caring for an individual's comfort. This chapter discusses the physical elements of comfort, specifically in relation to hygiene care and moving and positioning an individual. Management of pain is discussed in depth in Chapter 33. (Information about assisting an individual with stress and spiritual comfort is provided in Chapters 27 and 39.)

## FACTORS AFFECTING PERSONAL HYGIENE

**Personal hygiene** refers to the measures people take to keep their bodies clean. Neglect of personal hygiene can have a detrimental effect on physical and psychological health and the comfort of an individual. Many factors influence people with regard to personal hygiene practices. It is important for nurses to appreciate that emphasis on cleanliness varies according to an individual's personal preference, culture, religious values and lifestyle. Other factors that may affect an individual's hygiene practices include:

- Stage of development
- Level of independence
- Physical and intellectual capabilities
- Emotional state
- Economic status
- Knowledge of the significance of hygiene
- Availability of facilities (e.g. water)
- Environment or climate.

Nurses should respect individual preferences and cultural norms and, whenever possible, enable an individual to follow their usual routine of personal cleansing (Berman et al 2015). For example, if an individual prefers to shower in the evening rather than the morning, or to shower every second day, these practices are best continued. Maintaining routine and normality can help limit the stress during times of illness.

Many individuals will be able to attend to their own hygiene, while others will require partial or total assistance from the nurse. Some individuals, for example those who are unconscious, will be unable to participate in planning their own hygiene care. In these instances, it is the responsibility of the nurse to ensure that suitable nursing care plans are devised to meet hygiene needs. Assessing an individual's abilities to care for their own hygiene needs safely and effectively includes identifying factors such as loss of balance, poor vision, decreased sense of touch or limitations in mobility. In the case of some older people with dementia, the ability to remember, plan and carry out self-care activities will need to be assessed. It is important for the nurse to recognise that an inability to care for personal hygiene needs without assistance and the lack of privacy that accompanies intervention by another person can be very embarrassing for the individual. The associated loss of independence can have a negative impact on the individual's feelings of self-worth; they may feel that they are a burden to the nurses. A calm, sensitive, caring and professional approach can help reduce these feelings. Wherever care is provided, the nurse's role is to ensure

that the individual maintains high standards of personal hygiene for efficient body function and sense of wellbeing. It is important for the nurse to be aware of the function and care requirements of areas such as the skin, hair, mouth, eyes, nose, ears and nails to help individuals maintain high standards of personal hygiene in each of these areas. Assisting with hygiene provides an ideal opportunity for the nurse to observe and assess the individual for any abnormalities or changes in health status. It also provides a time to talk informally and privately together, which can provide the nurse with insights about the individual's psychological and spiritual wellbeing. The nurse must, on every occasion, seek the consent of the individual before starting to provide any personal care and assistance.

### Cultural considerations

An individual's cultural beliefs and personal values may influence hygiene care. People from diverse cultural backgrounds follow different self-care practices. In many cultural groups in Australia, it is common to bathe or shower daily, whereas in some other cultural groups it is customary to bathe completely only once a week (Berman et al 2015).

Culture plays a role not only in hygiene practices and preferences but also in sensitivity to personal space; for example, some Chinese people may view tasks associated with closeness and touch as being offensive or impolite (Crisp et al 2013). The nurse should ask the individual what would make them feel most comfortable during a bath. Perhaps they would prefer only a partial bath from the nurse, with a family member assisting with the bathing of more private body parts. The individual may also want to defer part of the hygiene. If, in the nurse's judgment, hygiene is critical to prevent problems, such as skin breakdown, the nurse must try to understand the individual's concerns then help them understand the reason for accepting the nurse's intervention. The nurse can play a very important role, particularly when caring for individuals in rural settings, poor individuals and older adults, in being able to screen for abnormalities such as dental decay and referring dental problems to a dental professional.

Hair care may also be important to people from other cultures. When caring for individuals from different cultures, it is important to learn as much as possible from them or their family about preferred hair care practices. Cultural preferences may also affect how hair is combed and styled (Crisp et al 2013).

## SKIN AND SKIN CARE

The skin is the largest organ of the body. It is a semi-permeable layer that protects underlying tissues and organs from injury or invasion by microorganisms. It is waterproof, controls the rate at which water is lost from the body by evaporation, helps regulate body temperature and produces keratin, melanin, sweat and sebum. The skin also plays an important role in perception of sensation through the sensory nerve endings it contains, which are sensitive to touch, pressure, pain and temperature (Crisp et al 2013). See Chapters 29 and 34 for more information about the skin and sensory abilities.

If the skin is not washed regularly dirt, sebum, dried sweat and dead skin cells collect, providing an ideal medium for the growth of bacteria and fungi. Bacteria decompose the dirt and dried sweat producing an unpleasant body odour, and infections such as boils are more likely if the skin is not cleansed adequately.

Skin undergoes many changes during a person's lifespan and, as a result, care needs may vary according to the individual's age or stage of development. In addition, characteristics of normal skin may vary according to ethnic or racial background. Consequently, replenishing the skin, particularly in older individuals, is essential to prevent skin tears. Skin tears occur due to drying of the skin, skin becoming fragile and hormonal changes causing skin transformation. Best practice standards and literature studies (Skin Tears 2006) demonstrate moisturising of the skin has a direct link to the reduction of the number of skin tears that occur in our elderly individuals.

When moisturising the skin, care must be taken to not further damage the skin with excess force, or with rings and bracelets the nurse may be wearing; all jewellery must be removed. The nurse must also investigate that an individual has no allergies to the moisturiser chosen and that it is clearly documented in the individual's history and plan of care that skin care has occurred.

### Infants

In infancy, the skin is thin and easily blistered or excoriated by friction, acid or alkaline substances. It is very sensitive to heat or cold, so it is vital that the temperature of bath water is tested before bathing; approximately 38°C is recommended as the newborn's skin is prone to irritation (Gunn 2010). Mild, non-irritating soaps or soap-free solutions may be used on the skin and, as the infant has no bladder or bowel control, thorough cleansing of the genital and anal areas is necessary to prevent excoriation. After washing, the infant's skin should be patted dry with a soft towel, paying particular attention to skin creases and folds. Cradle cap is a common form of dermatitis of infants which consists of thick, yellow waxy scales on the scalp, which may occur as a result of an accumulation of sebum. It can usually be prevented by regular gentle washing and drying of the scalp and hair (Barker 2013).

### Adolescents

Adolescence is accompanied by many changes that are due to hormonal activity. Sweating from the axillae usually occurs at this stage and the adolescent may need education concerning the importance of having a regular shower or bath. Education can also include information about the function of deodorant and antiperspirant (Berman et al 2015). Acne is a common problem as sebaceous glands become more active in adolescence. Skin hygiene, together with a balanced diet, is important in preventing secondary skin infections.

## The middle years

Middle age is often associated with further skin changes, particularly during the male climacteric (decreased levels of androgens) or the female menopause—because of a decrease in circulating ovarian hormone levels (primarily oestrogen and progesterone) the skin may become drier and the pubic and axillary hair may become sparse. Some women may experience thinning and dryness of the skin of the external genitalia, which may be accompanied by pruritus (Berman et al 2015). Lubricants are available to reduce any discomfort associated with such changes.

## Older adults

Older age is associated with increasing change in the dermis, with the result that skin is thinner, less elastic and dry. The decreased production of sebum and associated dryness mean that the skin of older people is less able to tolerate soap. To help counteract the dryness, a mild soap or soap-free washing lotion can be used and a moisturising lotion applied after a bath or shower. To prevent skin irritation caused by dry skin some older people choose to change from a daily shower or bath to every second day or less frequently (see Clinical Interest Box 23.1).

## Nursing observations of the skin

The skin should be observed for:

- Colour. Particular note should be taken of any abnormalities such as pallor, jaundice, cyanosis or altered pigmentation. Areas of red, deep pink or mottled skin that do not become paler with fingertip pressure may be a sign that a pressure injury is developing. (See Chapter 29 for information on the development and prevention of pressure injuries.)
- Hydration. Deviations from normal include excessive dryness or oiliness, increased sweating and fluid retention (oedema)
- Texture. The skin may be smooth and supple or contain rough scaly patches. It is also important to observe if the skin appears thin and fragile
- Turgor. Picking up and then releasing a small fold of skin is the simplest way to assess skin turgor. Adequately hydrated skin returns rapidly to its previous state, whereas the skin of an individual who is dehydrated is slow to respond. The skin of an older individual may also resume its shape more slowly because of reduced elasticity
- Lesions. The skin should be observed for the presence of bruises, blisters, inflammation, rashes and localised swellings such as cysts, petechiae, bites, scratch marks or puncture marks.

Abnormalities and changes should be reported and documented and appropriate nursing care implemented in response to nursing observations.

Care of the skin includes maintenance of cleanliness and protection from injury. The skin must be protected against injury by gentle handling and the use of appropriate bed linen and equipment. Cleansing involves the use of soaps and lotions that do not cause irritation or dryness and careful drying of the skin, particularly in folds or creases. If the individual wishes, and it is not contraindicated, deodorants, powders and perfumes may be used to enhance the feeling of freshness and to improve morale. Cleansing of the skin may be achieved by several means and the method selected depends on the individual's level of mobility and independence. Some individuals will be able to have a bath or shower, while more dependent individuals may require a bed or trolley bath. Whichever method of cleansing is used the nurse must ensure the individual's privacy, comfort and safety. It is now sometimes a reality that male and female individuals are accommodated in the same ward or unit area and some even share bathroom and toilet facilities. This can increase the individual's discomfort and concerns about privacy, especially during hygiene and toileting procedures. The nurse will need to be sensitive to the concerns of individuals faced with this situation and reassure them that every effort will be made to maintain their personal privacy (Crisp et al 2013; deWit 2013; Springhouse Staff 2011).

### CLINICAL INTEREST BOX 23.1 Hygiene and the elderly

I have noticed over the last couple of years that my skin feels and looks significantly dry. My local pharmacist recommended that I use a soap-free cleanser in the shower and suggested that I apply moisturiser to the dry, flaky skin after I wash. She also suggested that I shower every second day and just have a quick wash at other times.

**Mrs Anderson, aged 76**

# BATHING AND SHOWERING

An individual may have either a bath or a shower, depending on individual preference and general condition. Both methods of cleansing refresh the individual, stimulate circulation and promote relaxation. They also provide an opportunity for the nurse to observe the condition of the individual's body, including assessment of mobility and strength.

## Nursing observations and assessment

If individuals are able to attend to personal hygiene needs safely and independently, they may be left to bathe in private. It is the responsibility of the nurse to ensure that the bathroom has been prepared for use and that the individual has all the necessary items. The nurse should ensure that the individual knows where the call bell is located and that they know how to use it to call for a nurse.

It is the nurse's responsibility to assess how much assistance a dependent individual requires. Some individuals may require help with transfers, while others will require the nurse

to remain with them throughout the entire procedure. The nurse should remain with, and provide assistance to, any individual who is weak, frail, unsteady or confused. Some individuals may require a shower chair to sit on during the shower. For example, a chair would be helpful for a postoperative individual who can walk to the shower but is at risk of becoming easily fatigued.

## Devices used to assist when bathing and showering

There are several other devices designed to assist the nurse when providing hygiene care for individuals. These include handrails, bath seats, mechanical hoists, mobile baths and shower trolleys.

Handrails fixed to the wall at the side of the bath or shower can be used for support by individuals who are able to stand. Bath benches or seats fit across the top of a bath and allow the individual to shower using a hand-held shower hose.

Lifting devices such as hoists or standing machines may be used to safely transfer non-ambulatory individuals onto a mobile shower chair so that they have the opportunity to shower or bathe. It is generally easier to remove the individual's clothing before the lift and transfer to the bathroom, but being moved around in a lifting device can feel extremely undignified and distressing. It is recommended in the policy of many institutions that hoists and standing machine transfers be used by two nurses to ensure maximum individual safety. For further information regarding safe transfer of individuals, refer to http://www.worksafe.com.au/ or http://www.australia.gov.au/directories/australia/safeworkaustralia. The utmost care must be taken to ensure that the individual's privacy and dignity are maintained, in particular the individual's private body areas must be securely covered from view during transfer to the bathroom. Any individual who requires the use of a mechanical lifting machine must never be left unattended in the device or in the bath. Individuals who may require the use of a mechanical lifter include those who are heavy or extremely weak, frail or helpless.

When individuals require aids in the home, structural alterations to the house may be necessary to facilitate their use. Government-funded care packages sometimes provide for this need. In some situations, nurses teach family members who are providing home-based care for dependent relatives how to use the hoist safely. (See the Australian Department of Health and Ageing at www.health.gov.au.)

Mobile baths are available in some healthcare facilities. A mobile bath can be moved to the individual's bedside. The individual is transferred from the bed into the bath and transported to the bathroom. The bath is filled and the individual bathed in the usual manner.

Shower trolleys are designed for use in the normal shower area. Using a hoist, the individual is positioned onto the trolley and wheeled to the bathroom. The surrounding edge is inflated and converts the trolley into a shallow bath and the nurse washes the individual using the shower hose.

A full explanation about the aid being used, reassurance about its safety and maintaining the individual's personal privacy and dignity during use are important components of reducing stress and embarrassment for the individual. Examples of some aids that are available are illustrated in Figure 23.1.

### CRITICAL THINKING EXERCISE 23.1

Mr Kaur, a 27-year-old Indian man, sustained a fractured tibia and fibula of his right leg as a result of a motorcycle accident. He was taken straight from the accident to the emergency department and then surgery, and has not washed since before the accident. He has arrived on the ward direct from the operating suite, with a plaster cast on the injured leg, and in a considerable amount of pain. What needs to be done to meet his comfort and hygiene needs? What cultural aspects of care should be taken into account?

Key aspects of assisting an individual to bathe or shower are outlined in Clinical Skill 23.1.

## Individuals requiring special consideration

Individuals who are weak, frail, unsteady or confused will require the nurse's assistance to bathe or shower. An individual may feel faint and collapse in the bath or shower. If this occurs the nurse should immediately drain the bath or turn off the shower. Towels should be used to cover the individual for warmth and dignity and extra towels should be placed under the individual's legs and feet to increase venous return. The nurse should summon immediate assistance and remain with the individual, ensuring that the airway is clear. (See Chapter 44 for full emergency care actions in situations in which a person has collapsed.) Case Study 23.1 outlines the hygiene needs of an individual following a cerebrovascular accident (CVA).

Some individuals will require special consideration when bathing or showering; for example, special attention is needed for individuals who have drainage or intravenous (IV) tubing, wound dressings, plaster casts or specific skin disorders. There may also be special needs associated with surgical or other interventions.

### An individual with dementia

Difficulties often arise when bathing individuals who have dementia. The nurse can reduce their discomfort by avoiding running water over their face, maintaining warmth and keeping them covered as much as is practicable. Keeping routines and giving clear, simple instructions, cues or demonstrations, and allowing the individual as much independence as possible will also allay the anxiety associated with bathing (Berman et al 2015). Music, singing or talking during bathing may distract the individual from fretful reactions and improve the experience. It is necessary to check the water temperature prior to washing the individual. The skin of the older person may be more sensitive to temperature

**Figure 23.1** Devices to assist bathing and showering

A: Mechanical lifting device B: Shower chair C: Handrails attached to the walls in the shower and toilet D: Hand-held shower E: Shower trolley

*(**A**: Reproduced by permission of Haycomp Pty Ltd; **B**: © Lisa F. Young/Shutterstock; **C**: iStockphoto/YinYang; **D**: © B. Brown/Shutterstock; **E**: Image supplied by Hills Healthcare Equipment www.hillshealthcare.com.au)*

extremes due to deterioration in control mechanisms such as vasodilation and vasoconstriction (Crisp et al 2013).

## An individual with a skin disorder

Soap-free cleansers are best used on individuals with any dryness, erythema or pruritus, with care taken to follow any medically prescribed treatments. Emollient creams or lotions may also need to be applied following bathing. Where the application of medicated creams or lotions is required, gloves should be applied before they are administered because they are absorbed through the skin.

## An individual with an intravenous line

Care is necessary to avoid kinking or dislodging IV tubing and precautions must be taken to prevent the intravenous site from becoming wet. Pumps should be switched to battery mode when the individual is showering. The nurse will need to assist the individual to change their clothing. Remove the individual's gown or pyjamas. If an extremity has reduced mobility or is injured, begin removal from the unaffected side, then lower the IV container or remove from pump and slide gown covering affected arm over tubing and container. Rehang the IV container and check the flow rate or reset the pump rate. Do not disconnect the IV tubing.

## An individual with a urinary catheter or wound drainage tubing

Drainage tubing and the container receiving the drainage fluid must be positioned below the area into which the tubing is inserted in order to promote drainage and to prevent back-flow of fluids into the body. For example, a urinary catheter

## CLINICAL SKILL 23.1 Assisting with a shower or bath

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Personal toiletry items including clothing<br>2–3 bath towels<br>Bathmat<br>Face washers<br>Shower chair or commode<br>Plastic apron and shoe protection<br>Gloves<br>Soiled-linen container |

| **Skill activity** | **Rationale** |
|---|---|
| Review individual's care plan and current treatment orders | Provides information about individual's mobility, cognition, preferences and level and type of assistance required |
| Inform individual of proposed activity, assess for pain, gain consent | Promotes involvement and cooperation, maintains autonomy |
| Assess bathroom and equipment for safety | Maintains safe work environment |
| Ensure bathroom is clean and the floor is dry | Prevents cross-infection and promotes safety |
| Provide a shower chair or commode if needed | Promotes safety |
| Arrange required toiletry items within easy reach | Promotes efficiency and functional independence |
| Offer use of toilet facilities before activity | Promotes comfort |
| Perform hand hygiene | Reduces risk of transmission of microorganisms |
| **Assist with a shower** | |
| During the procedure, encourage individual to participate as able and assist as required. During the procedure, communicate proposed actions to individual to encourage cooperation. | |
| Turn on taps, direct flow away from individual and adjust water temperature | Maintains safety |
| Allow individual to check the water temperature for suitability | Promotes comfort and safety |
| Allow individual to hold shower handle and direct water flow onto own body if able | Promotes functional independence and cooperation |
| Keep flow of warm water across individual's back during procedure | Maintains comfort and warmth |
| Supply soap product and wash cloth to individual and encourage them to wash their own body as able | Promotes self-help skills and functional independence |
| Provide full assistance with washing if required. Wash the body in an efficient manner, starting with the face | Provides support to meet hygiene needs<br>Promotes individual comfort |
| Wash and rinse genital area from front to back | Avoids transmission of microorganism and cross-contamination |
| Dispose of the washcloth used to wash genitals immediately | Maintains hygiene and infection control principles |
| Assist as required with washing hard-to-reach areas such as lower legs, back and hair washing | Provides support to meet hygiene needs |

*Continued*

| CLINICAL SKILL 23.1 Assisting with a shower or bath—cont'd | |
|---|---|
| Apply disposable gloves if skin to mucous membrane contact is likely | Maintains infection control principles |
| Assess individual's skin condition, especially pressure areas over bony prominences | Identifies risks to skin integrity |
| Ensure soap product is completely rinsed from the body, especially under skin folds | Reduces irritants on the skin and helps maintain skin integrity |
| Turn hot tap off first, then cold | Promotes safety |
| Place towel around individual's shoulders and another towel or bathmat under the feet | Promotes comfort and warmth by maintaining body heat |
| Drying, dressing and grooming continued Step 3 | |
| **Assisting with a bath** | |
| Fill the bath with warm water to individual's hip level | Promotes safety. A deep, hot bath may cause vasodilation |
| Assist individual to the bathroom and close the bathroom door | Provides privacy and maintains individual dignity<br>Helps to maintain a comfortable room temperature |
| Assist individual to undress and to climb into bath | Provides support and promote safety |
| Assess level of supervision required and, if safe, leave individual to perform activity, but remain within calling distance of bathroom.<br>During the activity, encourage the individual to participate as able and assist as needed. During procedure, communicate proposed actions to individual to encourage cooperation. | |
| Supply soap and wash cloth and encourage individual to participate | Provides support, promotes self-care skills and functional independence |
| Assist with washing hard-to-reach areas such as lower legs and back | Provides support to meet hygiene needs |
| Provide full assistance with washing if required. Wash the body in an efficient manner, starting with the face | Provides support to meet hygiene needs<br>Promotes individual comfort |
| Dispose of wash cloth used on individual's genitals | Maintains infection control |
| Assess individual's skin condition, especially pressure areas over bony prominences | Identifies risks to skin integrity |
| Ensure soap product is completely rinsed from the body, especially under skin folds | Reduces irritants on the skin and helps maintain skin integrity |
| Drain bath first, then assist individual to climb out of bath | Promotes safety |
| **Assisting with drying, dressing and grooming** | |
| During the activity, encourage the individual to participate as able and assist as needed. During procedure, communicate proposed actions to individual to encourage cooperation. | |
| Sit individual on a chair covered with a towel and place a second towel around shoulders for warmth | Provides comfort and warmth |
| Ensure skin folds and hard to reach areas are completely dried, such as between toes | Maintains skin integrity |
| Apply prescribed creams or treatments such as anti-embolic stockings | Follows treatment orders |
| Assist with dressing as required. Dress injured or affected side first. Assist with zips, buttons or ties/laces | Promotes functional independence |

## CLINICAL SKILL 23.1 Assisting with a shower or bath—cont'd

| | |
|---|---|
| Set up toiletry items and assist with grooming as required, brushing teeth, drying hair, applying make-up, shaving, hearing aids and glasses<br>Dress affected side first | Maintains positive self-image and promotes independence |
| Assist individual to return to bed or chair | Promotes comfort and rest |
| Ensure all individual's requirements are within reach such as call bell, phone, fluids, reading glasses | Promotes independence |
| Collect toiletries from bathroom and return them to individual's bedside locker | Maintains tidy environment and care for individual's personal items |
| Dispose of towels and other linen in the soiled-linen container | Prevents cross-contamination |
| Clean and dry floors, shower chair or bath and leave bathroom door open | Maintains safe environment, infection control and allows ventilation of bathroom |
| Check individual has call bell and other personal items within reach before leaving | Promotes comfort and individual wellbeing |
| Perform hand hygiene | Prevents cross-contamination |
| Documentation is the responsibility of the EN or Registered Nurse and must be completed on behalf of unregulated health workers who may have been delegated the activity. | |
| Document the individual's response to the procedure in the healthcare record, noting the level of participation, changes in skin integrity or individual's condition | Provides clear and up-to-date communication of individual's data between healthcare professionals<br>Maintains legal document of care and interventions provided |
| Update the individual's care plan information on domains related to mobility, activities of daily living (ADLs), skin integrity and hygiene preferences | Allows clear and accurate communication of information about individual's care between nurses |
| Verbally report to Registered Nurse any changes in individual condition that indicate risk for deterioration | Allows for timely review, response and intervention |

*(Australian Commission on Safety and Quality in Healthcare 2015; Joanna Briggs Institute 2013a; 2013b; Nursing and Midwifery Board of Australia 2013; Rebeiro et al 2012; Wilkinson et al 2015)*

## CASE STUDY 23.1

Mrs Joan Bennett is a 68-year-old woman who was admitted to hospital 10 days ago following the sudden onset of left-sided arm and leg weakness. She has been diagnosed as having a right-sided CVA and has moderate weakness down her left side.

Mrs Bennett says that she knows she has had a stroke but insists that she can attend to her own hygiene needs; she prefers to shower daily in the evening when she is at home.

Mrs Bennett is right-handed so is able to assist the nurse with washing herself but she tends to only wash her chest and right leg; she forgets to wash the left side of her body unless prompted to do so by the nurse.

She requires supervision with ambulation as she is unsteady on her feet; the physiotherapist has provided her with a walking frame which she has reluctantly agreed to use. She says she prefers to walk unassisted as she is very independent. She needs to be reminded to walk with supervision as she has been found in the bathroom alone on several occasions attempting to get into the shower. She needs to sit down when showering in order to prevent a fall.

Mrs Bennett also requires assistance with dressing due to her left-sided weakness.

1. What would the nurse need to do to ensure Mrs Bennett's safety during the showering process?
2. What actions would the nurse take to allow Mrs Bennett to remain as independent as possible with her hygiene care?
3. How would the nurse assist Mrs Bennett to be as independent as possible with dressing?
4. Apart from the physiotherapist, which other members of the healthcare team would be involved in the care of Mrs Bennett?
5. What hygiene equipment could the nurse use to assist Mrs Bennett in the shower?

## NURSING CARE PLAN 23.1

**Assessment:** Mrs Joan Bennett is a 68-year-old woman who was admitted to hospital 10 days ago following the sudden onset of left-sided arm and leg weakness. She has been diagnosed as having a right-sided stroke and has moderate weakness down her left side.
**Issue/s to be addressed:** Inability to perform self-care hygiene independently
Skin integrity is maintained.
**Goals:** Mrs Joan Bennett will attend to personal hygiene
Mrs Bennett's skin remains intact.

| Care/Actions | Rationale |
|---|---|
| Assess Mrs Bennett's level of ability to attend to shower or bath to reduce risk of injury to self or others | The direct observation and assessment of Mrs Bennett will assist goal and intervention planning. Ensure appropriate aids and footwear of Mrs Bennett to reduce falls risk |
| Ask Mrs Bennett for input into personal hygiene habits and cultural preferences | Creating opportunities for Mrs Bennett to assist in intervention planning will preserve her self-esteem, prevent helplessness and achieve cultural appropriateness to the activity |
| Individualise the bathing routine based on Mrs Bennett's own history of practices that address skin needs, self-care needs, individual responses to bathing and equipment required | Bathing should not be routinely scheduled with a task focus. Mrs Bennett's input will produce a more positive experience and preserve her dignity |
| Encourage Mrs Bennett to attend to and participate with personal hygiene | This will encourage Mrs Bennett's independence and motivation to self-care |
| Use of Mrs Bennett's personal hygiene aids to assist with personal grooming including hair, teeth/dentures | This will assist Mrs Bennett to attend to her own personal hygiene, decrease the risk of injury and promote safety |
| Refer Mrs Bennett to the allied health team as necessary (e.g. OT, physiotherapist) | This will assist Mrs Bennett to maximise her ability to self-care |
| Promote privacy by closing doors, providing towels and clothes | This will promote privacy and retain Mrs Bennett's dignity |

**Evaluation**

Mrs Bennett's personal hygiene and personal grooming is attended to with an individualised holistic approach.
Mrs Bennett participates in her care which is culturally appropriate and promotes her independence, dignity, self-esteem and privacy.
Mrs Bennett's skin integrity is inspected during her shower and abnormalities reported.
Mrs Bennett's documentation is attended to and allied health staff are notified as required.

bag should not be raised above the level of the individual's bladder.

### An individual with a wound dressing or bandage

The nursing care plan should be checked to determine if the dressing or bandage is to be removed before the bath or shower. If wound dressings or bandages are to remain in position, they must be protected from moisture with a waterproof covering.

### An individual with a plaster cast/splint on a limb

A waterproof cover must be applied securely over the limb to protect the plaster/splint from moisture. Care should be taken to avoid applying tapes or adhesives to the individual's skin.

## Bathing the individual in bed

Individuals who are confined to bed or whose condition does not enable them to have a bath or shower may be provided with equipment for washing in bed, or may be given a bed bath (also referred to as a sponge) by the nurse. If individuals are able to wash unaided, they are provided with all necessary items, the upper bedclothes turned down and a towel placed over them for warmth and privacy. The nurse will need to help with washing and drying the back and any other parts of the body the individual is unable to attend to independently. When the bath is completed and the individual's hair and teeth have been attended to, the nurse remakes the bed.

A complete bed bath involves washing the entire body of an individual in bed. It is performed by the nurse when an individual is unable to wash unaided. Individuals who may require a bed bath include those who have a debilitating illness or are paralysed or unconscious. A bed bath is also frequently needed after surgery. Depending on the individual's level of mobility, either one or two nurses perform the procedure. Healthcare facilities commonly adopt their own specific guidelines concerning how to perform a bed bath. An alternative to the traditional sponge bowl method is the bag bath method (see Clinical Interest Box 23.2).

## CLINICAL INTEREST BOX 23.2 Bag bath method of washing an individual in bed

This method involves the use of a bag containing 10 pre-moistened disposable cloths, each one used for a different area of the individual's body. A bag bath is convenient because it is easy and quick to prepare by warming in the microwave for about 1.5 minutes. After washing, the skin is allowed to air dry so that moisturisers contained in the cloth can remain on the skin. Individuals who have mild–moderate skin conditions have reported improvement with consistent use of this method (Bauer 2013). However, they are an expensive option and are not used as commonly as other methods.

*(Bauer 2013)*

Key aspects related to performing a bed bath or sponge bath:

- Throughout the bed bath the nurse should promote the privacy, safety and comfort of the individual, while ensuring that all hygiene needs are met
- During the bed bath the nurse assesses the status of the individual's skin, hair, nails and level of mobility. The bed bath also provides time to talk with the individual without interruption and it is often during this time that issues of concern are raised
- Individuals should be encouraged to help themselves as much as they are able, to promote independence
- Individuals who have not been bathed in bed before may be embarrassed about the exposure of their bodies and their loss of independence. It is the responsibility of the nurse to demonstrate sensitivity and to ensure adequate privacy throughout the procedure. The individual's privacy and warmth is maintained by exposing only the area that is being washed: this is achieved by using a dry towel to cover other areas of the individual's body
- The nurse who is to perform the bed bath must be aware if there are any limitations of movement or positioning for the individual. For example, individuals who have had a total hip replacement must not lie on the affected side until the surgeon has given their approval and individuals who are experiencing difficulty in breathing may need to remain sitting up throughout the bed bath to prevent further respiratory distress
- During the bed bath, the individual's joints should be put through the full range of motion, unless this is contraindicated. Movement improves circulation, maintains joint mobility and preserves muscle tone
- When dressing an individual who has some impairment of an arm or leg (e.g. paralysis), the affected limb should be placed into the garment first so that maximum use may be made of the flexibility of the unaffected limb
- If an individual is experiencing pain (e.g. after surgery) ensure that prescribed analgesia is given before the bed bath is performed; make sure you allow sufficient time for the analgesia to take effect prior to commencing the procedure
- Ensure that the water is the correct temperature and changed throughout the procedure when it becomes cool, too soapy, dirty or after washing the genital area
- If individuals have a range of movement that permits it, when cleaning nails it may be helpful to place their hands and/or feet in the bowl of water. This is more refreshing for individuals and enables the nails to be cleansed more effectively
- Ensure that all soap is rinsed off the skin, as residual soap may cause dryness
- Special care should be taken to ensure that all skin folds and creases are washed and thoroughly dried; for example, under breasts, in the groin area between the buttocks, between fingers and toes. If these areas are not dried properly the skin may become excoriated and painful
- Throughout the bed bath the individual's skin should be observed for areas of redness, breaks, bruises and other deviations from normal. Deviations should be reported and documented. Nursing measures should be implemented as appropriate
- If the individual has an indwelling urinary catheter or has had certain types of gynaecological surgery, it is important to thoroughly clean the perineal area in order to prevent vaginal or urinary tract infection.

Refer to Clinical Skill 23.2 for information and guidelines on performing a bed bath.

### Perineal care

Many individuals prefer to wash their own perineal area and privacy should be provided for them if they are able to do so. The nurse may provide a degree of privacy by holding the covering towel or sheet up and away from the individual's body, forming a tent while the individual washes their genital area beneath it. If the individual is unable to wash the perineum independently, the nurse is advised to put on gloves and place a waterproof sheet (often referred to as a 'bluey') under the individual to protect the mattress. Only the area to be washed should be exposed. If faecal material is present it should be enclosed in a fold of the bluey or tissue and removed with disposable wipes. The anus and buttocks are then cleansed and dried and the soiled sheet removed and replaced with a clean one. The perineum should be washed and rinsed thoroughly and patted dry. Care should be taken to wash a female individual's perineum from front to back to minimise the risk of contamination from the anal area. Frequent hygiene care may be needed for menstruating women. If needed, a fresh sanitary pad should be put in place at the completion of the perineal wash.

Care should be taken to retract the foreskin of uncircumcised adult males so that the head of the penis can be cleaned effectively. Once the area is cleaned, the foreskin should be

## CLINICAL SKILL 23.2 Performing a bed bath

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Washbasin 2/3 full with warm water<br>2 towels<br>Disposable wipes<br>2 washcloths<br>Disposable gloves<br>Bed linen and soiled-linen container<br>Pyjamas or gown<br>Soiled-linen container<br>**Toiletries items:**<br>Soap product<br>Deodorant<br>Moisturiser, skin lotions or emollients<br>Toothbrush and toothpaste<br>Hair care products<br>Shaving equipment |

| Skill activity | Rationale |
|---|---|
| Review individual's care plan and current treatment orders | Provides information about individual treatment, level of assistance required and equipment/supplies needed |
| Perform hand hygiene | Reduces risk of transmission of microorganisms |
| Inform individual of proposed activity, assess for pain, gain consent to proceed | Promotes individual cooperation and comfort and maintains autonomy |
| Offer the individual use of toilet bedpan or bottle before procedure begins | Promotes comfort |
| Clear over-bed table for use | Prevents cross-infection |
| Collect equipment/supplies and prepare for use | Promotes efficiency |
| Ensure adequate lighting and provide privacy | Maintains individual dignity |
| Check the bed brakes are engaged and adjust the bed to safe working height | Follows safe work practices |
| Lower the head of the bed so the dependent individual is lying flat with one pillow | Promotes comfort |
| Fill bowl two-thirds full with warm water | Promotes safe work practices |
| Untuck, fold and remove upper layers of bed linen and place on a clean, flat surface | Promotes efficiency and maintains infection control |
| Cover individual with a bath sheet or bed sheet and assist the individual to remove clothing | Maintains warmth and maintains dignity |
| **Washing the front of the body**<br>During procedure, communicate proposed actions to individual to encourage cooperation. | |
| **For the individual who requires full assistance**<br>Begin to wash the front of the body starting with face, then the chest and abdomen, arms and hands, legs and feet then the groin | Promotes efficient practice |
| Expose only the body part being washed | Maintains warmth and dignity |
| Place one towel under or across the body part and use the other towel to dry | Protects bed linen from moisture |

| CLINICAL SKILL 23.2 Performing a bed bath—cont'd | |
|---|---|
| Rinse soap product thoroughly from skin before patting dry | Maintains skin integrity |
| Place a towel across the chest and wash the face with the wash cloth without soap products. Take care around the eyes. Clean the ears and neck then dry carefully | Maintains skin integrity |
| Place towel lengthwise under the arm. Use a small amount of soap product on the wash cloth to wash the arm, including the axilla | Maintains skin integrity |
| Use long and firm stokes and move joints through the normal range of motion as tolerated. Rinse and pat dry | Promotes circulation and maintains joint health |
| Wash individual's hand in the bowl of water if able. Take care to stabilise the basin on the bed and allow the individual's hand to rest in the water. Dry well | Promotes comfort |
| Repeat with other arm and hand. Apply deodorant and other creams if required | Promotes efficient work practices |
| Uncover chest and place towel between water basin and individual. Wash chest, taking care to wash and dry thoroughly under women's breasts | Protects bed linen<br>Maintains skin integrity and prevents excoriation |
| Cover the upper body with the bath towel | Maintains warmth and dignity |
| Wash abdomen, rinse and pat dry. Cover with the bath towel | Promotes efficient work practices |
| Check the warmth of the water and replace if cool or dirty | Maintains comfort |
| Repeat washing procedure with legs and feet taking care to dry between toes | Promotes efficient work practices and promotes individual comfort |
| Apply gloves to wash the genitals. Rinse and pat dry, in particular, skin folds | Maintains infection control |
| Change basin water and dispose of wash cloth | Maintains infection control |
| **For the individual who can partially assist**<br>Adjust the head of the bed to semi-recumbent position and place the wash basin within reach | Promotes functional independence |
| Encourage the individual to participate as able<br>Assist to reposition towels and rinse the wash cloth when necessary | Promotes independence and participation |
| **Washing the back and buttocks**<br>During procedure, communicate proposed actions to individual to encourage cooperation. | |
| Assist the individual to roll into a lateral position supported by the bed rail and a second person if required | Provides comfort and maintains safety |
| Keep individual covered with a bath towel and expose back and buttocks. Place towel on mattress and tuck gently against the back and buttocks | Maintains comfort and dignity |
| Wash the back starting at the neck using long firm strokes | Promotes circulation |
| Inspect the skin for signs of pressure or other injury | Maintains skin integrity |

*Continued*

| CLINICAL SKILL 23.2 Performing a bed bath—cont'd | |
|---|---|
| Pat dry thoroughly, especially at the buttocks and skin folds. Apply creams as required | Maintains skin integrity |
| Cover back with towel, ensure individual is comfortable in the lateral position and well supported for the linen change procedure | Promotes comfort and safety |
| Remove water basin and position clean bed linen and soiled-linen container within reach<br>Raise bed rail if moving away from the bed | Promotes safety and efficiency |
| Assist the individual into clean pyjamas or clothing of their choice | Promotes individual comfort |
| Assist the individual into a position of comfort | Promotes individual comfort |
| Lower bed to a safe height for the individual if appropriate | Maintains individual comfort and safety |
| Remove equipment, dispose of soiled supplies | Prevents cross-infection |
| Perform hand hygiene | Prevents cross-infection |
| Check individual has call bell and other personal items within reach before leaving | Promotes comfort and individual wellbeing |
| Document the activity, outcome and the individual's response to the activity in the healthcare record<br>Update the individual's care plan for domains related to mobility, activities of daily living (ADLs), skin integrity and hygiene preferences | Maintains legal document of care and interventions provided<br>Allows clear and accurate communication of information about individual's care between nurses |
| Verbally report to Registered Nurse any observations that may need review or changes in individual condition that indicate risk for deterioration | Facilitates timely response and intervention |
| *(Australian Commission on Safety and Quality in Healthcare 2015; Joanna Briggs Institute 2013a; 2013b; Nursing and Midwifery Board of Australia 2013; Rebeiro et al 2012; Wilkinson et al 2015)* | |

returned to its natural position. The scrotum should be lifted and the area below washed, rinsed and dried thoroughly. Retraction of an infant's or child's foreskin is not recommended. The foreskin is resistive to retraction until separation of the foreskin and glans penis occurs naturally at about age 3–5 years. After this it is recommended that the child's foreskin be checked only very occasionally for retraction. Therefore, under normal circumstances the nurse will not need to retract the foreskin of children during their hygiene care. However, if the tip of a child's penis shows signs of irritation this should be reported and documented.

If there is a urinary catheter in situ, the area around it should be carefully washed with unperfumed soap (or alternative) and water. When the perineal wash is completed the underpad is removed, all washers must be immediately disposed of and the individual made comfortable.

Providing intimate care can cause embarrassment to the nurse and to the individual, but this should never result in personal hygiene being neglected. A professional, dignified and sensitive manner can help with uncomfortable feelings (Crisp et al 2013; deWit 2013).

Many individuals prefer to undertake this task in the supine position, Sims' position or lateral position, depending on the individual's health history and assessment. Please refer to sitting position explanations later in this chapter.

### CRITICAL THINKING EXERCISE 23.2

Mr Jones, 85, has a permanent indwelling catheter for advanced multiple sclerosis. He has also recently been diagnosed with early dementia. He is unable to care for his own personal hygiene now unaided. Discuss the psychological impact of providing perineal care to Mr Jones. List 3 individuals who have special needs for perineal care. Correctly demonstrate the procedure for providing perineal care for the male and female individual.

## Bathing an infant

Bath time should be an enjoyable occasion for the infant and the bath should be completed as quickly and safely as possible

because prolonged exposure may cause the loss of body heat (Berman et al 2015). Preparation for a bath includes:

- Ensuring that the room is warm and draught free
- Assembling all the items required: baby bath half filled with water at 38°C, bath thermometer, two towels, a face washer, cotton wool swabs, a mild, soap-free cleansing lotion, a clean set of clothing and nappies, clean linen for the cot, a receptacle for soiled linen and a gown or apron
- Preparing an area (e.g. place a towel on the bench or table beside the bath) on which the infant can be placed while being undressed, dried and dressed.

The procedure for bathing the infant is as follows:

- Wash hands and put on gown or apron
- Undress the infant, except for the nappy, which is left on
- Wrap the infant in a towel, and wash the face with cotton wool swabs moistened with warm water. Care should be taken to wash the eyes from the inner to the outer canthus (corner) (Burton et al 2013). Items such as cotton swabs should not be inserted into the nose or ears. The inside of the ears should be left alone, but the outer ear should be cleansed with moistened cotton wool. Pat the face gently to dry
- With the infant on the bench, unwrap the towel and remove the nappy. The infant should be washed in a top-to-toe direction, turning the surface of the washcloth as the bath progresses. The genitalia should be washed from front to back to prevent faecal matter from coming into contact with the urethra, as this would risk the onset of a urinary tract infection. A mild soap may be needed for heavily soiled areas. Alkaline soaps should be avoided because they alter the pH of skin. Particular attention should be paid to the skin folds, axillae, groin and between the fingers and toes and under the chin where food accumulates. The infant must always be held firmly but gently with the dominant hand and never left unattended. Lowering the infant slowly into the water avoids startling
- The infant should be allowed some time to splash and kick in the water
- The nurse then lifts the infant from the bath and returns the infant to the prepared bench. The infant is dried quickly but thoroughly. Where skin areas come in contact with each other there is a possibility of chafing, and particular care is needed when drying these areas: the use of baby powder is not recommended because it may irritate the respiratory tract (Leifer 2010)
- The infant is then dressed before becoming cold
- The nurse reports and documents anything of concern relating to the infant.

As the infant grows rapidly in the first 12 months, the procedure is adapted to suit the child's developmental level and as the child grows, most of the actual washing is done in the bath, with the nurse supporting the infant as needed. Infants and young children must never be left unsupervised in a bath. Nurses have an important role in providing support and reassurance for new mothers, particularly when instructing them how to bathe their babies.

## HAIR CARE

Hair care is very personal and the appearance of the hair can indicate a person's general health status (Parker 2012). Hair that is well groomed generally promotes a positive body image. Hair that is not washed and brushed tends to become tangled, greasy and malodorous. The scalp can become encrusted with sebum and dried sweat, which causes a feeling of discomfort. In an attempt to relieve the discomfort the individual may scratch the scalp and cause breaks in the skin that provide a portal of entry for microorganisms.

Hair care includes beard and moustache care as well as shaving, brushing, combing and shampooing head hair. Brushing and combing the hair stimulates scalp circulation, removes dead skin cells and distributes the natural oils that give the hair a healthy sheen (Crisp et al 2013). To brush hair, the nurse parts the hair into several sections. Brushing from the scalp towards the hair ends reduces pulling. Shampooing removes grease, dirt, blood or other substances and prevents an offensive odour. The frequency of hair care depends on the length and texture of the hair, the individual's usual practice and general condition. Hair should be brushed or combed at least twice daily and shampooed according to personal preference or as necessary. Plaiting can help to avoid tangles, but plaits should be unplaited and the hair combed to ensure good hygiene. Plaits that are too tight can lead to discomfort and bald patches.

During long periods of hospitalisation, individuals may desire the services of a hairdresser to cut or style their hair, but hair should not be cut or restyled unless the individual gives permission. Brushes and combs should be washed regularly and never shared between individuals.

### Nursing observations and assessment of the hair and scalp

As part of individual assessment, the nurse should observe for and report any abnormalities such as excessive dryness, hair fragility or dandruff, **alopecia** (hair loss) or pediculosis capitis (head lice). The scalp should be observed for redness, heavy scaling, flaking or lesions. Some individuals will be able to care for their hair independently, while others will require the nurse's assistance. Individuals may have their hair shampooed during a bath or a shower, or it may be done with the individual sitting in front of a sink. If the individual is confined to bed the hair may be washed with the individual in bed or lying on a trolley.

### Washing the individual's hair in bed

Certain devices are available to facilitate hair washing in bed, such as a shampoo tray (Figure 23.2A). If specially designed equipment is not available, a waterproof sheet can be placed under the individual's head and arranged so that the water can drain into a bucket at the side of the bed (Figure 23.2B).

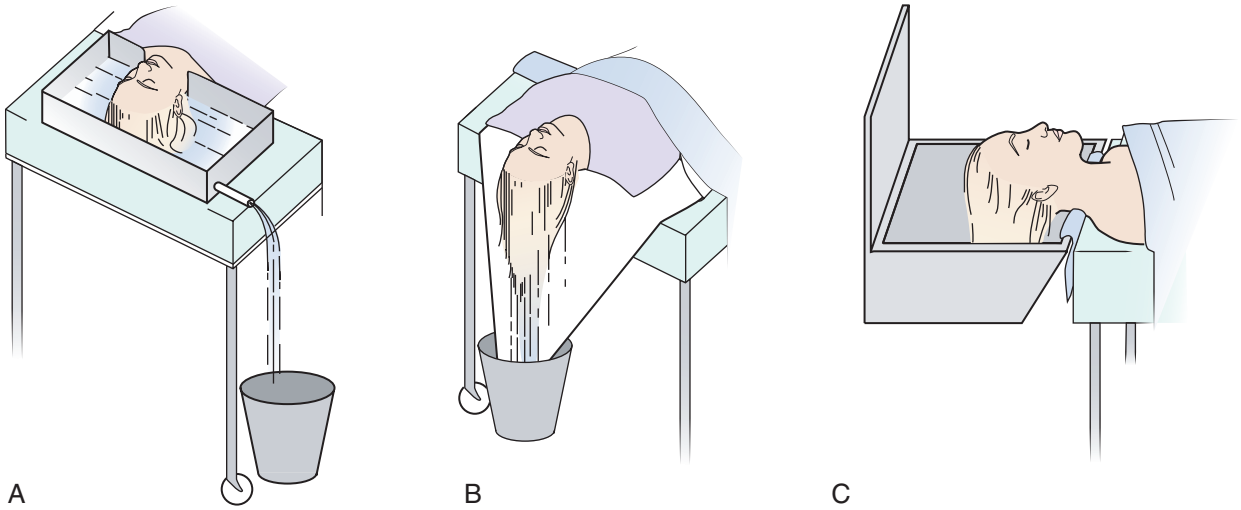


**Figure 23.2** Hair washing in bed

A: Using a shampoo tray B: Hair wash in hospital C: Individual on a trolley for hair wash

Individuals who can be moved from the bed onto a trolley may be wheeled to a sink and positioned so that the neck is supported on a pillow and the head extended over the sink (Figure 23.2C).

The method of giving the individual a shampoo is usually determined by the facilities available and the individual's condition. The basic equipment for shampooing the hair consists of:

- Shampoo of the individual's choice
- Conditioner if desired
- Two bath towels
- One face washer
- Protection for the bed (e.g. a waterproof sheet)
- Warm water (directed with handheld nozzle or jug)
- Brush and comb
- Hair dryer if available
- Shampoo tray or equipment for fashioning a trough
- A receptacle for soiled water.

If an individual is too ill or cannot tolerate a shampoo with water, a dry shampoo may be used. Several commercially prepared substances are available that are applied to the hair then brushed out.

## Management of pediculosis (lice)

**Pediculosis** is a condition in which hair is infested with lice. Lice (or pediculi) are parasitic insects that suck blood from the skin and inject a toxin that causes itching, which may result in excoriation from scratching. The lice lay eggs (or nits) which attach themselves along the shaft of the hair with a cement-like substance that makes removal difficult. Pediculosis can occur wherever there is hair and the three varieties of lice infestation are *pediculi capitis* (head lice) *pediculi corporis* (body lice) and *pediculi pubis* (pubic lice). Signs and symptoms that pediculi have infested the hair include pruritus, excoriation of the skin from scratching and visible lice or nits. The body louse tends to adhere to clothing and may not be evident on the body (Parker 2012). Untreated pediculosis can result in secondary skin infection such as dermatitis. The lice also spread from person to person on clothing, bedding, combs and brushes. It is important to note that pediculosis is not necessarily a sign of poor personal hygiene, as the parasites survive equally well on clean hair. The nits and lice can be destroyed by the use of a prescribed lotion or shampoo. With the available preparations, one single application is often effective. Sometimes a second treatment is recommended about one week later, in case any remaining nits have hatched into lice. The bed linen, personal clothing, hairbrush and comb belonging to the person infested with lice must also be treated to prevent re-infestation. To avoid transmitting the parasites to others, the nurse should wear gloves and perform thorough handwashing after the treatment.

## Shaving

Many men shave every day; if so, this should be continued during illness. Shaving promotes individual comfort by removing whiskers that may itch and irritate the skin. A facial shave should be performed using an electric razor—because the skin can be cut or nicked with a blade razor, an electric one is preferable. If an individual is unable to shave independently the nurse will need to assist or perform the procedure for the individual. Electric razors should be checked for function and cleanliness before use and brushed free of whiskers after use. If the razor head is adjustable the appropriate setting will need to be selected. The nurse proceeds as follows:

- The electric razor is moved in a circular motion, pressed firmly against the skin, and each area of the individual's face shaved until it is smooth
- Short gentle strokes are best around the nose and mouth to avoid irritation of these sensitive areas
- If the individual wishes, aftershave lotion may be applied.

Some females develop a growth of facial hair, and this is usually removed by depilatory creams, tweezers or wax. Shaving should be avoided because the blunt angle of the cut hairs makes the regrowth look heavier.

# EYE, EAR AND NASAL CARE

## Assessment and care of the eyes

The eyes are the organs of sight through which visual information about the environment is transmitted to the brain for interpretation. If the eyes are not cleansed adequately, secretions may accumulate. The conjunctiva of the eyes should be observed for inflammation or pallor, and the sclera observed for signs of jaundice. Any discharge, discomfort or pain and the presence of contact lenses, prostheses or spectacles should be noted. Under normal circumstances the eyes are kept clean by face washing and showering. If the eyes become irritated or infected, some individuals may require extra care, which consists of cleansing, usually with sterile, soft gauze swabs, to remove secretions from the eyelids and to reduce discomfort. As eye bathing/toilet is sometimes required as part of the individual's hygiene needs, guidelines for the procedure are outlined in Clinical Skill 23.3.

When bathing the eyes the nurse uses an aseptic technique to reduce the risk of introducing microorganisms. (See Chapter 22 for information concerning aseptic technique and the prevention and control of infection.) The eyes are always cleansed from the inner to the outer canthus. The procedure must be carefully performed to prevent any injury to the eyes (Figure 23.3).

Individuals who may require special eye care include those whose corneal reflex is impaired, due to altered consciousness

### CLINICAL SKILL 23.3 Performing an eye toilet

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | 1 sterile dressing pack or kidney dish<br>1 pack sterile cotton wool balls/gauze<br>Sodium chloride 0.9% × 1 sachet<br>Kidney dish<br>Extra sterile gauze swabs<br>1 towel<br>Disposable waterproof sheet ('bluey')<br>Rubbish bag<br>Alcohol-based hand rub<br>PPE: disposable gloves<br>Cleaning solution (alcohol) and wipe for trolley or work surface |

| **Skill activity** | **Rationale** |
|---|---|
| Review individual's care plan and current treatment orders | Provides information about individual's treatment, equipment/supplies needed |
| Inform individual of proposed activity, assess for pain, gain consent to proceed | Promotes individual's cooperation and comfort, maintains autonomy |
| Collect equipment/supplies | Promotes efficiency |
| Clean trolley or work surface | Prevents cross-infection |
| Ensure adequate lighting<br>Provide privacy | Allows observation of the individual's eyes<br>Maintain individual's dignity |
| Adjust the bed to safe working height | Follows safe work practices |
| Perform hand hygiene | Prevents cross-infection |
| During procedure, communicate proposed actions to individual to encourage participation. | |
| Use an aseptic non-touch technique (ANTT) to open and prepare dressing pack or procedure tray | Maintains infection control practices and principles |
| Place cotton wool/gauze swabs in tray and pour normal saline over swabs | Prepares supplies ready for use |
| Perform hand hygiene | Prevents cross-infection |

*Continued*

| CLINICAL SKILL 23.3 Performing an eye toilet—cont'd | |
|---|---|
| Ask or assist individual to lie flat if permitted | Facilitates drainage of fluid away from the face |
| Place towel or disposable waterproof sheet under individual's head | Protects pillow and bedding |
| Place kidney dish close to the individual's cheek | Protects individual and bed linen |
| Perform hand hygiene and apply gloves if required | Prevents cross-infection |
| Begin with the less affected or the cleaner of the two eyes | Prevents transmission of microorganisms from an affected eye to an unaffected eye |
| Ask or assist the individual to close the eyelid<br>Use a saline moistened swab to clean eyelid from inner canthus to outer canthus and discard swab in kidney dish | Prevents fluid and debris from entering the nasolacrimal duct |
| Use a new moistened swab for each action and continue to gently swab the eyelid and lashes until clean | Prevents cross-contamination |
| If the top and bottom eyelids or lashes are stuck together, gently swab across the eyelid until the eyelashes are free | Promotes comfort |
| Ask the individual to open the eye or assist individual to open eye if appropriate<br>Use a gauze swab in the hand to gently bring the lower eyelid down | Allows inspection of the eyeball |
| Inspect the eyeball and surrounding tissue and assess for signs of injury, inflammation, debris, foreign body or infection | Identifies risks to individual's eye health |
| Use gauze swab to absorb moisture and dry around the eye | Promotes individual comfort |
| Repeat the procedure for the other eye | Prevents cross-infection to unaffected eye |
| During the procedure, continue to communicate with the individual to facilitate cooperation. | |
| Dry any moisture from the individual's face, remove the towel from under the head | Promotes individual comfort and maintains skin integrity |
| Following the eye toilet, prescribed and non-prescribed drops may need to be instilled or ointments applied<br>Allow appropriate time in between instilling eye drops and applying ointment | Applies individual treatment and care orders for irritation or infection<br>Maximises effectiveness of treatment |
| Assist the individual into a position of comfort | Promotes individual comfort |
| Lower bed to a safe height for the individual if appropriate | Maintains individual comfort and safety |
| Remove equipment, dispose of soiled supplies | Prevents cross-infection |
| Perform hand hygiene | Prevents cross-infection |
| Document the individual response to the procedure and outcome in the individual's healthcare record and care plan | Provides clear and up-to-date communication of the individual's data between healthcare professionals<br>Maintains a legal record of care and interventions provided |
| Verbally report to Registered Nurse any changes in individual condition | Allows for timely review, response and intervention |
| *(Australian Commission on Safety and Quality in Healthcare 2015; Joanna Briggs Institute 2002, updated 2014; 2013c; Nursing and Midwifery Board of Australia 2013; Rebeiro et al 2012)* | |

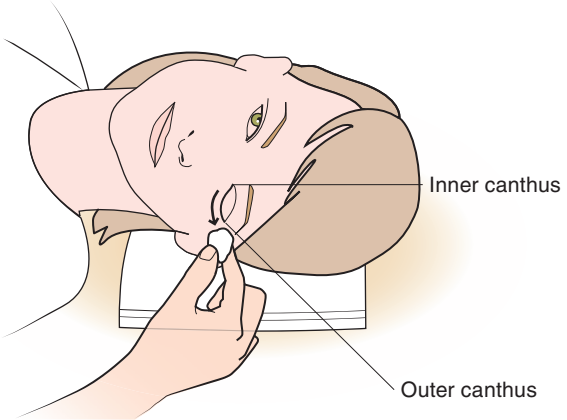


**Figure 23.3** Swabbing the eyes

or facial paralysis and those whose eyes are irritated or infected. Individuals with conjunctivitis, a common condition caused by infection, allergies or irritating substances such as dust or smoke, may also require special eye care.

It should be noted that, provided that the principles of asepsis are maintained, it may not always be necessary to use a sterile dressing pack each time an eye toilet is performed. It is best to consult the policy and procedure/safe operating procedure manuals of individual institutions for appropriate guidelines.

### Assessment and care of the ears

Lack of aural hygiene can lead to an accumulation of dirt and wax, which may result in discomfort and temporary hearing loss. The ears are cleaned as part of normal hygiene practices, for example, during a shower. They should be assessed for any discharge or complaints of tinnitus, discomfort or pain, and the use of a hearing aid should be noted. (See Chapter 34 for relevant information about hearing aids.)

Individuals who are dependent on others for their hygiene needs should have their ears cleansed with the face washer during the shower or bath. If there is an accumulation of debris or wax in the orifice, this should be documented and reported. The nurse should not insert any object, including cotton-tipped applicators, into an individual's ear canal as part of routine hygiene. Applicators may compact the cerumen, making the ear more difficult to clean (deWit 2013). Excessive cerumen or dry wax necessitates ear irrigation. This is undertaken only after examination and authorisation by a medical officer.

### Assessment and care of the nose

Secretions from the mucous membrane that lines the nose may accumulate, causing discomfort and providing a medium for the growth of microorganisms. The nose should be assessed for the presence of any discharge other than the normal mucus secretion, for bleeding, swelling of the mucosa or any obstruction.

Blowing the nose is the most effective way of removing secretions from the nostrils. If individuals are unable to perform this function, as a result of being unconscious or due to presence of an intranasal tube, the nurse may be required to clean the nostrils. This is commonly achieved using small cotton-wool-tipped applicators moistened with a solution such as water or normal saline. An applicator is inserted gently into the nostril, rotated and withdrawn, and the technique is repeated until the nostrils are clean. Sometimes a water-soluble cream is applied around the nostrils to prevent soreness. If an individual has an endotracheal, nasogastric or feeding tube inserted through the nose, any tapes anchoring the tube should be changed at least daily (Crisp et al 2013).

## MOUTH CARE

Poor oral hygiene leads to dental decay and unhealthy mucous membranes, providing a potential source of infection as well as being a source of discomfort for the individual. If food particles are not removed from the mouth and teeth, an unpleasant taste and **halitosis** (bad breath) can result. The mouth should be inspected for obvious dental decay, pallor, inflammation or the presence of ulcers on the mucosa. The lips should be observed for hydration, pallor or cyanosis and the presence of cracks or vesicles. Dentures, partial plates, bridges and crowns should be noted.

### Oral hygiene

Oral hygiene involves measures to keep the mouth and teeth clean and in healthy condition. Care of the mouth includes brushing the teeth, mouth rinses and regular visits to the dentist. The measures necessary to maintain the mouth and teeth in a healthy condition include:

- An adequate fluid intake to stimulate the flow of saliva. Saliva helps maintain a healthy mouth by washing away shed epithelial cells, food debris and microorganisms. Saliva also keeps the mouth lining moist and acts as a mild antiseptic that inhibits the growth of microorganisms, and maintains the pH balance inhibiting the formation of caries (Berman et al 2015)
- A well-balanced diet that provides the tissues with the nutrients necessary for growth and repair. Foods that require chewing stimulate saliva flow as well as blood circulation to the gums and should be included when possible
- Brushing and flossing the teeth to remove plaque and food debris massages the gums, while tongue brushing and cleansing prevent mouth odour and infection
- Rinsing the mouth with alcohol-free mouth washes to remove unpleasant tastes or odours
- Regular visits to the dentist to allow inspection of the teeth for decay, cleaning and treatment of any cavities and other abnormalities.

If oral hygiene is neglected, complications may occur, including:

- Dental decay and halitosis
- Reduced nutrition due to inability to chew and diet restrictions

- Coated tongue and subsequent dulling of taste, which may lead to loss of appetite
- Inflammation of the oral mucosa (stomatitis), inflammation of the tongue (glossitis), inflammation of the gums (**gingivitis**) and periodontitis (inflammation of ligaments, gums and bones supporting the teeth)
- An accumulation of food particles, dead epithelial cells and microorganisms on the teeth, tongue and lips
- The spread of oral infections to other parts of the body such as the parotid glands, eustachian (auditory) tubes and respiratory tract
- Dryness of the mucosa, resulting in cracking or ulcers
- Social isolation.

## At-risk individuals

Individuals with reduced flow of saliva or those who experience difficulty with normal chewing or whose swallowing actions are impaired are particularly prone to developing an unhealthy condition of the mouth. Examples include individuals who:

- Experience dyspnoea, which results in mouth breathing and consequently a dry mouth
- Are febrile or dehydrated
- Are not taking food or fluids orally or whose fluid intake is restricted
- Are receiving certain medications that cause dryness of the mouth
- Have impaired movement of the mouth, such as facial paralysis or surgical immobilisation of the jaw
- Have a nasogastric tube or airway in position, which may irritate or damage the mucosa or lead to an accumulation of debris in the mouth
- Wear partial or full dentures, which allow food particles to accumulate in the mouth
- Are unable to care for their oral hygiene adequately because of their physical or emotional state (Crisp et al 2013; Berman et al 2015).

Individuals who have had chemotherapy or radiotherapy are at risk of developing oral thrush and mucositis. It is, therefore, recommended to clean the mouth using saline or water after every meal (Marrs et al 2012).

## Assisting the individual with oral hygiene

Many individuals are able to attend to their oral hygiene but others may require encouragement and some assistance. The nurse should offer individuals the opportunity to brush their teeth after meals and in the evening. The nurse should ensure that each individual has a toothbrush and toothpaste and should assist them to the bathroom if necessary.

Some individuals with cognitive or memory impairment may need repeated prompting to enable them to complete the task of cleaning their teeth. Individuals may not clean effectively or may refuse to clean their teeth at all; individuals with Alzheimer's or dementia may not understand what it is they are being asked to do. They may get frustrated, irritated, agitated and even aggressive as a result. Sometimes the problem may be resolved by temporarily distracting the individual with another activity and returning later to cleaning the teeth. It may be helpful to follow the routine for cleaning the teeth conducted previously; for example the same time of the day, after breakfast or after getting dressed. It may even help to have a familiar mirror, towel or other object from home. It should be remembered that the individual is not being deliberately difficult; a calm, quiet approach and gentle encouragement is often the key to managing challenging responses. Nurses need to find the key to gaining trust from each person.

For individuals confined to bed, the nurse should provide teeth-cleaning equipment consisting of a toothbrush, toothpaste, a mug of water, a container for used water and a towel. Individuals who are accustomed to using dental floss as part of their normal hygiene should be encouraged to continue the practice. Flossing involves inserting waxed or unwaxed dental floss between the teeth. The motion used to pull floss between teeth removes plaque and tartar from tooth enamel. To prevent bleeding, individuals who are receiving chemotherapy or radiation or are on anticoagulant therapy should use unwaxed floss and avoid flossing near the line of the gum. To aid in cavity prevention, apply toothpaste before flossing, thus allowing fluoride to come in direct contact with tooth surfaces. Flossing once a day is sufficient. Floss holders are available for individuals who have difficulty managing the floss (Crisp et al 2013).

Individuals who are unable to brush their teeth will require the nurse's assistance with this procedure. Individuals are taken to the bathroom, or teeth-cleaning equipment is brought to the bedside. The individual should be assisted into a comfortable sitting position and the clothing protected by a towel. The nurse should apply toothpaste to a dampened toothbrush and gently but thoroughly brush the individual's teeth using an up-and-down movement. Water is provided for the individual to rinse the mouth, and a container is positioned to receive the used rinsing water. The mouth is then rinsed, but leaving some paste helps protect the teeth. Finally the lips are wiped dry, the toothbrush and toothpaste put away and the mug and container removed for cleaning.

Some individuals wear partial or full dentures, which, like natural teeth, require effective care to remove deposits and to prevent mouth odour. Care of dentures involves removing, brushing and rinsing them after meals. If it is the individual's usual practice, dentures may be soaked in a commercial denture cleaner before brushing. All dentures should be removed at night, so the nurse should ensure that they are put in a container labelled with the individual's name and placed in a safe position. Many individuals are very reluctant to be seen without their dentures, so it is important to pull curtains and close doors to provide privacy when necessary. If individuals are not able to care for their dentures independently it is the nurse's responsibility to attend to this.

To remove a partial denture the nurse, wearing disposable gloves, exerts equal pressure on the clips each side of the plate ensuring that pressure is not placed on the borders, because

they may easily bend or break. A full upper denture may be removed by breaking the seal of the denture from the palate. This can be achieved by taking hold of the denture at the front or side with the thumb and index finger. A lower denture is removed by holding it in the centre, and turning it slightly before lifting it out of the mouth. A gauze square may be used to provide a firm grip on the dentures. Dentures should be gently placed in a denture container and taken to the bathroom for cleaning and rinsing. When handling dentures care must be taken to avoid damage.

Before the dentures are replaced, the individual's mouth is rinsed and the gums brushed to remove any debris. When individuals are unable to insert their own dentures the nurse should assist. Moistening the dentures facilitates easier insertion and aids correct positioning into the mouth to keep them firmly in place. Individuals should be encouraged to wear their dentures to facilitate eating and speaking and to prevent changes in the gum line that may affect denture fit.

If normal oral hygiene practices are not possible, the mouth and teeth must be cleaned by other means. Special mouth care is often required if the individual:

- Is unconscious
- Is not taking oral food or fluids
- Experiences any impairment to mouth movement (e.g. facial paralysis)
- Has developed sores inside the mouth
- Has a mouth infection
- Has a very dry mouth (e.g. as a result of mouth breathing, dehydration or the effect of certain medications).

In these instances, the individual's mouth is cleansed either by the use of alcohol-free mouth rinses or by carefully swabbing all areas. The latter procedure is often referred to as a 'mouth toilet'. A variety of substances may be used to clean and refresh the mouth. The nurse should refer to the healthcare facility's policy and procedure/safe operating procedure manual for information on the equipment, substances and method to be used.

Refer to Clinical Skills 23.4 and 23.5 for information and guidelines on assisting with oral hygiene and performing special mouth care (swabbing).

## NAIL CARE

Care of the nails involves keeping them clean, shaped and trimmed. Regular care of the nails is important because dirty fingernails can carry microorganisms which may be transferred to food or passed to other people. People who have dirty nails can also infect themselves by scratching. Many individuals will be able to care for their nails independently, while others will require assistance. For example, individuals who have limbs encased in plaster, are unconscious, confused or vision impaired may need the nurse to assist with nail care.

### Routine nail care

Nails should be kept clean and trimmed according to the policy of the healthcare agency and the individual's personal preference. As part of the policy of many healthcare facilities, a podiatrist is required to perform nail care for individuals. Nails can be kept clean by removing any visible dirt with a blunt instrument such as an orangewood stick. A metal nail file is not used because it can make the nails rough and trap dirt. Some individuals will have their own hand-care products and they should be encouraged to use them after a shower or bath. Nails that are particularly dirty or thickened are easier to attend to if the individual's hands or feet are soaked in warm soapy water for 5–10 minutes before the care begins. Whenever nails are being trimmed, extreme care must be taken to prevent any damage to the nail beds and surrounding tissue.

### At-risk individuals

Individuals who have diabetes or any circulatory disorder that affects the lower limbs are at high risk of infection, which can start easily in a damaged nail bed. It is therefore often the policy of the institution that such individuals have foot and nail care undertaken only by a podiatrist. The podiatrist is also often required to care for the feet of older people whose nails have become thickened and distorted with age or for those with conditions such as corns, calluses or in-growing toenails. Nail clippers are used in preference to scissors for trimming nails. Toenails should be cut straight across. Nails not trimmed in this way tend to grow inwards, creating a risk for pain and infection in the surrounding soft tissue.

### Nursing observations and assessment

While undertaking nail care the nurse observes for:

- Discolouration, such as pallor or cyanosis
- The presence of inflammation around the nail edges
- Signs of brittleness or cracks
- Deviations from normal shape, such as a spoon-shaped or concave appearance.

Pallor or cyanosis of the nails may indicate heart disease, while brittleness and/or a spoon-like shape may indicate the presence of iron-deficiency anaemia. Any change or abnormality should be reported and documented. During nail care, the nurse can take the opportunity to educate individuals, or those who care for them at home, on how best to provide nail care. Education can also include how to inspect the hands and feet for lesions, dryness or signs of inflammation or infection, and the importance of reporting any change or abnormality promptly to the Registered Nurse or medical officer. See Progress Note Example 23.1.

**CRITICAL THINKING EXERCISE 23.3**

Mrs Smith is an 87-year-old woman who has recently had a right-sided CVA and has lost the ability to attend to attend her own foot care. Discuss the rationale for providing foot and nail care to Mrs Smith. List two other types of individuals who need special attention to their feet and nails and the rationale. Describe the procedure in safely performing foot and nail care.

## CLINICAL SKILL 23.4 Assisting with oral hygiene, cleaning teeth and dentures

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Kidney dish or small bowl<br>Warm water for rinsing<br>Soft toothbrush or electric toothbrush<br>Fluoride tooth or denture paste<br>Towel<br>Alcohol-based hand rub<br>PPE: non-sterile gloves and eye protection |

| **Skill activity** | **Rationale** |
|---|---|
| Review individual's care plan and current treatment orders | Provides information about individual treatment, equipment/supplies needed |
| Inform individual of proposed activity, assess for pain, gain consent to proceed | Promotes individual cooperation and comfort and maintains autonomy |
| Position individual seated at the basin or position clean over-bed table in front of individual at a suitable height for use | Promotes functional independence |
| Assist with preparation of items for use: apply toothpaste to brush, place towel over chest or within reach, fill cup with water | Promotes efficiency and functional independence |
| Perform hand hygiene | Prevents cross-infection |
| **Cleaning dentures** | |
| During procedure, communicate proposed actions to individual to encourage cooperation. | |
| Apply non-sterile gloves and eye protection | Prevents cross-infection |
| Ask or assist individual to remove dentures into small bowl or kidney dish | Facilitates cleaning |
| Use a finger to carefully break the suction between the gum and denture at the end of the gum line | Promotes individual comfort and maintains safe work practices |
| Wet toothbrush in water and brush the inner and outer surface of dentures using firm strokes | Ensures efficient cleaning |
| Rinse each denture under running water and ensure all paste is removed from denture surfaces | Promotes individual comfort and maintains oral health |
| Offer individual a cup of clean warm to cool water to rinse and a bowl to spit waste before reinserting dentures | Promotes individual comfort and oral hygiene |
| Allow individual to replace own dentures in mouth if able | Promotes individual comfort and independence |
| **Cleaning teeth** | |
| During procedure, communicate proposed actions to individual to encourage cooperation. | |
| Ask individual to open mouth and briefly inspect teeth and oral cavity for debris. Assist to rinse if necessary | Allows inspection of teeth and oral cavity<br>Removes debris from mouth to facilitate cleaning |
| Gently brush all teeth and gum surfaces using an up and down action or circular motion | Facilitates removal of debris and maintains tooth and gum health |
| Start at the upper back teeth and gently brush the outer surfaces of teeth and gum line towards the front teeth | Removes debris from teeth and gums |

## CLINICAL SKILL 23.4 Assisting with oral hygiene, cleaning teeth and dentures—cont'd

| | |
|---|---|
| Repeat with inner top teeth and gums | Removes debris from teeth and gums |
| Offer water to rinse mouth before continuing to clean outer and inner surfaces of lower teeth and gums | Facilitates removal of tooth paste from mouth |
| Brush chewing surfaces of teeth | Removes debris from teeth and gums |
| Brush surface of tongue if necessary | Promotes individual comfort |
| Offer water to rinse toothpaste from mouth | Promotes individual comfort and maintains oral health |
| Dry around mouth and apply water-based moisturiser to lips | Promotes individual comfort |
| Remove gloves and perform hand hygiene | Prevents cross-infection |
| Assist the individual into a position of comfort | Promotes individual comfort |
| Lower bed to a safe height for the individual if appropriate | Maintains individual comfort and safety |
| Remove equipment, dispose of soiled supplies | Prevents cross-infection |
| Perform hand hygiene | Prevents cross-infection |
| Check individual has call bell and other personal items within reach before leaving | Promotes comfort and individual wellbeing |
| Document the individual's response and outcome of the procedure in the healthcare record<br>Update the individual's care plan for domains related to oral hygiene | Maintains legal document of care and interventions provided<br>Allows clear and accurate communication of information about individual's care between nurses |

## CLINICAL SKILL 23.5 Performing special mouth care

**Review and carry out the standard steps for all clinical skills/interventions**

**NMBA Decision-making Framework considerations:**

1. Am I educated?
2. Am I authorised?
3. Am I competent?

If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator.

**Equipment:**

Kidney dish or similar × 2
Large cotton swab sticks
Cup of warm water
Soft toothbrush or electric toothbrush
Fluoride toothpaste
Chlorhexidine mouthwash
Towel
Disposable waterproof sheet ('bluey')
Pen torch
Tongue depressor
Labelled denture container
Water-based lip moisturiser
Prescribed or non-prescribed medication
Alcohol-based hand rub
PPE: disposable gloves and eye protection
Cleaning solution (alcohol) and wipe for trolley or work surface
Rubbish bag
Suction equipment (with Yankauer or y-suction catheter)

*Continued*

| CLINICAL SKILL 23.5 Performing special mouth care—cont'd | |
|---|---|
| **Skill activity** | **Rationale** |
| Review individual's care plan and current treatment orders | Provides information about individual treatment, equipment/supplies needed |
| Inform individual of proposed activity, assess for pain, gain consent to proceed | Promotes individual cooperation and comfort and maintains autonomy |
| Clean trolley or work surface | Prevents cross-infection |
| Collect equipment/supplies and prepare for use | Promotes efficiency |
| Ensure adequate lighting | Promotes safe practice |
| Provide privacy | Maintains individual dignity |
| Adjust the bed to safe working height | Follows safe work practices |
| Perform hand hygiene | Prevents cross-infection |
| Assist individual into lateral position | Allows secretions to be suctioned from the buccal cavity and protects airway from aspiration |
| Place towel or waterproof sheet under head | Protects pillow and bedding |
| Perform hand hygiene | Maintains infection control principles |
| During procedure, communicate proposed actions to individual to encourage cooperation. | |
| Apply gloves and eye protection | Maintains infection control principles |
| Ask the individual to open the mouth or use the tongue depressor to gently open the mouth<br>Carefully remove dentures or partial denture into kidney dish or denture container | Allows dentures or dental plates to be safely removed |
| Use torch to inspect oral cavity: teeth, gum surfaces, mucous membranes and tongue | Allows for close inspection of oral cavity to identify injury, inflammation or infection, loose teeth and foreign objects |
| Place kidney dish at individual's chin or cheek<br>Place a small amount of toothpaste on the toothbrush or prepare chlorhexidine mouth swabs for use | Protects individual and bedding from secretions |
| Brush or swab teeth and gums using a gentle up-and-down action, beginning with inside back teeth | Removes debris and plaque from teeth and gums |
| Offer water (and straw) to rinse mouth (only if gag reflex is present) and encourage individual to spit into kidney dish if able | Toothpaste and debris should be rinsed from teeth and gum surfaces |
| If individual is unable to rinse and spit, or gag is absent, rinse toothbrush with water and use to remove toothpaste from teeth and gum surfaces<br>Suction secretions from buccal cavity as required | Toothpaste should be removed from teeth and gum surfaces<br>Prevents aspiration of secretions into airway |
| Use toothbrush or mouth swabs to remove coating from tongue if required | Improves oral hygiene |
| Apply prescribed ointments | Completes individual treatment and care orders |
| Clean dentures using toothbrush and toothpaste before rinsing and replacing in the mouth | Promotes oral hygiene and comfort |

| CLINICAL SKILL 23.5 Performing special mouth care—cont'd | |
|---|---|
| Apply a water-based lubricant to the lips | Prevents soreness and cracking |
| Dry moisture from the individual's mouth, remove the towel | Promotes comfort |
| Assist the individual into a position of comfort | Promotes individual comfort |
| Lower bed to a safe height for the individual if appropriate | Maintains individual comfort and safety |
| Remove equipment, dispose of soiled supplies | Prevents cross-infection |
| Perform hand hygiene | Prevents cross-infection |
| Check individual has call bell and other personal items within reach before leaving | Promotes comfort and individual wellbeing |
| Document the individual's response and outcome of the procedure in the healthcare record<br>Update the individual's care plan for domains related to oral hygiene | Maintains legal document of care and interventions provided<br>Allows clear and accurate communication of information about individual's care between nurses |
| Verbally report to Registered Nurse any observations or changes in individual condition that may indicate risk for deterioration | Facilitates timely review, response and intervention |
| *(Australian Commission on Safety and Quality in Healthcare 2015; Joanna Briggs Institute 2013d; 2013e; 2013f; Nursing and Midwifery Board of Australia 2013; Rebeiro et al 2012)* | |

### PROGRESS NOTE EXAMPLE 23.1

| | |
|---|---|
| 23/12/2014<br>1415 hrs | Nursing: Mrs Bennett ambulated with one nurse to the shower. Required assistance onto the shower chair. Required prompting with showering was able to shower to her right side but required prompting and assisting to attend personal hygiene to left side of her body, including upper extremities but not lower extremities. Excessive fatigue displayed via excessive respirations and increased verbal prompting required. The use of a shower chair was required due to signs and symptoms of excessive fatigue displayed from Mrs Bennett when showering, causing her to become unsteady on her feet. Mrs Bennett is continent of bowel and bladder and was able to request to use the toilet prior to the shower. Skin assessment conducted—warm, moist and intact. Mrs Bennett appeared to have difficulty and became frustrated while putting her socks and shoes on. Referral to OT made today.<br>***S. Bava* (Bava) EN** |

## HYGIENE SUMMARY

Personal hygiene needs must be met to keep the body clean, to maintain healthy functioning and to promote a positive body image. Neglect of personal hygiene needs causes discomfort and may lead to infection and other serious complications. Continuous assessment of the individual's total body is important for planning and implementing appropriate, high-quality nursing care. It is the nurse's responsibility to ensure that all individuals have access to the facilities necessary for meeting their hygiene needs. Dependent individuals require assistance from the nurse in meeting these needs and the nurse should ensure that the individual's dignity, comfort and safety are promoted throughout all hygiene care procedures. The nurse also has an important role to play in educating individuals and those who care for them at home about all aspects of hygiene that promote optimal health.

## PROMOTING COMFORT

Human comfort depends on meeting a wide range and complex interaction of needs. Nutritional, fluid, elimination, oxygen and temperature regulation needs must be met for the human body to function efficiently and comfortably. The nurse's role incorporates monitoring and meeting these needs. In addition, the nurse promotes the comfort of individuals by promoting ease of movement, rest and sleep and freedom

from pain. (See the relevant chapters in Unit 8 for specific information relating to these areas.)

Physical and emotional comfort are interdependent and if either aspect is disrupted, the other is commonly affected. For example, if individuals are experiencing some form of physical discomfort such as pain, they may develop emotional tension and become withdrawn, anxious or depressed. Conversely, an anxious person may develop physical symptoms such as headaches, loss of appetite or gastrointestinal disturbances. Therefore, for individuals to be comfortable, they must be free from physical discomfort and emotional tension. An important nursing responsibility is assessing factors that are interfering with an individual's comfort, then planning and implementing measures that promote their physical and emotional ease. Discomfort can result from stimuli of physical or psychosocial origin. Freedom from anxiety is important in helping the individual to develop a sense of wellbeing and emotional security. To promote the physical comfort of individuals, the nurse should assist in meeting all care needs. This includes ensuring that individuals are wearing comfortable clothing which is suitable for the environment; individuals should be nursed in the most comfortable position possible.

## Clothing and comfort

A person's comfort is enhanced if they are able to wear clothes of their own choice. Many people feel uncomfortable and undignified if they are required to wear clothing such as a hospital gown provided by the healthcare facility. For this reason, individuals returning from surgery or other procedures are changed into their personal attire as soon as their condition allows. Some residents living in aged care facilities or special accommodation do not have adequate clothing of their own. In this case the nurse should ensure that the clothes supplied by the agency are appropriately selected to meet the residents' individual needs. For example, for an older person living in an aged care facility the choice of clothes should be appropriate in terms of age, gender, temperature and other environmental conditions. They should be clean, fit well and, in the case of individuals who are very frail or confused, be easy for them to manage; for example, Velcro fastenings for ease of dressing and toileting.

## Comfort and the environment

A suitable physical environment is one in which there is adequate lighting, fresh air, ventilation, warmth and cleanliness. Depending on the individual's age and physical condition, the room temperature should be maintained between 20°C and 23°C. The acutely ill, infants and older adults may need a warmer room. However, some ill individuals benefit from cooler room temperatures to lower the body's metabolic demands (Crisp et al 2013). Ideally the environment should be free from excessive noise and unpleasant sights and smells. In addition, there should be sufficient space for the individual's personal belongings, and facilities available for visitors. In the case of residents in long-term accommodation the environment should be as home-like as possible, have attractive views to the outside world and an outdoor area that is safe and accessible. Ideally, residents will have a single room. If not, the facility should provide a room where residents can spend private time with visitors if they wish. The environment should also provide a relaxed happy atmosphere and opportunities to enjoy activities that enhance quality of life, such as outings, concerts and games. For those who are able, the environment should provide the chance for residents to participate in simple everyday activities such as watching television, gardening, crafts or cooking. Comfort can be enhanced by promoting a psychological climate in which the individual is encouraged to communicate any fears or anxieties. A physical environment that reduces the individual's privacy and independence is unsuitable and can be a source of stress and discomfort.

## Equipment to promote comfort

### Provision of a comfortable bed

A comfortable position is, to a significant extent, dependent on the individual's bed. The prime objective of bed-making is the promotion of comfort, as a bed that is made incorrectly may disrupt rest and sleep and may be a contributing factor to the development of complications such as pressure injuries (Berman et al 2015). Beds may be made up in a variety of ways to meet the individual's needs and each healthcare facility commonly adopts its own method of bed making. Although the techniques may vary slightly, the **principles of bed making** remain the same.

Various types of bed are available, most of which can be adjusted manually, mechanically or electronically. Most beds can be raised or lowered horizontally and most can also be adjusted to alter the position of the head, foot or centre. Beds are fitted with wheels, which enables them to be moved easily when necessary, and a brake device that prevents inadvertent movement. The nurse should check that the brakes are applied at all times when the bed is stationary. There are several special types of beds, frames and mattresses that are used for particular circumstances.

Frames are available that may be either fitted to the bed or used in place of a more conventional bed. The Balkan frame, for example, is made from wood or metal, extends lengthwise above the bed and may be used in conjunction with traction apparatus. The Bradford frame consists of a metal frame across which canvas slings are stretched, and may be used to nurse a person who has a fracture or disease of the hip or spine. The Stryker frame consists of two canvas-covered frames attached to a metal frame and may be used to facilitate changing the position of a person with a spinal cord injury or paralysis. Figure 23.4 illustrates the Balkan and Stryker bed frames.

Foam mattresses are commonly covered with a waterproof fabric, which facilitates cleaning and therefore helps to prevent cross-infection. Individuals with specific needs, such as those who are more vulnerable to the development of decubitus ulcers, may be nursed on special mattresses. The most commonly used pressure-relieving devices are alternating air mattresses. These devices work by over- and underinflating in

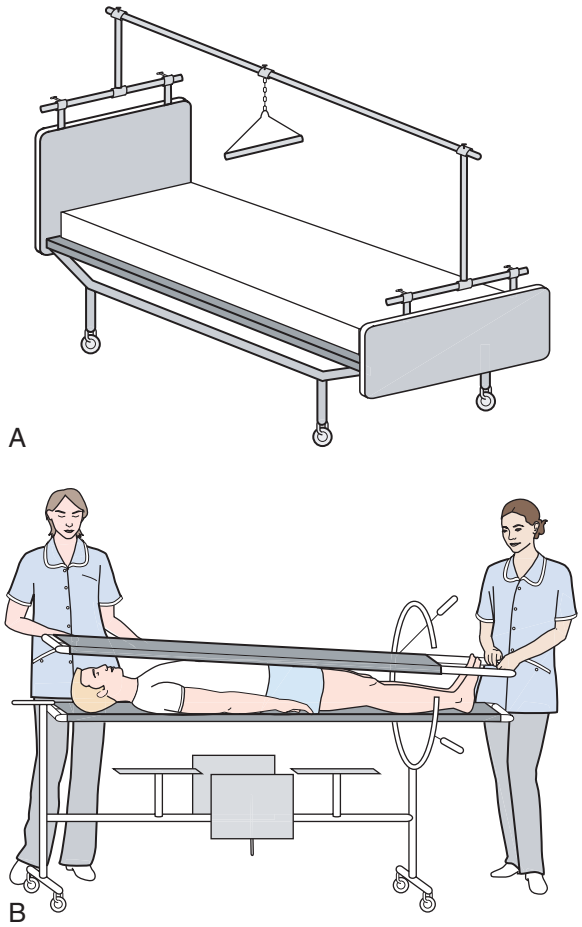


**Figure 23.4** Bed frames and special beds

A: Balkan frame B: Stryker frame. The individual is turned to the prone or supine position. Body alignment is not changed during repositioning

sequence as the individual moves around in the bed (Figure 23.5A). Other less commonly used devices include the gel mattress (Figure 23.5B) and the foam overlay (egg-crate style) mattress (Figure 23.5C). The type of mattress selected must meet the individual's needs, provide comfort and support and should help prevent development of complications.

Pillows are available in a variety of materials, most of which are enclosed in a protective waterproof covering over which a pillowcase is placed. The number of pillows used depends on the needs of the individual, and should be sufficient to provide maximum comfort and support.

Sheets are commonly available in two styles: the long sheet is similar to a conventional single-bed sheet; the draw sheet is a narrow sheet that may be placed across the bottom sheet. Because of their design, draw sheets are easy to replace under an individual without disturbing the other bedclothes. A waterproof sheet may be placed under the draw sheet to protect the bottom sheet against moisture; for example, if an individual is incontinent or is required to use toilet utensils in bed. In some care settings, special reusable incontinence bed protectors with tuck-in flaps are available and may be used instead of a draw sheet. These maintain an

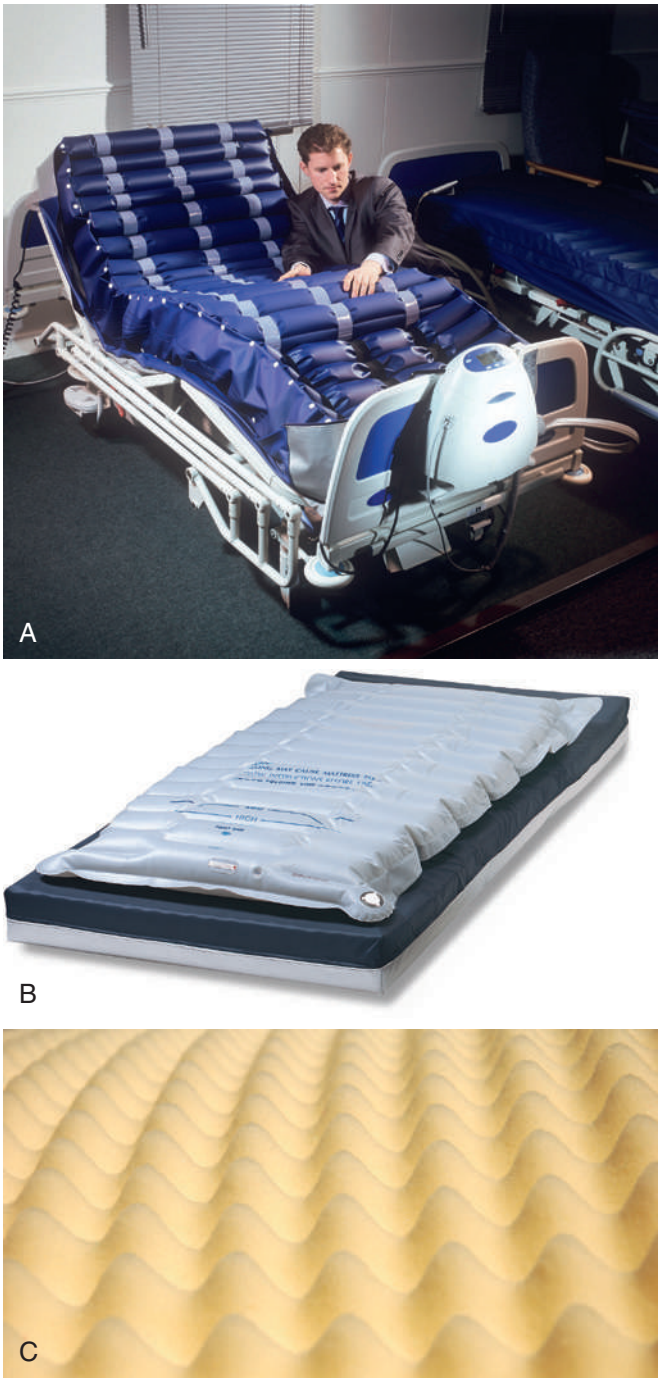


**Figure 23.5** Special mattresses

A: Air mattress B: Gel mattress C: An egg-crate mattress

*(**A**: © Brian Bell/Science Photo Library/Getty Images; **B**: Blue Chip Medical Products, Inc.; **C**: © kanusommer/Shutterstock)*

individual's comfort because they are double or multi-layered and very absorbent. They have an integral waterproof barrier, which means that the side on which the individual lies remains dry. They are commonly referred to as 'Kylie sheets'. Disposable liners are more commonly used these days. Care needs to be taken if an air mattress is in place that sheets are not tucked in, as this interferes with the inflation/deflation.

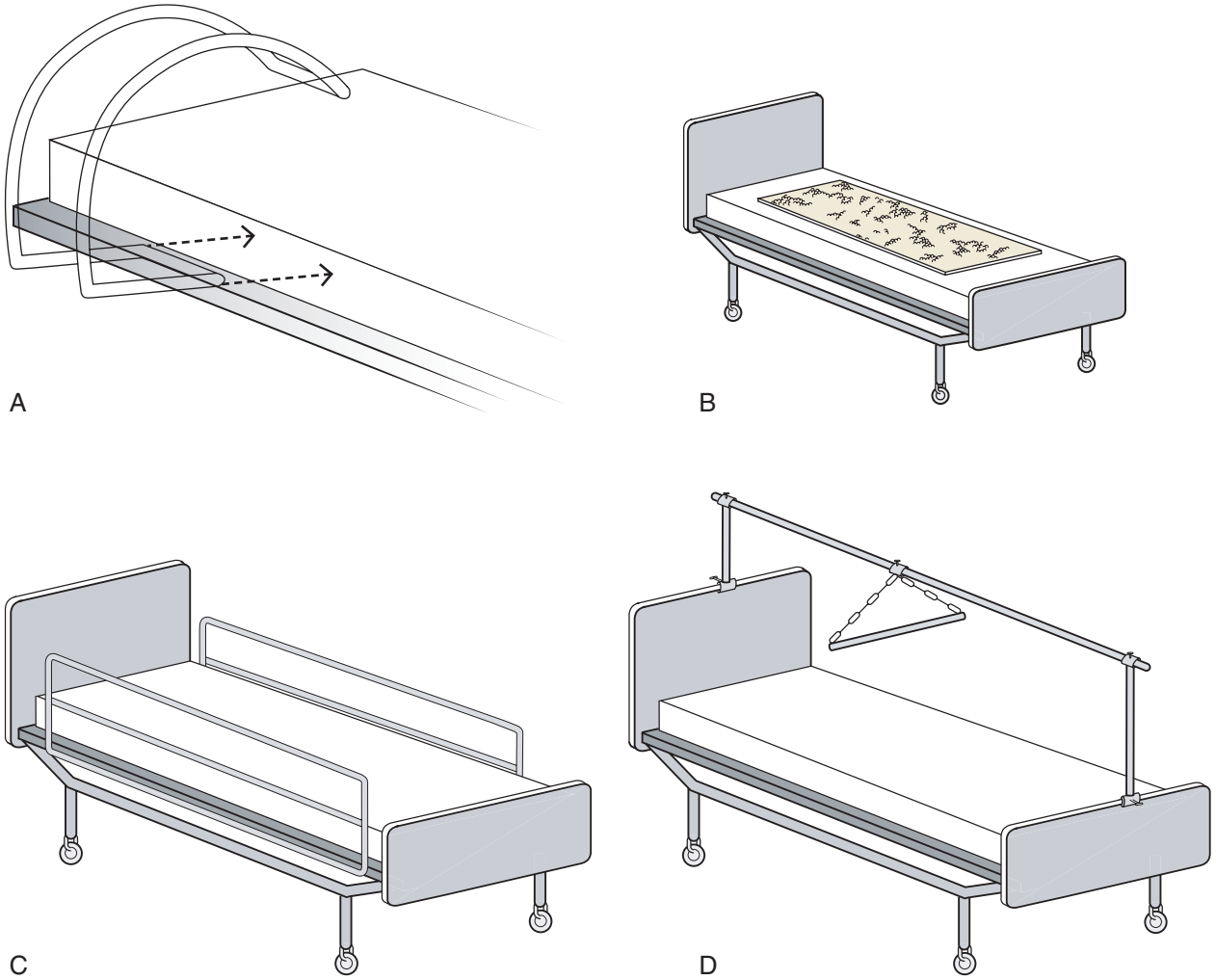


**Figure 23.6** Supplementary equipment used in bed making
A: Bed cradle B: Sheepskin board C: Bed rails D: Overhead trapeze

The frequency with which bed linen is changed depends on the healthcare facility's policy, but any bed clothing that becomes wet, soiled or excessively wrinkled should be replaced promptly to maintain the individual's comfort. Blankets, quilts and bedspreads are available in loosely woven cotton that is easily laundered. Some healthcare facilities may use continental-style quilts in place of blankets and a bedspread.

The use of supplementary items is also an important aspect of nursing care in maintaining comfort.

## Supplementary equipment

A variety of supplementary equipment is available that may be used to enhance comfort, provide added support or promote safety.

*Bed cradle*. A bed cradle is a frame designed to keep the upper bedclothes off all or part of a individual. The cradle may be large enough to extend from one side of the bed to the other, or small enough to place over one leg. The cradle is positioned directly above the area of the individual's body which is to be free of the bedclothes and the top sheet and blankets are brought up over the cradle. A bed cradle may be used for an individual with a burn, an uncovered or painful wound or a plaster cast. The cradle protects the area by elevating the bedclothes, and facilitates observation of the area by the nurse or medical officer (Figure 23.6A).

*Heel or elbow protectors*. Made from sheepskin, foam rubber or inflatable plastic material, these protectors are designed to fit the shape of the heel or elbow (Figure 23.6B). Polyurethane foam dressings may also be used. They are commonly used to prevent the development of decubitus ulcers on these areas, as they reduce friction between the skin and the bed linen.

*Bed rails*. Many beds are fitted with built-in side rails that can be raised (Figure 23.6C). Historically, side rails have been used to prevent individuals, such as those at risk of seizures or who are restless or confused, from falling from the bed. However, bed rails are a form of restraint and, whenever possible, the use of bed rails is replaced by less restrictive, safe alternatives such as the use of very low beds. This change is in line with a policy of careful risk assessment and the use of

the minimal restraint possible for any individual in any situation.

*Trapeze*. An overhead trapeze, monkey bar or hand grip is a swinging bar suspended from an overhead pole, which may be used by an individual to facilitate movement in bed (Figure 23.6D). They should not be used for individuals with upper body or shoulder injuries.

*Rope*. A length of rope or similar material may be attached to the foot of the bed and positioned on top of the quilt. By holding on to the end of the rope, the individual is able to pull themself up into a sitting position.

*Sandbag*. A sandbag is commonly a waterproof bag filled with sand, used to maintain part of the body in alignment; for example, sandbags may be used to immobilise a fractured leg before splinting or surgery.

*Wedge-shaped pillow*. A wedge-shaped pillow is placed between the legs to maintain abduction, for example, after total hip replacement.

The nurse must ensure that any supplementary equipment is positioned and used correctly to promote the individual's comfort and safety.

# BED MAKING

## Making an unoccupied bed

An **unoccupied bed** is the term used to describe a bed that is either temporarily vacated by the individual, for example, during a shower, or a bed that is being made up after an individual's discharge from the healthcare facility. The unoccupied bed can be made up as a 'closed' or an 'open' bed. To make a closed bed, the upper bedding is tucked in at the bottom and sides. To make an open bed, the upper bedding is folded up at the bottom and sides. The advantage of the open style is that the upper bedding can be quickly folded lengthwise, or into a pack to facilitate ease of transferring an individual from a trolley into the bed.

See Clinical Skill 23.6 for the step-by-step guidelines for making an unoccupied bed.

## Key principles related to bed making

- All the equipment such as clean linen and the soiled linen skip should be collected before the procedure is started

### CLINICAL SKILL 23.6 Making an unoccupied bed

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Flat sheet × 2<br>Draw sheet (if required)<br>Plastic sheet ('bluey')<br>Pillow case<br>Blanket<br>Bedspread<br>PPE: disposable gloves<br>Soiled-linen container |
| **Skill activity** | **Rationale** |
| Perform hand hygiene | Prevents cross-infection |
| Collect clean bed linen and place on a chair or flat surface near the bed<br>Place soiled-linen container near the bed | Facilitates access during the procedure<br>Prevents cross-infection |
| Ensure a chair or clean flat surface is available to place the bed linen to be reused | Prevents cross-infection |
| Move the bedside cabinet and over-bed table away from the bed | Provides safe work space around bed |
| Check the bed brakes are engaged then raise the bed level to a safe working height. Lower head of bed | Follows safe work practices |
| Remove pillowcases and place in soiled-linen container<br>Place pillows on a clean flat surface | Prevents cross-infection |
| Apply disposable gloves and apron if bedding is heavily soiled | Prevents cross-infection |

*Continued*

| CLINICAL SKILL 23.6 Making an unoccupied bed—cont'd | |
|---|---|
| Start at the top (head) of the bed, lift the mattress on one side of the bed and free the bottom sheet | Promotes work efficiency |
| Move down to the end (foot) of the bed, lift the mattress and loosen and untuck each layer at the corner | Facilitates ease of removal |
| If working alone, complete one side of the bed before moving to loosen other side | Promotes efficient work practices |
| Inspect each layer of bed linen for signs of soiling or damage and replace as required | Promotes skin integrity and individual hygiene and comfort |
| Remove each item of upper bed linen separately, fold and place on a clean flat surface | Folding facilitates replacement |
| Take the top hem of bed linen and fold down towards the centre of the bed and repeat with bottom hem | Promotes efficient work practices. Prevents cross-infection |
| From the side of the bed, bring each piece towards the centre and fold bundle again | Promotes efficient work practices. Prevents cross-infection |
| Lift off the bed, holding bundle away from body and place on a clean flat surface | Prevents cross-infection |
| Remove soiled linen by rolling towards the centre of the bed | Prevents cross-infection |
| Lift off bed, holding bundle away from body and place into soiled-linen container | Prevents cross-infection |
| Inspect mattress for signs of damage. Clean and dry if soiled | Prevents cross-infection |
| Remove gloves and perform hand hygiene | Prevents cross-infection |
| If working alone, complete bed making on one side of the bed before moving to complete the other side | Promotes efficient work practices |
| **If reusing bed linen**<br>Place folded bottom sheet in the centre of the mattress<br>Unfold sheet towards each side of the bed then unfold over the edge of mattress<br>Unfold the sheet towards the top and bottom ends of the bed | Bedclothes are easier to adjust or remove if they are replaced and tucked in separately |
| **If using a new sheet**<br>Place folded sheet in the centre of the mattress and unfold sheet along the length of mattress<br>Unfold the sheet across the mattress towards edge of the bed | Promotes efficient work practices |
| Position the sheet so it hangs equally on each side and move the sheet up towards the head of the bed to allow sufficient amount to tuck under mattress | Allows sufficient sheet at each corner to complete triangular folds |
| **Complete a triangular fold**<br>Stand facing the head of the bed, tuck in the sheet at each corner over the top of the mattress and pull tightly under the mattress | Maintains a neat appearance and holds the sheet firmly on the mattress |
| At the side of the bed, pick up the edge of the sheet about 40 cm from head of the bed and lift up onto mattress | Promotes individual comfort and maintains neat appearance |

| CLINICAL SKILL 23.6 Making an unoccupied bed—cont'd | |
|---|---|
| Pull sheet tightly to make a 45-degree angle from the top corner of the mattress | Promotes individual comfort and maintains neat appearance |
| Tuck remaining sheet under the mattress at each side | Promotes individual comfort and maintains neat appearance |
| Bring the triangular fold down over the side of the bed and tuck in tightly under the mattress | Promotes individual comfort and maintains neat appearance |
| Repeat at the foot or end of the bed then tuck in the remaining sheet along the long edge of the bed | Promotes individual comfort and maintains neat appearance |
| If working alone, move to opposite side of bed and begin tucking in the sheet at the head of the bed | Promotes efficient work practices |
| Ensure the sheet is smooth and tucked in tightly | Promotes individual comfort and maintenance of skin integrity |
| Position the waterproof sheet and draw sheet if required across the centre of the bed and tuck in along both sides | Protects the individual and bottom sheet and facilitates ease of removal and replacement if soiled |
| Place top sheet on bed and unfold along length of bed and position evenly over the bed | Allows sufficient amount of sheet to complete triangular folds |
| Bring the top edge of sheet to the level of the bed head | Allows sufficient amount of sheet to fold over and protect the blanket |
| Move to the end of the bed and tuck the sheet tightly under the bottom of the mattress | Promotes individual comfort and maintains neat appearance |
| Tuck the remaining sheet under the mattress using a triangular fold | Promotes individual comfort and maintains neat appearance |
| Place blanket on centre of bed and unfold, position as above and tuck in at the end of the bed using a triangular fold | Promotes individual comfort and maintains neat appearance |
| Move to the head of the bed and fold the blanket down 30 cm<br>Fold top sheet over to cover the blanket | Folded sheet protects the blanket |
| Place bedspread on centre of bed and unfold, ensuring it is evenly positioned on each side and covering the untucked portion of the blanket | Promotes individual comfort and maintains neat appearance |
| Bring top hem of bedspread level with the bed head then tuck in the remainder at the end of the bed using a triangular fold | Promotes individual comfort and maintains neat appearance |
| At the head of the bed, fold excess fabric under and bring neatly to the level of the sheet and blanket | Maintains neat appearance |
| Fold bedding back according to individual's need | Allows easy access for individual to return to bed |
| Replace pillows and arrange according to individual's need, adjust head of bed if required and lower bed level | Promotes individual comfort and safety |
| Reposition bedside cabinet and over-bed table | Allows safe access to individual's items |
| Assist individual to return to bed if needed or leave in a comfortable position with all personal items within reach | Promotes individual safety, wellbeing and functional independence |
| Remove soiled-linen container, perform hand hygiene | Prevents cross-infection |

- Measures should be implemented to prevent cross-infection:
  - the nurse's hands should be washed and dried before and after making the bed
  - it is important to ensure that the hands are washed after removing dirty linen from the bed prior to handling the clean linen
  - all linen should be held away from the body. This limits the risk of contaminating clean linen with any microorganisms on the nurse's clothing. It also limits the risk of contamination of the nurse's clothing with microorganisms from soiled linen
  - bedclothes should not be shaken or flicked, as this permits easy transmission of microorganisms to other people or other surfaces via the airborne route
  - soiled linen should immediately be placed into a soiled-linen skip. It should never be placed on top of clean linen (it may contaminate the clean linen), on the floor (it may collect microorganisms from the floor surface) or anywhere other than in the appropriate designated container
  - beds should not be made while procedures involving the use of sterile equipment are being performed nearby, as disturbed dust particles can travel and contaminate a sterile field. (See Chapter 22 for more information concerning infection prevention and control.)
- The nurse should don gloves to remove any solid faecal matter before placing the soiled linen in the container. Using toilet paper to envelop the faeces, the faecal matter should be placed in a bedpan, covered, taken to the pan room and flushed as normal
- During bed making, the nurse should observe the principles of body mechanics to prevent back strain, including raising the height of the bed
- When positioning the bottom sheet, the nurse should ensure that it is put on with the hem facing down. Sheets must be free from rough areas, wrinkles or creases, to promote comfort and to avoid damage to the individual's skin
- To maintain bedclothes in position, the corners are mitred (Figure 23.7). Mitred corners help to prevent the bedclothes becoming loose and uncomfortable for the individual
- To facilitate efficient bed making, bedclothes to be replaced are folded and placed on a chair. Folding the bedclothes avoids excessive wrinkling and facilitates ease of replacement. Alternatively, the bedclothes may be placed over a 'bed-stripper', which is a frame attached to the foot of the bed. Bedding that is not being replaced is rolled up and placed into the soiled-linen container
- If a waterproof draw sheet is used, it must be completely covered by a cotton draw sheet to prevent it making contact with the individual's skin

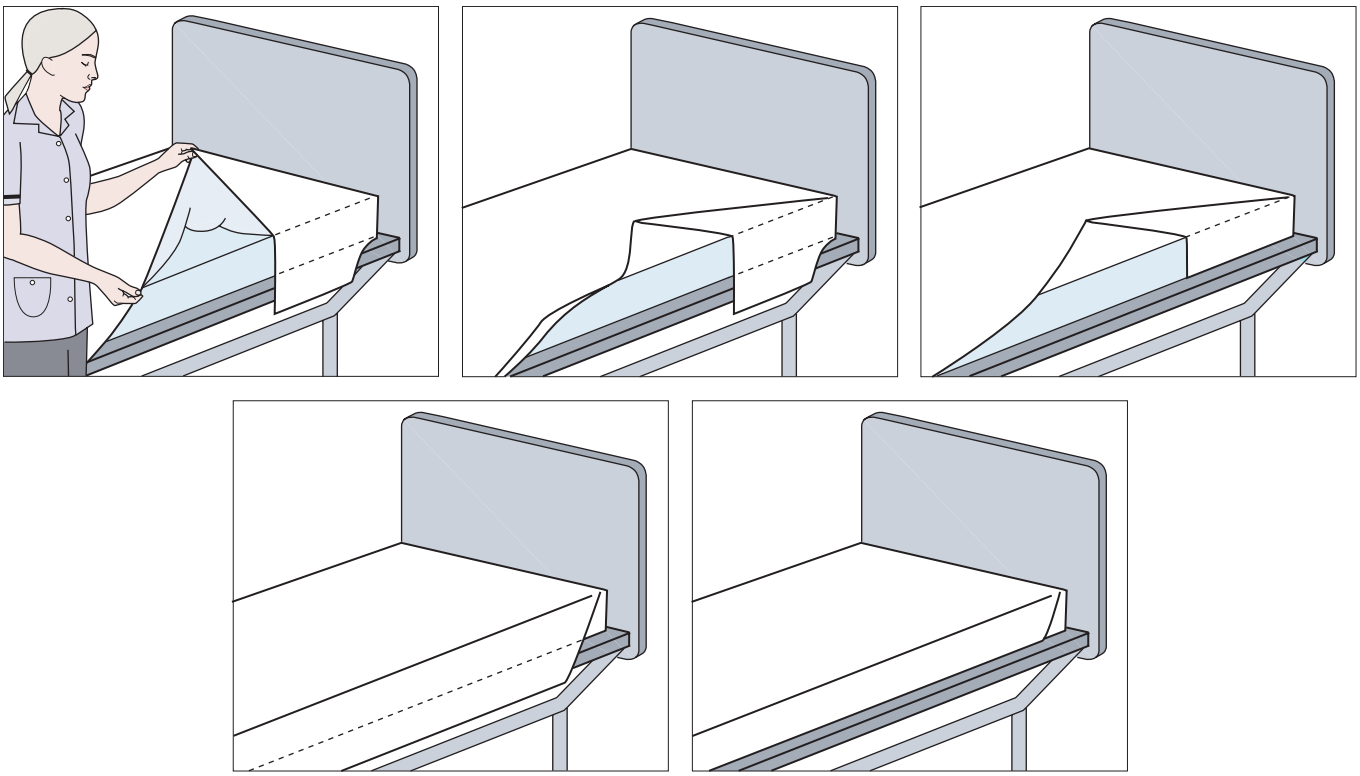

**Figure 23.7** Mitred corners

- A vertical pleat or fold should be made in the upper bedclothes, to provide room for the individual's feet. This technique prevents the bedclothes from pressing down on the feet, which can result in a condition known as foot drop
- When a bed is to be made up after an individual's discharge from the healthcare facility, the entire bed and fittings are cleaned beforehand. The bed should then be allowed to air before being made up with clean bedding.

## Making a surgical/post-anaesthetic bed

An **surgical/post-anaesthetic bed** (Figure 23.8) is a version of an open unoccupied bed and is made up to receive an individual after surgery or anaesthesia. The upper bedding is arranged into a pack, which can be easily removed to facilitate efficient transfer of the individual from a trolley into the bed. Once the individual is in the bed, the upper bedding pack is unfolded and carefully placed over the individual. The suggested procedure for making an **operation bed** is provided in Clinical Skill 23.7. (See Chapter 43 for information concerning other preparations required for receiving postoperative individuals back in their room.)

**Figure 23.8** Operation bed
*(Potter & Perry 2013)*

## Making an occupied bed

The term '**occupied**' is used to describe a bed that is being made while the individual is sitting or lying in it. When making an occupied bed the nurse must be aware of any restrictions in the individual's movement or position, such as a painful wound or a urinary catheter. The nurse should ensure that the individual's safety and comfort are maintained throughout the procedure. In addition to following the key principles relating to making a bed, before starting to make an occupied bed the nurse should:

- Assess the need for assistance. Two or more nurses may be necessary to move the individual safely and painlessly and to complete the procedure quickly to avoid the individual becoming fatigued. The individual must be adequately supported and kept warm during the procedure. Some individuals must be moved keeping the body in total alignment; for example, some individuals with spinal injuries or who have had spinal surgery must avoid twisting. In these circumstances individuals must be log-rolled so that the body is moved as one unit. At least three people are required to log-roll the person and keep their body in alignment. Standing on the side of the bed to which the individual is to be turned, one nurse supports the individual's head, another supports the trunk, while the third nurse supports the legs. Before starting movement, a pillow is placed between the individual's legs. At a given signal, the individual is rolled in one coordinated, smooth movement towards the nurses (Figure 23.9)
- Consider if it is preferable to make the occupied bed from top to bottom, rather than from side to side. It is often easier and less disruptive for an individual (e.g. one who has distressed breathing or a leg in traction) if the nurses adjust the bottom sheet in this manner.

The technique used to make an occupied bed should be one that causes minimal disturbance to the individual.

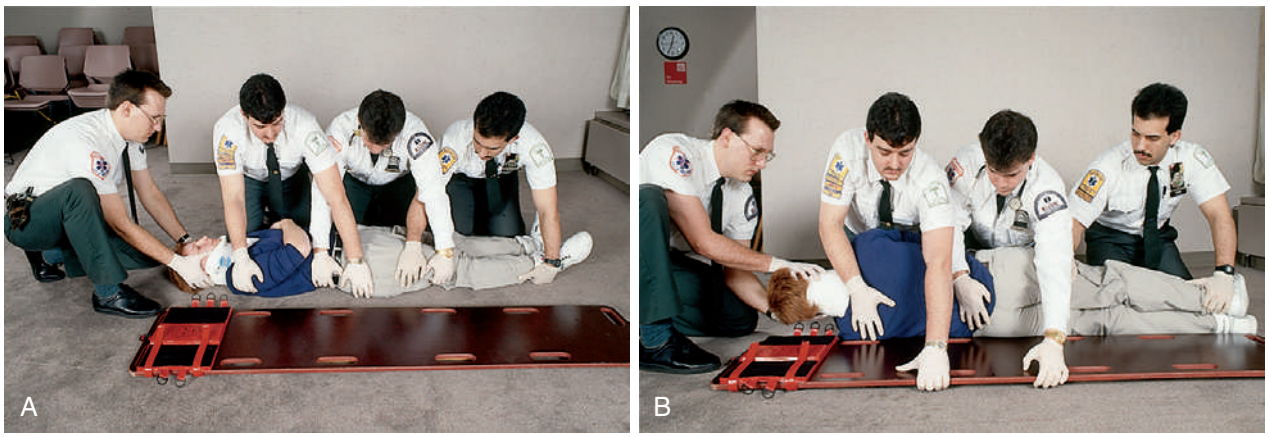


**Figure 23.9** The log-roll method of moving an individual
A: Positioning for log-rolling B: Log-rolling the individual
*(Swartz 2009)*

## CLINICAL SKILL 23.7 Making a theatre bed

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/ clinical facilitator/educator. | Flat sheet × 2<br>Draw sheet (if required)<br>Plastic sheet ('bluey')<br>Pillow case<br>Blanket<br>Bedspread<br>PPE: disposable gloves<br>Soiled-linen container |

| Skill activity | Rationale |
|---|---|
| Perform hand hygiene | Prevents cross-infection |
| Collect clean bed linen and place on a chair or flat surface near the bed<br>Place soiled-linen container near the bed | Facilitates access during the procedure<br>Prevents cross-infection |
| Move the bedside cabinet and over-bed table away from the bed | Provides safe work space around bed |
| Check the bed brakes are engaged then raise the bed level to a safe working height. Lower head of bed | Follows safe work practices |
| Remove pillowcases and place in soiled-linen container<br>Place pillows on a clean flat surface | Prevents cross-infection |
| Apply disposable gloves and apron if bedding is soiled | Prevents cross-infection |
| Start at the top (head) of the the bed, lift the mattress on one side of the bed and untuck the bottom sheet | Promotes work efficiency |
| Move down to the end (foot) of the bed, lift the mattress and loosen and untuck each layer at the corner | Facilitates ease of removal |
| If working alone, complete one side of the bed before moving to loosen other side | Promotes work efficiency |
| Remove each item of soiled linen separately by rolling towards the centre of the bed | Contains debris in linen bundle |
| Lift off bed, hold away from body and place in soiled-linen container | Prevents cross-infection |
| Inspect mattress for signs of soiling or damage. Clean and dry if soiled | Prevents cross-infection and maintains skin integrity |
| Remove gloves and perform hand hygiene | Prevents cross-infection |
| If working alone, complete bed making on one side of bed before moving to complete the other side | Promotes efficient work practices |
| Place folded sheet in the centre of the mattress and unfold sheet along the length of mattress<br>Unfold the sheet across the mattress towards edge of the bed | Promotes efficient work practices |
| Position the sheet so it hangs equally on each side and move the sheet up towards the head of the bed to allow sufficient amount to tuck under mattress | Allows sufficient amount of sheet to complete triangular folds at each corner |
| Stand facing the head of the bed and tuck sheet over the top of the mattress and pull tightly under the mattress | Provides a neat and secure fold for the sheet and promotes individual comfort |
| At the side of the bed, pick up the edge of the sheet about 40 cm from head of the bed and lift up onto mattress | Promotes individual comfort and maintains neat appearance |

| CLINICAL SKILL 23.7 Making a theatre bed—cont'd | |
|---|---|
| Pull sheet tightly to make a 45-degree angle from the top corner of the mattress | Promotes individual comfort and maintains neat appearance |
| Bring the triangular fold down over the side of the bed and tuck in tightly under the mattress | Promotes individual comfort and maintains neat appearance |
| Tuck remaining sheet under the mattress at each side | Promotes individual comfort and maintains neat appearance |
| Repeat at the foot or end of the bed then tuck in the remaining sheet along the long edge of the bed | Promotes individual comfort and maintains neat appearance |
| If working alone, move to opposite side of bed and begin tucking in the sheet at the head of the bed | Promotes efficient work practices |
| Ensure the sheet is smooth and tucked in tightly | Promotes individual comfort and maintenance of skin integrity |
| Position the waterproof sheet and draw sheet if required across the width of the bed according to surgical procedure. For example, place across the middle section of mattress for gynaecological and abdominal surgeries or at the top of the mattress for head and neck surgeries<br>Tuck under mattress on both sides | Protects the individual and bottom sheet and facilitates ease of removal and replacement if soiled |
| Place top sheet on bed and unfold along length of bed and position evenly over the bed | Allows sufficient amount of sheet at each corner to complete a triangular fold |
| Bring the top edge of sheet to the level of the bed head | Allows sufficient amount of sheet to fold over blanket |
| Allow the remaining sheet to hang over the end of the bed without tucking in | Allows sheet to be folded into bundle |
| Place blanket over sheet and bring to the level of the sheet at the top end of the bed and adjust to allow remaining blanket to overhang equally on both sides and over end of bed | Allows blanket to be folded into bundle |
| Place bedspread over blanket as above, if required | Allows bedspread to be folded into bundle |
| Fold bedspread down 30 cm from top. Fold blanket down over the bedspread and fold sheet over the blanket | Prepares bedding for folding into bundle |
| Move to end of the bed and fold the sheet, blanket and bedspread as above | Prepares bedding for folding into bundle |
| Pick up the sheet, blanket and bedspread at each corner and fold towards the middle of the bed making a 45-degree angle fold | Folds bedding into bundle |
| Pick up the point of the sheet, blanket and bedspread from each side of the bed and fold towards the centre of the bed | Folds bedding into bundle |
| Fold each edge of the bundle towards the centre of the bed and then fold one side of the bundle onto the other | Folds bedding into bundle |
| Fold each end of the bundle into the centre and then fold over again | Folds bedding into bundle |
| Place bed linen bundle at the end of the bed or place on a flat clean surface | Facilitates efficient replacement of bed linen |
| Replace pillowcase and place on bed | Promotes individual comfort |
| Perform hand hygiene | Prevents cross-infection |
| *(Australian Commission on Safety and Quality in Healthcare 2015; Joanna Briggs Institute 2013a; Rebeiro et al 2012)* | |

Commonly, the bed is remade after attention to the individual's daily hygiene needs. It may be necessary to make an occupied bed more frequently; for example, if the bedclothes become wet, soiled or disarranged. When possible, two nurses should work together to make the bed, for the promotion of individual comfort and safety. At times it may be necessary for more than two nurses to make an occupied bed; for example, to help when an individual has multiple injuries. The use of a slide sheet is helpful when moving individuals in and around the bed. It reduces the risk of injury to nurses and to individuals.

Making an occupied bed provides the nurse with an ideal opportunity for communicating with and observing the individual. During the procedure the nurse is able to assess certain aspects of the individual's condition, such as emotional state, skin colour, the presence of pain, the ability to move or distress associated with exertion. Observations should be documented and any deviations from normal should be reported immediately to the nurse in charge. When the condition of individuals permits, they may be able to move themselves during bed making, by using an overhead hand grip.

The suggested procedure for making an occupied bed is provided in Clinical Skill 23.8.

## Making a divided bed

A divided bed is sometimes referred to as a split or traction bed. Making a divided bed involves arranging the upper bedding into two sections. This style of bed is commonly used

| CLINICAL SKILL 23.8 Making the occupied bed | |
|---|---|
| **Review and carry out the standard steps for all clinical skills/interventions** | |
| **NMBA Decision-making Framework considerations:**<br>1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | **Equipment:**<br>Flat sheet × 2<br>Draw sheet (if required)<br>Plastic sheet ('bluey')<br>Pillow case<br>Blanket<br>Bedspread<br>PPE: disposable gloves<br>Soiled-linen container |
| **Skill activity** | **Rationale** |
| Prepare equipment and supplies | Promotes efficient work practice |
| Check bed brakes are engaged and raise the bed height | Maintains safe work practices |
| Assist the individual to roll into a lateral position supported by the bed rail and a second person if required | Provides comfort and maintains safety |
| **Change the bed linen** | |
| Start at the top (head) of the bed, lift the mattress on one side of the bed and free the bottom sheet | Promotes work efficiency |
| Move down to the end (foot) of the bed, lift the mattress and loosen and untuck each layer at the corner | Facilitates ease of removal |
| Fan fold or tightly roll sheet towards the centre of the bed and tuck under individual's back and buttocks | Facilitates ease of retrieval by assistant from under the individual |
| Inspect the mattress surface and smooth creases and remove debris | Maintains skin integrity |
| Place clean folded sheet in the centre of the bed. Unfold towards the top and bottom end of the bed | Promotes efficient work practices |
| Unfold half of the length of the sheet towards the edge of the mattress and position to allow a drop of 30 cm at the top, bottom and side edge of sheet | Ensures sheet is evenly positioned on mattress and allows sufficient amount of sheet to complete fold |
| Tuck in sheet at top and bottom using a triangular fold. Tuck in sheet along side of bed. Roll or fan fold excess sheet towards individual's back and tuck under as able | Ensures sheet remains in place and promotes individual's comfort. Maintains neat appearance |

| CLINICAL SKILL 23.8 Making the occupied bed—cont'd | |
|---|---|
| Inform the individual about the need to move over the linen roll and assist as necessary. Support with the side rail as needed | Encourages participation |
| Remove sheet from under individual and place carefully in soiled-linen container. Bring the clean sheet through from under the individual and pull tightly before tucking in at the top and bottom ends and along the side of the bed | Ensures sheet remains in place and promotes individual comfort. Maintains neat appearance |
| Pull bluey/Kylie or draw sheet through from under individual and tuck in firmly under mattress<br>Ensure the surface is free of creases or folds | Protects bottom sheet and mattress. Maintains individual comfort and skin integrity |
| Support individual to roll back to centre of the bed and assist into clean pyjamas or hospital gown | Promotes comfort and individual wellbeing |
| Replace top sheet, blanket and bedspread | Provides warmth and individual comfort |
| Unfold top sheet towards the top and bottom of the bed and fold over the top sheet at the level of the individual's chin to allow at least 30 cm to cover the chest | Promotes efficient work practices |
| Tuck in sheet at end of bed using a triangular fold. Ensure the individual has sufficient room to move feet and toes | Promotes individual comfort and maintains neat appearance.<br>Promotes skin integrity |
| Unfold blanket as above and tuck in using triangular fold at end of bed | Promotes individual comfort and maintains neat appearance |
| Fold blanket 30 cm from top then fold sheet over blanket | Folded sheet protects blanket from soiling. Promotes individual comfort |
| Replace bedspread and tuck in using triangular fold at end of bed | Promotes individual comfort and maintains neat appearance |
| Fold under the top 30 cm of bedspread at the level of the sheet and blanket | Promotes individual comfort and maintains neat appearance |
| Adjust the bedspread along each side of bed to cover the untucked sheet and blanket | Promotes neat appearance |
| Assist the individual into a position of comfort | Promotes individual comfort |
| Lower bed to a safe height for the individual if appropriate | Maintains individual comfort and safety |
| Remove equipment, dispose of soiled supplies | Prevents cross-infection |
| Check individual has call bell and other personal items within reach before leaving | Promotes safety, individual comfort and functional independence |
| Perform hand hygiene | Prevents cross-infection |
| Document the activity, outcome and the individual's response to the activity in the healthcare record | Maintains legal document of care and interventions provided |
| Verbally report to Registered Nurse any observations that may need review or changes in individual condition that indicate risk for deterioration | Facilitates timely response and intervention |
| Perform hand hygiene | Prevents cross-infection |

for an individual who has traction equipment applied to a lower limb. A divided bed allows the leg in traction to be free from the weight of the upper bedding, while the rest of the individual's body is covered. Because the upper bedding is arranged in two sections, the individual's torso and unaffected leg may be kept covered without interference to the traction apparatus. A lightweight cover may be placed over the leg in traction to ensure adequate warmth.

The foot of the bed is elevated to counterbalance the traction and a fracture board is commonly placed under the mattress to provide a firm and supportive surface. A trapeze or overhead bar should be provided to facilitate the individual's movement. When changing or straightening the bottom sheet, it is sometimes easier and less disruptive for the individual in traction if nurses work from the top to the bottom of the bed, rather than from side to side.

Certain adverse effects may be associated with prolonged bed rest and immobility; it is therefore important that the nurse implements preventive measures to reduce such effects.

## COMFORTABLE POSITIONING

Individuals assume, or are assisted into, the position they find the most comfortable, unless a specific posture is indicated for therapeutic reasons. If an individual is able to move without assistance, the nurse should ensure that the bed pillows are positioned for support and comfort and that there are adequate bedclothes. A call bell and the individual's personal requirements (water jug and tissues) should always be within easy reach. A specific position may be necessary to prevent deformities, relieve pressure and strain, to assist circulation or breathing or to enable various examinations or treatments to be performed. Some individuals will be able to assume a position independently, while others will require the nurse's assistance. The nurse should be aware of measures to promote the individual's safety and comfort and should be able to assist an individual into specific positions. Correct positioning can promote comfort, maintain and help restore body functioning and help to prevent the complications associated with bed rest and immobility.

Key aspects related to positioning:

- To minimise the risk of back strain, nurses are advised to observe the principles of body mechanics and the no-lift policy when assisting individuals to move (see Chapter 28)
- The individual should be provided with information about the importance of correct positioning and the reasons why a specific position may be indicated. To provide some exercise and to promote independence the individual should be encouraged to participate in regular changes of position unless active movement is contraindicated
- All parts of the individual's body should be maintained in proper alignment, with equal weight distribution and the joints in a functional or neutral position. Muscle tension and strain are prevented when the joints are maintained in a slightly flexed position
- Adequate support should be provided to maintain the natural curves of the individual's vertebral column
- To promote safety and comfort, adequate assistance should be obtained to move a heavy, very frail or dependent individual. The individual's body should be handled gently to prevent pain or injury. Appropriate lifting devices are used when necessary to assist individuals into position
- Supplementary equipment should be used when needed (e.g. slide sheets, pillows)
- To prevent prolonged pressure on any area of the body, the individual's position should be changed at least every 2 hours. Each time an individual's position is changed, the nurse should observe the status of the individual's skin to detect any signs of the consequences of prolonged pressure
- The individual should be encouraged to participate in some form of exercise unless this is contraindicated. Exercise helps to promote circulation and muscle tone; if the individual is unable to move independently, all joints should be put through the full range of motion
- There are various positions that an individual may assume, or be required to assume.

### Sitting positions

There are three variations of a sitting position:

1. The semi-upright, or semi-Fowler's, position, in which the individual sits supported by pillows, which are placed against the backrest of the bed (Figure 23.10A)

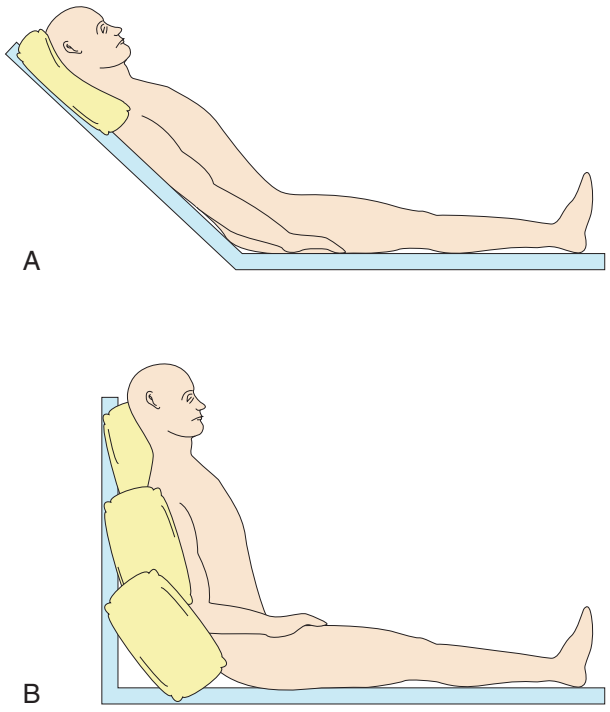


**Figure 23.10** Sitting positions

A: Semi-upright, or semi-Fowler's, position B: Upright, or high Fowler's, position may also be adapted to the orthopnoeic position if the person leans onto an over-bed table

2. The upright or high Fowler's position, in which the individual is in a full sitting position with pillows placed to support the upper body (Figure 23.10B)
3. The orthopnoeic position is an adaptation of the upright or high Fowler's position in which the individual leans onto an over-bed table.

A particular one of these sitting positions may be indicated:

- After abdominal or thoracic surgery. Less tension is exerted on an abdominal wound, therefore comfort is promoted. Drainage by gravity from body cavities is facilitated (e.g. when there has been a drainage tube inserted after surgery)
- To facilitate breathing and reduce dyspnoea. Because the diaphragm is able to flatten, maximal chest expansion is promoted and the risk of lung congestion is decreased. Leaning forwards, as in the orthopnoeic position, helps to increase lung capacity and therefore alleviate distressed breathing
- To facilitate independence, as a sitting position enables the individual to see and participate in ward activities. The activities of daily living (e.g. eating and drinking or using toilet utensils) are also facilitated in this position.

The disadvantages of a sitting position include:

- Difficulty maintaining the position, which may become tiring or uncomfortable
- Difficulty in sleeping
- Prolonged pressure on the buttocks and sacral area, which increases the risk of decubitus ulcers
- Difficulty maintaining a comfortable body temperature; in cold weather it may be hard to bring the bedclothes up to the shoulders, while in hot weather the individual may experience discomfort from the number of pillows required to maintain a sitting position.

## Positions for specific situations

There are a variety of other positions suitable for a range of different circumstances. These include:

- Supine
- Prone
- Lateral
- Sims'
- Coma
- Dorsal/lithotomy
- Genupectoral (knee–chest).

Figure 23.11 illustrates this range of positions.

### Supine position

In a supine position, the individual lies flat on their back with a pillow under their head. Limbs should be positioned in normal alignment. A foot board, firm pillow or other aid may be necessary to maintain the correct position of the feet. A supine position may be indicated:

- To facilitate relaxation of the abdominal muscles (e.g. during medical examination of the abdomen). After abdominal surgery, individuals may be placed in the supine position to relieve tension on the abdominal area
- For several hours after a lumbar puncture. Re-establishment of normal circulation of the cerebrospinal fluid is facilitated, and lying flat helps to prevent a severe headache, which may occur from a change of pressure in cerebrospinal fluid.

The disadvantages of a supine position include:

- Restriction of chest expansion. The lungs are unable to inflate fully, secretions accumulate and congestion of the lungs may occur
- Difficulty may be experienced when toilet utensils are being used. This may lead to incomplete emptying of the bowel or bladder, which may result in constipation or urinary tract infection
- Depression may result from loss of independence and the difficulties associated with activities of living (e.g. eating and drinking). An individual in a supine position may also experience difficulty in seeing, or participating in, ward activities
- Increasing the work of the heart, as lying flat increases venous return (preload).

### Prone position

In a prone position, the individual lies on the abdomen with the head supported on a small pillow and turned to one side. A small pillow may be placed under the abdomen to maintain the natural curve of the spine, or to relieve pressure on the breasts. A pillow may be placed under the ankles to maintain the feet in the correct position and to facilitate slight flexion of the knees (alternatively, the individual may be positioned so that the toes are extended over the end of the mattress.) The individual's arms should be positioned comfortably; for example, flexed beside the head or extended alongside the torso. A prone position may be indicated:

- To relieve pressure on the posterior surface of the body. If an individual has, for example, a burn or decubitus ulcer on the back, a prone position will alleviate pressure on the damaged area and therefore permit healing and relieve pain
- To provide access to the posterior surface of the body for medical examination
- To promote drainage from the respiratory tract. Drainage by gravity is further facilitated when the foot of the bed is elevated.

The disadvantages of a prone position include:

- Restriction of chest expansion. Lung congestion is more probable, as the lungs are unable to inflate fully and secretions accumulate
- Difficulty may be experienced in performing the activities of living; for example, eating, drinking or emptying the bladder or bowel
- Depression from loss of independence and an inability to participate in ward activities.

### Lateral position

In a lateral, or side-lying, position, the individual lies on the side, with the head supported on a pillow. The arms are

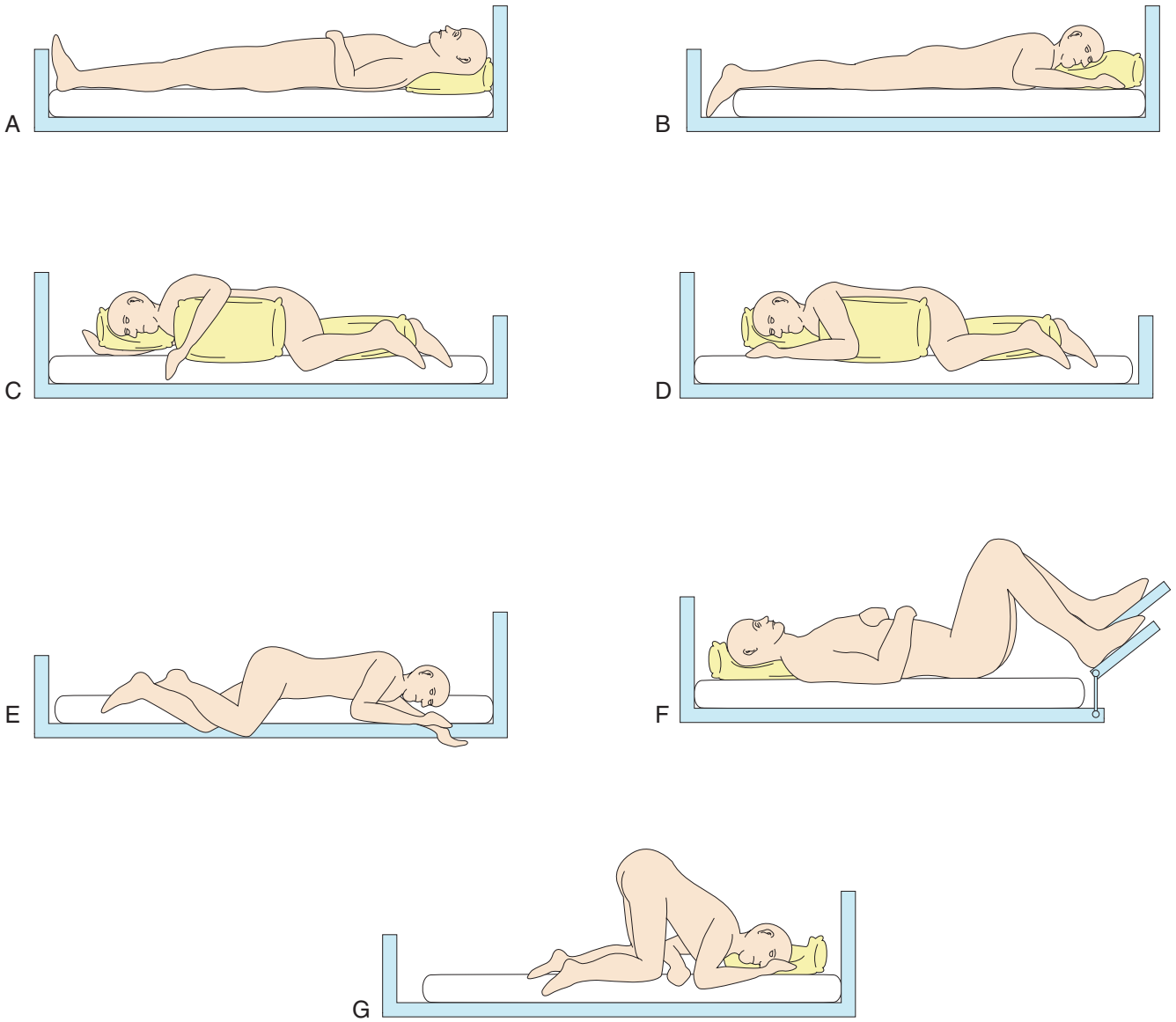


**Figure 23.11** Various positions
A: Supine B: Prone C: Lateral D: Sims' E: Coma F: Dorsal/Lithotomy G: Genupectoral (knee–chest)

placed comfortably in front of the body and, depending on the purpose of the position, the legs may be flexed or extended. If the individual is required to assume a lateral position for a prolonged period, a pillow may be placed along the back to facilitate maintenance of the position. The limbs should not assume a dependent position and may be supported; for example, the upper arm and leg may be flexed and supported on pillows. A lateral position may be adapted for specific purposes; the left lateral position, in which both legs are flexed, is commonly used for examination or treatment involving the rectum. During a lumbar puncture, the individual is positioned laterally with both knees flexed and drawn towards the abdomen, and the head flexed towards the chest. A lateral position may be indicated:

- For treatment or examination involving the rectum (e.g. the insertion of rectal suppositories)
- When a lumbar puncture is being performed. Placing the individual in a lateral position with the spine flexed facilitates entry of the needle between the vertebrae
- To nurse an unconscious individual. A lateral position promotes maintenance of a clear airway by preventing the tongue from falling back and causing obstruction. This position also prevents oral secretions from entering the trachea.

If a lateral position is assumed over a long period, the disadvantages are an increased risk of postural deformities, decubitus ulcers and various other complications associated with the prolonged use of any position.

## Sims' position

In the Sims', or semi-prone, position the individual lies on the side with the upper leg drawn up towards the chest and the buttocks towards the edge of the bed. The lower arm is placed behind the individual, and the upper arm is positioned comfortably in front. The head is supported on a small pillow. Women can adopt this position when having a vaginal examination but the dorsal position is used more commonly for this purpose. The Sims' position is most commonly used for rectal and vaginal examinations and it may also be helpful for women with physical impairments that make the dorsal position uncomfortable or unmanageable (Slater 2012). Some women might find the Sims' position less embarrassing than the dorsal position when a vaginal examination is being performed.

## Coma position

In the coma position, the individual is placed in a position that is basically the Sims' position but without a pillow under the head. Correct positioning of the head is essential to promote a clear airway, and a pillow may impede breathing. A coma position may be indicated temporarily during unconsciousness, such as after an episode of fainting. A clear airway is facilitated with the head on one side, as this prevents the tongue or oral secretions from obstructing the trachea.

If used for an extended time, the disadvantages of the coma position include:

- Restriction of chest expansion. The lungs are unable to inflate fully, secretions accumulate and the risk of lung congestion is increased
- Likely occurrence of postural deformities such as limb contractures. Also, prolonged pressure on the shoulder and arm placed behind the individual may result in damage to the brachial plexus.

Chapter 44 provides information concerning the use of the coma (recovery) position in an emergency situation.

## Dorsal/lithotomy position

In a dorsal/lithotomy position, the individual lies on their back, with knees flexed and apart, and the soles of their feet flat on the bed. Their head is supported on a pillow and their arms are positioned comfortably. A dorsal position may be indicated:

- To introduce a urinary catheter into a female, as the urethral meatus is made visible and accessible
- To perform vaginal examinations or treatments (e.g. insertion of vaginal ointment)
- To administer an enema or rectal suppositories, if the individual is unable to assume a lateral position.

The disadvantage of a dorsal/lithotomy position is that it may be embarrassing for the individual. A lithotomy position may be used during gynaecological surgery or during the birth of a baby.

## Genupectoral position

In the genupectoral or knee–chest position, the individual kneels so that body weight is supported on the knees and chest. The individual is positioned on the knees with the chest resting on the bed and either with the elbows supporting some of the weight, or with the arms extended beyond the head. The head is turned to one side and supported on a pillow. A genupectoral position may be indicated:

- For specific examinations of the lower colon, as the insertion of instruments is facilitated
- During the management of a specific obstetric emergency: if the umbilical cord prolapses, this position prevents the weight of the baby pressing on and obstructing the flow of blood through the cord.

The disadvantages of a genupectoral position include that it is difficult, uncomfortable and embarrassing to maintain; it may result in the person becoming dizzy or faint, and falling.

Whatever position the individual assumes, the nurse should implement measures to promote comfort and safety. Pillows should be arranged for maximum comfort and support and placed so that the individual's head, neck, shoulders and spine are supported at a comfortable angle. The pillow behind the head and neck should be placed so that the individual's head is not pushed forwards. **Supplementary equipment** such as sheepskins may be used to enhance comfort and to relieve pressure. Upper bedclothes should be arranged for maximum covering and warmth and tucked in loosely to allow room for movement. A foot board or firm pillow may be placed in the bed to help sustain the individual's position, and to help maintain the feet in a neutral position. When a person is required to assume a specific position for examination or treatment purposes, the nurse should ensure adequate draping and privacy to reduce embarrassment and promote comfort.

It is also important to ensure that the individual is correctly positioned when sitting in a chair. A variety of chairs is available and a style should be chosen to meet the individual's needs. A chair should be comfortable and support the individual adequately. Specially designed chairs may be indicated for some individuals; a chair with an elevated seat is used after hip surgery, to prevent strain on the joint. When sitting in a chair, the individual's spine and buttocks should be well aligned to the contours of the chair. Both feet should be flat on the floor, or (at times) it may be necessary to support one or both feet on a footstool or chair. Limbs should be supported in a position of comfort with pillows used when necessary; supporting an arm with an intravenous infusion in progress or a plaster cast are two such examples. The individual should be adequately dressed and light coverings should be provided to promote warmth and privacy.

## Summary

It is the role of the nurse to ensure that individuals have their hygiene needs met, are well groomed and, as far as is possible, free of physical discomfort and psychological stress. Nurses must be competent in their responsibilities and practices in assisting individuals with all areas of hygiene, in bed-making procedures and the use of supplementary equipment, and in the correct positioning of individuals to ensure the best possible level of comfort. Ensuring that individuals are clean, fresh and comfortable promotes relaxation, rest and sleep, which are essential for healing and wellness. The nurse who successfully assists individuals to meet all hygiene and comfort needs plays an essential role in promoting their physical and psychological wellbeing.

### DECISION-MAKING FRAMEWORK EXERCISE 23.1

Isobel is a student Enrolled Nurse currently undertaking clinical placement at an aged care facility. She is working alongside a Registered Nurse who is indirectly supervising Isobel during her shift. She is caring for 83-year-old Amy who is scheduled to attend a specialist appointment at the local hospital this morning at 1100 hours. Isobel needs to ensure Amy is ready for her outpatient appointment. It is 0830 hours and Amy has not showered or dressed, nor has she received her medications or breakfast.

Amy has type 2 diabetes. Isobel has completed the morning blood glucose level, which was 4.0 mmol, and has been informed that the transport for Amy will arrive at 1000 hours. Isobel knows that Amy will require her breakfast and medications prior to attending her appointment. However, she also knows that Amy needs to be dressed and packed and ready for her transport for her appointment. Isobel has not completed the medications unit.

Using the decision-making framework:

1. What should Isobel consider when prioritising her tasks for the morning?
2. Does Isobel have the required level of education and supervision to make these decisions?
3. Is prioritising her tasks without direct supervision within Isobel's scope of practice?

## Review Questions

1. List at least four (4) different factors that might influence an individual's hygiene practices.
2. When assessing an individual, what should the nurse observe in relation to the individual's skin, hair, nails, mouth, eyes, ears and nose?
3. List the assessment factors that influence whether an individual can be bathed in bed or showered.
4. What factors must a nurse take into consideration when showering an individual with a urinary catheter, intravenous drip or a plaster cast on a limb?
5. What items would a nurse need to gather when preparing an individual for a bed bath?
6. What would determine the nurse's choice to give an individual special mouth care or a mouth toilet?
7. List at least five (5) infection control principles that should be implemented by the nurse when making a bed.
8. How is the individual positioned when lying in each of the following positions: supine, prone or lateral? Give an example of when each of these positions might be used.
9. How is the individual positioned when sitting in each of the following positions: semi-upright, upright or orthopnoeic? Give an example of when each of these positions might be used.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australian Government, Department of Health and Ageing: www.health.gov.au

http://www.worksafe.com.au/

http://www.australia.gov.au/directories/australia/safeworkaustralia

CHAPTER

24

# Medication administration and monitoring

*Heather Redmond*

## KEY TERMS

absorption
allergic reaction
biotransformation
chemical name
generic name
trade name
compliance
distribution
drug metabolism
enteral
excretion
first-pass metabolism
intramuscular injection
intravenous injection
medication action
needleless intravenous system
parenteral
pharmacodynamics
pharmacokinetics
pharmacology
poisons Regulations
poisons schedules
protein bound
Quality Use of Medicines (QUM)
subcutaneous injection
therapeutic medication monitoring
topical

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Identify the different formulations of medications
- Identify a medication by generic and trade names
- List the medication administration routes
- Discuss factors affecting medication absorption
- Define 'first-pass metabolism' and discuss its impact on medication dosage
- Discuss the role of plasma proteins in medication distribution
- Compare enzyme induction and enzyme inhibition
- List the organs involved in medication excretion
- Discuss the reasons for therapeutic medication monitoring
- Define medication action, desired outcome, side effects, toxic effects, allergic reaction and medication interactions
- Discuss the legal and other responsibilities of the Enrolled Nurse (EN) regarding medication administration
- Demonstrate an ability to correctly calculate medication dosages for administration
- Demonstrate knowledge of the correct preparation and administration of subcutaneous, intramuscular, intradermal and intravenous injections; topical skin preparations; oral preparations; ophthalmic, otic and nasal drops; vaginal instillations; rectal preparations; and inhalers
- Demonstrate an understanding of the actions of the different medication groups in order to monitor medication effectiveness
- Show an understanding of safe handling of hazardous substances
- Discuss the importance of discharge planning and education in individual compliance with medication therapy

## CHAPTER FOCUS

Medications are an important part of many treatment regimens. It is the most common treatment given in healthcare settings, and as a result a higher incidence of medication errors and adverse medication reactions (ADR) occur (ACSQHC 2013). Administering medication is a nurse's key responsibility and should be treated with the importance it deserves. It is therefore vital for the nurse to have both the knowledge and the skills to administer medications safely and accurately (Brotto 2013). Medication administration offers nurses the opportunity to increase their knowledge and skills, to observe the individual for expected and unexpected actions and to ensure that individuals have been adequately educated about medications. The topics included in this chapter provide the nurse with the foundations to safely and competently administer medications to individuals.

## LIVED EXPERIENCE

Mum lives with us at the moment as she has a lot of health issues. I have been going with her to all her doctors' appointments lately. She sees a cardiologist for her heart failure, her own GP who looks after her diabetes and anything else that crops up, a gastroenterologist for her Crohn's and the oncologist for her chronic leukaemia, so yes, I am worried about all the medications she is on. I know some of the medications she is taking are for side effects she gets from taking other medications. It all gets a bit confusing when I look at all her tablets, as I am sure it is for her. I think, does she really need to take all of these medications, and do the other doctors she sees know what she is taking? Mum doesn't seem to tell them much when she goes to her appointments. I had to point out to one doctor what she was taking, as the doctor didn't know.

**Mary, daughter of Grace, who is 82 years old**

# PHARMACOLOGY

'Pharmakon' is the Greek word for 'drug', and **pharmacology** is the study of the actions, uses and adverse effects of drugs on living systems (Bryant & Knights 2014). Drugs and poisons are controlled substances defined by the *Drugs, Poisons and Controlled Substances Act 1981* and the Drugs, Poisons and Controlled Substances Regulations 2006. The term drugs and poisons are defined together as prescription medicines; pharmacy-only medicines; drugs of dependence; chemicals for household, industrial and chemical use; and veterinary medicines (Bryant & Knights 2014). The definition of a 'drug' is any substance that produces a biological effect when introduced into the body (Rang et al 2012). The term drug can be further divided into medicinal drugs (or medications), which are substances used in the treatment, prevention, diagnostic, curative and health maintenance; and non-medicinal drugs (or social drugs). Social drugs are substances for recreational use and may include caffeine, alcohol, nicotine, cannabis, heroin and cocaine. The distinction between the two is not always clear cut, as some non-medicinal substances can be used in a medicinal way (e.g. caffeine is included in some preparations to treat migraine) and some medicinal substances can be used in non-medicinal ways (e.g. opioid analgesia such as codeine phosphate may be used recreationally for its mind-altering properties). In the general community, however, the term 'drugs' tends to be associated with non-prescription or illicit substances, and 'medications' is the common term used for prescribed drugs that have the intention of producing a therapeutic effect (Rang et al 2012). The term 'poison' as referred to under the definition of drugs, however, is 'any substance that harms the body or causes death' (Bryant & Knights 2014). Medicinal medications given at high doses may also have similar effects to a poison.

Pharmacology can further be subdivided into **pharmacokinetics**, which is the way the body affects the medication during absorption, distribution, metabolism and excretion, and **pharmacodynamics**, which are the effects of the medication on the body (e.g. therapeutic effect and side effects) (Bryant & Knights 2014). Before considering these two areas of pharmacology, it is important to consider the process for naming medication, as well as medication formulations and administration routes.

## Medication names

The nurse should be aware that each medication has various names—chemical, generic and trade (brand or proprietary) names.

The **chemical name** provides an exact description of the medication's chemical composition, which is usually a temporary name until the generic name is assigned (Broyles et al 2013).

The **generic name** is given by the manufacturer who first develops the medication; it is then approved by the medicines regulatory authority (Bryant & Knights 2014). Even generic names are not standardised and nurses should be careful when using textbooks published in countries other than the one where they are practising nursing. Examples of different names used in different countries include adrenaline (Australia) = epinephrine (US), pethidine (Australia) = meperidine (US),

and paracetamol (Australia) = acetaminophen (US). Generic names are always written with a lower-case first letter (Bryant & Knights 2014). Occasionally a medication's generic name may describe its chemical compositions, such as with lithium carbonate or potassium chloride.

Quality Use of Medicines (QUM) recommends that medications be prescribed using the generic rather than trade name (e.g. metronidazole rather than Flagyl); however, Atik (2013) highlighted that not all prescribers adhere to this requirement. Generic prescribing avoids confusion, as some trade names are similar, and may also reduce the cost of the medication for individuals as they can choose a cheaper alternative brand name (Bryant & Knights 2014).

The **trade (brand or proprietary) name** is the name under which a manufacturer markets a medication and is copyrighted to that particular medication. Others are restricted from using the trade name; therefore, there are multiple names for the same generic medication. Examples include the diuretic frusemide, marketed as Urex, Lasix, Frusid and Uremide, and antibacterial agent amoxicillin marketed as Alphamox, Amoxil, Cilamox and Maramox. Trade/brand names are written with an initial upper case letter. Individuals may wish to purchase a cheaper brand and identification of the cheaper medication under a trade name is made easier using the generic name (as costs may vary dramatically between brands). In recent times, the Pharmaceutical Benefits Scheme (PBS) has allowed brand substitution for tablets of the same dose, unless the prescriber has ticked 'brand substitution not permitted' on the prescription form (Bryant & Knights 2014). While brand substitution can save the individual money, it can also cause confusion as the medication may appear different in colour (e.g. 40 mg frusemide tablets can be white (Uremide) or yellow/cream (Lasix)), shape and packaging, which could result in the person taking more than one form of the same medication. When changing medication brands it is important to consider the bioavailability of the new brand compared to what the individual has been taking, as some medications with the same generic name have been shown to have significant differing pharmacological effects (Broyles et al 2013). The prescriber may tick the box on the prescription 'Brand substitution not permitted' if it is known that a different brand name medication with the same generic name has a different chemical composition to other cheaper brand names (Bryant & Knights 2014). See Case Study 24.1 regarding brand substitution.

## Classification

Medications are allocated to a class or category, which have similar characteristics or actions on specific body systems. Antihypotensives have the primary action of reducing blood pressure and are divided into six categories: central and peripheral antiadrenergic agents, beta-adrenergic blockers, vasodilators, ACE inhibitors, angiotensin II antagonists and calcium channel blockers (Tiziani 2013). The medication prescribed will depend on the individual's symptoms and the desired effect, frequency required and cost. A combination of medications in the same class may be chosen to control a person's blood pressure (an ACE inhibitor and a calcium channel blocker; amlodipine and benazepril) or from another medication class (an ACE inhibitor and a diuretic: fosinopril/hydrochlorothiazide) (Tiziani 2013). A medication may also be classified into more than one class; for example, aspirin is classified as an analgesic, antipyretic, anti-inflammatory and anti-platelet (Brotto 2013).

### CASE STUDY 24.1

Mary is a 75-year-old woman who presents to hospital for a hip replacement. She has a history of atrial fibrillation, hypertension, gastro-oesophageal reflux disease and type 2 diabetes, for which she is stable on her current medication regimen. She is a widow and lives with her son. Mary is ambulant and self-caring with no obvious impaired cognitive function. Mary's medications are metformin 500 mg BD (twice daily), glibenclamide 5 mg mane, digoxin 125 micrograms mane, atenolol 50 mg mane, enalapril 5 mg mane, omeprazole 20 mg nocte and warfarin usually 5 mg nocte. Mary states that the last few times she had scripts filled she was asked if she would like the cheaper alternative, when available, and was reassured that some of the actual medicine remains the same. However, warfarin could not be substituted. Mary was happy about the reduced cost of some of the medicines but remains concerned about different brands being effective and safe.

1. When is brand substitution inappropriate? (Give medication- or individual-related reasons.)
2. List some steps you could take to avoid confusing Mary if she changes the brand of her medications now and in the future.

## Quality use of medications

In 1985, the World Health Organization (WHO) called a Conference of Experts on the Rational Use of Drugs as it found that inappropriate prescription and use of medications was occurring globally. WHO called on all healthcare professionals and governments to assist in developing their own National Medicinal Drug Policy (Department of Health 2014). Australia responded to this by instituting the National Medicines Policy (NMP) in 1999. This policy focused on ensuring that health outcomes were improved for all Australians, to be achieved through access to and wise use of medicines (Department of Health and Ageing 1999).

There are four central objectives of the NMP: timely access and cost effective medications for Australians; meeting quality, safety and efficacy in medicine standards; Quality Use of Medicines (QUM); and that a responsible and viable medicines industry is maintained (Department of Health and Ageing 2011). This will ensure that medications that are prescribed, purchased over the counter or complementary are appropriate, safe and effective, and are used to promote the health outcomes of individuals (Brotto 2013).

The NMP definition of **Quality Use of Medicines** (QUM) is that medications are selected wisely; are appropriate, taking into consideration the individual and their health concerns as well as factors such as risks, benefits, alternative therapies, comorbidities, regimen, monitoring and associated costs; and are used safely and effectively to optimise health outcomes. The Australian National Strategy for QUM has set guidelines for the approach and principles required to achieve QUM in Australia. In addition, a QUM Strategic Action Plan was developed from the National Strategy for QUM which is reviewed biannually, and a plan developed to assist all Australian healthcare stakeholders to incorporate QUM strategies into medication practices (Department of Health and Ageing 2002). QUM involves the government and policy makers deciding about the supply of a medicine and the subsidy applied. It is important that the QUM is a team approach encompassing those that prescribe, dispense and administer medicines as well as individuals who take the medicine (Brotto 2013).

## The prescriber's role

Medications are primarily prescribed by a medical officer; however, veterinarians, dentists, pharmacists and nurse practitioners (NPs) can prescribe within a specific scope of practice (Brotto 2013). In addition, hospital policy may allow for Registered Nurses (RNs) to 'nurse initiate' medications from an approved list to certain hospitalised individuals (Brotto 2013). The person prescribing the medication must follow the QUM objectives to ensure the medication is appropriate and safe for the individual taking the medication.

## The pharmacist's role

Pharmaceutical companies make medications in their specific forms, which are ready for dispensing to community and hospital pharmacies. Prescribed medications are prepared and dispensed by the pharmacist for community and hospitalised individuals (Brotto 2013). Compounding pharmacists also make special orders for medications by mixing compounds and/or solutions. Hospital pharmacists may mix up intravenous (IV) additive solutions (e.g. total parental nutrition TPN) for individual medication requirements. When dispensing, the pharmacists needs to ensure that the medication is suitable for the individual, including looking for any contraindications or interactions. The correct labelling of the right dosage and number of tablets is also part of the pharmacist's role. In many acute settings the hospital pharmacist also checks each individual's medication chart to ensure accuracy and the correct medication and dosage is prescribed. Amendments may be made by the pharmacist. Healthcare workers and individuals can access the pharmacist for a valuable resource to provide information relating to the prescribed medication including action, side effects, interactions and incompatibilities (Brotto 2013).

## The nurse's role

Nurses have several roles in prescribing (NP only) and administering medications. Nurses require knowledge of the rationale, as well as the therapeutic and non-therapeutic effects of the prescribed medication, adverse drug reactions (ADRs) and contraindications (Brotto 2013). This enables nurses to ascertain the appropriateness of the medication they are about to deliver and be able to provide individual and/or family education about specific medications and their effects. Administering medications includes the responsibility of assessing individuals prior to administration, following the seven rights, and evaluating the therapeutic effectiveness and outcomes after administration (Brotto 2013).

## The consumer's role

The individual who has been prescribed the medication has a role in adhering to the prescribing regimen, having regular health reviews with the medical officer, and reporting any health concerns and side effects associated with the medication being taken. Information regarding any alternative therapies being used should be discussed, such as naturopathy, homeopathy or over-the-counter medications (OTC) to ensure they do not interact with the prescribed medications being taken.

Medication management in residential aged care facilities (RACF) falls under the *Aged Care Act 1997*, Quality of Care Principles, Residential Care Standards and the Accreditation Standards. The approach in QUM in RACF for the use and management of medications is outlined in *The Guiding Principles for Medication Management in Residential Aged Care Facilities* (2012). The QUM in RACF approach means that suitable medications are chosen which treat illness and maintain health, the necessity of the medication is considered and that medications are used safely and effectively.

Medications accessed OTC are non-prescription medications and are generally used for short-term, self-limiting illnesses such as headache, heartburn and constipation. They also include vitamins, minerals and herbal medications and remedies which, unfortunately, many people consider to be safe because they are natural. However, herbal medications and remedies do interact with prescription medications (e.g. St John's wort interacts with warfarin, increasing warfarin's metabolism and decreasing its therapeutic effect) and non-prescription medications (e.g. aspirin and ibuprofen) can cause gastrointestinal bleeding and must only be taken at recommended doses (Bryant & Knights 2014).

### CRITICAL THINKING EXERCISE 24.1

An 85-year-old woman was admitted to the medical ward after presentation to the emergency department in acute pulmonary oedema. On arrival at the medical ward you are completing her admission and discharge plan when she tells you that when she has something special on in the day she does not take her Lasix as it makes her go to the toilet too often. She had her granddaughter's wedding over the weekend, so had not taken the medication for 3 days. Is this quality use of medications and how would you respond?

## Medication formulations and administration routes

Medications are given by three general methods: **enteral**, **parenteral** and **topical** administration. Enteral administration is when medication enters into the gastrointestinal tract. Parenteral medication administration involves injection into the body tissues. Topical administration includes medication applied to the skin, mucous membranes and intraocularly (Brotto 2013). A single medication may be available in a variety of forms (Table 24.1, Figure 24.1) and administered via several different routes.

Enteral administration of medications include:

- Oral (PO)—the most convenient and least expensive way of administering medications as most are available in oral preparations (Bryant & Knights 2014). Most

**TABLE 24.1 | Medication forms**

| | |
|---|---|
| Capsule | Gelatine container enclosing a medication in liquid, powder or granule form |
| Tablet | A medication mixed with a base compound and compressed into a variety of shapes. Tablets are sometimes coated, which delays release of the medication until the tablet reaches the intestine. Tablets are coated if the medication could cause gastric irritation or if it would be destroyed by gastric juice. Another form of tablet is 'slow release' (or sustained release), which contains a medication that is released over a prolonged period |
| Granules | Small rounded pellets that are usually coated |
| Lozenge | Small tablet containing a medicinal agent in a flavoured fruit or mucilage base, which dissolves in the mouth to release the medication |
| Mixture | Aqueous vehicle in which medications are dissolved or suspended |
| Suspension | Liquid in which insoluble particles of a medication are dispersed |
| Elixir | Sweetened, flavoured alcoholic solution containing a medication |
| Linctus | Sweetened syrup containing a medication |
| Tincture | Alcoholic solution containing a medication |
| Emulsion | Mixture of oil and water containing a medication |
| Syrup | Concentrated sugar solution containing a medication |
| Cachet | Envelope of rice paper that encloses a medication |
| Injection | Sterile aqueous or oily solutions and suspensions containing a medication, which are administered parenterally |
| Suppository | Solid preparation containing a medication, which melts when inserted into the rectum |
| Pessary | Solid preparation containing a medication, which is administered vaginally |
| Drops | Aqueous or oily solution containing a medication. Drops may be instilled into the eye, ear or nose |
| Cream | Aqueous or oily emulsion for topical application |
| Ointment | Semi-solid greasy preparation for topical application |
| Paste | Similar to ointment but contains a high proportion of powders. Pastes have a very stiff consistency and will adhere to lesions at body temperature |
| Liniment | Oily or alcoholic preparation for topical application |
| Paint | Liquid preparation for application to the skin or mucous membranes |
| Lotion | Aqueous, alcoholic or emulsified vehicle for topical application |
| Powder (dusting) | Medicated substance for topical application |

*(Adapted from Bryant & Knights 2014; Broyles et al 2013; Brotto 2013)*

**Figure 24.1** Forms of oral medications
*(Potter et al 2013)*

medications are not absorbed until they reach the small intestine (Rang et al 2012), and effects may not be seen for 30 to 45 minutes after administration. Disadvantages may include slow absorption, irritation to the gastric mucosa, possible unpleasant taste and inability/decreased absorbency in the critically ill (as the gut may not be functioning). This route is not suitable in those who are vomiting or are not able to take oral medications (e.g. unconscious person, child, person with dementia) (Broyles et al 2013). Oral liquid medications are administered via a specialised oral syringe. The oral syringe is orange in colour to differentiate between syringes used for parenteral medication delivery. The tip does not allow for a needle to be attached, therefore ensuring there is no risk of mistakenly administering oral medication via the parenteral route.

- Orogastric/nasogastric/percutaneous endoscopic gastrostomy (OG/NG/PEG)—this route is generally used for oral medications when the individual already has the tube in place for other reasons. (See Chapter 30 for information about nasogastric and PEG tubes.) An orange oral syringe or catheter tip syringe would be used to administer the medication.

Parenteral administration of medications include:

- Intravenous (IV)—medication delivery via the IV route is rapid, as it is administered directly into the blood stream (Rang et al 2012). The IV route may be accessed for therapeutic or diagnostic purposes (e.g. serum blood levels). Nurses may care for individuals receiving IV medication therapy as inpatient or outpatients, or in their homes (Broyles et al 2013). The individual must be observed and assessed more closely to detect ADRs as these may occur more quickly with IV medication administration (Brotto 2013). In preparing and administering IV medication infection control principles are followed, maintaining asepsis and a non-touch technique to prevent infection occurring (Brotto 2013). Advantages include route of choice in an emergency situation, when other routes are not appropriate (e.g. the unconscious person), volume and dosages can be titrated more closely and constant blood levels can be maintained (Rang et al 2012). Disadvantages include increased risk of ADRs, local reactions such as pain/discomfort, irritation, risk of infection, more costly than other routes and unsuitability for self-administration.
- Intramuscular (IM)—the medication is injected into the muscle tissue, from which it is absorbed into the bloodstream. Medication absorption IM is generally fast because of the vascular nature of muscle. However, this can be slowed by the addition of oily substances (termed a depot preparation). IM injection is suitable for medications that are irritating or painful, as this is minimised when the medication is injected into a large muscle (Broyles et al 2013).
- Subcutaneous (subcut)—medications are injected into fatty, subcutaneous tissue underlying the dermis and overlying the muscle. This route is used more frequently than the IM route (Broyles et al 2013). Medication absorption subcutaneously is relatively slower than with IM injection because of the poor blood supply in subcutaneous tissue (Brotto 2013). One advantage of the subcutaneous route is the suitability for medications requiring a slower absorption rate, such as insulin. Disadvantages include unpredictable absorption rates, may cause bruising and only small volumes (≤ 1 mL) can be given (Brotto 2013).
- Intradermal (ID)—medications are administered into the dermis (under the epidermis). Medications are not commonly given via this route. Substances such as local anaesthetics are sometimes administered intradermally and this route is used for allergy testing; for example, Mantoux tests.
- Intrathecal (IT)—injections are given directly into the central nervous system (CNS) via the cerebrospinal fluid, bypassing the blood–brain barrier. (See Chapter 35 for an explanation of the blood–brain barrier.) Epidural injections are given into the space between the arachnoid mater and the dura mater and are often used as regional anaesthetics during surgical procedures involving the pelvic region (Rang et al 2012).
- Intraarticular—injections are given directly into articular joints. Examples include corticosteroids to reduce joint inflammation and radio-opaque contrast to view structures. Disadvantages to this route are that it can be painful and is often required to be done under radiological imaging to ensure that it is administered into the joint cavity.

Topical administration of medications include:

- Cutaneous—application of medication to the skin where a local effect is desired. Preparations include antiseptics, creams and lotions. Some preparations have systemic as well as local effects, as small amounts may be absorbed systemically (Broyles et al 2013).

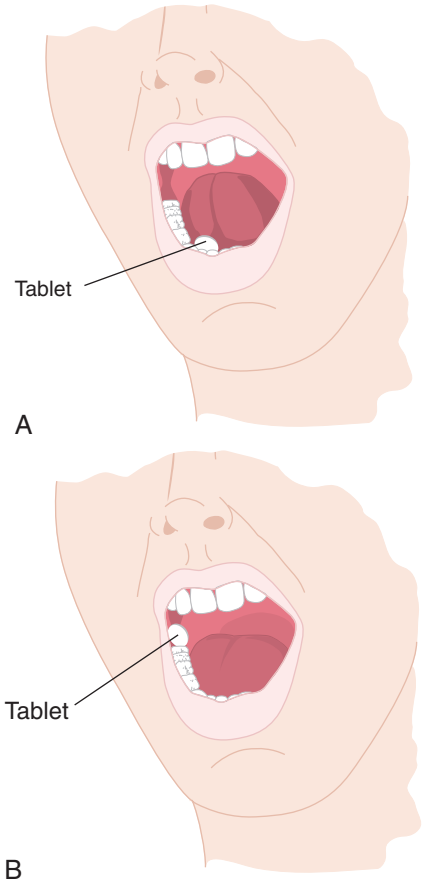


**Figure 24.2** A: Sublingual administration of a tablet B: Buccal administration of a tablet
*(Potter et al 2013)*

- Transdermal—medications given via this route require a steady rate of delivery of the medication over a longer period of time. Transdermal preparations are lipid soluble medications and include hormones, antiemetic agents, antianginal agents and nicotine patches (Rang et al 2012).
- Mucous membranes—some medications administered via this route have both local and systemic effects. Medications designed to be absorbed through the mucous membranes can be administered:
- Sublingually (subling) (Figure 24.2A)—even though medication is placed into the mouth and under the tongue (e.g. sprays, lozenges) the medication is absorbed directly into the systemic circulation and does not pass though the stomach. Any subling or buccal medication swallowed is usually metabolised quickly by gastric acid (Rang et al 2012)
- Buccally (Figure 24.2B) between the inner linings of the cheeks
- Intranasally via aerosol or drops instilled in the nose, where the medication is rapidly absorbed through the vascular network in the nasal tissues
- Rectally (PR), where it may have both local (evacuation suppositories) and systemic (antiemetic) effects (Brotto 2013). Advantages include its suitability in individuals who are nauseous or vomiting, have swallowing problems, are unconscious or have severe inflammatory bowel disease. The slow absorption of anti-inflammatory preparations makes this route ideal for overnight analgesia administration, unlike oral preparations where the effects have often worn off by the following morning. Disadvantages include suppositories causing anal or rectal irritation, especially with prolonged use, self-administration may be difficult for some individuals and the presence of faecal matter in the rectum interferes with medication absorption, making it erratic and unpredictable
- Vaginally (PV)—preparations include pessaries, foams, jellies or creams inserted into the vagina with a special plunger (Brotto 2013). One advantage of this route is that the individual is often able to self-administer. The onset is slow and effects are generally local
- Conjunctivally is the ophthalmic administration of aqueous solutions and ointments into the eyes. The disadvantage of solutions is that corneal contact time is brief, and ointments cause blurred vision (Rang et al 2012).
- Otic—medication is placed into the ear via drops or creams.
- Inhalation—the large surface area and blood flow in the lungs facilitates rapid absorption (Rang et al 2012). Agents given via this route include oxygen, anaesthetic agents, mucolytic agents and bronchodilators. A proportion of inhaled medications will reach the systemic circulation and may cause ADRs (e.g. salbutamol causing tremor) (Rang et al 2012).
- Intraocular—a disc is inserted into the eye much like a contact lens and the medication is released over a period of time.

### CRITICAL THINKING EXERCISE 24.2

A 72-year-old woman, who has been recently diagnosed with throat cancer and is palliative, has been admitted to your ward for implementation of a pain management plan. The medical officer has written up for PRN oxycodone hydrochloride 10 mg oral 4–6 hourly. The patient has difficulty swallowing and is not eating any food. What are other route options for delivery of this medication? What nursing action would you implement?

## PHARMACOKINETICS

Pharmacokinetics is the study of the way the body affects the medication over time and relates to the processes of absorption, distribution, metabolism and excretion. Figure 24.3 simplifies this process.

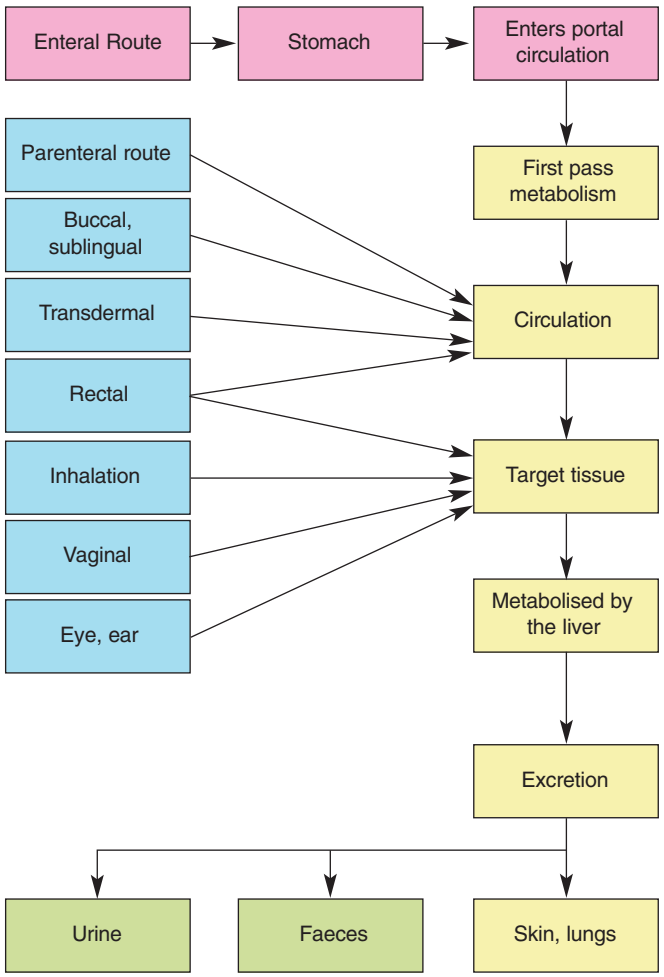


**Figure 24.3** Pharmacokinetics simplified

## Absorption

**Absorption** is the movement of a medication from the site of administration into the bloodstream where it is carried to the site of action (Broyles et al 2013). The rate and amount of medication absorbed depends on different factors including:

- Route of administration: affects the speed with which a medication takes effect. This is important for all medication routes as most medications must enter the blood stream before they exert their action (Rang et al 2012). An oral medication has to undergo absorption in the gastrointestinal tract before it reaches the bloodstream. It is therefore slower acting than if the same medication were given by injection. A medication given by injection bypasses the gastrointestinal tract. The fastest effect for medication occurs via the IV route, because the medication is injected directly into circulating blood.
- Dissolvability of the medication: how fast an oral medication dissolves depends on its form or preparation, as a liquid form will be more readily absorbed than in a tablet or capsule form (Brotto 2013). If the tablet is enteric-coated, it will be prevented from breaking down in the stomach, therefore delaying absorption of the medication until it reaches the intestine (Brotto 2013).
- Food: can delay the passage and therefore absorption of some medications. These medications may need to be administered on an empty stomach or after meals (Broyles et al 2013). Some IM or subcutaneous are suspended in an oily substance or fluid which provides a sustained release of the medication from the site of injection (Broyles et al 2013).
- Degree of blood flow to the area: a medication will be absorbed more rapidly from a highly vascular area (as with IM injections) and less rapidly from poorly vascularised areas (such as fat in subcutaneous injections). In addition, heat or massage can increase the absorption rates of the medication in IM and subcutaneous injections (Broyles et al 2013).
- Solubility of the medication: to be effectively absorbed across the cell membrane, a medication should be lipophilic (fat loving). Acidic medications are readily absorbed in the stomach, while alkaline medications are better absorbed in the intestine. However, because most medications pass rapidly through the stomach, absorption mainly takes place in the intestine (Broyles et al 2013).
- Body surface area: the larger the body surface area the faster the medication will be absorbed. The small intestine has a larger surface area than the stomach and therefore medications will be absorbed at a faster rate (Brotto 2013). Gastric motility plays a large role in the rate of medication absorption; for example, medications can affect motility by increasing (metoclopramide) or decreasing (codeine) the speed of motility and therefore affecting the absorption time of other medications (Rang et al 2012).

## First-pass metabolism

Enteral medications are absorbed from the gastrointestinal tract, enter the hepatic portal system where they reach the liver and either pass through unchanged (in parent form) or are metabolised (Bryant & Knights 2014). During this hepatic **first-pass metabolism**, **biotransformation** occurs where liver enzymes break down the medication, resulting in reduced amounts of the medication entering the systemic circulation (Rang et al 2012). Biotransformation occurs primarily in the liver; however, the lungs, kidneys, blood and small intestine also play a role in metabolising some medications (Brotto 2013). Bioavailability is the percentage of the unchanged medication that reaches the systemic circulation for distribution (Rang et al 2012). Medication delivered via the IV route has 100% bioavailability as it is delivered directly into the blood stream because it bypasses first-pass metabolism. Some medications are better given via the parenteral route as they are almost entirely metabolised by digestive system if given orally. An example of this is glyceryl trinitrate (Anginine), which is used to treat angina pectoris. If given

orally, it is ineffective as it is destroyed by the hepatic first-pass metabolism. Given sublingually, the medication is absorbed through the oral mucous membranes into the blood stream and is able to reach the target organs to exert its therapeutic effect (Rang et al 2012). First-pass metabolism is also the reason why oral doses and parenteral doses are not equal—giving medications via the parenteral route means that smaller doses can be given to achieve the same therapeutic effect.

## Distribution

After the medication has been absorbed into the systemic circulation, it will then be distributed to specific tissues for medication action to occur. The chemical and physical properties of the medication affect the **distribution** rate and delivery of the medication as well as the physical makeup of the individual consuming the medication (Brotto 2013). The blood plasma contains a variety of plasma proteins (e.g. albumin, corticosteroid-binding globulin (CBG) and glycoproteins), which are able to bind to medications to produce a medication–protein complex. Medication molecules are transported in blood either bound to these proteins or freely in the plasma. Molecules that become **protein bound** (i.e. bind loosely to blood proteins) cannot elicit a pharmacological effect; however, there is always some unbound (or free) medication that is available to bind with receptors to exert an effect (Broyles et al 2013). Equilibrium exists between the bound and unbound medication and when the unbound plasma levels of the medication diminish the bound medication is able to be released from the plasma protein and become available to bind with target tissues (Broyles et al 2013).

If an individual has a condition which causes decreased levels of plasma proteins (e.g. liver disease, malnutrition or extensive burns) a greater portion of the medication remains unbound and is available to bind to the tissue, increasing the effects of the medication and therefore requiring a decrease in the dose. Conversely, if there is an increased level of plasma proteins (e.g. in a individual who has multiple myeloma) this will cause more of the medication to be bound, reducing the availability of the medication to bind with receptors. This will decrease the medication's effectiveness, and therefore requires an increase in dose to exert the required effect.

Medications may also compete for the same binding site on the plasma protein when more than one medication is administered concurrently. The medication with the higher affinity (or greater attraction) will be bound and displace the other(s) from the protein-binding site, resulting in an increase in the plasma concentration of the now unbound medication (Broyles et al 2013). For example, aspirin will displace warfarin (an anticoagulant) from the plasma protein, resulting in increased levels of unbound warfarin and potentially increasing the risk of haemorrhage (Broyles et al 2013). The effect is the same as giving an increased dose of the medication.

The blood–brain barrier of the CNS is generally very selective and allows only fat-soluble medications to pass through it (Brotto 2013). However, some conditions alter the permeability of the blood–brain barrier (e.g. meningitis renders the blood–brain barrier permeable to penicillin, which it would otherwise be unable to pass through). The placental barrier is not as effective as the blood brain–barrier, and many fat soluble and non-fat soluble medications are able to cross the placenta to the fetus, potentially causing significant damage, including congenital malformations (Brotto 2013). Unless absolutely necessary, medications should not be taken during pregnancy and especially not during the first trimester, when organ development in the fetus occurs.

## Metabolism

**Drug metabolism** is the process of chemical modification of a drug and is usually carried out by enzymes. For most drugs metabolism results in the formation of a more hydrophilic (water-loving) compound or metabolite so that it can be readily excreted from the body via the kidneys (Bryant & Knights 2014). **Biotransformation** is the process of detoxification, degradation and removal of biologically active chemicals by enzymes (Brotto 2013). This is important in inactivating medication before it accumulates and produces a toxic effect (Broyles et al 2013). These enzymes are primarily produced by the liver; however, some are also found in plasma, lungs, kidneys and intestines in smaller amounts than produced by the liver (Brotto 2013). In some circumstances the amount of enzymes produced can alter, thereby also altering the rate of metabolism. For example, alcohol stimulates production of hepatic enzymes in habitual drinkers, resulting in the alcohol being more rapidly metabolised than in a non-drinker (Broyles et al 2013). Alcohol can also cause the levels of other enzymes involved in medication metabolism to increase, leading to the rapid metabolism of the medication and therefore reducing the therapeutic effect (Broyles et al 2013). Some medications are known enzyme inhibitors and have the opposite effect, causing a decreased synthesis of enzymes, resulting in decreased metabolism and increasing the therapeutic effect. Medications such as cimetidine, erythromycin, allopurinol and metronidazole and foods such as grapefruit juice are enzyme inhibitors (Rang et al 2012).

## Excretion

After metabolism, medications and their metabolites are **excreted** from the body via the kidneys, lungs, exocrine glands (e.g. sweat, saliva, tears, breast milk), liver and/or intestine (Brotto 2013). The kidneys, however, are the main organs for medication excretion. Some medications are excreted in the urine unchanged and others have undergone the process of biotransformation before being excreted (Brotto 2013). If an individual's renal function is impaired, the individual is at risk of medication toxicity due to the medication failing to be excreted as required; this may occur more slowly in the very young and in older people (Bryant & Knights 2014).

The chemical composition of medications determines the organ(s) of excretion; for example, 100% of frusemide, 80% of digoxin and 50% of salbutamol are excreted in the urine. Gaseous compounds such as general anaesthetic agents are expelled via the lungs (Brotto 2013). Alcohol is also partially excreted via the lungs and this is the basis of the police

random breath test to detect drink-drivers. Some medications (e.g. penicillin) are excreted unchanged in the urine, while others must undergo biotransformation in the liver before being excreted by the kidneys. Many medications enter the hepatic circulation to be broken down by the liver, excreted in bile and then into the intestines to be excreted in faeces (Brotto 2013). The liver has a large metabolic capacity so, in people with liver disease, medication elimination is generally not affected until a large portion of the liver's functional capacity is lost. Many medications can enter the mammary glands and be excreted in breast milk, increasing the risk of infants ingesting the excreted medication (Bryant & Knights 2014).

## Importance of therapeutic medication monitoring

Monitoring for a medication's therapeutic effect can be done by observing or measuring the individual for clinical signs and symptoms, including expected outcomes (antihypertensives lowering blood pressure) and ADRs, as well as taking blood samples to ascertain the medication levels in the body (Bryant & Knights 2014). For medications to be therapeutic, certain blood levels need to be reached and maintained. It is therefore a priority that medications are administered on time. To maintain therapeutic levels of a medication the time interval between each medication dosing is important. The subsequent dose is determined by the medication **half-life**, which is the time taken for the medication concentration to be reduced by half from the time it was administered (Brotto 2013). If medications are administered late, the level of the medication in the blood may drop below a therapeutic level; for example, if the level of an antibiotic is too low, it provides an opportunity for microorganisms to multiply and also potentially develop resistance. If the blood levels are too high, toxicity and serious consequences might occur. This also provides the basis for adjusting medication dosages (Bryant & Knights 2014).

The main aim of **therapeutic medication monitoring** is to optimise medication therapy by achieving adequate medication levels while minimising toxicity. This is especially important in individuals at the extremes of age—infants and the older person. Clinical Interest Box 24.1 outlines some signs and symptoms of toxicity commonly seen in older individuals.

Clinical Interest Box 24.2 identifies changes related to ageing that influence pharmacokinetics.

Medication serum blood levels are measured to:

- Individualise the dose to the individual; for example, insulins and warfarin. Insulin, as a hypoglycaemic agent, lowers blood glucose levels and therefore the dose may vary depending on the person's blood glucose levels at the time of administration. Warfarin is an anticoagulant used to manage or prevent the formation of a thrombus (blood clot) and is varied depending on the serum International Normalisation Ratio (INR) result in maintaining the warfarin levels within the therapeutic range (Tiziani 2013). With each of these medications the optimal dose is highly individual, the effects need careful monitoring and the dose may need to be adjusted periodically
- Avoid toxicity; for example, digoxin and vancomycin. Digoxin is a medication that slows the heart rate and strengthens the force of contraction of the heart, increasing cardiac output. Therapeutic levels of digoxin

### CLINICAL INTEREST BOX 24.1 Indicators of medication toxicity in older adults

Skin
- Rashes
- Pruritus
- Urticaria
- Photosensitivity (e.g. abnormal responses to sunlight)

Gastrointestinal tract (GIT)
- Discomfort and pain (e.g. pancreatitis)
- Nausea and vomiting
- Blood in stools or vomitus
- Diarrhoea

Cardiovascular system
- Abnormalities in cardiac rhythm (e.g. palpitations, tachycardia)
- Hypotension or hypertension
- Congestive cardiac failure
- Depression of bone marrow activity (causing anaemia, leucopenia or other abnormalities of the blood)

Central nervous system
- Increasing confusion and irritability
- Alterations in gait (e.g. stumbling)
- Tremors
- Unusual drowsiness or insomnia
- Blurred vision or other vision abnormalities
- Slurred speech
- Ototoxicity (changes in hearing and balance)
- Intolerance to heat or cold (changes in temperature regulation)
- Anticholinergic effects (ranging from dry mouth and hot dry skin to serious mental impairment and seizures)

Renal system
- Electrolyte imbalance
- Urine retention
- Polyuria
- Fluid retention

Respiratory system
- Dyspnoea
- Asthmatic responses

Biliary system
- Jaundice
- Impaired liver function
- Clotting changes

*(Adapted from Touhy & Jett 2012)*

## CLINICAL INTEREST BOX 24.2 Age-related changes that influence pharmacokinetics and pharmacodynamics

Many age-related changes to the body have an impact on the way that a medication may be absorbed, distributed, metabolised and excreted from the body (Broyles et al 2013). Because of these differences, all medication therapy should be given cautiously and monitored carefully in the older individual. Age-related changes that may affect the pharmacokinetics of a medication include:

- Altered nutritional habits and ingestion of non-prescription medications that may alter medication absorption (e.g. ingestion of antacids and laxatives)
- Dry mouth and decreased saliva leading to potential difficulty swallowing oral medications
- Changes in the quantity and quality of digestive enzymes
- Increase in gastric pH
- Decrease in gastric motility
- Decrease in intestinal blood flow
- Delayed gastric emptying
- Decreases in total body water and lean body mass and increase in body fat, which may all lead to an altered distribution of the medication, as well as potential decrease in absorption of transdermal or topical medications
- Decreased levels of plasma proteins and therefore decreased protein binding of medications if malnutrition or acute illness is present
- Changes in liver mass and blood flow leading to reduction in the Phase I metabolism in the liver, involving the microsomal enzymes
- Alteration in bioavailability of medications (e.g. some medications undergoing extensive first-pass metabolism may have significant increase in availability while others may be reduced or decreased, such as ACE inhibitors available as promedications)
- Reduction of the liver's ability to recover from injury such as hepatitis
- Hepatic function may also be affected by severe nutritional deficiencies
- Decreased cardiac output and reserve
- Decreased blood flow to liver and kidneys
- Congestive cardiac failure reduces both the capacity of the liver to metabolise medications as well as the hepatic flow
- Creatinine clearance decreases with age, resulting in a longer half-life of many medications and the subsequent risk of accumulation
- Decreased renal excretion
- Changes in response to medications related to changes in medication concentration (related to above factors)
- Risk of medication interactions is increased
- Decrease in ability to read label correctly

*(Broyles et al 2013; Bryant & Knights 2014; Rang et al 2012)*

are within a very narrow range and can easily reach toxic levels (Bryant & Knights 2014). Blood tests are performed to measure digoxin levels to indicate toxic levels. Symptoms that may indicate toxicity include slow or irregular heartbeat, anorexia, nausea, vomiting, diarrhoea, drowsiness and extreme tiredness, weakness, confusion, abdominal pain, blurred vision or visual disturbances (Tiziani 2013). Vancomycin is a powerful antibiotic reserved for the treatment of severe infections that are not responding to other antibiotics. This medication can produce severe adverse effects that include rash, itching, fever, tachycardia, nausea, vomiting, diarrhoea and, sometimes, hearing loss or kidney damage (Tiziani 2013). Blood levels are taken immediately before the third dose to ensure therapeutic levels are achieved and the dose is adjusted accordingly. If treatment is ongoing serum trough levels need to be repeated as per the hospital protocol
- Ensure therapeutic blood levels are maintained; for example, prophylactic anticonvulsants (antiepileptics) such as phenytoin, sodium valproate and carbamazepine used to manage epileptic (convulsive) seizures
- Check individual compliance/concordance/adherence
- Ensure comorbidities have not altered medication metabolism and excretion as they may have an adverse effect on therapeutic blood levels; for example, renal impairment, hepatic failure, shock, sepsis
- Ensure that concurrent medication administration is not affecting therapeutic levels
- Indicate a need for change of route of administration; for example, from IV or IM to oral administration or change of dosage; to increase, decrease or cease a medication.

# PHARMACODYNAMICS

Pharmacodynamics relates to how a medication acts on the body, including the strength and duration of its effects. Medication actions are similar in all individuals that take the same medication; however, factors such as tachyphylaxis, desensitisation and tolerance can affect the medication action responses (Bryant & Knights 2014). *Tachyphylaxis* and *desensitisation* occur when there is a sudden decrease (over minutes) in the effect of the medication (Rang et al 2012). *Tolerance* occurs when the individual develops a gradual reduction (over weeks and months) in the responsiveness to the medication, rendering the dose inadequate (Bryant & Knights 2014).

## Medication action

The extent of the response to a **medication** depends on its concentration at the site of **action**, and the affinity the medication has with the receptors, which then exert its response (Bryant & Knights 2014). This is linked to the medication dose and the pharmacokinetic processes of absorption, distribution, metabolism and excretion. Other factors that may

influence a person's response to a medication include their age, weight, gender, disease state and route of administration. However, more than any other factor, the route of administration determines the onset of medication effect. Medications that are administered directly into the bloodstream provoke a rapid response, whereas medications administered orally or topically must be absorbed into the bloodstream before they can take effect. Medications act by affecting or controlling changes in biochemical or physiological processes in the body.

Medications produce their actions in one of three ways: altering body fluids, altering cell membranes or interacting with receptor sites. Most medications act at specific cell receptor sites. When a medication binds with a receptor the action is either agonistic (causing an action) or antagonistic (blocking an action) (Bryant & Knights 2014). An agonist will increase or decrease an action on the receptor site similar to the endogenous ligand (the body's own neurotransmitter or hormone), which normally binds with those receptors. An antagonist takes up the receptor sites blocking the endogenous ligand from binding to the receptor sites, therefore blocking or decreasing the cells' response (Bryant & Knights 2014). A specific medication forms a complex with one type of receptor but may in turn produce multiple effects, because those receptor types may be found in other cells of different tissues or organs.

An agonist (medication) binds with cells receptor sites until they become saturated, producing a response. This is termed *maximal efficacy* and increasing the concentration of the medication dose does not increase the response; however, it may increase the risk of side effects (Rang et al 2012). This is why medication potency (dose of medication required to bind to receptors, eliciting the therapeutic effect) needs to be determined, without causing unwanted side effects. When an antagonist binds with receptor sites it blocks the binding of the endogenous agonist, therefore there is no efficacy (Rang et al 2012).

Medication action is either classified as selective or non-selective. Selective medications bind with their target sites producing the intended effects. A 'selective' medication has a preference for a particular receptor and will have little influence at similar receptor sites in other organs (Bryant & Knights 2014). For example, if a selective beta-blocker was chosen, such as metoprolol tartrate, then the beta-1 cells in the myocardium would be targeted, resulting in a lesser effect on the beta-adrenergic receptors in the lungs, decreasing the likelihood of unwanted side effects compared to the non-selective medication.

Non-selective medication will affect tissues or organs for which the effect is unintended (Bryant & Knights 2014). For example, both the heart and lungs have beta-1 and beta-2 adrenergic receptors. For example, sotolol is a non-selective beta-blocker medication (antagonist) which has the intended action of reducing heart rate by blocking the beta-1 cells in the myocardium. This medication will also affect the beta-2 adrenergic receptors in the lungs, causing bronchoconstriction, and the person taking sotolol may develop an unwanted side effect (cough) due to the non-selective characteristics of the medication.

A medication may produce more than one effect:

- The physiological response occurs to the medication, which exerts the expected therapeutic effect.
- **Adverse effects** (also called adverse drug reactions (ADRs)) are undesirable secondary effects, which may be expected (constipation with codeine) or unexpected (cough with beta-blocker). These effects may also be called *side effects* by consumers. ADRs will indicate to the medical officer that treatment may need to be modified or ceased (Brotto 2013). If a patient is having oxycodone for pain and is experiencing nausea, metoclopramide (antiemetic medication) may also need to be prescribed.
- Toxic effects develop after prolonged administration of high doses of medication, or when a medication accumulates in the blood because of impaired metabolism or excretion. Some medications such as digoxin and lithium have a very narrow safety margin and toxicity can occur at recommended or therapeutic doses (Brotto 2013).
- **Allergic reactions** are unpredictable responses to a medication that the body sees as foreign. This stimulates the body to produce antibodies or immunoglobulins that then bind to the antigen (medication) upon a second exposure, triggering an allergic response (Bryant & Knights 2014). Allergic reactions may be mild, such as urticaria (hives) and pruritus (itching), or they may be severe; for example, severe wheezing and respiratory distress, or life-threatening anaphylactic reaction. Some reactions occur within minutes of the medication being given while other allergic reactions may be delayed for hours or days (Brotto 2013).
- Idiosyncratic reactions are those where the individual's body either overreacts or underreacts to a medication, or when the reaction is unusual and there is no known cause (e.g. the antihistamine promethazine (Phenergan) is sometimes used for sedation; however, in some individuals it can cause insomnia and agitation (Brotto 2013)).
- Pharmacogenetic reactions occur because a person may have a genetic trait, which leads to abnormal reactions to medications. For example, malignant hyperthermia is a genetic autosomal disorder which is triggered when general anaesthetics and muscle relaxants are administered, causing a hypermetabolic state to develop that can quickly lead to death. As a result all individuals who undergo a general anaesthesia have their temperatures monitored (Bryant & Knights 2014).
- Medication tolerance may also occur where a person has a decreased response or resistance to a medication over time, necessitating an increase in dosage to achieve the required response (Broyles et al 2013) (e.g. tolerance to glyceryl trinitrate patches if nitrate-free periods are not adhered to).

- Medication-to-medication interactions occur when one medication changes the action of another medication, by either increasing or decreasing its action (Bryant & Knights 2014). A medication interaction may be synergistic (enhances the effects of another medication), antagonistic (opposes the effects of another medication) or additive (where the two medication actions are added together enhancing the effect) (Brotto 2013).

## SAFETY AND LEGAL REQUIREMENTS IN MEDICATION ADMINISTRATION

The National Safety and Quality Health Service (NSQHS) Standards were developed by the Australian Commission on Safety and Quality in Health Care (ACSQHC) to ensure relevant systems are in place to improve the quality of healthcare practices and to protect the public from harm.

Medicines are the most common healthcare treatment that individuals receive, and as a consequence there is a higher incidence of errors and ADRs than with any other health procedure (ACSQHC 2012b; 2015a). The outcomes of these errors and ADRs add a huge cost to the healthcare system, and are largely avoidable (ACSQHC 2012b). **Medication safety** is one of the NSQHS Standards (2012b) and 'describes the systems and strategies to ensure clinicians safely prescribe, dispense and administer appropriate medicines to informed patients' (p. 3). The Standard outlines the standardised and systematic processes to be implemented to prevent common errors occurring and includes improving communication between clinicians and the workforce and patients; utilising technology for recording and transferring information; and improving accessibility of patient data and support for clinical decision making at the point of care.

A range of paper and electronic National Inpatient Medication Charts (NIMC) were introduced in 2006 for all acute facilities, public and private, across Australia with the aim of addressing the ongoing prescription errors in medication charting (Atik 2013) and subsequent administration errors. This was to ensure safe use of medicines; as healthcare professionals moved employment the medication prescribing stayed the same.

The nurse's role in medication administration is a complex one and must take into consideration the NSQHS Standards, organisational policy and procedure guidelines and scope of practice. These practices promote safe and correct medication administration. Accountability and responsibility are paramount in administering medications and the nurse requires knowledge about all medications being administered, including:

- Generic names and classifications
- Indications for use
- Rationale for prescribed medication
- Medication action
- Desired therapeutic effects and possible adverse reactions
- Normal dosage range
- Correct routes of administration
- Seven rights of medication administration
- Safe handling and storage
- Legislation and healthcare facility policies and procedure guidelines.

The nurse also requires certain skills to:

- Administer medications by the various routes
- Calculate the correct amount of medication to administer
- Evaluate the effects of medications
- Educate individuals about medication therapy
- Teach self-administration
- Record the medications administered and the individual's response.

### Legal aspects of medication administration

Registered and Enrolled Nurses are authorised to administer medications under the *Health Practitioner Regulation National Law Act 2009* as well as relevant regulations and legislation in each state and territory. ENs must work under the direction and supervision of the Registered Nurse (RN). In some states and territories unregulated healthcare workers in RACF may administer medications as guided by their training; however, they must administer medications as set down in the legislation and standards (Department of Health and Ageing 2012). Before a medication can be administered safely, the nurse needs to be aware of the legal aspects of medication administration. This includes knowledge of the laws governing the possession, use and dispensation of medications and the guidelines set down by the Nursing and Midwifery Board of Australia (NMBA) and Australian Nursing and Midwifery Advisory Council (ANMAC) on the administration of medications to individuals. It also means observing the employing healthcare facility's work health and safety (WHS) regulations which are designed to promote safe storage, handling and use of medications.

### Nursing competency

The NMBA is one of the national boards of the Australian Health Practitioner Regulation Agency (AHPRA). In 2009 AHPRA made changes to the registration of nurses and as the EN study programs now have a compulsory medication administration competency, the medication endorsement is no longer added to their registration. In order to protect the public, the NMBA has stipulated that ENs must hold a Board-approved competency (accredited by ANMAC) to be able to safely administer medication. Those ENs who have not completed the required competency units to deliver medications will have a notation reading 'Does not hold Board-approved qualifications in administration of medicines' against the individual nurse's name on the register (NMBA 2015). Jurisdictional legislation and policy specifies the routes and schedules of medicines that the Enrolled Nurse (EN) is able to administer and it is therefore of paramount importance that the nurse and employer understand and comply with the medications and poisons legislation and policy.

Furthermore, to administer intravenous medication, the nurse is required to have completed a separate NMBA-approved unit on the administration and monitoring of intravenous medications (NMBA 2015).

Legal Acts concerning drugs and poisons and the subsequent regulatory bodies in each state and territory in Australia deal with the control of all medications, from prescription medication through to agricultural poisons and research medications. The laws and **Regulations** apply to sale, supply, storage, dispensing and labelling. The medications and **poisons schedules** divide medications into groups according to their mode of action, therapeutic use, potency, potential for abuse and addiction and safety. While there is currently no national medicines and poisons schedule in Australia, the recommendations of two expert advisory committees (Advisory Committee on Medicines Scheduling and Advisory Committee on Chemical Scheduling) in the form of the Poisons Standard 2014 (*Standard for the Uniform Scheduling of Medicines and Poisons* (SUSMP 6)) (Table 24.2) are incorporated into the legislation and regulations of each state and territory in Australia (Australian Government, TGA 2015). Aims of this document include promoting uniform scheduling, labelling and controls on availability and use of medicines throughout Australia (Australian Government, TGA 2015). SUSMP applies to all medicines and poisons in Australia.

## Safe administration of medications

Before administering medications in any form or by any route the nurse must check that the individual does not have any medication allergies. The nurse also observes the individual who is starting a new medication for any signs of allergy or adverse reaction, and reports and records such responses promptly to the medical officer and the nurse in charge. If the situation arises that an individual chooses not to take a prescribed medication, this must also be reported and recorded on the individual's medication chart. The principles of asepsis (see Chapter 22) are employed during the preparation and administration of all medications.

To ensure that medications are administered correctly and safely, the nurse must observe the seven rights of medication administration (Brotto 2013).

1. The right medication
2. The right dose
3. The right person
4. The right route
5. The right time
6. The right reason
7. The right documentation.

Before any medication is administered the individual medication chart (Figure 24.4) must be checked thoroughly and systematically to determine the accuracy of the identity of the individual receiving the medication, the name of the medication, the dosage, the route and the date and time for administration of the medication prescribed.

1. **The right medication:** the nurse compares the label of the medication container with the individual medication chart three times:
   1. Before removing the container from the trolley or cupboard
   2. Before removing the medication from the container
   3. Before returning the container to the trolley or cupboard (Brotto 2013).

   Medication sleeves in the prescribed medication box must be removed from the packaging and the medication sleeve checked for the right medication, as potentially wrong sleeves may have been placed in the medication box.
2. **The right dose:** medications are written in SI unit form. Medication calculations and conversions need to be calculated accurately to ensure the individual obtains the correct dose (Brotto 2013). The correct measuring devices such as cups, spoons, syringes or droppers assist in giving the precise ordered dosage (Broyles et al 2013).
3. **The right person:** to identify a person correctly, before a medication is administered, the nurse:
   - Checks the person's ID label on the medication chart against the person's identity bracelet
   - Asks the person to state their full name and date of birth.

   Special care should be taken when identity bracelets are not worn (e.g. in residential care settings) or where the individual is unable to state their own name, because of dementia or mental disturbance, for example. One safety measure that has been implemented in some aged care residential settings is to have a current photograph of each resident that can help with identification.
4. **The right route:** the route is indicated by the prescriber on the medication chart. The nurse administering the medication must assess if this route is suitable for the individual receiving the medication, and if not should consult with the prescriber (Brotto 2013).
5. **The right time:** medications have different administration time periods. Medications may be administered BD (twice a day), TDS (three times a day), QID (four times a day), mane (morning), midday, nocte (night), before food, after food, with food, stat (immediately and once only), PRN (when required) or on an hourly or day basis (e.g. 6 hourly; every 2nd day). When administering medications at any of the times ordered the nurse must be aware of normal medication intervals and any medication to medication interactions so these can be rescheduled and avoided. The nurse must prioritise her daily workload to ensure medications are given at the correct time.
6. **The right reason:** the nurse must understand the rationale for the prescribed medication and what the expected outcomes should be (Broyles et al 2013). The principles of the QUM and whether the individual requires the prescribed medication must also be taken into consideration (Brotto 2013). For example, if an individual who has been admitted for dizziness and hypotension normally takes an antihypotensive, the need for the medication at this point in time must be reviewed.

## TABLE 24.2 | Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)

| Schedule | Label | Description | Examples |
|---|---|---|---|
| **Unscheduled substances** | | | |
| | — | Unscheduled substances are those not requiring control by scheduling. They are not considered to be poisons. It is important to note that many therapeutic preparations are unscheduled substances and may be purchased in supermarkets and health food stores | Most antacids, laxatives, contact lens products, infant formulas, vitamins, sunscreens, topical antiseptics and many herbal remedies |
| Schedule 1 Poisons | — | This schedule is not currently used. It was formerly used for substances requiring proof of age, identity and the signature of the purchaser. It has been suggested that some complementary and alternative medicines be moved into this Schedule so that they can be subject to control | |
| **Pharmaceutical substances** | | | |
| Schedule 2 Poisons (or Medicinal/ Therapeutic Substances/Poisons/ Products) | Pharmacy medicine | Available to the public only from pharmacies or, where a pharmacy service is unavailable, from persons licensed to sell Schedule 2 poisons. A pharmacist's advice is available if required | Most cough and cold preparations, some antihistamines, mild analgesics, worm tablets, antiangina sprays, anti-inflammatory agents, topical antifungals, histamine $H_2$-receptor antagonists for gastro-oesophageal reflux (small packets) and decongestant eye drops |
| Schedule 3 Poisons (or Medicinal/ Therapeutic/Potent Substances/Poisons/ Products) | Pharmacy only medicine | Only available to the public from a pharmacist or from medical, dental or veterinary practitioners, but without need for a prescription. The safe use of these substances requires professional advice. The storage must not be accessible to the public | Metered-dose bronchodilator asthma aerosols, topical corticosteroids (low-strength preparations, small packs), adrenaline injections (high strength, for anaphylaxis) |
| Schedule 4 Poisons (or Restricted/ Therapeutic Medications/ Substances/Poisons/ Products) | Prescription only medicine or Prescription animal ready | May be used or supplied only under prescription from a medical, dental or veterinary practitioner. Must be stored in a dispensary. In some Australian states and territories, specially qualified nurses (nurse practitioners), optometrists and podiatrists may prescribe a limited range of Schedule 4 medications | Many medications: all new medications, antibiotics, insulins, antidepressants, hormones (including contraceptives), most cardiovascular and central nervous system medications, antineoplastic agents, vaccines, anti-glaucoma eye drops and most injections |
| **Agricultural, domestic and industrial substances** | | | |
| Schedule 5 Poisons (or Domestic/ Household Type Poisons or Hazardous Substances, or Industrial/Agricultural/ Veterinary Products) | Caution | Substances with a low potential for causing harm, which can be minimised by the use of appropriate packaging with simple warnings and safety directions on the label. For sale by a pharmacist, Poisons licence holder or general dealer. Must not be stored or supplied in a drink or food container | Household poisons, ether, naphthalene, petrol, some head lice preparations and borax |

## TABLE 24.2 | Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP)—cont'd

| Schedule | Label | Description | Examples |
|---|---|---|---|
| **Agricultural, domestic and industrial substances** | | | |
| Schedule 6 Poisons (or Domestic/ Industrial/Agricultural and Veterinary Poisons) | Caution or poison (depending whether for internal or external use) | More dangerous chemicals than Schedule 5, with a moderate potential for causing harm. Extra storage and packaging controls and warning labels are required | Household and garden pesticides and solvents, some iodine preparations |
| Schedule 7 Poisons (or Dangerous Agricultural/Industrial Poisons) | Dangerous poison | Substances with a high potential for causing harm at low exposure and which require special precautions during manufacturing, handling, storage or use. A permit is required to buy these chemicals and the purchaser must be over 18 years of age. These poisons should be available only to specialised or authorised users who have the skills necessary to handle them safely. Special Regulations restricting their availability, possession, storage or use may apply | Arsenic, strychnine, cyanide and commercial pesticides |
| **Controlled medications and prohibited substances** | | | |
| Schedule 8 Poisons (or Medications of Addiction/ Dependence or Controlled Medications or Narcotic Substances) | Controlled medication | Substances that may produce addiction or dependence. Possession without authority is illegal. The tightest controls are used to reduce abuse, misuse and dependence. Prescriptions are only valid for 3 months. Medications must be stored in a locked cabinet and records kept for 3 years | Opioids (e.g. morphine, methadone, high-dose codeine) and CNS stimulants (e.g. dexamphetamine) |
| Schedule 9 Poisons | Prohibited substances | Substances for which the manufacture, possession, sale or use is prohibited except in special circumstances. Medications that may be abused or misused and medications possibly required for teaching, research or analytical purposes, but which are too toxic for therapeutic use | Heroin and most recreational medications (except alcohol and tobacco) |
| Schedule 10 APPENDIX C | Substances of such danger to health as to warrant prohibition of sale, supply and use | A list of substances or preparations, the sale, supply or use of which should be prohibited because of their known dangerous properties. | e.g. Coal Tar, Formaldehyde, hydrogen peroxide, lead compounds |

*(Based on content from Australian Government, Department of Health and Ageing, Therapeutic Goods Administration (2015).* Poisons Standard *from the Federal Register of Legislation at 08/04/16. For the latest information on Australian Government law please go to https://www.legislation.gov.au)*

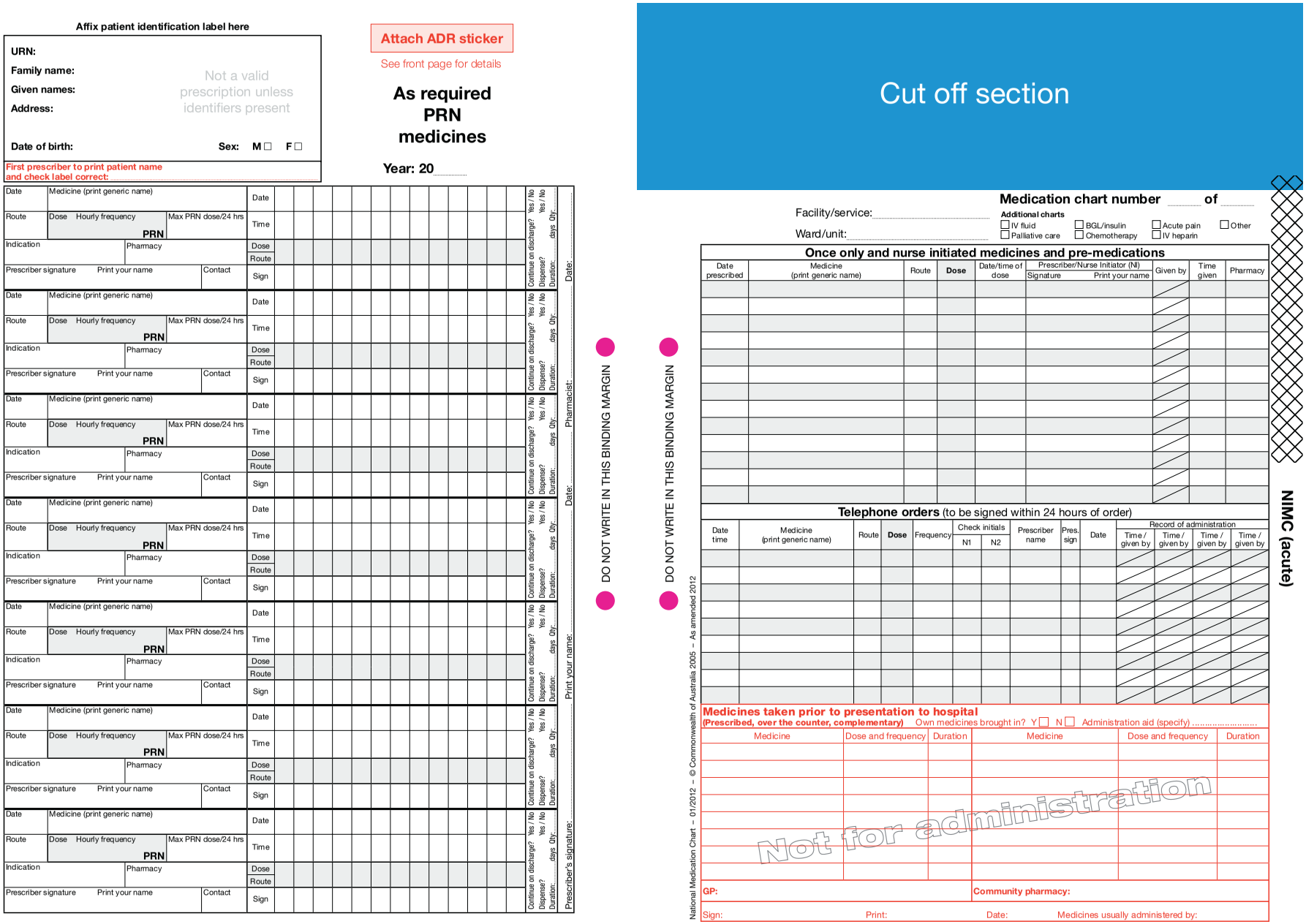


**Figure 24.4** Example of the National Inpatient Medication chart (NIMC Acute)
*(Australian Commission on Safety and Quality in Health Care 2012a)*

Cut off section

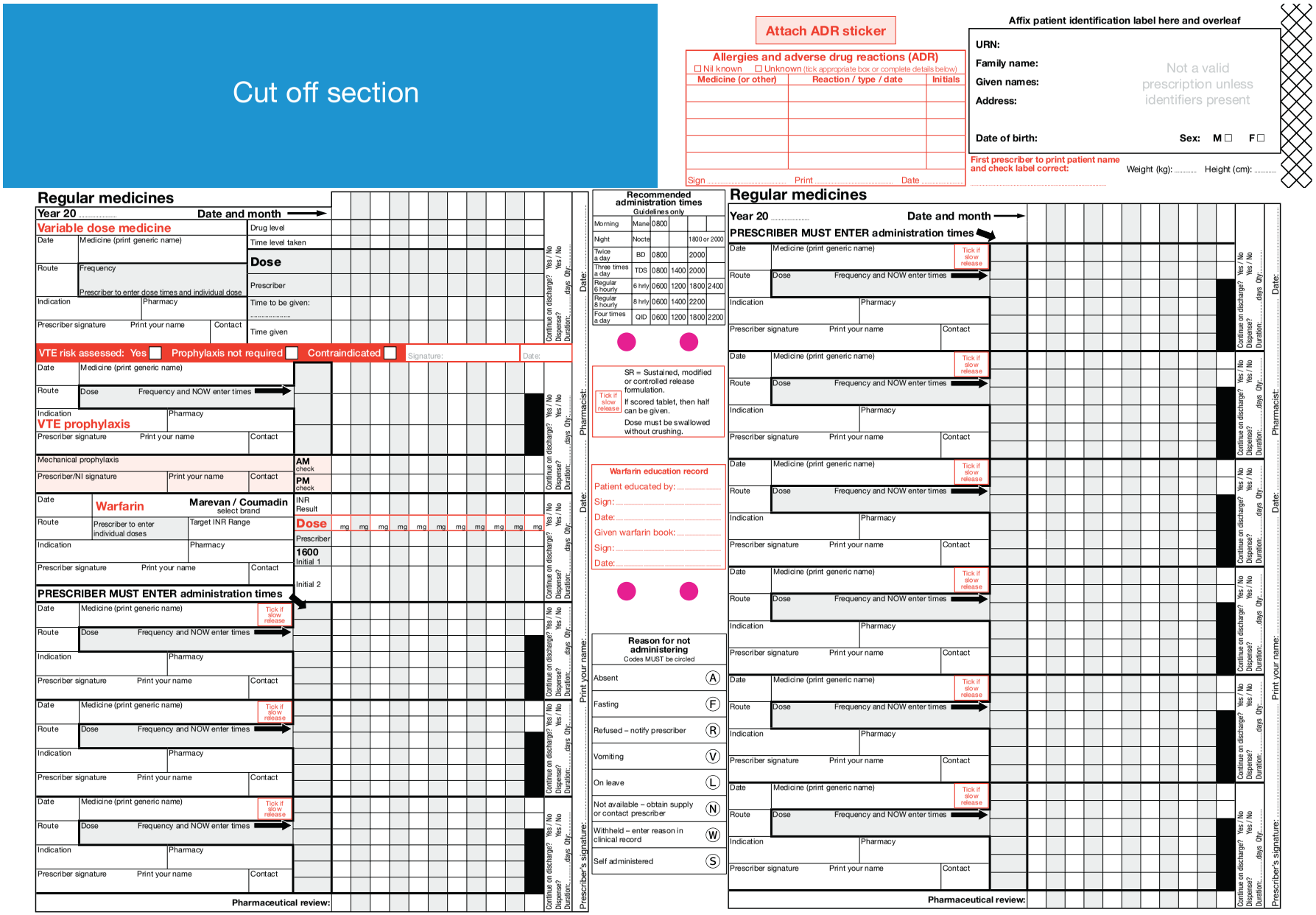


Figure 24.4, cont'd

## PROGRESS NOTE EXAMPLE 24.1

| | |
|---|---|
| 30/04/2015<br>2100 hours | Nursing: Mr George was admitted to the medical ward at 1630 hrs for observation and medication management. Mr George presented to the casualty department with his wife at 0940 this morning after experiencing central chest pain radiating into his jaw. Pain was described as 7/10. ECG and bloods attended. Chest pain resolved with 3 × 600 micrograms of Anginine subling. ECG showed ischaemia, which resolved when he became pain free. Troponin was negative and other bloods NAD. Mr George was pain free on arrival to the ward and no further chest pain this shift. Admission and discharge plan completed. Mr George has a past history of hypertension, osteoarthritis in his lower back and hyperlipidaemia. Vital signs T 36.7°C, RR 18, HR 42 and BP 95/57. Reviewed by medical officer who withheld the evening dose of metoprolol. To be reviewed prior to morning dose. Urinalysis NAD. Referral to cardiac nurse completed. Education commenced for Unstable Angina and education information pack given. Subcut enoxaparin and oral medications given as per order. For fasting bloods in the morning LFTs, FBE, U&Es, & Troponin. Referral for angiogram is being organised by senior medical officer, awaiting call back from angiogram clinic.<br>***H. Redmond*** **(Redmond) EN** |

7. **The right documentation:** the medication chart must be completed accurately by the prescriber, and it is the nurse's responsibility to check the chart for errors and report to the prescriber before administering the medication. The ACSQHC (2011) released a document in 2006 outlining nationally accepted terminology, abbreviations and symbols that are to be used in Australian hospitals in the documentation process in prescribing and administering medicines. The nurse must document accurately and in a timely manner the date and time of medication administration. If missed it may be determined the person has not been given their dosage and there is a risk of a medication error with a second dose being given. If for any reason the medication is not given, this needs to be recorded on the medication chart with the appropriate symbol as indicated on the NIMC and then recorded in the progress notes. The medical officer will also need to be informed to complete a review. See Progress Note Example 24.1.

Most medication errors occur when a nurse fails to follow the recommended safety guidelines, or when the nurse is distracted while preparing or administering medications. The most frequent type of medication errors reported are omission or overdose (particularly analgesics or anticoagulants), which typically occur at the morning and evening medication administration times (Roughead & Semple 2008). To prevent medication administration errors the nurse must:

- Be proficient with the seven rights
- Ensure the accuracy of the prescribed medication order
- Check the date and time to be given
- Read medication labels carefully
- Be aware that many medications have similar names
- Check the expiry date on the medication label
- Check the decimal point on prescriptions and medication container labels
- Not administer a medication if the prescription or medication label is illegible (or if the nurse has any doubt at all about the order)
- Be proficient in calculating medication dosages using correct formulas
- Use administration equipment (e.g. a medicine glass or syringe) with distinct markings
- Not administer any medication prepared by another person; the nurse preparing the medication must be the nurse administering the medication
- Not prepare medications in advance of the prescribed time for administration
- Not prepare more than one person's medication at the same time (e.g. DDAs)
- Not leave prepared medications (e.g. a loaded syringe, transdermal patch or oral medication in a medicine cup) unattended in the medication room, on the medication trolley or at the person's bedside and, most importantly,
- Give full attention to the task.

### CRITICAL THINKING EXERCISE 24.3

You are working in a residential aged care facility. The shift is very busy and the RN you are working with has asked you to check some DDAs for patients requiring oxycodone. When you arrive at the DDA cupboard she tells you that she will also take out another resident's DDA, MS Contin, to save time due to the shift being busy.

What safety issues may arise from checking out two DDA medications at the same time? What is your response?

## Errors in administration

Errors in medication administration occur from failure to follow correct processes in prescribing, dispensing and administration. Information to prevent errors in administration is provided throughout this chapter and focuses on the NSQHS standards and ACSQHC recommendations discussed previously, and is also listed in Clinical Interest Box 24.3. Each healthcare facility has its own protocol for monitoring and

## CLINICAL INTEREST BOX 24.3 Safe medication management guidelines

- All medications must be kept in a locked cupboard or medication trolley, the key of which is kept by an RN at all times. Some preparations (e.g. suppositories, vaccines, thyroxine and insulin) require refrigeration and are stored in a lockable refrigerator. Nothing else should be stored in this refrigerator. Medications or preparations for external use are stored apart from those intended for internal use.
- Medications of addiction (e.g. Schedule 8 or other medications of addiction such as benzodiazepines or panadeine forte) are kept in a separate locked cupboard that is firmly fixed to a wall or floor, within a locked room. The key is kept in the possession of an RN at all times.
- A register must be maintained of all medications of addiction, and the records must contain full details of all receipt of medications and all disposal of medications, whether by administration to a individual, return to the pharmacy department or discarded by any other means. The nurse who administers the medication and the nurse who checks the medication both sign their names in the register.
- Healthcare facilities implement a protocol that conforms to the relevant state or territory Regulations whereby certain medications (usually medications of addiction such as morphine) are checked at the change of shift (e.g. every 8 hours). Two nurses, one of whom should be an RN who has worked the current shift, and one RN from the following shift count the medications together and document their findings in a register. The number of medications in the containers is compared with the number of medications already recorded in the register. Both nurses sign the register to indicate that the count is correct. If the count is not correct, the healthcare facility protocol should be followed.
- Medications of addiction and restricted substances can only be supplied by the pharmacist with a written order by a medical officer or dentist.
- A qualified pharmacist has complete responsibility for all containers issued from the pharmacy department. No one else is permitted to supply a medication, label a container, alter the wording on a label or transfer the contents of one container to another.
- There should be a written medical officer's order for all medications administered to individuals. Verbal orders, including telephone orders, are open to misinterpretation. A written prescription must contain the date of prescribing, the individual's full name, the name and dosage of the medication, the route of administration, the frequency of administration and the signature of the medical officer who is writing the prescription. If the nurse has any doubt about the meaning of an order, the medical officer must be contacted immediately for clarification (before the medication is administered).
- The nurse administering the medication must check the accuracy of the medication order prior to administration and if there are any discrepancies then the order needs to be reviewed by the original prescriber.
- An RN must check every dose of medication to be administered by an undergraduate student nurse. Nursing regulations dictate that an RN must accompany student nurses during administration of a medication. Any medication that requires the process of double checking with another RN must also be done when a student nurse is administering the medication.
- A nurse should administer only a medication that has been prepared personally; for example, the nurse should not administer any medication that has been prepared by someone else and not witnessed personally (Brotto 2013).
- The nurse who administers a medication to be taken orally must remain with the individual until the medication has been swallowed.
- If the nurse is checking a medication that is to be administered by another nurse (e.g. a medication of addiction or intravenous antibiotic), in addition to the safety measures already stated, the checker must observe the dose being measured, reconstituted and drawn up, and then witness the medication being administered via any route (Brotto 2013).
- After administering any medication the nurse records it immediately on the appropriate medication chart. Prompt recording prevents errors. Details recorded on the individual's medication chart include the name of the medication, dosage, route and exact time of administration. The nurse who administers the medication must sign the record sheet (Broyles et al 2013).

recording medication errors, and the nurse must understand and adhere to that protocol.

If the nurse makes a medication error (e.g. administering the wrong medication or dose, or via the wrong route, or to the wrong individual) or identifies an error made by another nurse, the correct reporting processes must be followed, from reporting to the nurse in charge to documenting the incident. In medication administration the nurse accepts responsibility to ensure the individual's safety is maintained and that the individual is not harmed by the nurse's actions (Brotto 2013). The nurse has a professional and ethical responsibility for reporting any error, no matter how minor or trivial it may seem at the time (Brotto 2013). Measures to counteract the effects of the error may be necessary, such as administering an antidote (with a medical officer's order) or monitoring the medication's effects over time. The reporting process

provides an objective analysis of why the medication error occurred and is a means for the facility's quality assurance personnel to monitor such events and to implement measures to prevent recurrence. The medication error, measures taken and outcomes should also be recorded in the individual's medical notes (see Chapter 18 for information on nursing documentation).

### Medical abbreviations

When writing prescriptions, the medical officer frequently uses abbreviations that are derived from Latin. From 2008, standard prescribing terminology, abbreviations and symbols have been introduced in an attempt to reduce the number of associated errors. Abbreviations are also used when referring to strength of medications such as grams (g) and milligrams (mg). For example, the abbreviation for micrograms using the Greek letter μ (mu) (i.e μg) is not recommended, nor is mcg, as these may lead to errors; microg is the preferred and recommended abbreviation, or the whole word (microgram) should be written. Other error-prone abbreviations and symbols which should be avoided include IU (international units—can be mistaken for IV), IVI (intravenous injection—mistaken for IV 1) and qd (every day—mistaken as QID (four times daily). 6/24 can be interpreted as every 6 hours or 6 times in 24 hours; therefore 6 hourly should be written so there is no confusion (ACSQHC 2011).

## SYSTEMS OF MEASUREMENT

To promote accurate and safe administration of medications, the nurse must understand the system of weights and measures used in prescriptions and correctly calculate dosages (Brotto 2013). The metric system is the standard system used for measurement in all medication administrations. The metric system is based on the International System of Units (SI units) where decimals are used to write measurement for length, mass, time, temperature and amount of substance (Bryant & Knights 2014).

### SI units

Commonly used SI units in medication administration are mass (kilograms (kg)), volume (litres (L)), time (min) and amount molecules of a substance (mole (mol)). These basic units can be multiplied or divided by 1000 to form secondary units (Bryant & Knights 2014).

Measures of mass commonly used are:

- grams (g): 1000 g = 1 kg
- milligrams (mg): 1000 mg = 1 g
- micrograms (microg): 1000 microg = 1 mg.

Measures of volume commonly used are:

- millilitres (mL): 1000 mL = 1 L
- microlitres (microL) 1000 microL = 1 mL

Measures of amount of substance are:

- millimoles per litre 1000 mmol/L = 1 mol

The mole is the molecular weight of a substance expressed in grams (Bryant & Knights 2014). The strength of a pharmaceutical preparation used in electrolyte replacement therapy is normally expressed in millimoles per given volume of solution (e.g. mmol/L). Millimoles are also used to express the concentration of substances other than electrolytes and are used widely in laboratories; for example, in haematology reports (cholesterol 5.2 mmol/L).

It is important to note that units are not capitalised (e.g. kilogram, not Kilogram) except for litres (L); full stops should not be used in unit abbreviations (e.g. mL, not m.L or mL.); quantities less than 1 should have a zero to the left of the decimal point to avoid potential errors (e.g. 0.35 mg, not .35 mg) and abbreviations should not be plural (e.g. 100 mL, not 100 mLs). A trailing zero should not be added after the decimal point (e.g. 1.0 mg) as it may be mistaken as 10 mg if the decimal point is not seen (Bryant & Knights 2014).

### Medication calculations

Competence in calculating the required dose of prescribed medications is an important factor in preventing an administration error. The nurse must understand basic mathematical skills in order to be able to accurately calculate dosages, using the correct formulas based on the form of medication and route of administration, as well as mixing medications (Bryant & Knights 2014).

#### Conversions

Medications are not always supplied in the order of measure in which they are prescribed. Nurses are required to convert the available units of volume and weight to the ordered dosages. This is a systematic process. To convert an SI unit of mass the dose is divided or multiplied by 1000 to change to the next SI mass unit (see Figure 24.5). For example, to change milligrams to grams, divide the dose by 1000, which involves moving the decimal point three places to the left:

The medication ceftriaxone comes in 1.2 g and the order written is for 800 mg

$$1.2\text{ g} \times 1000 = 1200\text{ mg} \quad 1.2\text{ g} = 1200\text{ mg}$$

To convert litres to millilitres, multiply by 1000, or move the decimal point three places to the right:

$$0.6\text{ L} \times 1000 = 600\text{ mL} \quad 0.6\text{ L} = 600\text{ mL}$$

These converted SI can then be used to calculate the required medication dosage.

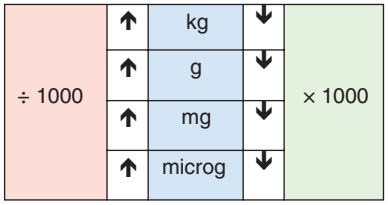


**Figure 24.5** Medication calculation conversion table for mass

## Calculating dosages

Although the introduction of unit doses and prepared solutions has meant that the need for nurses to undertake calculations has decreased, there are certain situations where the nurse will need to perform basic calculations for administration of medications, fluids and other pharmaceutical products. The calculation of dosages must be performed with total accuracy and therefore the nurse must be competent in dealing with decimals, fractions, percentages, ratios and proportions. If any doubt exists, it is important that the nurse double check all calculations with another health professional, such as another nurse, medical officer or pharmacist.

Formulae for calculating medication doses include:

### Liquid medications

$$\frac{\text{Stock required}}{\text{Stock strength}} \times \text{Volume} = \text{volume to be administered}$$

**Example**. A medical officer prescribes fentanyl 100 micrograms intramuscularly (IM). The medication in stock is available in ampoules containing 50 micrograms per mL.

$$\text{Dose required} = 100 \text{ micrograms}$$

$$\text{Stock strength} = 50 \text{ micrograms/mL}$$

$$\text{Volume in stock strength} = 1 \text{ mL}$$

$$\frac{100}{50} \times 1 = 2 \text{ mL} = \text{volume to be administered}$$

### Solid medications

$$\frac{\text{Stock required}}{\text{Stock strength}} = \text{amount to be administered}$$

**Example**. A medical officer prescribes morphine 15 mg orally. The medication in stock is available as tablets containing 30 mg.

$$\text{Dose required} = 15 \text{ mg}$$

$$\text{Stock strength} = 30 \text{ mg}$$

$$\frac{15 \text{ mg}}{30 \text{ mg}} = 0.5 \text{ tablet} = \text{amount to be administered}$$

### Medications measured in units

$$\frac{\text{Stock required}}{\text{Stock strength}} \times \text{Volume} = \text{volume to be administered}$$

**Example**. A medical officer prescribes insulin 10 units subcutaneous (subcut). The insulin is available in 100 units per mL. An insulin syringe must be used to administer all insulin, which is marked in units/mL

$$\text{Number of units required} = 10$$

$$\text{Number of units in stock solution} = 100$$

$$\text{Volume in stock strength} = 1 \text{ mL}$$

$$\frac{10 \text{ units}}{100 \text{ units}} \times 1 \text{ units/mL} = 0.1 \text{ unit}$$

## Calculation of paediatric dosages

Children do not always metabolise medications in the same way as adults, due to a greater body water content and immaturity of their liver and kidneys. In addition children's recommended dosages are not always standard (Broyles et al 2013). In most cases the prescriber will calculate the dose based on weight or weight and height (body surface area (BSA)) before ordering the medication. Clinical Interest Box 24.4 provides interventions to assist the nurse with administering medications to infants and children.

Dosages based on weight use kilograms of body weight per kilogram recommendations to arrive at the approximate and safe dose.

$$\frac{\text{mg/kg}}{\text{Stock Strength}} = \text{tablets to be administered}$$

or for liquids

$$\frac{\text{mg/kg}}{\text{Stock Strength}} \times \text{Vol} = \text{Volume to be administered}$$

**Example**. A medical officer prescribes benzylpenicillin sodium (penicillin G) to be given IV 6 hourly for a 6-year-old child who weighs 18 kg. The recommended dose of penicillin G is 60 mg/kg/dose every 6 hours.

$$\text{Dose required} = 60 \text{ mg/kg}$$

$$\text{Stock strength} = 1200 \text{ mg}$$

$$\text{Child's weight} = 18 \text{ kg}$$

$$\frac{60 \text{ mg} \times 18 \text{ kg}}{1200 \text{ mg}} \times 20 \text{ mL} = 18 \text{ mL} = \text{Vol to be administered}$$

The most accurate way of calculating paediatric dosages is based on BSA. The BSA is calculated using the child's height and weight and a nomogram (see Figure 24.6) and is an indicator of metabolic mass. It is used to calculate correct dosages for paediatric dosages and for cytotoxic medications. A nomogram is used to make the calculation easier. There are 3 columns to the nomogram: Height, Weight and the SA (surface Area). The individual's height is marked on the chart (first column) and then weight (third column) and a line is drawn between these two crossing over the SA (middle) column and the point at which it crosses the SA column is the BSA used in the calculation (Broyles et al 2013).

It should be noted that preparing medications for infants and children requires additional skills. Nurses caring for children are recommended to consult paediatric textbooks for more information. These provide general guidelines concerning administering medications to infants and children.

## CLINICAL INTEREST BOX 24.4 Interventions to assist the nurse with medication delivery for infants and children

For oral medications these interventions may assist the child in taking the oral medication:

- Where possible use liquid rather than tablet form as children find it difficult to swallow tablets
- Offer a pleasant-tasting drink or treat after medication is swallowed as this will remove the unpleasant after-taste and makes compliance/concordance/adherence more likely with next dose
- Mix medication with a tiny amount of pleasant-tasting substance, such as honey (unless contraindicated by pharmacist) to help persuade a reluctant child to take medication
- Avoid mixing the medication with food. If the child does not eat the food the whole dose will not be delivered. This will also prevent food aversion
- Use an oral medication syringe to draw up and deliver liquid medications inside the mouth between the cheek and the gums.

For IM or subcut injections:

- Ensure that a large well-developed muscle is chosen for the intramuscular injection to avoid pain and bruising
- Ask a parent or guardian to be present to assist in decreasing the child's anxiety
- The parent or guardian may need to assist in holding the child
- Use distraction techniques such as a toy or talking reassuringly to the child.

For IV infusion:

- Every child must be weighed before IVT commences and then daily
- Serum electrolytes and glucose must be checked before IVT commences and again within 24 hours if IVT continues
- An inline burette must be used
- IVT is delivered through a volumetric pump
- The IV cannula site is observed every hour when IV therapy is in progress to monitor for extravasation or infiltration
- An accurate fluid balance chart is maintained, documenting input, ongoing losses and urine output.

*(Brotto 2013; The Children's Hospital Westmead 2015)*

## Intravenous administration calculations

There are several methods used to infuse IV fluids and medications directly into the blood stream: gravity feed line, volumetric pump, syringe driver and syringe. With the **gravity feed** line the IV fluid passes from an IV infusion bag into a drip chamber. The drip chamber is designed to allow a fixed number of drops per mL to be delivered, which is controlled by a roller clamp, allowing the nurse to adjust the flow rate.

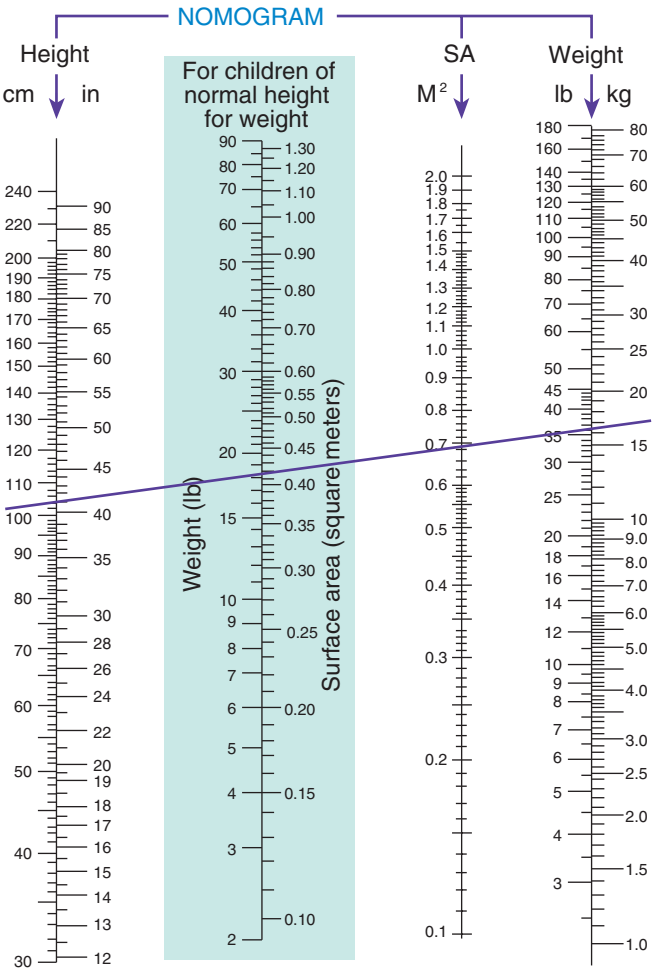


**Figure 24.6** Nomogram
*(Kliegman et al 2011)*

A **volumetric infusion pump** is able to be programmed to maintain an accurate flow rate; however, it should still be checked at regular intervals. A **syringe driver** allows for medications to be administered in smaller amounts of fluid into an IV cannula or a subcutaneous butterfly, which is delivered in minute doses (e.g. insulin or morphine). A single syringe can be attached to the IV cannula directly and a volume of fluid or medication is delivered as a push, either slowly or quickly over a period of time (e.g. sodium chloride 0.9% flush). The calculation of the volume to be infused and delivery rate may vary depending on the device used. The *Australian Injectable Drugs Handbook* by The Society of Hospital Pharmacists of Australia (2014) gives the recommended mixing volumes, type of fluid and rates that certain medications should be administered over and *must be checked prior to every IV medication calculation and administration*. Hospital procedure guidelines also guide the nurse regarding the delivery method and also must be reviewed prior to delivery.

### Calculation of intravenous infusion rate

Volumetric pump rates are calculated in mL/hour or mL/min.

mL/hour is calculated by dividing the total infusion volume by the total infusion time in hours.

$$\frac{\text{Volume to be infused}}{\text{Time (hours)}} = \text{rate mL/hour}$$

**Example**. A medical officer orders sodium chloride 0.9% (normal saline) 1 L to be delivered over 24 hours via an infusion pump.

$$\text{Volume to be delivered} = 1\text{ L} = 1000\text{ mL}$$

$$\text{Time} = 8\text{ hours}$$

$$\frac{1000\text{ mL}}{8} = 125\text{ mL/hour}$$

The rate on the volumetric pump is set at 125 mL/hour and the volume to be infused is set at 1000 mL.

Calculating mL/min is done by dividing the volume to be infused by the minutes then multiplying by 60, which converts the volume to be infused from minutes to hours.

$$\frac{\text{Volume to be infused}}{\text{Time (minutes)}} \times 60 = \text{rate mL/hour}$$

**Example**. A medical officer has ordered 500 mg of IV metronidazole to be delivered over 40 minutes. The stock is metronidazole 500 mg in 100 mL.

$$\text{Volume to be delivered} = 100\text{ mL}$$

$$\text{Time} = 40\text{ minutes}$$

$$\frac{100\text{ mL}}{40\text{ min}} \times 60 = 150\text{ mL/hr} = \text{rate mL/hour}$$

### Gravity feed IV delivery

The number of drops delivered per millilitre of solution varies with different brands and types of infusion sets. This rate is called the drip or drop factor and is usually printed on the back of the package. In Australia, the macrodrops IV infusion sets most commonly used are those with a 20 drops/mL drip chamber. The drip chamber for microdrip is 60 drops/mL.

The nurse will be required to closely regulate the drops per minute to ensure that the total prescribed volume will be delivered in the required time. Drops per minute are calculated using the following formula:

$$\frac{\text{Volume to be infused}}{\text{hours}} \times \frac{\text{drops per mL}}{\text{min}} = \text{rate drops/min}$$

**Example**. A medical officer orders sodium chloride 0.9% 1 L to be delivered over 8 hours. The IV infusion drip chamber delivers 20 drops/mL.

$$\text{Volume to be delivered (mL)} = 1\text{ L} = 1000\text{ mL}$$

$$\text{Drops/mL} = 20\text{ drops}$$

$$\text{Time} = 8 \times 60\text{ (to convert hours to minutes)}$$

$$\frac{1000\text{ mL}}{8} \times \frac{20}{60} = 41\text{ drops/min}$$

When delivering a fluid or medication via a gravity feed line over less than an hour the time in hours is not factored into the equation as only the minutes are used in the calculation.

$$\frac{\text{Volume to be infused}}{\text{min}} \times \text{drops/mL} = \text{rate drops/min}$$

**Example**. A patient is to receive 1 g of IV Cefazolin added to 50 mL of sodium chloride 0.9% and delivered over 25 minutes. The IV giving set delivers 20 drops/mL.

$$\text{Volume to be infused} = 50\text{ mL}$$

$$\text{Time} = 25\text{ min}$$

$$\frac{50\text{ mL}}{25} \times 20\text{ drops/mL} = 40\text{ drops/min}$$

## ADMINISTERING MEDICATIONS

The medication administration route will depend on the rationale for prescription, type and form of medication, medication properties and the desired therapeutic effect (Brotto 2013). The nurse should assess the individual prior to medication administration and collaborate with the medical officer if the prescribed route is not suitable (Broyles et al 2013).

### Administering enteral medications

#### Oral route

The oral route is the most common route by which medications are administered. Oral medications may be presented in solid (tablets, capsules or powder) or liquid (solution, elixir or suspension) form (Bryant & Knights 2014). Oral medications may be contraindicated in individuals who are unconscious, unable to swallow or unable to retain the medication in the stomach (vomiting, gastric drainage, fasting) (Brotto 2013). Before administering any oral medication the nurse must ascertain if any individuals have a nil by mouth status, such as individuals who are to have certain tests or surgery. The nurse must know whether solid medications are to be swallowed whole, chewed or sucked, and whether the medication can be crushed for administration. The nurse will need to consult *Do Not Rush to Crush* published by The Society of Hospital Pharmacists of Australia (2015) to ascertain if certain medications may or may not be crushed prior to administration. Most medications in tablet and capsule form should be swallowed with at least 100 mL of water (Brotto 2013). Powdered medications and some medications in granule form are mixed with a liquid before administration. Enteric-coated or sustained-release preparations must never be crushed, chewed or opened and must be swallowed whole. Enteric coatings are used to:

- Protect the medication from being metabolised by gastric acids
- Protect the stomach from medication that may cause gastric irritation and side effects such as nausea and vomiting
- Cause a delayed release of the medication allowing it to reach the small intestines where it will be absorbed (Bryant & Knights 2014).

Suggested guidelines for safely administering oral medications are provided in Clinical Skill 24.1. Effervescent powders and tablets should be taken immediately after dissolving. All liquid preparations should be shaken before they are poured. Any mixture that stains the teeth should be taken through a straw, and the individual should rinse out the mouth after each dose.

In certain circumstances oral medications may be administered through a nasogastric or PEG tube. Clinical Skill 24.2 provides guidelines to ensure safe administration of medications via a nasogastric or PEG tube. More information about nasogastric and PEG tubes can be found in Chapter 30. Administering medication via a nasogastric or PEG tube is the main reason that tubes become blocked, so nurses must ensure that flushing is thorough and that they never mix medications together to instil via a feeding tube because this causes the clumping responsible for blocking the tube (deWit & Williams 2014). The pharmacist or *Do Not Rush to Crush* should be consulted before crushing any tablets and administering them orally or via a nasogastric or PEG tube. It is often the case that the medication is manufactured and available in a preferable formulation; for example, liquid instead of a solid form.

For oral medication administration the equipment required includes:

- The medication chart
- Medicine receptacle
- Prescribed medication
- Glass of water or thickened fluids as required
- Drinking straw or spoon if necessary
- Oral medication syringe (if required); specific oral liquid medication syringe must be used for all oral liquid medication administration only.

**CRITICAL THINKING EXERCISE 24.4**

Describe the nursing actions if an individual prescribed medication is unable to take it (e.g. is 'nil orally') or is refusing to take the medications.

## Oral mucosal absorption

Some medications are administered by buccal or sublingual application, for the purpose of being absorbed directly into the systemic circulation through the oral mucosa (Broyles et al 2013). These routes are indicated for medications that tend to be destroyed by gastric juice, or those that are rapidly detoxified by the liver. Buccal tablets or wafers are placed in the space between the upper molar teeth and gums. Individuals should be advised to alternate cheeks with each administration to prevent mucosal irritation occurring. Sublingual tablets are placed under the tongue. Both forms remain in place while they dissolve. The individual should be advised not to chew or swallow such tablets or drink fluids until the medication has fully dissolved (Brotto 2013).

## Rectal instillation

Medication may be given rectally in the form of suppositories or retention enemas. The rectal route may be used for a local effect such as evacuation suppositories, or a systemic effect such as analgesia or antiemetic. If individuals are vomiting or unconscious the rectal route may be an option for medication delivery. Some individuals may be able to insert suppositories without assistance of a nurse, avoiding embarrassment, and others will require the nurse to administer the suppository. The individual is placed in the left lateral position and the suppository or enema is inserted past the internal anal sphincter (Brotto 2013). This prevents the medication being expelled. Suppositories have a rounded end to prevent trauma to the rectum upon insertion (Brotto 2013). The nurse should be aware of the different types of suppositories and enemas available. Evacuant suppositories prescribed to promote a bowel action are composed of various substances, such as glycerine, and act by softening and lubricating the faeces to facilitate easier passage and excretion, or by increasing

## CLINICAL SKILL 24.1 Administering oral medications

**Review and carry out the standard steps for all clinical skills/interventions**

**NMBA Decision-making Framework considerations:**

1. Am I educated?
2. Am I authorised?
3. Am I competent?

If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator

**Equipment:**

Medication chart/order
Prescribed medication
Disposable medication cups
Glass of water, juice or preferred liquid
Straw (if required)
Medication cutting device (if required)
Clean pill crusher (if required)
Liquid measure or oral/enteral syringe
Resource material (e.g. MIMS)

## CLINICAL SKILL 24.1 Administering oral medications—cont'd

| Skill activity | Rationale |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Assess the individual's ability to receive the medication via this route | If the individual is nauseous they may not tolerate medication given via this route. Some individuals may require their medication to be crushed |
| Consider any medication administration requirements such as whether the medication must be given with food | Failure to administer the medication according to the guidelines may impact on its effectiveness |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Promotes correct and safe administration of the medication<br>Confirms the individual's identity |
| Perform any necessary assessments related to the medication such as BP, apical pulse, respiratory rate (RR) | Apical pulse should be performed before administering digoxin; RR checked before opioid (narcotic) analgesics; BP checked before antihypertensives. If any abnormalities are found the nurse should not administer medication and should contact nurse in charge and medical officer |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered<br>Prevents preparation errors |
| **Solid dose forms** | |
| Calculate the number of tablets to be given. Ensure you double check the medication calculation | Ensures correct dose is given and reduces the risk of error |
| Tip the required number of tablets or capsules into the lid of the container and transfer into the medicine cup. Do not touch the medication with your bare hands | Maintains cleanliness of medications and prevents cross-infection |
| Some individuals may require their medication to be crushed. Crush medications using the pill crusher if required (Note: not all solid medications can be crushed. The nurse must use an appropriate resource to determine if a particular medication can be crushed) | Some medications cannot be crushed. Crushing these medications can alter their effectiveness |

*Continued*

## CLINICAL SKILL 24.1 Administering oral medications—cont'd

| Liquid dose forms | |
|---|---|
| Calculate the amount of liquid medication to be given (if necessary). Ensure you double check the medication calculation | Ensures correct dose is given and reduces the risk of error |
| Shake bottle thoroughly (unless contraindicated) | Promotes mixing of the contents and a uniform distribution of the medication in the liquid |
| Hold the bottle with the label against the palm of the hand | Mixture will be poured away from the label, to avoid smearing of the label |
| Remove bottle cap and place it upside down | Prevents contamination of the inside of the cap |
| Hold the medicine cup at eye level and pour the prescribed dose (marking on the cup should be even with the fluid level at the base of the meniscus), or withdraw the required dose from the container using an approved oral/enteral syringe. Discard any excess | Ensures accuracy of measurement<br>Note that parenteral syringes should not be used for administration or administration of doses |
| Check the label of the container again | Reading the label again reduces risk of errors |
| Explain the purpose of the medication and its action | Understanding improves compliance with medication therapy |
| Assist the individual into a sitting (preferred) or side-lying position when possible | Prevents aspiration during swallowing |
| Administer the medication. Individual may self-administer, assist as required. Offer the individual a glass of water, unless this is contraindicated. Advise individual to take a few sips of water before placing medication in the mouth | Solid forms of medication are swallowed more easily in a moistened mouth and by swallowing with liquids |
| Remain with the individual until the medication is swallowed. Never leave medication unattended at the bedside or on the medication trolley | The nurse assumes responsibility for ensuring that the individual receives the prescribed medication. Other individuals may access the medications if left at the bedside |
| Give individual any special instructions related to medications, such as sitting upright for 30 minutes after ingestion | Prevents side effects such as oesophageal ulceration |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Record and report immediately if medication is unable to be administered (e.g. the individual refuses medication, is vomiting, is absent); medication not available; health status has changed (hypotensive when on antihypertensives) | Reason can be reviewed by medical officer as required. Document in healthcare record |
| Monitor individual for therapeutic effect of the medication (if applicable) | Ensures medication is achieving the desired effect. |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Brotto 2013; Joanna Briggs Institute 2014a; 2013a)* | |

## CLINICAL SKILL 24.2 Administering medications via enteral routes (nasogastric tube, percutaneous endoscopic gastrostomy tube, percutaneous endoscopic gastrojejunostomy tube)

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Prescribed medication<br>Disposable medication cups<br>Oral/enteral syringe for measuring liquid medication forms<br>Pill cutter/crusher (if required)<br>Water<br>50 mL catheter tip syringe<br>Non-sterile gloves<br>pH indicator paper/strips (if nasogastric tube in use)<br>Resource material (e.g. MIMS) |

| **Skill activity** | **Rationale** |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Understanding improves compliance/concordance/adherence with medication therapy<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name and any other relevant identifiers. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Promotes correct and safe administration of the medication<br>Confirms the individual's identity |
| Perform any necessary assessments related to the medication such as BP, apical pulse, respiratory rate (RR) | Apical pulse should be performed before administering digoxin; RR checked before opioid (narcotic) analgesics; BP checked before antihypertensives. If any abnormalities are found the nurse should not administer medication and should contact nurse in charge and medical officer |
| Calculate the amount of medication to be given | Ensures correct dose is given |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Compare the medication container with the order on the medication chart<br>Prepare medications as per administration guidelines. Medications should be given in liquid form if available. Other medications may require crushing<br>Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered. Prevents preparation errors<br>Following administration guidelines ensures the medication's effectiveness |

*Continued*

| CLINICAL SKILL 24.2 Administering medications via enteral routes (nasogastric tube, percutaneous endoscopic gastrostomy tube, percutaneous endoscopic gastrojejunostomy tube)—cont'd | |
|---|---|
| Follow steps for preparation of solid dose forms or liquid dose forms in Clinical Skill 24.1. Mix the crushed medications with a small amount of water<br>Each medication should be administered separately and tubing flushed in between each medication<br>Check the fluid status of the individual | Following administration guidelines ensures the medication's effectiveness<br>Administering medication via a nasogastric or PEG tube is the main reason that tubes become blocked, so nurses must ensure that flushing is thorough and that they never mix medications together to instil via a feeding tube because this causes the clumping responsible for blocking the tube<br>Checking to see if there is a fluid restriction may determine the amount of fluid used to flush the line before and after medication administration |
| Position in semi-Fowler's position depending on their condition | Reduces the risk of regurgitation and aspiration |
| Perform hand hygiene and follow infection control procedures. Put on non-sterile gloves | Prevents cross-infection |
| Stop the flow of any feed solutions in progress as required by specific medications | Some medications may require feeding to be stopped for a set length of time to allow for the most effective absorption. Again, check with the pharmacist if you are unsure |
| Connect the appropriate type of syringe to the tube (no less than a 30 mL syringe)<br>Determine placement of nasogastric tube (if this route used) by aspirating stomach contents and testing the pH indicator strips. Should be <6<br>Flush the PEG tube with 20–30 mL of water by removing the plunger of the oral/enteral syringe, connecting it to the tube and pouring the medication into the barrel | Ensures patency of PEG tube. Reduces incidence of occlusion<br>The smaller the syringe the greater the pressure which could rupture the tubing |
| Administer medication through the syringe into the tube by holding the barrel of the syringe above the level of the stomach<br>If more than one medication is to be given they must be given separately | Holding the barrel of the syringe above the level of the stomach assists with the gravity feed of the medication directly into the stomach via the tube |
| When the last medication is given, flush the tube with at least 30 mL of water<br>Remove the syringe barrel and clamp the tube if feeding is not being administered. If the individual is receiving continuous feeding, check the facility policy on when to recommence | Ensures patency of tube. Reduces incidence of occlusion |
| Advise individual to remain in semi-Fowler's position for 30 minutes | Reduces risk of regurgitation and aspiration |
| Remove non-sterile gloves, perform hand hygiene | Prevents cross-infection |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is appropriate for the individual |

**CLINICAL SKILL 24.2 Administering medications via enteral routes (nasogastric tube, percutaneous endoscopic gastrostomy tube, percutaneous endoscopic gastrojejunostomy tube)—cont'd**

| | |
|---|---|
| Monitor individual for any adverse effects to the medication. Report any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2014a; 2014b; 2013d; deWit & Williams 2014)* | |

peristalsis through the irritation of intestinal sensory nerve endings. Suggested guidelines for administering rectal suppositories are presented in Clinical Skill 24.3.

The equipment required includes:

- Medication chart
- Prescribed suppository/suppositories
- Non-sterile gloves
- A small disposable sheet to protect bed linen
- Water-soluble lubricant
- Waste receptacle for used articles
- Appropriate toilet facilities (e.g. bedpan, toilet paper)
- Soap, face washer and towel for hygiene after bowel motion or insertion of suppository.

## Administering parenteral medications

### Injections

Nurses commonly administer medications by parenteral injection through the subcutaneous, IM or IV routes. Medications are given by injection for a variety of reasons, including:

- Inability to be absorbed when given orally (e.g. aminoglycoside antibacterial agents)
- Destroyed by digestive juices (e.g. insulin)
- Rapid onset of action may be required
- Very precise control over dosage may be needed
- Inability of the individual to take medications orally.

The administration of an injection is an invasive procedure that must be performed using aseptic non-touch technique (ANTT) as there is a risk of infection when a needle pierces the skin. Infection is prevented by hand hygiene, aseptic technique when preparing the solution and in administration of the injection, and by preparing the skin prior to the injection (Broyles et al 2013). Principles of ANTT (see Chapter 22) are used when preparing for and administering parenteral medications.

A variety of syringes and needles are available, and are single use and disposable. Syringes are available in a range of sizes, varying in capacity from 1 to 50 mL. A syringe consists of a cylindrical barrel with a tip designed to fit the hub of a needle, and a close-fitting plunger (Figure 24.7). The syringe tip is either straight where the needle slides firmly over, or a luer lock where the needle is screwed securely into place. The barrel of the syringe is calibrated into millilitres and tenths of a millilitre or, in the case of an insulin syringe, into units. Selecting an appropriate syringe size depends mainly on the prescribed route, and amount of medication to be administered. Generally a 2–3 mL sized syringe is adequate for subcutaneous, IM and some IV injections.

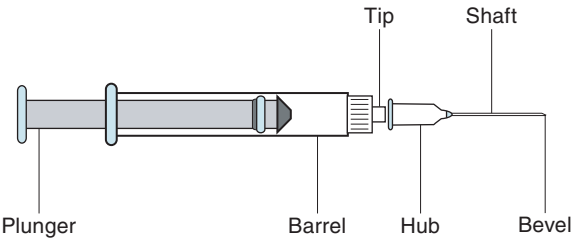


**Figure 24.7** Components of a needle and syringe *(Potter et al 2013)*

Needles are available in various lengths and gauges, with different sized bevels. A needle has three parts (Figure 24.7): the hub, which fits onto the tip of a syringe, the shaft and the bevel tip. Needle gauge is determined by the lumen of the needle: as the diameter of the lumen increases, the gauge number decreases. For example, a 16-gauge needle is substantially larger in diameter than a 22-gauge needle.

Selecting an appropriate needle depends mainly on the prescribed route, viscosity of the medication and the individual's body size and amount of fat. Subcutaneous injections are generally given through a small-diameter needle (e.g. 25-gauge) while IM injections usually require a 21–23-gauge needle. **Intravenous injections** are generally administered through a needleless system. There are specially designed needles that contain a sheath that slide down and cover the needle and tip, to prevent needlestick injury, after the injection has been given (Brotto 2013).

## CLINICAL SKILL 24.3 Inserting a rectal suppository or disposable enema

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Enema/suppository<br>Lubricant<br>Waterproof sheet<br>Gloves<br>Resource material (e.g. MIMS) |

| **Skill activity** | **Rationale** |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Confirms the individual's identity and reduces risk of allergic reaction<br>Promotes correct and safe administration of the medication |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Compare the medication container with the order on the medication chart | Ensures the correct medication is being administered. Prevents preparation errors |
| Place the individual in a left lateral position with the right leg flexed | Anatomical site of the lower colon means that this position is the most effective for the introduction and retention of suppositories |
| Ensure that the person is adequately covered, with only the buttocks exposed | Promotes warmth and comfort |
| Perform hand hygiene and follow infection control procedures. Put on non-sterile gloves | Prevents cross-infection |
| Lubricate finger of glove and suppository/enema nozzle | Facilitates insertion of suppository/enema |
| Gently insert the suppository/enema by directing it with the finger, through the anus about 10 cm into the rectum | Suppository/enema must pass the internal anal sphincter and come in contact with rectal mucosa |
| During insertion, encourage the individual to take deep breaths through the mouth | Helps to relax the anal sphincters |
| Ask the individual to remain on their side or supine for at least 5 minutes. Encourage the individual to retain the suppository/enema for the correct length of time. A suppository administered to cause a bowel action should be retained for at least 20 minutes. An enema will be held for the time stated on the manufacturer's instructions | Individual must be aware whether the suppository/enema is to be retained to allow any medication to be dissipated, or whether to expect a bowel action. Suppositories/enemas to promote a bowel action must be retained long enough to be effective |

| CLINICAL SKILL 24.3 Inserting a rectal suppository or disposable enema—cont'd | |
|---|---|
| Ensure the individual has easy access to toilet facilities and the signal device (e.g. nurse call bell) | Reduces anxiety related to accidental expulsion of the suppository or faeces |
| Dispose of used equipment appropriately, remove gloves and perform hand hygiene | Prevents cross-infection |
| If a bowel action results, the faeces are observed and the observations reported and documented | Helps to assess the effectiveness of the treatment and detects any abnormalities |
| Attend to the individual's hygiene and position | Helps promote comfort |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2014f; 2014g)* | |

Medication for injections may be presented in sterile ampoules, vials, IV medication bags or bottles (Figure 24.8). Prepared IV medications are premixed in bags in a suitable IV fluid, and will need an IV line connected to it for administration. An ampoule is made of clear glass or plastic, with a constricted neck that must be snapped off to allow access to the medication. Ampoules contain volumes from 0.2 mL to 20 mL or more. A vial is a single-dose glass container with a rubber seal at the top, which is protected by a metal cap until it is ready for use. Vials contain medications in either liquid or powder form, requiring reconstitution prior to administration. Sterile water labelled 'water for injection' and sodium chloride 0.9% are commonly used as diluents to dissolve medications in powder form. The *Australian Injectable Drugs Handbook* specifies type and volume of diluent to use, as well as any other recommendations for administration (e.g. compatibilities, how fast to administer). These instructions must be consulted before the preparation and administration of any parenteral medication. Table 24.3 illustrates the procedure for the preparation of medications from ampoules and vials.

Some medications are available in disposable, single-dose pre-filled syringes and may not need calculations to prepare dose of the medication. It may be necessary to advance the plunger a small way to expel some medication if the dose ordered is less than that in the syringe or to prime the needle (e.g. insulin pen). The nurse must still follow correct checking procedure including name, strength, expiry date and volume of the medication. Particular care is needed because many pre-filled syringes look the same but contain very different medications. Some emergency medications (e.g. adrenaline) are available in an injection system that requires the plunger in a standard syringe to be screwed into the end of a pre-filled vial with an inbuilt needle. After use the whole injection unit is discarded into the appropriate sharps safe container. This device is designed to minimise the risk of needlestick injury (Brotto 2013).

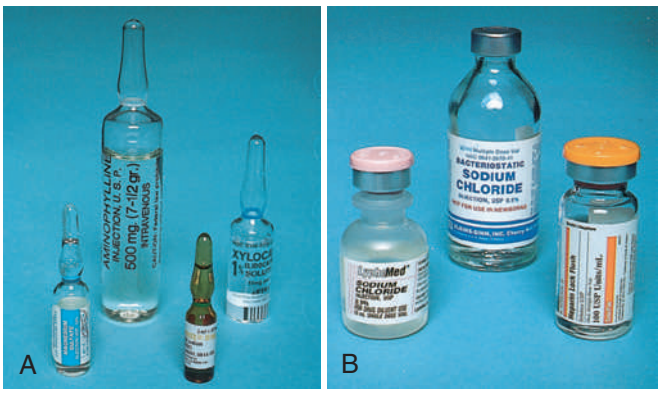


**Figure 24.8** A: Medication in ampoules. B: Medication in vials *(Potter et al 2013)*

**TABLE 24.3 | Preparation of medications from ampoules and vials**

| Ampoules | Vials |
|---|---|
| Rotate the ampoule or tap the top lightly with a finger to dislodge any fluid above the neck of the ampoule | Remove the metal cap to expose the rubber seal |
| Face the dot on the tip of the ampoule away from the body. Gently tilt the tip towards the body and snap away from the body. The tip should easily snap off. If resistance is felt use an ampoule snap device or place a gauze square around the neck of the ampoule to protect the fingers as the glass is snapped | Wipe the surface of the seal with an alcohol swab, to remove any dust or grease |
| Snap the neck in a direction away from the hands, to prevent shattering the glass towards the fingers or face | To prepare a powdered medication, assemble needle and syringe and draw up the amount of diluent recommended on the label of the vial or in the manufacturer's information, and gently inject into the vial. Gently shake or roll the vial between the hands to dissolve the powder |
| Assemble needle and syringe. Remove needle cover<br>Use a blunt filter needle (if available) to draw up medication from a glass ampoule. Filter drawing up needles prevent micro glass particles from entering the syringe and thus avoids injection of these particles into the individual. | Before drawing up the solution, assemble the needle and syringe and remove the needle cover. Draw back on the plunger to draw air into the syringe, equivalent to the volume of medication to be aspirated |
| Insert the needle (attached to the syringe) into the centre of the ampoule opening, being careful not to touch the needle on the rim of the ampoule, to prevent needle contamination | With bevel pointing up, insert the tip of the needle through the centre of the rubber seal |
| Aspirate the medication by pulling back on the syringe. Keep the needle tip below the surface of the medication to prevent aspiration of air bubbles | Inject the air from the syringe into the vial. Hold the plunger, as it may be forced backwards by air pressure within the vial |
| To expel air bubbles from the syringe, remove the needle from the ampoule and hold syringe with the needle pointing up. Draw back slightly on the plunger and then push the plunger up to eject the air (but avoid dispersing medication into the environment). Holding the syringe and needle upright, tap the syringe barrel to dislodge remaining air bubbles. It is important to expel air bubbles because if air is injected it may gain entry to the bloodstream and block a blood vessel | Holding the syringe and plunger, invert the vial. Hold the vial in the non-dominant hand<br>Allow air pressure to gradually fill the syringe with medication. Ensure to keep the tip of the needle below fluid level. Pull back slightly on the plunger to keep the needle tip below the water level<br>Remove the needle from the vial by pulling back on the barrel of the syringe<br>Tap the syringe barrel to remove any air bubbles |
| Remove the drawing-up needle from the syringe before administering the medication via the IV needleless system | Remove the drawing-up needle from the syringe before administering the medication via the IV needleless system |

*Adapted from Brotto (2013)*

## Parenteral fluids

Parenteral fluids correct imbalances in individuals and the IV fluid ordered will be determined by the illness and its effect on the fluid balance status of the individual. IV fluids are divided into isotonic, hypotonic and hypertonic fluids (Wotton 2013). The osmolarity of a fluid is determined by the concentration of solutes (primarily sodium) in a litre of fluid (mOsm/L). Body fluids have an osmolarity of 280–296 mOsm/L. Isotonic fluids have a similar osmolarity as blood and are primarily used to increase the volume of the intravascular space, in the presence of dehydration (from ongoing fluid losses such as vomiting and diarrhoea), hypovolaemia (blood loss) and hypernatraemia (high sodium) (Phillips & Gorski 2014). Isotonic fluids will not cause fluid shifts between the intracellular and extracellular compartments and any isotonic fluids administered IV will remain in the intravascular compartment (Phillips & Gorski 2014). Therefore, the nurse will need to monitor the individual for signs and symptoms of fluid overload (pulmonary and peripheral oedema) especially if they have other comorbidities such as congestive heart failure or hypertension (Wotton 2013). Daily weighs are a good measure of acute body fluid gain,

and should be measured in individuals where there is risk of fluid volume overload.

Hypotonic fluids have an osmolarity less than blood (<250 mOsm/L), and will cause a fluid shift from the intravascular compartments into the intracellular compartment, restoring fluid levels to cells (Phillips & Gorski 2014). Hypotonic fluids are used to treat conditions such as hypertonic dehydration and diabetic ketoacidosis. The individual receiving hypertonic fluids will need to be monitored closely as the fluid shift from the intravascular compartment may cause insufficient fluid in the blood vessels and lead to circulatory collapse.

The osmolarity of hypertonic fluids (>375 mOsm/L) is greater than that of body fluids and will cause a fluid shift from the intracellular space to the extracellular compartment, and is mainly used to treat conditions such as shock (Phillips & Gorski 2014). Individuals will need to be monitored for fluid overload (Wotton 2013).

Potassium chloride (KCl) is a common premixed additive with another IV fluid. The writing on the bags containing the IV solution and the KCl is red, as an alert that the fluid contains potassium. Fluid boluses must not be given from IV fluids containing KCl, as it can be fatal (Wotton 2013). Many hospital facilities now have protocols that individuals going to theatre must not have IV fluid running that has the additive KCl in case they need to have a rapid bolus while having surgery.

Parenteral fluid replacement includes crystalloid fluids (IV fluid and electrolyte replacement) and colloid fluids (blood and blood products) (see Table 24.4). Crystalloids are used to correct and prevent fluid loss as well as correcting electrolyte balances (Wotton 2013). Crystalloids, once mixed with the blood, are able to disperse through the intracellular and extracellular compartments through osmosis without changing the osmolarity of the body's fluids in these compartments (Phillips & Gorski 2014).

Colloids are essentially a hypertonic fluid that contains proteins and starches and once infused normally remain in the intravascular space. These proteins cause an increase in the osmolarity of blood and draw fluid into the blood vessels expanding the volume of the plasma. Colloids are also called volume expanders and include products such as Albumin, Dextran and Mannitol (Phillips & Gorski 2014).

**TABLE 24.4 | Common intravenous fluid types**

| Crystalloids solutions | Therapeutic use |
|---|---|
| 5% Glucose | Provides calories and free water, diluent for IV medications, treatment for hyperkalaemia and dehydration |
| 0.9% Sodium chloride | Replaces electrolytes, hyponatraemia, DKA, flush pre- and post-IV medication delivery and access devices, extracellular fluid replacement, irrigation of wounds |
| Hartmanns | Dehydration, hypovolaemia, extracellular fluid replacement, shock |
| **Colloid solutions** | |
| 20% Albumin | Extremely low albumin in the critically ill, burns, ascites in liver cirrhosis, haemodialysis |
| Dextran | Plasma expander, fluid replacement, perioperative shock, haemorrhage, trauma, |
| Gelofusine | Plasma expander, fluid or blood loss, perioperative shock, haemorrhage, trauma |

*Adapted from Broyles et al (2013); Phillips & Gorski (2014)*

## Injection sites

**Subcutaneous injection** involves injecting medication into the loose connective tissue under the dermis (Brotto 2013). Small volumes of medication that will not damage subcutaneous tissue are administered by this route and must be water soluble (Brotto 2013). Subcutaneous sites that are commonly used include the upper lateral aspect (middle third) of the upper arm, the upper anterior thighs, the abdomen below the costal margins to the iliac crests and the upper ventro or dorsogluteal region (Figure 24.9) (Broyles et al 2013). These injection sites are generally free from bony prominences and large underlying muscles or nerves; the nurse must also assess the skin to avoid skin lesions (Brotto 2013). Subcutaneous injections are administered with the needle inserted at an angle of 45 degrees or 90 degrees (Figure 24.10), depending on the size of the needle used and the amount of adipose tissue on the individual (Broyles et al 2013). An elderly person with minimal subcutaneous tissue should have the needle inserted on a 45-degree angle. Figure 24.11 illustrates

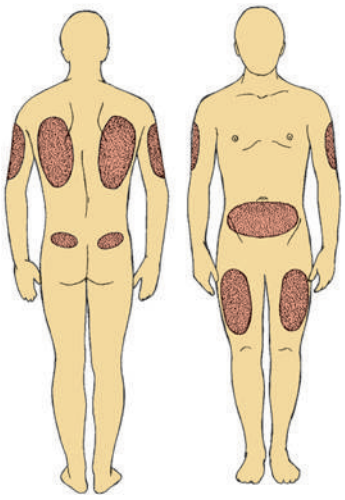

**Figure 24.9** Common sites for subcutaneous injections *(Brotto 2013)*

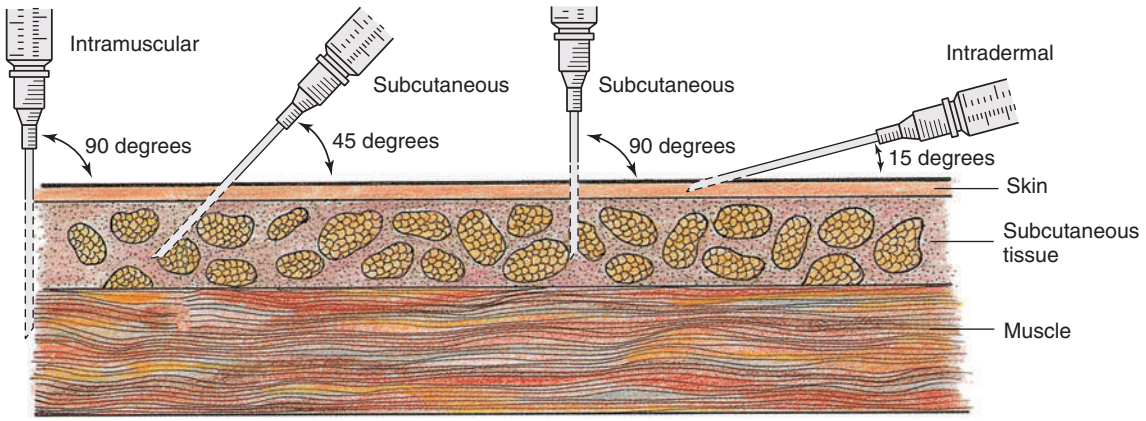


**Figure 24.10** Comparison of angles of insertion for A: subcutaneous injections (45 and 90 degrees), B: intramuscular injections (90 degrees), C: intradermal injections
*(Brotto 2013)*

**Figure 24.11** Administering a subcutaneous injection in the abdomen
*(Potter et al 2013)*

the most common site for administration of subcutaneous injections.

**Intramuscular (IM) injections** involve injecting medication into deep muscle tissue. Muscle is less sensitive to irritating or viscous medications, and specific volumes for each IM muscle site can be injected into muscle without causing severe discomfort. IM injections are administered with the needle inserted at an angle of 90 degrees (Figure 24.10). Any medication given IM or IV must be mixed and administered as per the guidelines outlined in the *Australian Injectable Drugs Handbook* and/or hospital procedural guidelines. These *must be checked prior to IM or IV medication calculation and administration.* The recommended volumes for injecting into specific muscle sites are a maximum of 4 mL for ventrogluteal and 5 mL for vastus lateralis, and up to a maximum of 2 mL for the deltoid muscle (Brotto 2013). Smaller volumes are recommended for elderly or frail individuals, or those with less developed muscle mass or children. The sites chosen are areas where there is minimal risk of the needle penetrating a large blood vessel, nerve or bone.

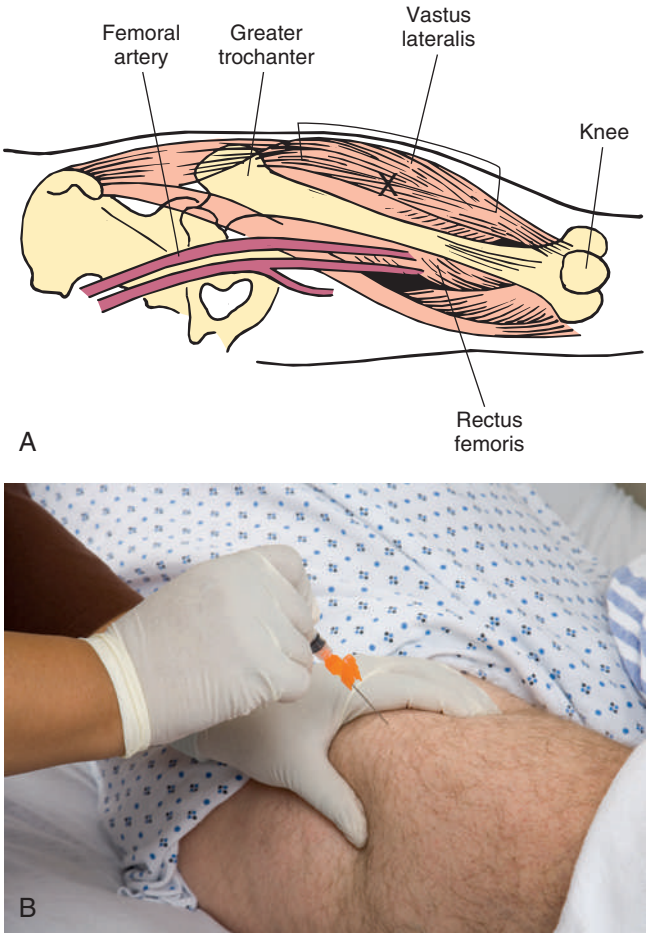


**Figure 24.12** A: Landmark for IM injection vastus lateralis region. B: Injection location vastus lateralis muscle
*(Potter et al 2013)*

The IM injection is always aspirated (syringe is drawn back 0.5 mL) after the needle is inserted into the muscle but before injection of vthe medication, to ascertain that the needle has not entered a blood vessel. Intramuscular sites and their anatomical locations commonly used are the vastus lateralis muscle (Figure 24.12), located at the middle third of

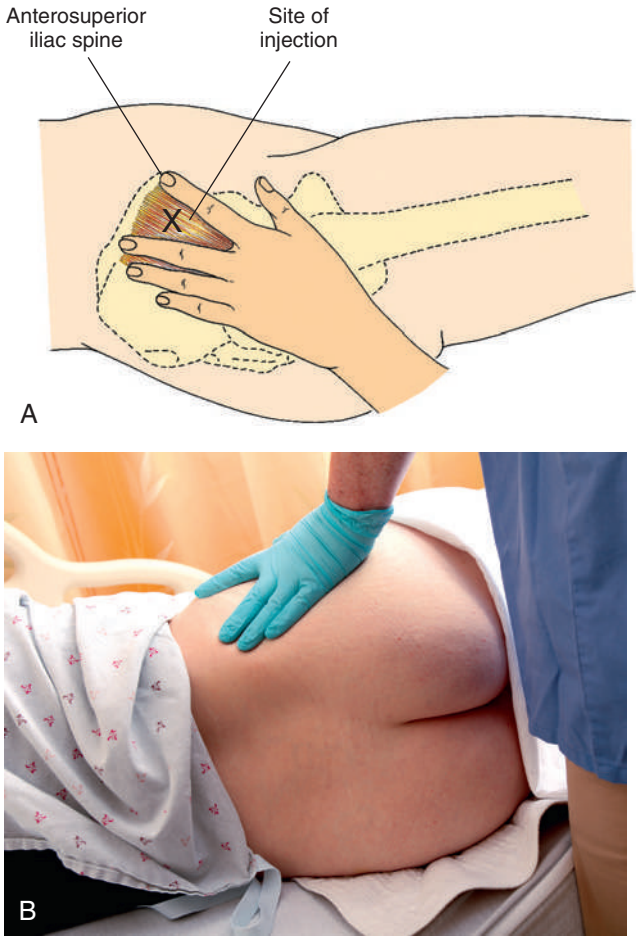


**Figure 24.13** A: Landmark for IM injection ventrogluteal region. B: Injection location ventrogluteal muscle
*(Potter et al 2013)*

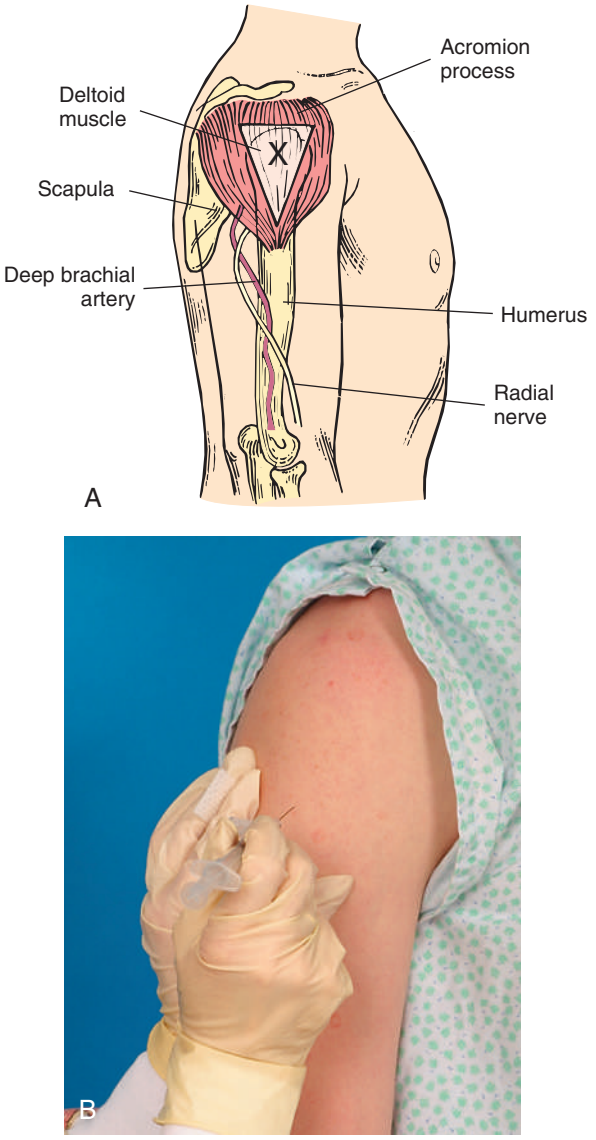


**Figure 24.14** A: Landmark for IM injection deltoid region. B: Injection location deltoid muscle
*(Potter et al 2013)*

the anterior lateral aspect of the thigh; ventrogluteal region (Figure 24.13) where the injection occurs into the gluteus medius muscle located between the greater trochanter and the iliac spine; and deltoid muscle (Figure 24.14) located at the upper outer aspect (middle third) of the upper arm (Brotto 2013). The injection site for ventrogluteal is located midway between greater trochanter and the hip. The ventrogluteal site is the preferred site for intramuscular injections because it does not contain large blood vessels or nerves, is sealed off by bone, contains less fat than the buttock area and has the greatest thickness of gluteal muscle (Brotto 2013; Berman et al 2015). The heel of the hand is placed over the person's greater trochanter, and then the anterior superior iliac spine is palpated with the index finger. The middle finger is widened from the index finger, making a space pointing towards the iliac crest. The injection site is located in the space between the index finger and middle finger (Figure 24.13).

The Z-track method of injection (Figure 24.15) is a technique used when irritating preparations such as iron are given IM. A new needle is attached to the syringe after preparing the medication so that no solution remains on the outside of the needle. The skin and subcutaneous tissue are drawn to one side with the non-dominant hand, the needle is then inserted and medication injected. After removal of the needle the skin is released to close the injection track, preventing the viscous medication seeping into the subcutaneous tissue (Broyles et al 2013). This promotes absorption of the medication at the site and also prevents skin staining and pain. The Z-track method of injection deposits medication into the muscle without tracking residual medication through sensitive tissues.

**Intravenous (IV) injection** involves delivering medication or fluid directly into a vein. It is accessed by a **needleless intravenous system.** Needleless IV systems administer medications or fluids through an IV access device without using a needle. Blunt filter needles may be used for drawing up sterile solutions from ampoules and the needleless ports are then accessed with the hub of the syringe only. Needleless systems are commonly used in acute healthcare settings, and are important in preventing the risk of needlestick injuries in

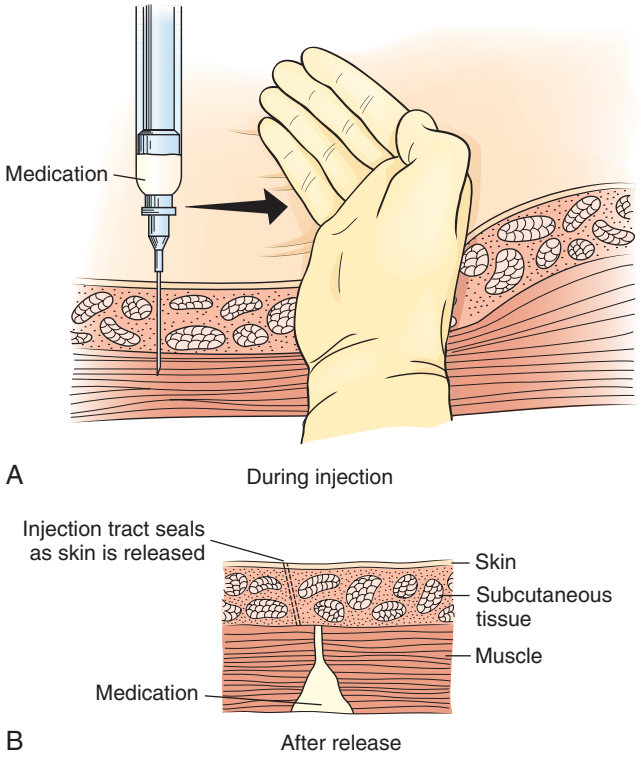


**Figure 24.15** Z-track injection: A: pulling overlying skin down before IM injection and B: releasing after injection to prevent tracking of medication into sensitive tissue *(Potter et al 2013)*

the workplace, as injuries occur with attempts to recap needles, mishandling of needles and syringes, and when needles are left at bedsides (Broyles et al 2013).

### Promoting safety and comfort

To ensure correct subcutaneous or IM administration of an injectable medication and to minimise the individual's discomfort, the nurse should:

- Position the individual comfortably to reduce muscular tension
- Use a sharp needle in the smallest suitable length and gauge
- Select the correct injection site, using anatomical landmarks
- Sites should be rotated to minimise discomfort and tissue damage and aid absorption. This may be achieved by asking the individual the site of the last injection and/or documenting the site in the individual's clinical notes or care plan or on the medication chart
- Insert the needle smoothly and quickly
- Securely hold the syringe steady while the needle remains in the tissues
- Aspirate the syringe in IM injections only before injecting the medication, to check that the needle has not entered an artery or vein
- Remove the needle and press on, or gently massage, the area for several seconds after administration, unless contraindicated
- Dispose of the needle directly into a sharps container to prevent needlestick injuries
- Assess the injection sites ensuring they are free of any bruising, hardness, signs of inflammation or other abnormality.

Suggested guidelines for administering subcutaneous and intramuscular injections are outlined in Clinical Skill 24.4. The equipment required includes:

- Medication chart
- Kidney dish
- Syringe, selected according to the volume of medication to be administered
- Needles, selected according to the route and body size of the individual
- Alcohol swabs
- Prescribed medication in ampoule or vial
- Cotton swab for applying pressure to the site
- Non-sterile gloves
- Sharps receptacle for immediate disposal.

Nurses must be aware of their responsibilities and limitations to their scope of practice in relation to the law and Acts as stipulated by government bodies in each of the states and territories in Australia. They must also practise according to organisational policy and procedural guidelines of the employing hospital or other agency regarding the administration of IV medications.

## Administering fluids and medications via the intravenous route

IV therapy is frequently prescribed for individuals requiring restorative, replacement, maintenance and medication treatment (Broyles et al 2013). The nurse requires knowledge regarding the IV fluids and medications to be administered, rationale for IV therapy, and of the fluid and electrolyte balance of the individual receiving the treatment (Broyles et al 2013). In addition the nurse requires the skills to assist with the establishment of the IV therapy, prepare the equipment required and manage the IV therapy once established. (See Clinical Skills 24.5 and 24.6.) Most organisations require all IV fluid and medications diluted in fluids to be administered through a volumetric pump.

IV medication or fluids need to be administered over a certain time period as giving IV fluids or medication too fast or too slowly can cause serious adverse reactions. The *Australian Injectable Drugs Handbook* gives the recommended times over which individual medications should be administered.

IV fluids and medications may be administered in a number of different ways (see Clinical Skill 24.7), including:

- Large or small volume infusions—IV fluids are available in a variety of fluid types and volumes in 50, 100, 250, 500 and 1000 mL bags. Medications can be added to a compatible fluid and specific volumes for administration. IV fluids may be administered at a rate to keep vein open (TKVO) in instances where IV access is not stable and to preserve the patency of the

*Text continued on page 604*

## CLINICAL SKILL 24.4 Administering subcutaneous and intramuscular injections

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Prescribed medication<br>Syringe<br>23G needle (for IM injections)<br>25G needle (for subcut injections)<br>Antiseptic swab<br>Sterile gauze<br>Injection tray<br>Sharps container<br>Gloves<br>Resource material (e.g. MIMS) |

| **Skill activity** | **Rationale** |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Understanding improves compliance/concordance/adherence with medication therapy<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Promotes correct and safe administration of the medication<br>Confirms the individual's identity and reduces risk of allergic reaction |
| Gain the assistance of another nurse if the individual is a child, or an adult who is restless or irrational or may need assistance with positioning | Promotes safety during administration |
| Perform hand hygiene and follow infection control/ANTT procedures. | Prevents cross-infection |
| Calculate the correct dose and prepare the medication according to Table 24.3: Preparation of medications from ampoules and vials<br>Check the label and expiry date. Have two nurses check (one must be a Registered Nurse) according to safe administration guidelines and the facility/organisation policy<br>Compare the medication container with the order on the medication chart | Promotes safety during administration<br>Ensures the correct medication is being administered. Prevents preparation errors |

*Continued*

| CLINICAL SKILL 24.4 Administering subcutaneous and intramuscular injections—cont'd | |
|---|---|
| Select an appropriate injection site and assist the individual into a comfortable position. Select a site that has not been used frequently. If possible, ask the individual the site of the last injection | Appropriate site selection aids absorption, reduces likelihood or injury and discomfort. Rotating sites minimises tissue damage<br>Comfort promotes relaxation and helps to reduce anxiety |
| Locate the site using anatomical landmarks. Check site for any masses, lumps, signs of infection, scars or skin lesions | Insertion of medication into the correct site avoids injury to underlying structures. Masses, scars, etc will interfere with medication absorption |
| Cleanse the site with an antiseptic swab and allow to dry. For subcutaneous injection, follow facility/organisation policy regarding skin cleansing | Removes microorganisms from the skin |
| Put on gloves. Remove the needle cap and hold the syringe in the dominant hand. Hold the individual's skin between the thumb and forefinger and either pull it taut or pinch<br>it up | A needle penetrates tight skin more easily than it does loose skin. Pinching the skin up may be necessary when an subcut injection is given to an obese individual, or when an IM injection is given to an individual with small muscle mass |
| Insert the needle quickly and firmly, at a 45° or 90° angle for subcutaneous injection, and at a 90° angle for IM injection | Quick, firm insertion minimises anxiety and discomfort |
| For an IM injection slowly pull back on the plunger. If blood appears in the syringe, the needle is withdrawn and the injection repeated at another site, using a fresh dose, syringe and needle (this does not need to be performed for a subcut injection) | Muscles are more vascular than subcut tissue. Checks whether needle has penetrated a blood vessel |
| Inject the medication slowly. After injection pause for at least 5 seconds before withdrawing the needle | Slow injection reduces tissue trauma and pain<br>Pausing permits dispersal of the medication |
| Withdraw needle at same angle of insertion while applying gauze gently over the injection site | Support of tissues minimises discomfort as the needle is withdrawn<br>Use of alcohol swab may cause discomfort |
| Activate the needle safety guard (if used) or dispose of syringe without recapping into proper receptacle | Recapping used needles may result in a needlestick injury |
| Apply pressure with sterile gauze if bleeding occurs. Do not massage | Use of alcohol swab may cause discomfort. Massage may cause bleeding, increase the absorption rate, damage underlying tissue |
| Assist the individual into a comfortable position | Promotes comfort |
| Discard syringe and needle into an appropriately labelled rigid-walled sharps container without recapping the needle | Proper disposal prevents sharps injury to personnel or visitors |
| Remove gloves and perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Record each medication administered on the medication chart, including the site of injection | Prompt documentation prevents errors. Sites should be rotated for long-term therapy such as insulin, as repeatedly using the same site leads to thickening of skin and tissue atrophy |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is effective/appropriate for the individual |

## CLINICAL SKILL 24.4 Administering subcutaneous and intramuscular injections—cont'd

| | |
|---|---|
| Monitor individual for any adverse effects to the medication. Report any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Bartley 2012; Hopkins & Arias 2013; Joanna Briggs Institute 2014c; Ogston-Tuck 2014)* | |

## CLINICAL SKILL 24.5 Establishing intravenous (IV) therapy (assisting)

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Intravenous fluid orders, IV fluid, IV infusion set, burette (if applicable), 10 mL syringe and needle, 10 mL normal saline, IV cannula, IV cap/bung, dressing pack, antiseptic skin prep (chlorhexidine 70% solution), disposable gloves, tourniquet, tape, occlusive dressing, arm-board, IV stand, IV pump, FBC, IV line label, IV cannula care plan |
| **Skill activity** | **Rationale** |
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check all allergies including latex or tape | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Understanding improves compliance/concordance/adherence with therapy<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Reduces risk of allergic reaction |
| Check the relevant medical orders (intravenous orders) prior to preparation of infusion<br>Ensure the correct IV fluid is given by checking the 'seven rights'<br>Check the label and expiry date. Have two nurses check (one must be a Registered Nurse) according to safe administration guidelines and the facility/organisation policy | Promotes correct and safe administration of the medication<br>Abides by the legal and ethical frameworks regarding safe administration and checking procedures |
| Perform hand hygiene and follow infection control/ANTT procedures | Prevents cross-infection |
| Prepare the giving set by closing the clamp, spiking the IV fluid bag using aseptic technique, and then priming the line with the IV fluid by squeezing the drip chamber to allow fluid to enter and then opening the clamp.<br>Continue priming with fluid until all of the air in the giving set has been expelled | Ensures safe administration and ensures the tubing is filled with solution and free of air to prevent air embolus |

*Continued*

## CLINICAL SKILL 24.5 Establishing intravenous (IV) therapy (assisting)—cont'd

| | |
|---|---|
| Assist the medical doctor or registered nurse with cannulating the individual in order to establish IV access<br>Prepare the dressing tray using aseptic technique<br>Support the individual and help to anchor the proposed site for cannulation<br>Secure tapes and dressing once instructed by medical officer/Registered Nurse<br>Insert primed line onto cannula hub or needleless system (if competent to do so) otherwise give primed line to medical officer/Registered Nurse for attachment | Prevents cross-infection and the introduction of microorganisms<br>Relieves anxiety and allows for easier cannulation without complications<br>Abides by organisation policy and procedure, and the legal frameworks around the safe administration of IV fluids |
| Establish the ordered flow rate with a Registered Nurse, and/or as per policy<br>Ask individual to notify staff if they feel pain/discomfort around the cannula site or any swelling | Ensures the safe administration of IV fluid<br>Prevents circulatory overload |
| Clean, replace and dispose of equipment appropriately<br>Documentation:<br>• ensure that the person who inserted the cannula documents the insertion and gauge of the IV cannula on appropriate form<br>• document the commencement of IV fluid<br>• complete/commence a FBC as per policy<br>• complete and attach a change of line label to IV tubing<br>Report any relevant information to the Registered Nurse/nurse in charge<br>Report to oncoming nursing staff: type of fluid, flow rate, condition of cannula site, any side effects | Reduces transmission of microorganisms<br>Prevents a needlestick injury<br>Alerts staff of IV cannula presence and fluid administration (if in progress)<br>Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Phillips & Gorski 2014; Centers for Disease Control and Prevention 2011; Berman et al 2015; Tollefson et al 2016)* | |

## CLINICAL SKILL 24.6 Intravenous management

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Intravenous fluid orders<br>IV infusion pump<br>FBC<br>IV cannula care plan |
| **Skill activity** | **Rationale** |
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check all allergies including latex or tape | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Reduces risk of allergic reaction |

## CLINICAL SKILL 24.6 Intravenous management—cont'd

| | |
|---|---|
| Explain the procedure to the individual in relation to the following assessments:<br>Local—check the IV insertion site for any redness/pallor, temperature (hot or cold), pain/discomfort, swelling (infiltration or extravasation) or bleeding; check the patency of the IV cannula; check IV line<br>Ask individual to report any pain or discomfort<br>Systemic assessment—check for any signs of circulatory overload, fluid volume deficit, signs of infection/ septicaemia or pulmonary air embolism | Alleviates anxiety<br>Ensures cooperation and allows for consent for procedure<br>Understanding improves compliance/concordance/ adherence with therapy<br>Abides by legal and ethical guidelines as well as organisation policies and procedures<br>Pain or burning may be an early sign of phlebitis |
| Calculate flow rate and ensure the rate compares with the correct fluid order<br>Check the fluid bag for expiry date, colour and leakage | Ensures safe administration of IV fluid<br>Prevents circulatory overload |
| An individual with IV therapy may need assistance with changing into different clothing, ambulating and hygiene. Be careful not to disconnect the IV tubing<br>Ensure care is taken when assisting them and explain the reason for care when doing any of the above in order to maintain IV access | Educates individual about importance of maintaining IV access and the risks associated with poor management<br>Ensures safety with IV management<br>Prevents complications |
| Monitor IV infusion every hour as per facility/organisation policy. Assess IV patency, rate of flow and response to treatment | Prevents complications related to delivery of IV fluid and early detection of inflammation or tissue damage |
| Change IV fluid as ordered ensuring that correct checking procedures are in place as per policy and procedure<br>Complete FBC as per policy and procedure<br>Document IV management in health record and other forms as required:<br>• signs IV fluid chart, records date and time infusion commenced, completes and attaches change of IV line label to IV tubing<br>• condition each shift, any complications such as infection, injury or loss of patency | Maintains IV access and maintenance<br>Ensures individual is receiving recommended therapy as ordered<br>Prevents complications and monitors status |
| Discontinue IV therapy and remove IV cannula when:<br>there is a medical order (verbal or written)<br>complications have arisen (as mentioned above) and these have been discussed with a Registered Nurse or medical officer (see Clinical Skill 24.8)<br>Document date and time of removal, condition of site at time of removal and whether cannula and tip were complete and intact (see Clinical Skill 24.8) | IV cannulas are inserted to administer medications and/or fluids |
| Communicate abnormal findings to the Registered Nurse/ medical officer<br>Report to oncoming nursing staff: type of fluid, flow rate, condition of cannula site, any side effects | Alerts staff of IV cannula/fluid administration<br>Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Phillips & Gorski 2014; Centers for Disease Control and Prevention 2011)* | |

## CLINICAL SKILL 24.7 Administration of intravenous (IV) medications: infusion and bolus

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication orders, IV fluid, medication, diluent, IV infusion set, burette, syringe and needleless device for administration and vial access (if applicable), IV additive label, IV line label, antiseptic swabs, disposable gloves, IV pump and fluid balance chart (FBC), injection tray<br>Resource material (e.g. MIMS, Injectable Drugs Handbook) |

| **Skill activity** | **Rationale** |
|---|---|
| **General procedures for administration of all IV medications** | |
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions<br>Collect all necessary information about the medication, including action, purpose, normal dose, side effects, any special administration information and compatibility of fluids and medication | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Understanding improves compliance/concordance/adherence with medication therapy<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction.<br>Promotes correct and safe administration of the drug and enables the nurse to monitor the therapeutic effects of the medication |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth.<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Promotes correct and safe administration of the medication<br>Confirms the individual's identity and reduces risk of allergic reaction |
| Perform hand hygiene and follow infection control/ANTT procedures | Prevents cross-infection |
| Calculate the correct dose and prepare the medication according to Table 24.3: Preparation of medications from ampoules and vials<br>Check the label and expiry date. Have two nurses check (one must be a Registered Nurse) according to safe administration guidelines and the facility/organisation policy<br>Compare the medication container with the order on the medication chart | Promotes safety during administration<br>Ensures the correct medication is being administered<br>Prevents preparation errors |
| Check cannula insertion site for any signs of redness, warmth, swelling, pain or tenderness on palpation<br>Assess the patency of the cannula as per facility/organisation policy | Ensures safe administration of medication into venous system rather than into surrounding tissues |

| CLINICAL SKILL 24.7 Administration of intravenous (IV) medications: infusion and bolus—cont'd | |
|---|---|
| If necessary, check vital signs before, during and after infusion of medication as recommended and/or as per policy and procedure | Allows nurse to monitor individual's response to medication<br>Ensures safety of the individual during the administration of the medication |
| Perform hand hygiene and follow infection control/ANTT procedures. Put on disposable gloves | Prevents cross-infection |
| Safely dispose of equipment into the correct disposal unit after use | Prevents accidental needlestick injuries (if needle used) and disposes of waste correctly as per policy and procedure |
| Record medication administration promptly on medication/infusion administration sheet | Prevents medication errors from occurring; for example, dose being duplicated |
| Record volume of fluid in medication bag (used for piggyback/tandem administration) or burette on intake/output form | Prevents circulatory overload |
| Observe closely and report any adverse reactions to medical officer and/or nurse in charge; document in individual's progress notes | Allows medical officer to stop or change medication promptly if an adverse reaction occurs, and to treat the symptoms of an adverse reaction |
| **Large volume infusions (e.g. potassium chloride, vitamins)** | |
| Before adding medication, ensure that it is compatible with the IV fluid | Prevents chemical reaction occurring, which may result in clouding or crystallisation of the IV fluid |
| Perform hand hygiene<br>Vigorously rub injection port with alcohol swab and allow to dry | Prevents introduction of microorganisms and cross-infection |
| Insert the needle, needleless adaptor or syringe and add required medication to the IV infusion bag via the medication injection port, which should have a rubber stopper at end. Do not select port used for IV tubing | Correct addition prevents infection, as medication port is self-sealing to prevent the introduction of microorganisms |
| After withdrawing syringe, gently mix contents of infusion | Ensures even distribution of medication throughout the infusion fluid |
| Complete an IV medication additive label, with details of medication added to fluid, date, time and nurses' signatures | Informs all staff of the contents of the infusion |
| Attach and prime labelled IV tubing. Ensure infusion rate is correct. A volumetric pump or burette may be added (according to facility/organisation policy) | Prevents circulatory overload<br>Ensures correct and safe administration of infusion |
| **Intravenous bolus via IV cannula/IV line** | |
| As well as preparing medication, prepare two syringes with 5–10 mL of normal saline each, for flushing the cannula/line before and after medication administration | Prevents blockage of line and ensures medication has been injected completely, and prevents chemical irritation to the vein |
| Take equipment to the individual in injection tray ensuring all sharps contained/capped correctly<br>Select injection port closest to individual | Ensures correct transporting of equipment and abides by infection control/ANTT procedures.<br>Allows for easier aspiration for blood return to check placement |

*Continued*

| CLINICAL SKILL 24.7 Administration of intravenous (IV) medications: infusion and bolus—cont'd | |
|---|---|
| Perform hand hygiene<br>Vigorously rub the cannula bung/injection port with alcohol swab and allow to dry | Prevents risk of cross contamination and the introduction of microorganisms |
| Connect syringe containing normal saline to IV line or IV bung/smart site by either inserting needle into injection port (needle system) or removing cap of needleless injection port and connecting syringe tip directly | Allows for access |
| If IV line in situ, occlude infusion line above port by pinching tubing. Gently pull back on syringe plunger to aspirate blood | Checks position of cannula, prevents back-flow into IV line and ensures medication to be administered is into venous system |
| Slowly inject 2 mL of normal saline for a short line. Longer lines may need 2–5 mL of normal saline | Clears reservoir of blood and checks patency of access port |
| Inject medication slowly over several minutes (or as directed by manufacturer's information), continuing to occlude tubing above port if applicable | Ensures medication is given at the correct rate. Rapid administration may cause pain or phlebitis or be fatal |
| Withdraw syringe and flush with 2 mL of normal saline for a short line. Longer lines may need 5–10 mL to allow for medication clearance | Flushes medication properly into the venous system preventing chemical irritation |
| Release tubing and regulate infusion rate if necessary | Occluding tubing may affect the infusion rate<br>Ensures the return to the original infusion rate as ordered |
| Vigorously rub the injection port with alcohol swab and allow to dry and if the port was capped, replace cap | Prevents introduction of microorganisms |
| **Piggyback/tandem infusion** | |
| Perform hand hygiene<br>Connect infusion tubing to medication bag using aseptic technique and allow solution to fill tubing | Prevents the introduction of microorganisms and cross-infection<br>Tubing should be filled with solution and free of air to prevent air embolus |
| Hang medication bag and connect tubing to infusion port (e.g. stopcock, needleless system, tubing port) on the primary infusion line after having vigorously rubbed the port with alcohol swab and allowed alcohol to dry | Prevents introduction of microorganisms |
| Infuse medication as per manufacturer's recommendations and/or an intravenous drug administration book<br>Regulate flow rate using regulator clamp | Ensures medication is administered at the correct rate to maintain therapeutic levels and prevent toxicity or adverse reactions |
| When completed, remove and discard secondary infusion bag in a safe and appropriate manner<br>Connect compatible IV fluid to flush medication, then remove secondary line from the primary line<br>Return to primary infusion rate | Ensures complete infusion of medication<br>Ensures the return to the original infusion rate as ordered |
| Ensure primary infusion is running at the correct rate | Secondary infusion may have interfered with the flow of the primary infusion<br>To prevent circulatory overload |

## CLINICAL SKILL 24.7 Administration of intravenous (IV) medications: infusion and bolus—cont'd

| Burette | |
|---|---|
| Perform hand hygiene<br>Fill burette with desired amount of fluid from infusion bag as per the recommendations listed in the manufacturer's guidelines and/or an intravenous drug administration book | Prevents cross-infection<br>Ensures correct amount of diluent for the safe administration of the medication<br>Prevents the risk of circulatory overload<br>Prevents toxicity |
| Clean injection port on top of burette with alcohol swab and allow alcohol to dry | Prevents introduction of microorganisms |
| Inject medication into port and gently mix with fluid in burette | Ensures even distribution of medication throughout fluid |
| Regulate infusion rate to allow medication to infuse at the required rate as per the recommendations listed in the manufacturer's guidelines and/or an intravenous drug administration book | Ensures medication is administered at the correct rate to maintain therapeutic levels and prevent toxicity or adverse reactions |
| Label burette with medication administration label containing name of medication, total volume, time of starting administration, individual details and checking staff signature/initials | Ensures all staff are aware of medication infusion occurring; prevents other medication being added to burette at same time<br>Abides by policy and procedure |
| When infusion is complete, fill burette to desired flush and infuse over the same rate medication administered (ensure flush is enough to completely infuse total medication through the IV giving set)<br>Once complete remove label from burette and return infusion to previous rate | Ensures medication infused correctly and totally in order to allow for therapeutic levels and ensure no crystallisation of fluid occurs<br>Alerts staff that medication infusion is complete |
| If more than one medication is to be administered, ensure that burette and line are 'flushed' in between the medications, and wait the recommended time between the administration of medication as per the recommendations listed in the manufacturer's guidelines and/or an intravenous drug administration book | Prevents incompatible medications coming into contact with each other<br>Ensures that medication actions are adhered to and therapeutic outcomes are optimal |
| Record each medication administered on the medication chart | Prompt documentation prevents errors. Sites should be rotated for long-term therapy such as insulin, as repeatedly using same site leads to thickening of skin and tissue atrophy |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is effective/appropriate for the individual |
| Monitor individual for any adverse effects to the medication. Report any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Phillips & Gorski 2014; Centers for Disease Control and Prevention 2011; Berman et al 2015; Tollefson et al 2016)* | |

cannula. They are often administered at small rates (e.g. 10 mL/hour). Large volume infusions are where fluids or medications are delivered in 500–1000 mL bags, and as any medication added to these volumes is not concentrated it is less likely ADRs will occur (Brotto 2013). Small volume infusions are mixed in 50–100 mL bags and given intermittently over a shorter period of time.

- IV bolus—a volume of fluid or medication that may be given quickly over a short time period or as an IV push. A bolus is a prescribed volume delivered from an already existing IV infusion (250 mL over 15 minutes) or by syringe into an IV access port. Some medications that may be given as a push include opioids, antiemetics or antibiotics. Prior to administration of a bolus the patency of the IV cannula must be ascertained to ensure medication enters the vein and not surrounding tissue (Brotto 2013).
- Intermittent IV infusions—as a mixture in a small volume (e.g. 50–100 mL) of compatible fluid in a secondary fluid container separate from the primary infusion.

The two most commonly used additive or secondary setups are:

- The piggyback or add-a-line infusion (Figure 24.16)
- The burette (volume-control administration set) (Figure 24.17).

Both are acceptable procedures for intermittent medications to be administered.

**Figure 24.16** Add-a-line/piggyback setup
*(Potter et al 2013)*

The individual will already have an existing infusion line or an intermittent venous access port. The advantages of the intermittent venous access port include increased mobility, comfort and safety, and the nurse not needing to monitor flow rates on an ongoing basis. Many acute healthcare facilities now have pumps preprogrammed with medication dosages and delivery rates to minimise the risk of medication administration errors.

## Medication administration

Medication administered intravenously gives an immediate response, and allows more control over the rate of medication being delivered, either as a bolus or by diluting it in IV

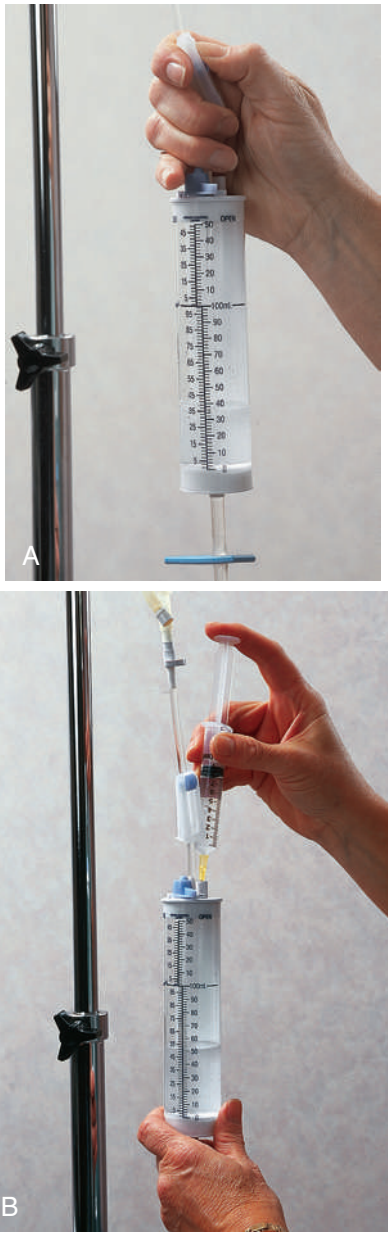


**Figure 24.17** A, B: Burette delivery
*(Brotto 2013)*

solution and giving it intermittently or over a longer time frame (Phillips & Gorski 2014). Immediate adverse reactions and incompatibilities can also occur (Amero et al 2010).

IV medications are often delivered concurrently with other IV fluids or medications and the nurse preparing the fluid or medication must ensure all fluids or medications being delivered are compatible. For the medication to be mixed successfully the diluent and the medication must be compatible (Amero et al 2010). Incompatibility occurs when fluids or medication alter the action of other medications they are mixed with. These are classified as physical, chemical or therapeutic incompatibilities (Phillips & Gorski 2014).

Physical incompatibilities occur when mixing a medication with a fluid or another medication, causing insolubility (where the medication does not dissolve completely in the fluid) (Phillips & Gorski 2014). Cloudiness, colour change or gas bubbles are a sign that there is an incompatibility (Broyles et al 2013). Chemical incompatibility is where the pH is altered by mixing incompatible medications or fluids together, resulting in instability of one or both of the medications (Phillips & Gorski 2014). This can occur when acid or alkaline medications and solutions are mixed (Amero et al 2010). Therapeutic incompatibility is where the individual suffers an ADR when two or more medications are given concurrently, resulting in a decreased or increased therapeutic response (Phillips & Gorski 2014). Medication incompatibilities are outlined in the *Australian Injectable Drugs Handbook* (The Society of Hospital Pharmacists of Australia 2014), and these must be identified prior to mixing medications and fluids to ensure an incompatibility reaction does not occur. The nurse must observe the mixed medication while preparing and prior to administration of the medication, and if any changes in the solution have occurred the medication must not be administered (Broyles et al 2013).

In preparing medications for IV administration the nurse must ensure that the medication solution being mixed or added to a fluid flask is adequately mixed. Inadequately mixed medications can mean the individual inadvertently receives a bolus of the medication (especially if the medication is dense and settles to the base of the fluid flask), which can result in serious ADRs (Phillips & Gorski 2014). If the individual receiving the IV medication complains of pain, burning or stinging in the arm, this is a warning that the concentration of the medication is irritating the vein wall. The concentration of the fluid may need to be altered by mixing in a larger volume of fluid or a slowing of the delivery rate, after review by the medical officer.

### Complications of IV therapy

In the delivery of IV fluids and medications it is the nurse's responsibility to assess and monitor the individual for complications. Complications occur either locally or systemically. Local complications are most common and result from adverse medication reactions or trauma at the IV cannula site (Phillips & Gorski 2014). See Table 24.5 for a list of common local IV therapy complications and clinical manifestations. Systemic complications are less common; however, when they occur they can be life-threatening (Phillips & Gorski 2014). Early detection is required to prevent complications becoming more severe; therefore, any change in the individual's health status while receiving IV fluids or medication must be reported immediately to the nurse in charge. (See Clinical Skill 24.8.)

## Administering topical medication

Topical medications are applied locally to the skin or mucous membranes such as the ear, eye, vagina, rectum and nose. They can be in the form of lotions, pastes, creams, pessaries, powder, oil or ointments.

### Skin applications

Topical preparations such as those used in the treatment of dermatological conditions may be formulated as an ointment, lotion, cream, jelly, powder, paint, paste or spray (Broyles et al 2013). Medications may be applied to the skin by painting, spreading or spraying medication over an area, applying moist dressings or by soaking body parts in a solution. Medications applied to the skin generally have a local effect; however, traces of some medications may be absorbed transdermally into the blood stream (e.g. cortisone). To avoid medication being absorbed through the skin of the hands, the nurse should wear non-sterile gloves for protection or use an applicator during administration of topical medications (Brotto 2013). To prevent accumulation, any residual medication on the skin should be removed before reapplication. In addition, removal of residual medication allows the nurse to assess the application site for any irritation. When applying a prescribed topical preparation, the manufacturer's directions must be followed. (See Clinical Skill 24.9.)

### Applying transdermal medications

Certain medications can be applied to the skin to supply medications directly into the bloodstream for prolonged systemic effect. The medications are applied via an adhesive patch or disc which releases a known amount of medication per time (e.g. 5 mg over 24 hours). Transdermal medications include glyceryl trinitrate (known as nitroglycerine in the US) (to relieve angina pectoris), nicotine (for nicotine withdrawal) and oestrogen (for hormone replacement therapy). Medications administered transdermally bypass the liver and therefore first-pass metabolism.

Adhesive patches or discs which are applied to the skin are composed of an adhesive layer, a rate-limiting membrane, a medication reservoir and a waterproof external layer. The discs are applied to a dry, clean, hairless area of the body. The waterproof external layer enables the individual to shower or bathe without adversely affecting the medication's action. Medications applied in this manner can exert their effects for as long as 72 hours. Education should include the correct application of the transdermal patch or disc (including the removal of the old disc), the frequency of application, the need to rotate application sites to prevent skin irritation occurring, correct storage of the discs, the need to wash the hands after application and correct disposal of the discs after

## TABLE 24.5 | Common complications of IV therapy and clinical manifestations

| Local complications | Clinical manifestations |
|---|---|
| **Infiltration**<br>The IV cannula becomes dislodged from the vein or passes through the wall of the vein. Infusion fluid enters into the surrounding tissue. Often caused by poorly secured cannulas | Oedema surrounding the cannula site, cool to touch, pale skin, infusion slows and pinkish coloured blood on draw back |
| **Thrombosis**<br>A blood clot forms in the vein at the tip of the cannula causing an obstruction in the cannula. Do not force the flush as this can dislodge the clot into the systemic circulation | Cannula does not flush, infusion does not flow and there is pain at site |
| **Extravasation**<br>Vesicant medication enters into the surrounding tissue. This may be caused by a dislodged cannula, increased pressure or irritation of the vesicant fluid on the vein wall, or vein wall being punctured on insertion of the cannula | Site pain and tenderness, oedema, paleness around insertion site, burning sensation and slow or stopped infusion. |
| **Phlebitis**<br>Inflammation of the vein may be caused by irritating medications or fluids, or from the cannula irritating the vein wall | Local erythema, heat, swelling, cording, infusion rate slowed or stopped, and pyrexia |
| **Haematoma**<br>Infiltration of blood into the tissues commonly caused by trauma to the vein wall on insertion of the cannula | Ecchymosis at the insertion site and surrounding tissue, swelling and discomfort |
| **Systemic complications** | **Clinical manifestations** |
| **Peripheral oedema**<br>Caused by infusion of excessive IV fluid or given too rapidly, failure to monitor the person's fluid balance status in a person with renal or cardiovascular compromise. Excess fluid causes pressure in the intravascular space causing it to leak into dependent limbs (legs) | Pitting oedema and pallor in lower extremities that can progress to abdomen, weight gain over short period, taut skin, indentation from pressure of socks and clothing |
| **Acute pulmonary oedema**<br>Caused by infusion of excessive IV fluid or given too rapidly, failure to monitor the person's fluid balance status, in a person with renal or cardiovascular compromise. Excess fluid causes pressure in the intravascular space, causing pressure in the pulmonary capillaries as fluid passes into the alveoli, causing pulmonary oedema. This is a life-threatening condition and an emergency call (MET or code blue) should be made | Shortness of breath, cyanosis around lips and mouth, decreasing oxygen saturations, restlessness, cough, pink frothy sputum, crackles to lung bases on auscultation, weight gain over short period |
| **Speed shock**<br>When the IV fluid or medication is delivered too quickly | Dizziness, hypotension, headache, flushing of the face, chest tightness, may progress further to circulatory shock |
| **Septicaemia**<br>Microorganisms enter the systemic circulation through poor aseptic procedure during insertion and in accessing the cannula | Pyrexia, diaphoresis, diarrhoea, nausea and vomiting, abdominal pain, tachycardia and hypotension |
| **Air embolism**<br>Rare but lethal. Air enters the cannula and the systemic circulation. Occurs when air is present in the IV line from poor priming or changing an IV bag without checking for air in the line | Dizziness, dyspnoea, cyanosis, cough and expiratory wheeze, hypotension and chest pain, confusion, coma |

*Adapted from Broyles et al (2013); Brotto (2013); Phillips & Gorski (2014)*

## CLINICAL SKILL 24.8 Removal of intravenous cannula

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Disposable gloves, dressing pack/sterile gauze (as per facility/organisation policy), injection tray, antiseptic solution/swab (as per facility/organisation policy) and tape |
| **Skill activity** | **Rationale** |
| Check/confirm the medical order for removal of the IV cannula<br>(If removal required due to complications from the IV therapy refer to the Registered Nurse and the facility/organisation policies) | Abides by policy and procedure, and medical order |
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check all allergies including latex or tape | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Understanding improves compliance/concordance/adherence with therapy<br>Promotes participation in care and understanding of health status<br>Reduces risk of allergic reaction |
| Perform hand hygiene and don gloves<br>Follow infection control/ANTT procedures | Prevents cross-infection and abides by infection prevention policy |
| Gently remove tapes securing the IV and the occlusive dressing ensuring no pulling of excess hair<br>Use scissors to cut away hair if required | Decreases discomfort and helps prevent complications to the surrounding skin |
| Once tapes and dressing removed, clean with normal saline chlorhexidine according to facility/organisation policy and allow to dry. Place sterile gauze over insertion site (do not press) and gently remove cannula along the line of the vein<br>Place gauze and a strip of tape over site ensuring adequate pressure until there is no further bleeding from site<br>Inspect the PIVC for completeness | Prevents the introduction of microorganisms<br>Prevents a haematoma or injury to the vein post removal<br>Ensures whole cannula was removed and none left behind |
| Place all discarded equipment in injection tray and dispose in the required waste receptacle.<br>Perform hand hygiene and document removal of IV cannula. Document date and time of removal, condition of site at time of removal and whether cannula and tip were complete and intact.<br>Communicate abnormal findings to the Registered Nurse/medical officer | Abides by infection prevention policies<br>Abides by facility/organisation policies<br>Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |

*(ACSQHC 2012c; 2015b; Phillips & Gorski 2014; Centers for Disease Control and Prevention 2011)*

## CLINICAL SKILL 24.9 Administration of a topical medication

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Prescribed medication<br>Gloves<br>Resource material (e.g. MIMS) |

| **Skill activity** | **Rationale** |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth.<br>Check the name of medication, dose, route, time of last administration and frequency of administration. The nurse should also identify the site the topical medication needs to be applied | Promotes correct and safe administration of the medication |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered<br>Prevents preparation errors |
| Perform hand hygiene and follow infection control procedures. Put on gloves | Prevents cross-infection. Wearing gloves prevents the nurse absorbing the medication through their skin |
| Apply the required amount of topical medication onto the individual's skin | The amount of topical medication applied depends on the type of medication being applied. For example, if applying a corticosteroid the fingertip unit is used as guide to determine how much product to apply. Other treatments such as emollients may require more generous application of the product |
| Remove gloves, perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |

| CLINICAL SKILL 24.9 Administration of a topical medication—cont'd | |
|---|---|
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is appropriate for the individual |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2015a; Lawton 2013)* | |

use. Education should particularly stress the importance of keeping the discs out of reach of children. Gloves should be worn and hands washed immediately after applying the discs to avoid the nurse absorbing any of the medication transdermally through the hands (Brotto 2013). (See Clinical Skill 24.10.)

## Instilling eye drops and ointments

Eye drops or ointments prescribed may include those that treat infection, dilate or constrict the pupil, act as a local anaesthetic, stain the cornea, reduce inflammation or reduce intraocular pressure. Key aspects regarding the use of ophthalmic medications include checking the:

- Name, strength and amount of drops or ointment to be instilled
- Frequency and time of last administration
- Eye into which the eye medication is to be instilled (i.e. left, right or both eyes)
- Expiry date on the container, and discarding the medication if the expiry date has passed. Eye drops tend to have a short use-by date after opening, therefore the date is written on the container the day it is opened so the discard date can be observed.

Eye drops are supplied in a squeeze bottle with a nozzle top through which the drops are delivered. To prevent cross-infection a separate container of drops or ointment is supplied for each individual. Single-dose packaging is preferred, as contamination of the medication is likely to occur if a container such as a dropper bottle is used repeatedly. Guidelines for instilling eye drops and ointment are presented in Clinical Skill 24.11.

The equipment required comprises:

- Medication chart
- Non-sterile gloves
- Prescribed drops or ointment
- Normal saline (if required)
- Two or three gauze swabs to cleanse eye prior to instillation
- Rubbish bag for used swabs
- Sterile eye pad and tape if required.

## Instilling ear drops

Ear drops prescribed may include those that treat infection or soften wax. The ear drops must be at room temperature when instilling, as the inner ear is sensitive to temperature extremes, and cold fluids can provoke vertigo or nausea (Brotto 2013). Guidelines for instilling ear drops are presented in Clinical Skill 24.12. The equipment required comprises:

- Medication chart
- Non-sterile gloves
- Prescribed drops, warmed to body temperature
- Two or three cotton wool swabs
- Cotton-tipped buds (if required)
- Rubbish bag for used swabs.

## Inserting vaginal medications

Vaginal medications are available as creams, jellies, ointments or pessaries (Broyles et al 2013). Pessaries and creams are generally administered with an inserter or applicator, allowing the medication to be placed high in the vaginal vault for maximum effect. Vaginal pessaries are presented in conical, oval or cylindrical shapes and are supplied in individual foil or plastic wrappers. Vaginal anti-infective medications are prescribed to treat vaginal infections, and vaginal hormone preparations are prescribed to treat conditions such as senile vaginitis. Unlike the rectum, the vagina does not have a sphincter and therefore the pessaries and creams, when they melt as they warm to body temperature, may run out (Brotto 2013). To help avoid this, vaginal preparations should be instilled at night whenever possible, when the individual is in bed ready for sleep. Sanitary pads are recommended to prevent staining or soiling of underwear. The use of tampons is not recommended.

Individuals who require vaginal medication may prefer to self-administer to avoid embarrassment and should be provided the privacy to do so (Brotto 2013). The nurse may be required to perform the technique or to instruct the individual in how to insert vaginal medications. A suggested procedure is outlined in Clinical Skill 24.13.

*Text continued on page 616*

## CLINICAL SKILL 24.10 Applying transdermal medications

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Prescribed medication<br>Resource material (e.g. MIMS)<br>Gloves |

| **Skill activity** | **Rationale** |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual compared to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Confirms the individual's identity and reduces risk of allergic reaction<br>Promotes correct and safe administration of the medication |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered<br>Prevents preparation errors |
| Perform hand hygiene and follow infection control procedures. Don non-sterile gloves | Prevents cross-infection<br>Prevents nurse absorbing medication if medication is touched |
| Inspect the skin to ensure that it is intact<br>Rotate site | Broken skin can affect the medication's absorption<br>Reduces irritation. Increased absorption may occur if applied to the same site |
| Ensure that any old patches that are in situ are removed before applying another patch. Patches that contain narcotic agents must be folded with adhesive sides sticking together and disposed of in a sharps container | Ensures the individual receives the correct dose of the medication<br>Ensures that these patches cannot be inappropriately used by another individual |
| Write the date and time on the patch<br>Remove the adhesive backing and apply the patch onto a dry, hairless area of the individual's skin. The patch cannot be cut into smaller pieces | It can be clearly seen when the patch was applied<br>Cutting the patch into smaller pieces can affect the dose of the medication that the individual receives |
| Remove gloves. Perform hand hygiene and follow infection control procedures | Prevents cross-infection |

## CLINICAL SKILL 24.10 Applying transdermal medications—cont'd

| | |
|---|---|
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is appropriate for the individual |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2015a; Lawton 2013)* | |

## CLINICAL SKILL 24.11 Instilling eye drops or ointment

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Eye drops/ointment<br>Gauze<br>Normal saline (if required)<br>Non-sterile gloves<br>Resource material (e.g. MIMS) |
| **Skill activity** | **Rationale** |
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment.<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Understanding improves compliance/concordance/adherence with medication therapy<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose (number of drops), route (including whether medication will be administered to right or left eye or both), time of last administration and frequency of administration | Promotes correct and safe administration of the medication<br>Confirms the individual's identity |

*Continued*

| CLINICAL SKILL 24.11 Instilling eye drops or ointment—cont'd | |
|---|---|
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date<br>Check the date that the container was opened<br>Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Promotes correct and safe administration of the medication<br>Out-of-date medication may be ineffective. Some eye drops must be discarded 30 days after opening the container |
| Assist the individual to a position with the head tilted well back (if possible) | Facilitates correct instillation of medication |
| Perform hand hygiene and follow infection control procedures. Put on non-sterile gloves | Prevents cross-infection |
| If eye contains any discharge or crusting, it should be cleaned with normal saline and gauze swabs before instilling drops or ointment | Discharge or crusting prevents adequate absorption of medication |
| Gently pull down the lower lid to form a pouch | Facilitates correct instillation of medication |
| Remove the cap of the container and hold the dropper or tube slightly away from the eye | Avoids contacting any part of the eye and contaminating the nozzle |
| If drops are being instilled, the prescribed number is dropped into the pouch of the lower lid. 5 minutes should be left between administering multiple eye drops | Medications should be instilled correctly (e.g. into the pouch of the lower lid and not directly onto the eyeball)<br>If eye drops are administered too quickly the previous eye drops may be washed away and not absorbed |
| Advise the individual to close their eyes for 60 seconds after the drops have been administered | This prevents the drops running into the nose and being swallowed |
| If ointment is being instilled, the eye drops should be administered first | Ointment waterproofs the eye |
| The initial 1.25 cm of the ointment is discarded onto a swab. Directing the nozzle of the tube near the lid, a ribbon of ointment is squeezed along the rim of the lower lid | Reduces the risk of instilling contaminated ointment |
| Request the individual to close the eyelid gently. Wipe away any excess with a gauze swab. Request that the individual blink gently several times | Facilitates even distribution of the medication over the eye's surface |
| Apply an eye pad if required (see Clinical Skill 16.1) | A pad may be prescribed for comfort or protection |
| Assist the individual into a comfortable position | Promotes comfort |
| Remove non-sterile gloves, perform hand hygiene | Prevents cross-infection |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable). Record appearance of eye in medical record | Ensures medication regimen is appropriate for the individual |
| Monitor individual for any adverse effects to the medication. Report any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2013b; 2013c)* | |

## CLINICAL SKILL 24.12 Instilling ear drops

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Ear drops<br>Cotton balls<br>Cotton-tipped applicator<br>Resource material (e.g. MIMS) |

| **Skill activity** | **Rationale** |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration. The nurse should also identify the site the topical medication needs to be applied | Promotes correct and safe administration of the medication |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Check the date that the container was opened<br>Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered. Prevents preparation errors<br>Out of date medication may be ineffective. Some ear drops must be discarded 30 days after opening the container |
| Assist the individual to lie on the side opposite to the affected ear side | Facilitates instillation of the drops into the ear |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Inspect the ear for any wax or drainage. Wipe out gently using a cotton bud, ensuring that wax is not forced inwards | Any occlusion will prevent drops from being evenly distributed |
| Gently pull the auricle up and back. For a child under 3 years, the earlobe is pulled down and back | Straightens the ear canal |
| Ensure that the drops are at room temperature. Instil the prescribed number of drops so that they fall against the sides of the canal and not on the tympanic membrane | Cold drops may cause vertigo and nausea. Avoids discomfort |
| Gently massage or apply pressure to the projection in front of the meatus (the tragus) | Ensures that the drops flow into the canal |

*Continued*

## CLINICAL SKILL 24.12 Instilling ear drops—cont'd

| | |
|---|---|
| Wipe the outer ear free of excess drops | Promotes comfort |
| If prescribed, place a cotton wool swab loosely into the meatus, or instruct the individual to lie with affected ear upwards for 10 minutes | Prevents the medication from leaking out |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is appropriate for the individual |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer. | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2015b)* | |

## CLINICAL SKILL 24.13 Administration of a vaginal medication

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication order/chart<br>Medication<br>Applicator<br>Gloves<br>Tissues<br>Perineal pad<br>Lubricant for a suppository/pessary<br>Resource material (e.g. MIMS) |
| **Skill activity** | **Rationale** |
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment | Ensures consent<br>Ensures efficiency |
| Ensure therapeutic interaction | Reduces the incidence of performing an activity on the incorrect individual |
| Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status |
| Ask the individual to empty their bladder | Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction<br>If the bladder is empty the individual may have less discomfort. Voiding after the medication is administered may result in the medication not being retained |

| CLINICAL SKILL 24.13 Administration of a vaginal medication—cont'd | |
|---|---|
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Confirms the individual's identity and reduces risk of allergic reaction<br>Promotes correct and safe administration of the medication |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered. Prevents preparation errors |
| Ensure privacy and assist the individual into the dorsal recumbent position, with legs flexed and extended apart | Privacy reduces embarrassment. Position provides easy access to and adequate exposure of the vaginal canal |
| Perform hand hygiene and follow infection control procedures. Put on non-sterile gloves | Prevents cross-infection |
| Attach the applicator to the tube of cream or place the pessary in the applicator. Apply lubricant to the applicator | Promotes correct and safe administration of the medication. Lubrication facilitates insertion |
| Gently retract the labial folds | Exposes the vaginal orifice |
| Insert the applicator into the vagina in an upwards and backwards direction, about 7.5 cm. Push the plunger to deposit the medication | Proper placement ensures equal distribution of medication along the walls of the vaginal cavity |
| Withdraw the applicator, wipe any residual cream from the labia and apply a perineal pad | Promotes comfort; perineal pad prevents staining of clothing |
| Encourage the individual to remain in the recumbent position for at least 10 minutes after administration | Allows medication to melt and be absorbed into the vaginal mucosa. The vagina has no sphincters and the medications may not be retained if the individual stands immediately after administration. Medication given via the vaginal route is best administered at night for this reason |
| Wash applicator in warm soapy water, rinse and dry. The applicator is stored for future use by that individual only. Remove gloves. Perform hand hygiene | Prevents cross-infection |
| Record administration on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2014h)* | |

The equipment required comprises:

- Medication chart and medication chart
- Prescribed pessaries or cream
- Inserter or applicator
- A small disposable sheet to protect bed linen
- Non-sterile gloves
- Receiver (e.g. paper bag) for used articles
- Perineal pad.

## Administering medications by inhalation

Medications can be inhaled to produce a local or systemic effect via the respiratory tract by steam inhalation, nebuliser, atomiser or aerosol spray. Most commonly, medications are delivered to the lungs' membranes as sprays from pressurised aerosol dispensers, or as dry powder from an inhaler (Brotto 2013).

Aerosol inhalers are widely used to administer bronchodilators for the management of asthma, chronic obstructive pulmonary disease or bronchitis. The medication and its inert propellant are maintained under pressure in a small canister. When the valve is activated, a measured quantity of propellant carrying the medication is released through the mouthpiece. It is important that the individual is instructed in the correct technique on inhaler use, otherwise the medication will be deposited on the tongue and not into the airways. A spacer is recommended to be used to ensure maximal benefit from inhalation, and can be particularly beneficial for young children or individuals who find it difficult to manage aerosol inhalation (Brotto 2013). The bronchodilator is released into the plastic spacing device and then inhaled. It is also useful if an individual is unable to coordinate aerosol inhalation. In the use of an inhaler the mouth is placed over the mouthpiece, the individual inhales through the device causing medication particles (in powder form) to be drawn into the respiratory tract. If two inhalers are to be used, the bronchodilator medications should be given before the other medication to open the airways, allowing the second medication to enter more easily to exert a maximal effect. If steroids are used the mouth must be rinsed post dose to prevent fungal infections.

A nebuliser adds moisture and/or medications to inspired air, using the aerosol principle. Nebulisation is often used for administering bronchodilators or mucolytic agents. A high-pressure gas source (air or oxygen) is used to draw up the medication from a chamber creating a mist, which the individual inhales. Small-volume nebulisers are generally used for administering medications. These medications come prepared in 0.9% sodium chloride in plastic vials and are emptied into the aerosol chamber. To prevent cross-infection, each individual should be provided with their own nebuliser and mask for use on repeated occasions. The mask and nebuliser should be cleaned at regular intervals and disposed of when treatment is discontinued or the individual is discharged. (See Clinical Skill 24.14.)

A suggested procedure for using a hand-held inhaler is outlined in Clinical Skill 24.15. The equipment required comprises the medication chart, the prescribed medication, inhaler and the spacer if required.

## Administering medication by intranasal absorption

Medications may be administered intranasally via aerosol or drops instilled in the nose. The medication is rapidly absorbed through the vascular network in the nasal tissues. They may

### CLINICAL SKILL 24.14 Administration of a medication via nebuliser

**Review and carry out the standard steps for all clinical skills/interventions**

| NMBA Decision-making Framework considerations: | Equipment: |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Prescribed medication<br>Nebuliser mask<br>Nebuliser bowl<br>Oxygen tubing<br>Resource material (e.g. MIMS) |
| **Skill activity** | **Rationale** |
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment | Ensures consent<br>Ensures efficiency |
| Ensure therapeutic interaction | Reduces the incidence of performing an activity on the incorrect individual |
| Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |

| CLINICAL SKILL 24.14 Administration of a medication via nebuliser—cont'd | |
|---|---|
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Confirms the individual's identity and reduces risk of allergic reaction<br>Promotes correct and safe administration of the medication |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered. Prevents preparation errors |
| Assist the individual into a semi- or high-Fowler's position | Position facilitates entry of the medication into the respiratory tract |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Attach the oxygen tubing to the oxygen or air outlet | Nebuliser can be administered using the air or the oxygen outlet. Individuals with airway disease should not be given high doses of oxygen |
| Open the nebuliser and add the medication that is to be administered to the nebuliser bowl | |
| Attach the nebuliser mask to the oxygen tubing. Turn the oxygen/air on to 6–8 L/min and check that mist is coming from the nebuliser mask | Setting the oxygen/air delivery to 6 L/min ensures that the medication is nebulised |
| Remove mask once medication has been delivered | Mist will no longer come from the mask once the medication has been delivered |
| Dispose of or clean mask as per facility policy | It is imperative that the nurse adheres to the facility policy in regards to the use of nebuliser masks |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is appropriate for the individual |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2014i)* | |

## CLINICAL SKILL 24.15 Use of a hand held inhaler and spacer

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Hand-held inhaler<br>Spacer<br>Resource material (e.g. MIMS) |

| **Skill activity** | **Rationale** |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration | Confirms the individual's identity and reduces risk of allergic reaction.<br>Promotes correct and safe administration of the medication |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered. Prevents preparation errors |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Assist the individual into a semi- or high-Fowler's position | Position facilitates entry of the medication into the respiratory tract |
| Load the inhaler with the canister of medication. Remove the mouthpiece cap. Shake the inhaler | Prepares the inhaler for administration of the medication |
| Attach the mouthpiece of the inhaler into the spacer | The use of a spacer is recommended to ensure more of the medication is delivered into the respiratory tract |
| Instruct the individual to place the mouthpiece of the spacer well into the mouth, close the lips firmly around it and tilt the head back slightly | Tight seal is necessary to prevent the escape of medication into the air |
| Advise the individual to start to breathe in through the mouth and to press the canister to deliver one puff of medication. Inform the individual to breathe in and out for 4 breaths | Ensures the whole dose is delivered into the respiratory tract |

| CLINICAL SKILL 24.15 Use of a hand held inhaler and spacer—cont'd | |
|---|---|
| The technique is repeated if necessary until the prescribed dose has been inhaled or a different inhaler is also required. Time between inhalations depends on which medications are being inhaled | Time between inhalations allows deeper penetration of the second inhalation |
| Clean mouthpiece and spacer after each use with mild soap and water. Replace the cap on the mouthpiece | Prevents contamination of mouthpiece |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Encourage the individual to rinse their mouth after administration | Prevents hoarseness, irritated sore throat or oropharyngeal candidiasis |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is appropriate for the individual |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2013e)* | |

be used to loosen secretions or treat infections of the nasal cavity or sinuses. Repeated use may lead to nasal irritation or a rebound effect (an increase in nasal congestion). If excess nasal decongestant is swallowed, systemic effects may also develop. It is usually easier for the individual to self-administer sprays. They are positioned in a supine position with the head tilted back (see Clinical Skill 24.16).

## MONITORING THE EFFECTS OF MEDICATIONS

The nurse plays a vital role in monitoring the effects of prescribed medications. Evaluating the individual's response is essential and the nurse is required to assess, report and record all responses to medication. This includes the desired therapeutic effects and any adverse reactions. To monitor the effects of any medication the nurse must first have a clear understanding of the purpose of the medication and its desired effects. Table 24.6 lists the major classes of common medication and their actions, and provides the nurse with a guide to the expected effects of various groups of medications. For example, the nurse needs to be aware that an analgesic medication is administered for the purpose of alleviating pain, an anti-inflammatory medication to relieve inflammation and an antipyretic to lower body temperature. Assessment and documentation should therefore indicate whether or not the medication has successfully achieved the desired therapeutic effect; for example, if the pain has been successfully relieved by the analgesic.

Whenever medication of any sort is administered there is always a possibility that side effects or adverse reactions may occur. Adverse reactions to a medication may be due to overdose, idiosyncrasy, toxic effects, allergy or medication interactions (Brotto 2013). Early detection of the manifestations of an adverse reaction and immediate, factual and concise reporting of these manifestations allows prompt action to be taken. Manifestations of an adverse reaction will depend on the type of medication administered and on each individual. It is important for the nurse to refer to either the manufacturer's information or a reliable textbook to have all of the information concerning possible adverse reactions. The nurse must be informed and knowledgeable about every medication before it is administered and document and report any adverse or side effect immediately to the nurse in charge and medical officer.

*Text continued on page 625*

## CLINICAL SKILL 24.16 Administering nasal sprays and drops

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medication chart/order<br>Nasal spray/drops<br>Tissues<br>Gloves<br>Resource material (e.g. MIMS) |

| **Skill activity** | **Rationale** |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure/medication, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status on the medication chart and with the individual; compare to the medication ordered; check for medication interactions | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Determines if medication should be given and reduces risk of allergic reaction |
| Verify the indication for the medication | It is important that the nurse understands why the individual is receiving this medication |
| Ensure the correct medication is given by checking the 'seven rights'. Check the medication chart for the individual's name, date of birth and UR number. Check this against the individual's identity band/photo identification (if used) and ask them to state their full name and date of birth<br>Check the name of medication, dose, route, time of last administration and frequency of administration. The nurse should also identify the site the medication needs to be applied | Promotes correct and safe administration of the medication |
| Prepare the individual's medication by first reading the name of medication on the container and the expiry date. Check the date that the container was opened<br>Compare the medication container with the order on the medication chart. Recheck the medication container before returning it to the drawer | Ensures the correct medication is being administered. Prevents preparation errors<br>Out of date medication may be ineffective. Some ear drops must be discarded 30 days after opening the container |
| Ask the individual to gently blow their nose | Clear the nasal passages of mucus that may inhibit absorption of the medication |
| Assist the individual into an appropriate position: supine with head tilted back | Facilitates administration of the medication |
| Perform hand hygiene and follow infection control procedures. Determine if gloves are required for this procedure | Prevents cross-infection. Gloves may be required depending on the risk of exposure to nasal secretions |
| Instil the nasal medication aiming for the midline of the nose<br>Drops: hold the dropper 1 cm above the nares and instil the prescribed number of drops<br>Pressurised container: hold the spray container just into the nostril and press down as the individual slowly breathes in<br>Pump bottle: squeeze the pump as the individual inhales | Promotes correct administration of the medication |

| CLINICAL SKILL 24.16 Administering nasal sprays and drops—cont'd | |
|---|---|
| Use tissues to wipe away any excess fluid and advise the individual to not blow their nose and to remain in the supine position for a few minutes | Promotes absorption of the medication |
| Remove gloves (if used), perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Record each medication administered on the medication chart | Prompt documentation prevents errors |
| Report immediately if the individual refuses medication | Refusal to take medication should be documented on medication chart |
| Monitor individual for medication effectiveness (if applicable) | Ensures medication regimen is appropriate for the individual |
| Monitor individual for any adverse effects to the medication. Report and document any significant deviations to Registered Nurse/medical officer | Any adverse effects can be managed promptly |
| Safe medication management guidelines, outlined in Clinical Interest Box 24.3, should be incorporated into relevant aspects of this procedure and the nurse must act only within the laws, facility/organisation policy and scope of practice, which govern nursing practice. | |
| *(ACSQHC 2012c; 2015b; Joanna Briggs Institute 2014d; 2014e)* | |

**TABLE 24.6 | Major actions of common medication classes**

| Medication class | Action |
|---|---|
| **Medications acting on the cardiovascular system** | |
| Antianginal agents | Relax smooth muscle and reduce myocardial oxygen demand, thereby reducing angina |
| Antihypertensive agents | Reduce high blood pressure |
| Antiarrhythmic agents | Prevent, alleviate or correct cardiac arrhythmias |
| Antiplatelet agents | Decrease platelet aggregation to prevent thrombus formation |
| Cardiac glycosides | Increase force of myocardial contraction |
| Diuretics | Promote the formation and secretion of urine |
| Fibrinolytic agents | Activate the endogenous fibrinolytic system to dissolve intravascular blood clots |
| Lipid-regulating agents | Reduce blood cholesterol level |
| Vasodilators | Dilate blood vessels, improving circulation |
| **Medications acting on the respiratory system** | |
| Antiasthma agents | Prevent asthma symptoms |
| Bronchodilators | Relax bronchiole smooth muscle to relieve bronchospasm and improve ventilation |
| Cough suppressants; expectorants and mucolytics | Depress the cough centre in the medulla oblongata; break up mucus, enabling expectoration |

*Continued*

**TABLE 24.6 | Major actions of common medication classes—cont'd**

| Medication class | Action |
|---|---|
| **Medications acting on the nervous system** | |
| Analgesics | Alter the perception of pain |
| Antianxiety agents | Prevent or relieve anxiety |
| Antidepressants | Prevent or relieve depression |
| Antiepileptics | Also called anticonvulsants. Prevent or reduce the severity of epileptic seizures |
| Antimigraine agents | Prevent or relieve migraine headaches |
| Antimuscarinic agents | Also known as anticholinergics. Inhibit the transmission of parasympathetic nerve impulses, resulting in reduced muscle spasm, decreased secretion of sweat, saliva and nasal, bronchial and gastrointestinal secretions |
| Antipsychotic agents | Counteract or reduce symptoms of psychosis |
| Dopaminergic agents | Either stimulate dopamine receptors or replenish supply of dopamine. Commonly used in the treatment of Parkinson's disease |
| General anaesthetics | Used to induce and maintain anaesthesia during surgery |
| Local anaesthetics | Block nerve conduction |
| Muscle relaxants | Reduce contractility of muscle fibres, thereby reducing muscle spasm |
| Neuromuscular-blocking agents | Have an action at the muscle receptor end-plate and are used as an adjunct to general anaesthetics to relax muscle |
| Opioid analgesics | Alter perception of pain, induce euphoria, depress respiratory and cough reflexes |
| Parasympathomimetic agents | Central nervous system stimulants. Either mimic action of acetylcholine or block acetylcholine breakdown at receptor sites, thereby increasing total amount of acetylcholine |
| Sedatives and hypnotics | Depress the central nervous system |
| Stimulants | Excite the central nervous system |
| Sympathomimetic agents | Mimic noradrenaline and have effects including cardiac stimulation and relaxation of bronchial smooth muscle |
| **Medications acting on the endocrine system** | |
| Antidiabetic agents | Regulate the metabolism of glucose |
| Antithyroid agents | Inhibit synthesis of thyroid hormone (thyroxine) |
| Calcium-regulating agents | Lower blood calcium levels |
| Corticosteroids | Hormones that influence or control key processes in the body, including carbohydrate and protein metabolism, electrolyte and water balance |
| Hypothalamic and pituitary hormones | Used as replacement therapy |
| Thyroid agents | Replace thyroid hormones |

**TABLE 24.6 | Major actions of common medication classes—cont'd**

| Medication class | Action |
|---|---|
| **Medications acting on the gastrointestinal tract** | |
| Anorectic and weight loss agents | Suppress hunger sensation |
| Antacids | Neutralise gastric acidity and reduce pepsin activity |
| Antidiarrhoeal agents | Relieve diarrhoea |
| Antiemetics | Prevent and relieve nausea and vomiting |
| Antiulcer agents | Assist in the healing of gastric and duodenal ulcers |
| Laxatives | Promote peristalsis and evacuation of the bowel by increasing the bulk of faeces by softening the stool or by lubricating the intestinal wall |
| Prostaglandins | Inhibit gastric secretion |
| Topical rectal agents | Reduce pain associated with haemorrhoids |
| **Medications acting on the urinary system** | |
| Bladder function disorder agents | Treat disorders of the bladder to re-establish normal bladder function |
| Diuretics | Promote the formation and secretion of urine |
| **Medications acting on the reproductive system** | |
| Androgens | Control development of and maintenance of male sex organs and male secondary sex characteristics |
| Erectile dysfunction agents | Treats erectile dysfunction by promoting blood flow |
| Oestrogens | Control development and maintenance of female sex organs, secondary sexual characteristics and mammary glands |
| Prostaglandins | May cause contraction or relaxation of smooth muscle in blood vessels, bronchi, uterus or gastrointestinal tract |
| Progestogens | Convert the endometrial proliferative phase to the secretory phase in preparation for a fertilised ovum |
| Sex hormones | Sex hormones are prescribed for a variety of reasons, including the development or control of male or female sex organs and secondary sex characteristics. Common uses include oral contraceptives, hormone replacement medications to treat primary amenorrhoea, delayed onset of puberty or to relieve the symptoms of menopause. Sex hormones may also be used therapeutically to treat osteoporosis, to promote sex drive and fertility and in treatment related to breast or prostatic cancer.<br>The sex hormones include anabolic steroids, androgens, antiandrogens, oestrogens and progesterones |

*Continued*

**TABLE 24.6 | Major actions of common medication classes—cont'd**

| Medication class | Action |
|---|---|
| **Medications acting on the musculoskeletal system** | |
| Analgesics | Prevent and reduce pain |
| Non-steroidal anti-inflammatory medications (NSAIDs) | Reduce inflammation |
| Disease-modifying antirheumatic medications (DMARDs) | Treat rheumatoid arthritis |
| Antigout agents | Reduce pain and inflammation associated with gout or alter production or distribution of uric acid |
| Muscle relaxants | Reduce contractility of muscle fibres, reducing muscle spasm |
| **Medications acting on the immune system** | |
| Antihistamines | Reduce the effects of histamine released from cells |
| Corticosteroids | Hormones that influence or control key processes in the body, including carbohydrate and protein metabolism, electrolyte and water balance |
| Immunomodifiers | Modify the immune system |
| Vaccines, immunoglobulins and antisera | Vaccines induce a specific active artificial immunity. Antisera contain antibodies (immunoglobulins) against a specific disease to confer passive immunity |
| **Medications acting on the blood** | |
| Anticoagulants | Prevent or delay the coagulation of blood |
| Antiplatelet agents | Decrease platelet aggregation to prevent thrombus formation |
| Fibrinolytic agents | Activate the endogenous fibrinolytic system to dissolve intravascular blood clots |
| Haemostatics | Treat or prevent haemorrhage by inhibiting fibrin clot breakdown |
| Lipid-regulating agents | Reduce blood cholesterol level |
| Vasodilators | Dilate blood vessels, improving circulation |
| **Medications acting on the skin** | |
| Dermatological agents | Prevent or treat skin infections; cleansers; moisturising agents; sunscreen agents; topical anaesthetics; topical analgesics |
| **Anti-infective agents** | |
| Anthelmintics | Treat worm infestations |
| Antibacterial agents | Inhibit the growth of or destroy bacteria |
| Antifungal agents | Inhibit the growth of or destroy fungal infections |
| Antimalarial agents | Prevent or treat malaria |
| Antimycobacterial agents | Treat tuberculosis and Hansen's disease (leprosy) |

**TABLE 24.6 | Major actions of common medication classes—cont'd**

| Medication class | Action |
|---|---|
| **Medications acting on the cardiovascular system** | |
| Antiprotozoal agents | Treat protozoal infections |
| Antiviral agents | Prevent or treat viral infections |
| **Medications used in neoplastic disorders** | |
| Antineoplastic agents | Also called cytotoxics. Prevent the proliferation of malignant cells by attacking them at various stages of the cell cycle |
| Corticosteroids | Hormones that influence or control key processes in the body, including carbohydrate and protein metabolism, electrolyte and water balance |
| Immunomodifiers | Modify the immune system |

*(Adapted from Tiziani 2013; Bryant & Knights 2014)*

## SAFE HANDLING OF HAZARDOUS SUBSTANCES

Cytotoxic agents can be absorbed through the skin of people handling cytotoxic medication or bodily fluids from a person who has taken the medication (Bryant & Knights 2014). Cytotoxic medications (used in chemotherapy) may be prescribed in the treatment of malignant disease to inhibit the growth of malignant cells, and may be administered orally, IV or by regional perfusion. As cytotoxic agents are harmful to normal as well as malignant cells, extreme care is required during their preparation and administration.

Although the EN may not be required to administer cytotoxic medications, they may nonetheless assist in the care of an individual receiving chemotherapy increasing, the risk of exposure. It is essential therefore that the nurse is aware of, and understands, the related safety guidelines. Clear guidelines, which are developed by health authorities and are available in healthcare facilities, set down procedures to be followed in the preparation and administration of cytotoxic agents (Bryant & Knights 2014). In addition, the guidelines specify how to deal with spillages, extravasation (leakage of antineoplastic agents into the individual's subcutaneous tissues) and the safe disposal of used equipment and the individual's body wastes (Bryant & Knights 2014). Nurses who are pregnant must avoid contact with any cytotoxic agent, especially during the first trimester, when fetal organs are developing.

A material safety data sheet (MSDS) should be available with every hazardous substance used in a healthcare facility. It is the primary source of safety information provided for people using hazardous substances in the workplace. It provides essential information, direct from the manufacturer, about what to do in the event of leakage, spillage or any type of accident or incident involving the chemical (Worksafe Victoria nd). See Chapter 22 for more information about cleaning and spills.

## SAFE STORAGE, ADMINISTRATION AND DISPOSAL OF MEDICATIONS

Safety precautions with medications in the healthcare facility include:

- Locking the area in which medications are stored, to make them inaccessible to unauthorised persons
- Schedule 8 medications are to be stored in a lockable cupboard or safe, affixed to the wall or floor in a locked room
- Recognising that the pharmacist is responsible for the contents of most medical substances supplied
- Recognising that only the pharmacist may attach or alter a label, fill a container or transfer medication from one container to another. If a label on a container is illegible, the container must be returned to the pharmacist for clarification
- All unused medications are returned to the pharmacy department for correct disposal
- Observing the safety precautions for prescribing, preparation and administration of all medications.

## MEDICATIONS AND THE OLDER ADULT

Older adults are at particular risk of developing ADRs by prescribed medications, as they take more prescribed and OTC medications than any other age group, take multiple medications and their increased age alters the rate at which medications are absorbed, metabolised and excreted from the

body (Bryant & Knights 2014). Toxicity can occur as a result, and can be exacerbated as body weight is often lost as people age, resulting in altered distribution of medications around the body, and the need for a lower dose than has been prescribed (Bryant & Knights 2014). The elderly are also admitted to hospital with ADRs more often than younger adults (Bryant & Knights 2014).

As older adults generally consume more prescription and over-the-counter medications than any other age group they frequently take a combination of many different medications on a daily basis. Sometimes older people are referred to medical specialists and therefore may be prescribed medications by more than one doctor (Bryant & Knights 2014). This results in what is known as polypharmacy, a potentially dangerous indiscriminate use of multiple medications at the same time (Bryant & Knights 2014). Nurses can help prevent poisoning by prescribed medications in older adults by keeping these factors in mind, and actively:

- Observing for and promptly reporting any signs of toxicity; for example, tinnitus, gastric disturbance, mental status changes, visual disorders
- Advocating for frequent reviews of individual medication regimens
- Encouraging older individuals to ask questions of the medical officer, Registered Nurse (RN) or pharmacist about prescribed and non-prescribed herbal or other medications
- Encouraging older people to discuss with the medical officer the possibility of withdrawing medications that may no longer be essential
- Ensuring that non-pharmacological approaches are considered whenever appropriate
- Checking that the individual has understood instructions about taking medications and, if necessary, seeking the help of an RN to clarify instructions.
- Review serum blood of renal and liver functions to ascertain if metabolism and excretion of certain medications may be affected
- Review serum levels of medications to ensure the medications are within the required therapeutic range
- Checking for medication interactions.

ENs can participate in medication-related interventions only under the supervision of the Registered Nurse (RN) within their scope of practice, and in accordance with the code of practice in the state or territory in which they work.

## MEDICATIONS AND THE CHILD

Many medications that have been proven to be safe and effective in adults may not be for children (Bryant & Knights 2014). Standard medication dosages for children often do not exist and therefore the dosage will be calculated based on the weight or the BSA of the child (Bryant & Knights 2014). As children have a higher ratio of body water (75%) than adults (50–60%) and also less body fat than adults, some water-soluble medications need to be given at a higher rate (Bryant & Knights 2014). However, according to the *Australia Medicines Handbook 2010* if the calculated dose based on weight or the BSA is greater than the adult dose then the adult dose should be given. Review Critical Thinking Exercise 24.5 on different dosages of medication for children compared to the average adult.

**CRITICAL THINKING EXERCISE 24.5**

Children and the elderly may be prescribed dosages of medications that are different from the 'average' adult. What are the reasons for this? Outline nursing actions that could assist these groups in receiving the correct medications in the correct dosage.

IV medication and fluid administration in children require accurate prescribing and close monitoring, especially IV fluids as more ADRs occur with IV fluids than any other individual medication (The Royal Children's Hospital nd). See Clinical Interest Box 24.4 for requirements for interventions when administering IV medications to an infant or child.

## CONTINUATION OF MEDICATION REGIMEN AFTER DISCHARGE

It is important that individuals have the correct information to enable them to engage in self-care activities and maintain compliance with the prescribed medication regimen (Broyles et al 2013). The nurse must assess the individual's ability and readiness to absorb information, and ensure that it is geared towards the individual's level of understanding (Broyles et al 2013). See Nursing Care Plan 24.1.

Before discharge from a healthcare facility with medications, the nurse must ensure that the individual:

- Is able to demonstrate safe self-medication techniques after being adequately instructed
- Understands the medication regimen, including the purpose of the prescribed medications, the frequency of administration and any contraindications
- Understands the importance of any related blood tests
- Understands the importance of not stopping medications abruptly without first discussing the matter with the general practitioner or other medical officer
- Is advised to consult the medical officer about any untoward effects from the medication
- Understands the importance of notifying other health professionals about the medication regimen; for example, the visiting community health nurse
- Understands the reasons for not sharing medications with others
- Knows how to store the medications correctly and safely
- Has the contact numbers for emergency services (e.g. ambulance service and Poisons Information Centre) readily at hand (e.g. kept close to the telephone)
- Knows how to discard out-of-date or unwanted medications safely

## NURSING CARE PLAN 24.1

**Assessment:** Mr Albert George is a 73-year-old man who presented to the casualty department this morning experiencing central chest pain radiating into his jaw, after walking his dog in the park. His ECG showed T wave inversion and troponin levels after 6 hours were negative. Vital signs within normal limits. After review by the medical officer it was determined that Mr George has Unstable Angina and was admitted to the medical ward for observation and medication management. Mr George has a past history of hyperlipidaemia, osteoarthritis and hypertension. He currently takes atorvastatin 20 mg mane, Panadol osteo TDS and perindopril 2.5 mg mane. The medical officer has commenced him on enoxaparin 1 mg/kg subcutaneous BD, metoprolol 25 mg oral BD, Anginine 300 microg subling PRN as per protocol and increased his atorvastatin to 40 mg oral mane. He is scheduled for a repeat ECG, fasting bloods and troponin in the morning.
**Issue/s to be addressed:** Knowledge deficit regarding new medication regimen.
**Goal/s:** Mr George will demonstrate ability to follow newly prescribed medication regimen by discharge date.
Mr George will understand rationale for new medication management in relation to Unstable Angina within 2 days.
Mr George will understand and verbalise rationale for PRN administration of Anginine within 2 days.

| Care/Actions | Rationale |
|---|---|
| Assess Mr George's readiness and ability to absorb information | Learning best occurs when the person is able to focus and understand information given. Some individuals are prepared and once they are diagnosed are ready for information; however, others need time to absorb the new diagnosis and will want to wait (Gulanick & Myers 2014) |
| Assess hearing, sight, comprehension and cognition | Cognitive impairments can interfere with learning as well as physical limitations (impaired hearing or vision, or poor hand coordination) so correct tools to assist learning can be used (Gulanick & Myers 2014) |
| Provide information in simple terms at the level of the individual | Person will be able to understand terminology |
| Provide information to support self-regulation and self-management (Gulanick & Myers 2014) | Gives the person the tools to be able to self-manage and know when to seek support (Gulanick & Myers 2014) |
| Refer to pharmacist for information on new medications | Gives the person the most current information |
| Provide pharmacy information sheet on individual medications | Gives the person an easy reference tool showing when and what medications need to be taken |
| Instruct on correct dosage and times of new medications | Allows person to self-manage medication regimen |
| Instruct on correct dosage, administration, storage, use-by date and common side effects (headache and dizziness) for PRN Anginine (Broyles et al 2013) | Provides information to ensure Anginine medication is taken correctly and is discarded 90 days after opening to ensure medication effectiveness (Broyles et al 2013) |
| Provide fridge magnet for Anginine regimen; Rest, ½ Anginine sublingual until medication has dissolved and every 5 minutes × 3 till pain resolves. Call 000 if pain persists | Provides quick and easy access to information so when chest pain is experienced the correct regimen is followed |
| Encourage Mr George to ask questions | Provides clarification and assists with learning (Gulanick & Myers 2014) |

**Evaluation**

Mr George states the rationale for taking his newly prescribed medication.
Mr George states the process for taking the new medications at the required time and correct dose.
Mr George is able to recall the process for taking Anginine for when he is experiencing chest pain, according to protocol.

- Knows how to dispose of used syringes and needles safely if used
- Has been provided with written instruction on each medication
- Has had instruction from the pharmacist for any new medications or changes to medication regimen.

Alternatively, if the individual is unable to complete the above, a family member or friend should be instructed in the safe administration of the medication, covering all the points listed. Another alternative is a visiting district or community nurse, who may be required to call on the individual at home and assist in the administration or monitoring of the medication therapy. The nurse may also be able to gain an understanding of any difficulties the individual is experiencing, offer information that may help the individual deal with them, and monitor **compliance**/concordance/adherence with the medical officer's directions (Broyles et al 2013). Sometimes individuals do not comply/adhere with the prescribed medication regimen after they return home. There are a variety of reasons why this may occur (Clinical Interest Box 24.5).

## CLINICAL INTEREST BOX 24.5 Issues with non-compliance/ concordance/adherence with medication regimens

How many of us have been guilty of not completing a course of antibiotics because we 'feel better' or forget to take them and decide we are better anyway, or keep a few of those antibiotics for the next time it happens, to save going to the medical officer again? Non-compliance/concordance/adherence with medication therapy can be both deliberate and unintentional. Some reasons for non-compliance/concordance/adherence with medication therapy are that individuals:

- Do not understand the information given to them regarding illness and medication regimen
- Disregard the information given to them, perhaps because they do not believe in, or have a fear of, using medications or believe another sort of remedy is more likely to be effective. Attitudes and beliefs about medications can be influenced by cultural background and past experiences with medications
- Alter the medication regimen to fit with lifestyle; for example, only eating meals twice a day so only taking a medication twice a day instead of as ordered; that is, three times a day with meals
- Decrease dose or stop medication because of adverse effects
- Take double doses to make up for missed doses
- Stop medication because there is no change in condition ('It isn't doing me any good')
- Find them too expensive
- Perceive that they do not need them anymore
- Receive unclear directions (given in a rush, too much jargon, given rapidly in English when English is not the first language of the individual)
- Have problems with changing routine; for example, their medication routine differs from their previous regimen
- Have difficulty implementing the regimen; for example, multiple medications to be taken at several different times of the day
- Simply forget to take them.
- Too many medications to take

Several nursing interventions may enhance the ability and willingness of individuals to comply with the prescribed medication regimen (see Clinical Interest Box 24.6).

*(Adapted from Broyles et al 2013; Brotto 2013)*

One measure to promote safe medication administration in the home for older individuals, improve adherence to medication regimens and provide professional support is the use of dose administration aids (DAAs) (i.e. blister packs provided by the community pharmacist which contain medications set out in colour-coded packs that separate doses into times and days of the week) (Figure 24.18) (Pharmaceutical Society of Australia 2015). DAAs are commonly used in residential aged care facilities.

**Figure 24.18** Dose administration aid: Webster-pak® colour-coded blister pack

*(Courtesy Manrex Pty Ltd WebsterCare, www.webstercare.com.au)*

When an older individual has visual impairment it will help if instructions for taking the medications are clearly printed in large bold letters. If individuals are confused it may be necessary for the medications to be taken under the supervision of a family member and kept out of reach at other times. Clinical Interest Box 24.6 provides suggestions to help the nurse enhance individual compliance/concordance/adherence with medication regimens after discharge.

### CRITICAL THINKING EXERCISE 24.6

There are many factors that can result in an individual not being compliant/concordant/adherent with medication therapy. Identify the reasons for non-compliance/concordance/adherence. Outline some nursing actions that you could apply before an individual is discharged to reduce the risk of non-compliance/concordance/adherence with medication therapy.

## CLINICAL INTEREST BOX 24.6 Nursing interventions to enhance individual compliance/concordance/adherence with medication regimens after discharge

### Education

- Assess the individual's knowledge base prior to education so they do not tune out because they already know some of the information
- Assess the individual's understanding of English; if they do not understand English, arrange for an interpreter
- Assess the individual's memory and cognitive function for understanding and retention of information
- Assess the individual's level of hearing; for example, hearing aid in place and switched on
- Assess the individual's level of concentration; for example, is not uncomfortable, needing the toilet, in pain, thirsty, hungry or anxious
- Provide a quiet, calm private area so that individual is not distracted while you are providing information and so that the individual's medical condition remains confidential
- Provide verbal and written instructions to the individual and family members when appropriate. Other visual material may be available (video instructions are available for education about certain medications, such as insulin)
- Ascertain the individual's level of understanding by asking them to repeat the instructions back to you. Encourage them to ask any questions they have about the purpose of the medication and when and how to take it. If necessary, arrange for a visiting nurse to check on the individual's ability to cope with more complex medications, such as insulin injections and disposal of sharps. In the home sharps can be safely disposed of in an empty plastic milk container that has a screw top cap and a 1:10 bleach:water solution in the bottom of it. The environmental biohazard waste-management strategies in the local area should be followed when disposing of the full container
- Provide adequate time when educating the individual about medication. Avoid giving instructions just as the individual is ready to leave the hospital. Provide time for individual to practise and demonstrate their ability with devices such as needles and syringes or nebulisers and inhalers.

### Willingness to follow the medication regimen

- Discuss the individual's feelings, attitudes and beliefs about health alteration and the need for the medication prescribed. If the individual indicates an unwillingness to carry out the medication after being provided with reasons to comply, refer this information to the medical officer and nurse in charge. Alternative therapies may be possible
- Discuss how the regimen fits in with the individual's lifestyle and how any adverse effects might cause a problem to planned activities

### Ability to follow the medication regimen

- Ensure that the individual will be able to read labels on medication pots and bottles. If vision is a problem, contact the pharmacy about printing bigger labels or providing additional large print information
- Check that motor skills will allow the individual to successfully use the medication; for example, that they can open the childproof lid on the container or are able to pour out liquid medication or instil their own eye or ear drops
- Evaluate the individual's social situation; for example, is the cost of the medication a problem? Is the individual sufficiently mobile to go to the pharmacist to fill the prescription?

This is certainly not an exhaustive list. Make a list of your own and see how many more actions you can add to it.

*(Adapted from Broyles et al 2013; Brotto 2013)*

## Summary

As part of the holistic care of the individual, the EN may be required to administer and monitor the effects of medications; it is therefore essential to have the necessary knowledge to ensure the safety of all individuals who are receiving medications. Of particular importance is an understanding of the legal responsibilities involved in administering medication. Nurses must be willing to accept that responsibility and work within their scope of practice as dictated by AHPRA and NMBA. To promote accurate and safe medication administration the nurse must understand the system of weights and measures used in prescriptions, know the meanings of abbreviations and be competent in performing the correct calculation of dosages.

The nurse must have a basic understanding of how medications are transported in the body, how they act, how they are metabolised and how they are excreted. Furthermore, it is important to have an understanding of the actions of the various medication groups so that the nurse will know what the desired effects of the medication are and will therefore be able to monitor the individual's reaction more adequately.

*Continued*

Medications are presented in a variety of forms (e.g. tablets, capsules, mixtures and injectable solutions) which are administered via a variety of different routes. The nurse should not only be competent in administering medication via these routes, but also in monitoring both the desired effects and any side effects that may occur.

The nurse must observe the seven rights of medication administration (right medication, right dose, right person, right route, right time, right reason, right documentation) at all times and understand the procedure if a medication error does occur. To maintain a safe working environment it is important that the nurse understands the guidelines regarding safe handling of hazardous substances. The nurse has an important role in ensuring that the individual understands all aspects of any prescribed medication regimen before being discharged from a healthcare facility. Nurses must follow the principles of asepsis during the preparation and administration of medications via any route and must constantly assess and promote the individual's safety and comfort throughout the administration of any medication therapy.

## DECISION-MAKING FRAMEWORK EXERCISE 24.1

You have just been employed in the medical ward as an Enrolled Nurse. You are working on an afternoon shift and one of the people you are assigned to care for is a 57-year-old woman who is in palliative care. She has end-stage ovarian cancer. She has a syringe driver in situ, giving subcutaneous delivery of 120 mg of morphine and 40 mg of metoclopramide over a 24-hour period. You remember learning about syringe drivers when you did the medication unit in your training; however, that was almost 12 months ago. The syringe driver medication is due to be changed on your shift.

1. Using the decision-making framework determine your scope of practice in caring for and monitoring the individual in delivering the medication by the syringe driver.
2. Do you accept responsibility of caring for the lady over the shift?
3. What is your long-term plan to ensure competency?

## Review Questions

1. What are the three different names a medication may have?
2. Name the routes of medication administration that a nurse may use to administer medications.
3. Name the three factors that medication absorption depends on.
4. What is first-pass metabolism?
5. What are the standardised and systematic processes of the Medication Safety Standard to prevent common medication errors from occurring?
6. What is the difference between a 'bound' medication and an 'unbound' medication?
7. Why is therapeutic medication monitoring important?
8. Explain the differences between side effects, toxic effects and allergic reactions.
9. What do the Poisons Act and Poisons Regulations of each state and territory deal with?
10. What are the 'seven rights' the nurse must observe when administering a medication?
11. How does the nurse identify the correct individual?
12. What does the nurse do if there is any doubt about a medication order?
13. What is the procedure to follow if a medication error occurs?
14. Name the common sites for subcutaneous injections.
15. Name the common sites for intramuscular injections.

Calculation exercises

1. Convert the following to milligrams (mg):
   a. 0.75 g
   b. 22.5 g
   c. 0.003 g
2. Convert the following to grams (g)
   a. 7600 mg
   b. 48 mg
   c. 700 mg
3. Convert the following to micrograms (microg)
   a. 0.0625 mg
   b. 0.36 mg
   c. 0.06 mg

4. Convert the following to milligrams (mg)
   a. 56 microg
   b. 4 microg
   c. 354 microg
5. An individual is prescribed 150 mg soluble aspirin orally. Stock on hand is 300 mg strength tablets. How many tablets would you administer?
6. Mr Stewart is ordered 0.125 mg digoxin orally daily. Digoxin tablets are available in 62.5 microg strength. How many tablets should you administer to Mr Stewart?
7. Mr Newton has epilepsy and has been ordered phenobarbitone 140 mg IM stat for seizures. Stock ampoules contain 200 mg/mL. What volume should be administered?
8. Maddy is a 10-month-old infant weighing about 10 kg. She is ordered paracetamol for pain. Stock on hand is 120 mg/5 mL. The dose is weight based at 15 mg/kg. Calculate the dose required.
9. A child is prescribed penicillin syrup 250 mg orally 6 hourly. Penicillin syrup is available as 250 mg/5 mL. Calculate the total amount (in mL) that the child will receive in a 24-hour period.
10. Poppy Koulouris is ordered 500 mL normal saline to be delivered over 24 hours via a gravity feed line.
    a. Calculate the volume of normal saline she will receive per hour.
    b. If the drip chamber delivers 20 drops/mL, what would be the drip rate in drops per minute?
11. If Alex Brown is ordered 1 L of dextrose 5% to be given over 8 hours, what rate would you set the volumetric pump at?
12. Sara Hart has been ordered 500 mL normal saline. The volumetric pump has been set at 25 mL/hour. How long will the fluid last?
13. Calculate the required drip rate in drops per minute (using a drip chamber that delivers 20 drops/mL) if Alice Ball is to have 100 mL normal saline delivered over 1 hour.
14. Mr Lee is critically ill and has two intravenous lines inserted. One line is running at 45 mL/hour, the second at 30 mL/hour. What volume of fluid would Mr Lee receive over 24 hours?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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UNIT

8

# Health promotion and psychosocial and physiological nursing care


CHAPTER 25
Nursing care of an individual: cardiovascular and respiratory

CHAPTER 26
Nursing care of an individual: fluid and electrolyte homeostasis

CHAPTER 27
Promotion of health and wellbeing: rest and sleep

CHAPTER 28
Promotion of health and wellbeing: movement and exercise

CHAPTER 29
Maintaining and promoting skin integrity and wound care

CHAPTER 30
Promotion of health and wellbeing: nutrition

CHAPTER 31
Nursing care: urinary elimination and continence

CHAPTER 32
Nursing care: bowel elimination and continence

CHAPTER 33
Nursing assessment and management of pain

CHAPTER 34
Nursing assessment and management of sensory health

CHAPTER 35
Nursing assessment and management of neurological health

CHAPTER 36
Nursing assessment and management of endocrine health

CHAPTER 37
Nursing assessment and management of reproductive health

CHAPTER
25

# Nursing care of an individual: cardiovascular and respiratory

*Kylie Porritt*

## KEY TERMS

agranular
airway
basophils
bradypnoea
cardiovascular
diffusion
eosinophils
erythrocytes
exhalation
expiration
gas exchange
granulocytes
hypercapnia
hypocapnia
hypoventilation
hypoxaemia
hypoxia
inhalation
leucocyte
lymph
lymphocytes
monocytes
neutrophils
respiration
tachypnoea
thrombocyte

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define the key terms
- Describe the structure of the respiratory system
- Explain the functions of the respiratory system
- Explain the structures of the cardiovascular system
- Describe the position of the heart and the function of the circulatory system
- State the factors that affect respiratory function
- Describe the major manifestations of respiratory system disorders
- Describe the major manifestations of circulatory system disorders
- Briefly describe the specific disorders of the cardiac and respiratory systems outlined in this chapter
- Assist in planning and implementing nursing care for the person with a cardiac and respiratory system disorder
- Apply relevant principles in the planning and implementation of nursing actions to assist a person receiving oxygen therapy

## CHAPTER FOCUS

The human body relies on oxygen to survive and it is the role of the cardiac and respiratory systems to supply the body's oxygen demands. The two systems work together to achieve and maintain homeostasis. Cardiopulmonary physiology involves the delivery of oxygenated blood from the lungs to the left side of the heart out to the tissues, and deoxygenated blood from the tissues to the right side of the heart out to the pulmonary circulation for re-oxygenation. Blood is oxygenated through the processes of ventilation, perfusion and transport of respiratory gases.

The overall function of the cardiovascular system, which includes the lymphatic system, is to move blood around the body. The heart pumps the blood for circulation around the body through blood vessels. These blood vessels transport oxygen, nutrients and other substances to the cells and transport waste away from the cells. Blood also assists in protecting the body against infection and distributing heat evenly throughout the body, and prevents its own loss by means of a built-in clotting mechanism.

The respiratory system provides the body with the ability to absorb oxygen and excrete carbon dioxide and other waste products from the body. Oxygen from the atmosphere is delivered to the bloodstream and carbon dioxide diffused out from the bloodstream. This is achieved through the capillary alveoli membrane in the lungs.

Ventilation is the method of delivering air into and out of the lungs and is achieved through inhalation and exhalation. Respiration involves both the respiratory and the circulatory system and is the exchange of gases.

An adequate supply of blood is necessary for the normal function of every cell. Homeostasis depends on the ability of the heart to adequately circulate the required volume of blood and oxygen to the tissues. Cells temporarily deprived of blood or oxygen will not function normally, and continued disruption of blood supply causes irreversible damage or cell death. Any disorder that interferes with the distribution or delivery of blood to tissues or the uptake or excretion of gases in respiration is a potential harm to body cells and may have permanent effects on a part, or all, of the body.

The most common complication of a respiratory disorder is carbon dioxide retention. This can be a result of alveolar hypoventilation, or a cardiovascular disorder altering the ventilation or the perfusion of the lungs and other tissues.

Nursing care related to oxygenation requires an understanding of how the three systems work together to achieve oxygenation within the body. Knowledge of how to maintain and restore a clear airway is an essential component to nursing care. This includes measures directed at removing secretions by the use of suction via the nasal, oropharyngeal or endotracheal routes or by tracheostomy. The patency of airways can be assisted by the use of humidification, nebulisation and physiotherapy using isotonic or hypotonic solutions or certain medications. Education is essential to promote exercise, which maintains optimal circulation of blood, and deep breathing and coughing exercises are encouraged to minimise the retention of secretions and secondary infections. Circulation can be assisted by changes in diet, fluid, exercise, medications and positioning.

Although disorders of the cardiovascular and the respiratory system are common in most communities, the incidence of cardiac and respiratory disease is controlled to some extent by: legislation to minimise airborne irritants; immunisation programs; and health education regarding risks such as diet, exercise practices, smoking and alcohol consumption, hypertension and environmental pollution (Nascimento et al 2014).

## LIVED EXPERIENCE

Stewart, a 69-year-old man, was admitted to the ward with exacerbation of his chronic obstructive pulmonary disease (COPD). Initially his observations were stable and he was treated with oxygen therapy at 4 L/min via nasal prongs and oral corticosteroids. He was breathless on exertion and needed help with his ADLs. Throughout my shift I noticed that his oxygen saturations fell into the clinical review zone on the adult observation chart. He also became drowsy. I reported this to my RN who asked the resident doctor to review him.

The doctor did some arterial blood gases which confirmed a rising carbon dioxide ($CO_2$). I was asked to monitor his oxygen saturations, respiratory rate and conscious state hourly. They also gave an additional dose of IV corticosteroid. As the medical team were worried about possible carbon dioxide retention I was instructed to only administer low-flow oxygen (<3 L per minute) and he had his calling criteria altered to accept 88–92% to avoid further $CO_2$ retention. He was starting to improve when I went home at the end of my shift.

**Alexa, Enrolled Nurse**

# STRUCTURE OF THE RESPIRATORY SYSTEM

The function of the respiratory system (Figure 25.1) is to deliver oxygen from the atmosphere to the bloodstream and to deliver carbon dioxide from the bloodstream to the atmosphere. The structures that make up the respiratory tract constitute the means by which this exchange of gases occurs. The respiratory system consists of cavities and conducting airways that begin at the nasal and oral cavity and end at the alveoli, the functional unit of the respiratory system (Berman et al 2015). The larger **airways** are composed of cartilage and

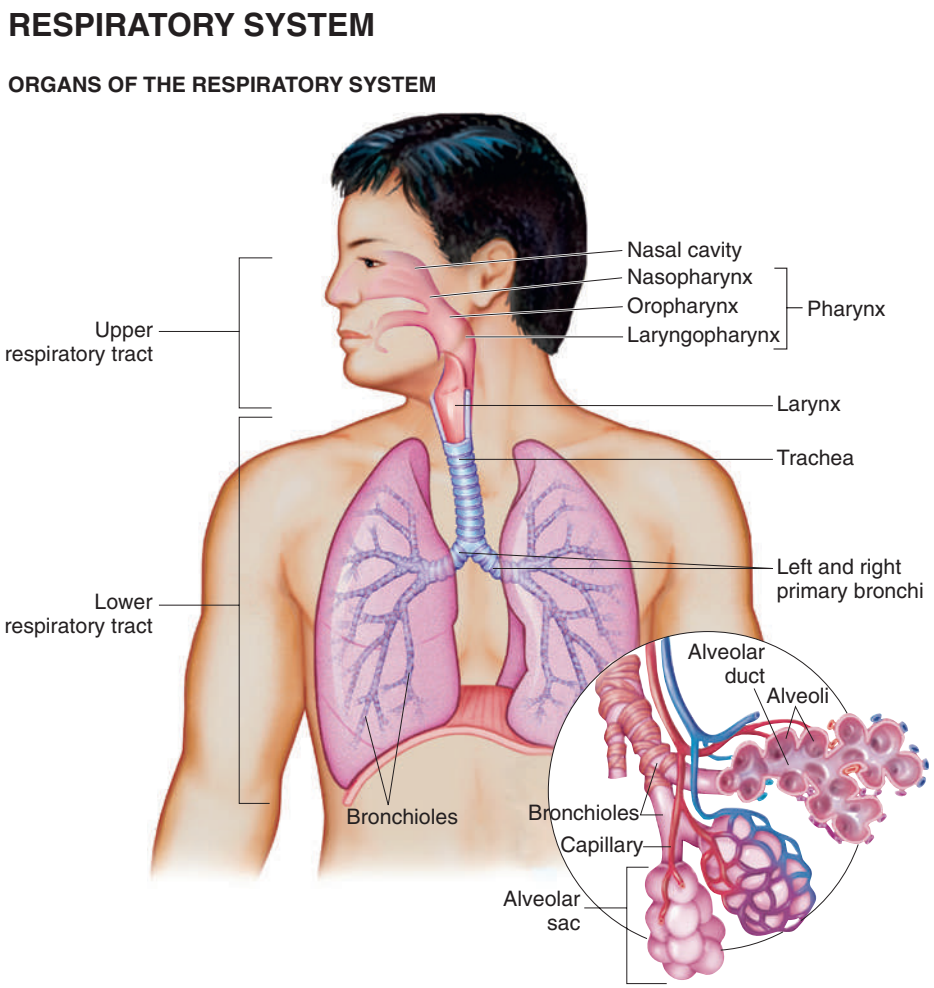


**Figure 25.1** The respiratory tract

*(Thibodeau & Patton 2012, Fig 14-1, p 327)*

smooth muscle that maintain their patency, and are gradually replaced with smooth muscle in the terminal airways, which allows alterations in airway diameter and ventilation. The two lungs are located in the thoracic cavity, encased by a double membrane known as the pleura, and are separated by the mediastinal cavity that contains the heart and great vessels. The thoracic cavity has ribs that aid in ventilation and protect the lungs from damage. The diaphragm and the internal and external intercostal regions are composed of skeletal muscle and constitute the main muscles of ventilation; other muscles are used when required for more forceful inhalation or expiration (Berman et al 2015).

## Upper airways

### Nasal cavities

The nose is a bony cartilaginous structure divided into a right and left nasal cavity by the nasal septum. The anterior portion of the septum is cartilage and the posterior portion is bone, formed by the small thin bone separating the left and right nasal cavity and part of the ethmoid bone. Inside each nostril (nares) is a vestibule lined by skin containing sebaceous and sweat glands and coarse hairs that act as filters. Apart from the vestibules, all other areas of the nasal cavity are lined by mucous membrane. In most of the cavity the membrane is covered by ciliated epithelium with many 'goblet' cells. Mucous cells are also present in the underlying connective tissue. The nose consists of these chambers, with specific structures and cells that have the following functions:

- Hairs and cilia line the nasal cavities and filter foreign particles and pathogens from the inhaled air
- Mucus secreted by the mucosa traps substances in inhaled air, and the cilia move particles of mucus towards the pharynx to be swallowed or expectorated
- Inhaled air is warmed and moistened as it passes over the mucosa. The three nasal turbinate bones in each cavity cause air flow to become turbulent, which enhances contact of air with the mucosa
- Sensory organ for the sense of smell (olfaction) (Marieb & Hoehn 2013).

### Paranasal sinus

A sinus is a cavity within a bone. There are four air-filled paranasal sinuses (Figure 25.2): frontal, maxillary, sphenoid and ethmoid sinuses.

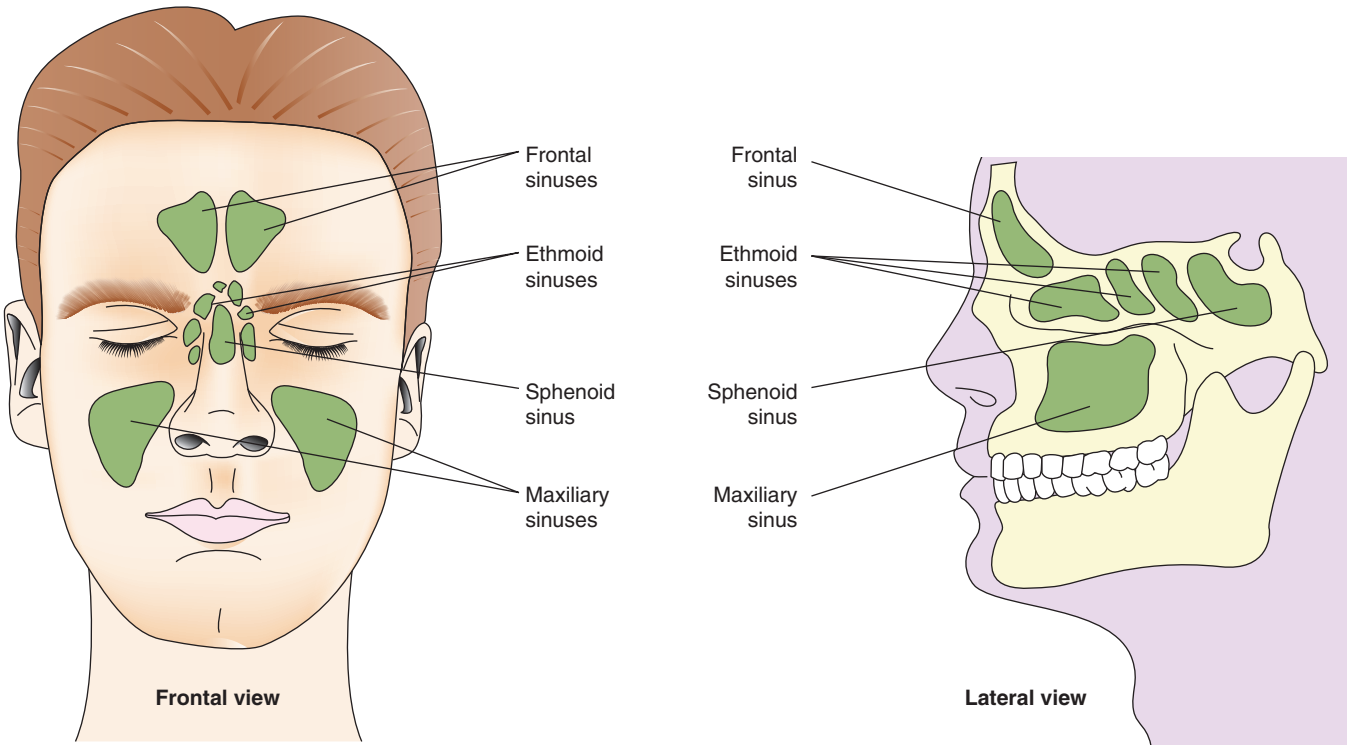


**Figure 25.2** Paranasal sinus

These sinuses are important resonance chambers and aid in voice production (Marieb & Hoehn 2013).

## The pharynx

The pharynx is a muscular tube about 13 cm long, lying in front of the cervical vertebrae and behind the nose, mouth and larynx. It is lined with mucous membrane and has three sections:

***1. Nasopharynx*** The nasopharynx, which is continuous with the nasal cavity above and with the orpharynx below. Its functions include:

- Warming and moistening inhaled air
- Protecting from infection, by patches of lymphoid tissue such as the adenoids
- Equalising pressure in the middle ear with the atmospheric pressure by allowing air to travel along the eustachian tubes to the middle ear.

***2. Oropharynx*** This section lies behind the mouth and is separated from the cavity of the mouth by two folds of mucous membrane (the fauces). Between these folds lie the oral tonsils, which are patches of lymphoid tissue involved in the immune system. The oropharynx provides a common passage for air, food and fluids. The uvula is a muscular projection of the soft palate in the middle of the arch formed by the fauces, and prevents the entry of food and fluid into the nasal cavity (Marieb & Hoehn 2013; Potter et al 2013).

***3. Laryngopharynx*** The laryngopharynx is the section that opens into both the larynx and the oesophagus. It contains the epiglottis (see next section).

## The larynx

The larynx is situated in the upper region of the neck and extends from the pharynx above to the trachea below. It is composed of pieces of cartilage connected by membranes and provides a passageway for air between the pharynx and trachea. As air passes through, it is further moistened, warmed and filtered. The main cartilages that form the larynx are:

- The thyroid cartilage, which is the largest and forms a prominence known as the 'Adam's apple'
- The epiglottis, a leaf-shaped cartilage attached to the upper part of the thyroid cartilage. During swallowing, the larynx rises and the epiglottis covers its opening, directing food and fluid into the oesophagus and preventing entry into the trachea and subsequent aspiration into the lungs
- The pitch of the voice depends on the length and tightness of the cords, and the air sinuses in the skull bones influence the resonance of the voice. The vowels and consonants that make up speech are formed by various positions of the lips and tongue. Speaking requires coordination of the larynx, mouth, lips, tongue, throat, lungs and abdomen (Marieb & Hoehn 2013).

# Lower airway

## The trachea

The trachea is about 12 cm long and lies in front of the oesophagus, extending from the larynx to the mid-thorax, where it divides into a right and a left bronchus. The trachea consists of 15–20 C-shaped rings of cartilage joined by

involuntary muscle and fibrous tissue. Posteriorly the trachea lacks cartilage and is replaced with smooth muscle to enable the oesophagus to expand, while the cartilages maintain the patency of the airway. It thus provides a permanently open passageway for air travelling to and from the lungs. The trachea is lined with ciliated epithelium containing mucus-secreting goblet cells. The cilia sweep the mucus, cell debris and any foreign particles that enter the trachea up into the pharynx to be swallowed or expectorated. During swallowing, the larynx rises and the epiglottis covers its opening, directing food and fluid into the oesophagus and preventing its entry into the trachea and subsequent aspiration into the lungs.

The cricoid cartilage lies below the thyroid cartilage, and is shaped like a wide, banded ring to provide attachments for the various muscles, cartilages and ligaments involved in opening and closing the airway and in speech production. The larynx is lined with mucous membrane, which becomes ciliated in the lower part. In the upper part, two folds of membrane containing embedded fibrous and elastic tissue form the vocal cords. The vocal cords extend from the anterior wall to the posterior wall of the larynx to form the glottis, or voice box, which produces sounds. The nerve supply to the larynx is from the laryngeal and recurrent laryngeal nerves, which are branches of the vagus nerve (Marieb & Hoehn 2013).

***Voice production*** The vocal cords are apart during normal breathing. Contraction of muscles attached to the cords brings them closer together, and expired air is used to cause vibration of the cords. The brain, tongue, lips, nasal cavity and facial muscles all help to convert the resultant sounds into speech. The pitch of the voice depends on the length and tightness of the cords, and the air sinuses in the skull bones influence the resonance of the voice. Speaking requires coordination of the larynx, mouth, lips, tongue, throat, lungs and abdomen.

## Bronchi

At about the middle of the thorax, the trachea divides to form the right and left bronchus. The bronchi enter the lungs; the right bronchus dividing into three, and the left bronchus dividing into two branches. There are three lobes in the right lung and two lobes in the left lung; therefore, one branch of each bronchus enters each lobe. The left bronchus is longer than the right because of the position of the heart. Smooth involuntary muscles surround the airways to allow for alteration in airway diameter (Marieb & Hoehn 2013).

## Bronchioles

Respiratory bronchioles have a dual function: they serve as part of the airways and as part of the alveolar volume (gas exchange) (Broaddus et al 2015). Bronchioles are the smallest branches of the bronchi, and their walls consist of involuntary muscle with elastic fibrous tissue, allowing for expansion and constriction. They divide to form terminal bronchioles that give rise to microscopic alveolar ducts, which terminate in clusters of air sacs called alveoli.

## Lungs

The two lungs lie in the thoracic cavity on either side of the mediastinum. The mediastinal cavity contains the heart, major blood vessels and the oesophagus. The lungs are light and spongy and consist of the bronchioles, alveoli and blood vessels and are supported by areolar tissue. There is also a great deal of elastic tissue to enable the lungs to expand and recoil freely during respiration. The base of each lung rests on the diaphragm and the apex of each extends to just above each clavicle. The right lung has three lobes and is shorter and wider than the left lung, which has two lobes. Each lobe is made up of lobules, each with its own blood, nerve and lymph supply. On the medial side of each lung is a depression called the hilus, through which the bronchi, lymphatic vessels and blood vessels enter and exit (Marieb & Hoehn 2013).

## Alveoli

Alveoli are microscopic air sacs in the lungs. Their walls are composed of one layer of type I, simple squamous epithelial cells, and type II cells that produce surfactant which maintains alveolar expansion by reducing surface tension. Macrophages are present and their role is to phagocytose cell debris and pathogens. The alveoli form a surface area of about 70 $m^2$ for semi-permeable membrane diffusion of gases. The alveoli are surrounded by networks of capillaries, arising from the pulmonary arteries and their tributaries. The function of alveoli is the interchange of oxygen and carbon dioxide between the air in the alveoli and the blood in the capillaries (Figure 25.3).

## Pleura

The pleura (Figure 25.4) comprise a double layer of serous membrane, consisting of the visceral pleura, which adheres to the surface of the lungs, and the parietal pleura, which lines the thoracic cavity and covers the superior surface of the diaphragm. The pleura secrete a thin film of serous fluid, maintained at about 50 mL, which lies between the two

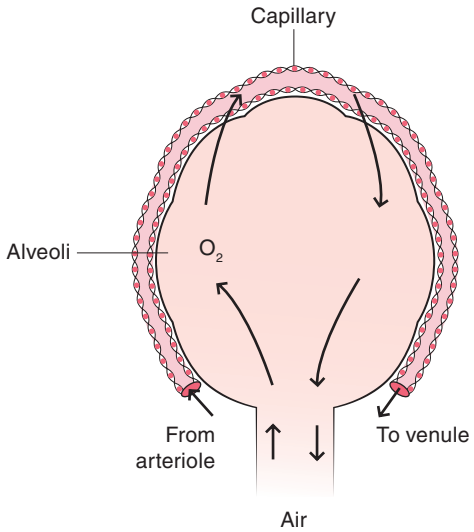


**Figure 25.3** Exchange of gases in the alveoli

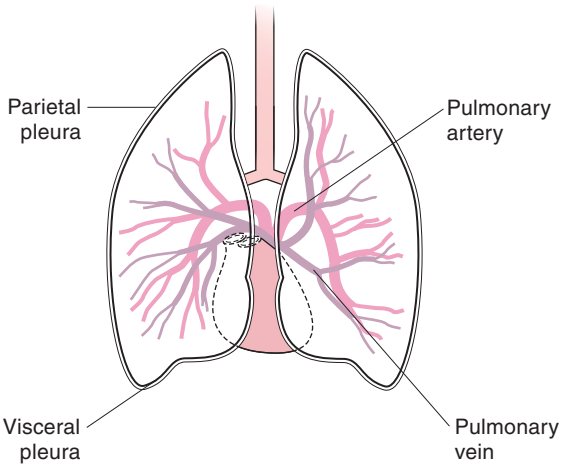


**Figure 25.4** The lungs and the pleura

layers and prevents friction between the surfaces. The pressure within the pleura is 2 mmHg below atmospheric pressure to prevent lung collapse.

### Muscles of ventilation

The main muscles responsible for ventilation are the diaphragm and internal and external intercostal muscles. During difficult or forced breathing, accessory muscles are used, such as the muscles of the neck, thorax (e.g. sternocleidomastoid, anterior serrate, scalene) and abdominal muscles, including the rectus abdominus and transverse abdominus (Marieb & Hoehn 2013).

## SCIENTIFIC PRINCIPLES OF VENTILATION AND RESPIRATION

The major purpose of respiration in to supply oxygen to the body and remove carbon dioxide from the cells. This is accomplished by the process of *ventilation* (movement of air in and out of the lungs), *external respiration* (exchange of gases between the atmosphere and the pulmonary capillaries) and *internal respiration* (exchange of gases between the systematic capillaries and the cell). An understanding of pressure relationships and key principles of respiration will assist in understanding the process of ventilation and respiration (Broaddus et al 2015).

### Pressure

Pressure may be defined as force (or stress) per unit area applied to a surface. The concept of pressure, or force, applies equally to solids, liquids and gases. Described below are some of the principles and concepts relating to pressure that are relevant to nursing.

### Atmospheric pressure

Atmospheric pressure arises by virtue of the weight of the air above the earth. Atmospheric pressure decreases as altitude increases because of the reduced amount of air above. Even at a particular altitude, atmospheric pressure is not constant, but varies according to atmospheric conditions. The total pressure exerted by the atmosphere is about 6.8 kg per 25 $mm^2$ of surface area at sea level. The atmosphere consists principally of nitrogen ($N_2$) 79.03%, oxygen ($O_2$) 20.93% and carbon dioxide ($CO_2$) 0.0004%, which totals 99.9604%. Other gases such as carbon monoxide (CO) are present in minute quantities. Oxygen, a colourless and odourless gas, is essential in sustaining most forms of life.

Water vapour and gases in the atmosphere have weight and, at sea level, exert a pressure defined as 1 atmosphere of pressure ('atmospheric pressure') equivalent to 760 mmHg. The terms negative and positive pressure are used to compare a pressure to normal atmospheric pressure at sea level. Any pressure above normal atmospheric pressure is regarded as a positive pressure, and any pressure below normal atmospheric pressure is regarded as a negative pressure.

The following three laws of physics define the characteristics of gases:

1. Pascal's principle, which states that a confined liquid transmits pressure, applied to it from an external force, equally in all directions
2. Boyle's law, which states that the volume of a given mass of gas is inversely proportional to the pressure to which it is subjected, provided that the temperature remains constant
3. Charles' law, which states that the volume of a given mass of gas is directly proportional to its absolute temperature, provided that the pressure remains constant; for example, as the temperature of a gas is increased (at constant pressure) the gas expands.

The combined effects of atmospheric pressure and the application of the gas laws above provide the basis for the operation of many common devices, and also of the lungs. Boyle's law refers to pressure differentials and is able to be applied to the process of breathing. By changing the volume of the thoracic cavity, the air pressure in the lungs can be made lower or higher than atmospheric pressure, leading to inhalation or exhalation, respectively (Marieb & Hoehn 2013).

### Sensory mechanisms of the respiratory system

Every cell in the human body requires oxygen for normal metabolism and must excrete the metabolic waste product, carbon dioxide. To maintain homeostasis, cells in different locations of the body react to changes in oxygen and $CO_2$ levels. Sensory cells include chemoreceptors, pressorreceptors and baroreceptors.

#### Chemoreceptors

Chemoreceptors are specialised cells located centrally in the upper medulla of the brainstem and peripherally in bodies located in the carotid and aortic arteries. They respond to slight increases in arterial or cerebrospinal fluid $CO_2$ pressure ($P_{CO2}$) and acidity (an increased concentration of hydrogen ($H^+$) ions). Regulation of ventilation depends mainly on the

level of $CO_2$ in the blood. A slight increase in $CO_2$ concentration stimulates chemoreceptors to increase the respiratory rate and depth until the excess $CO_2$ is eliminated. Conversely, a decreased $CO_2$ level slows the ventilatory rate. Oxygen levels are normally sensed by the carotid bodies, which are sensitive to a fall in oxygen concentration of less than 50%. Stimulation of the carotid receptors increases the respiratory rate, the exception being individuals with chronic hypercapnia such as in emphysema.

### Pressorreceptors

Pressorreceptors, or mechanoreceptors, are stretch receptors present in lung tissue and within the thoracic wall. The bronchioles and alveoli also have stretch receptors that respond to extreme over-inflation as well as extreme deflation. When over-inflation occurs, impulses are transmitted from the stretch receptors to the medulla by the vagus nerve, the expiratory centre is activated and exhalation occurs. When extreme deflation occurs impulses from the lungs activate the inspiratory centre, and inhalation occurs.

### Baroreceptors

Baroreceptors are cells sensitive to blood pressure, which normally monitor changes in blood pressure. When blood pressure increases, impulses are sent to the respiratory centres to cause a decrease in respiratory rate. Rate, depth and rhythm of respirations are further affected by reflex responses, chemical signals and voluntary control; for example, during actions such as swallowing, impulses from gustatory centres are conveyed to the respiratory centre, and breathing stops temporarily.

Any abnormal mechanical disturbance, for example, the presence of chemical substances such as cigarette smoke, causes excitement of the lung irritant receptors, which induces hyperventilation and a reflex bronchoconstriction. Information from other parts of the body may also be received by the respiratory centres; for example, a rise in body temperature initiates an increase in the rate of ventilation, while a sudden cooling of the body induces a sudden inhalation followed by hyperventilation.

## The respiratory centres

Respiration is controlled both voluntarily and involuntarily. The automatic control of breathing is regulated by three respiratory centres, known as the medullary centre, located in the medulla oblongata, the apneustic centre in the pons and the pneumotaxic centre in the upper pons of the brainstem. These centres receive stimuli from sensory cells described above, and from each other. Their function is to control the rate, rhythm and depth of ventilation. Impulses travel from the respiratory centres along separate nerves that exit the spinal cord at different levels to separately innervate and control the diaphragm and internal and external intercostal muscles. Impulses are also transmitted to the other centres and cause stimulation of the respiratory muscles via the phrenic nerves, to stimulate the diaphragm to contract, and the intercostal nerves, which stimulate the intercostal muscles.

# VENTILATION AND RESPIRATION

**Respiration** is the term used to describe an interchange of gases. The main purpose of respiration is to supply the body with oxygen and dispose of carbon dioxide. The four processes involved are:

1. Ventilation: movement of air containing different gases into the respiratory tract
2. External respiration: exchange of oxygen and $CO_2$ between the blood and the alveoli (Figure 25.3)
3. Internal respiration: exchange of oxygen and $CO_2$ between the bloodstream and the tissues
4. Cellular respiration: exchange of gases by cells.

## Ventilation

Ventilation has two phases (Figure 25.5): inhalation and exhalation.

### Inhalation

During **inhalation** the diaphragm contracts and flattens, enlarging the thoracic cavity lengthwise, particularly in males. In females normal inhalations occur primarily by contraction of the external intercostal muscles, which raise the ribs and sternum, thus increasing the size of the thoracic cavity from

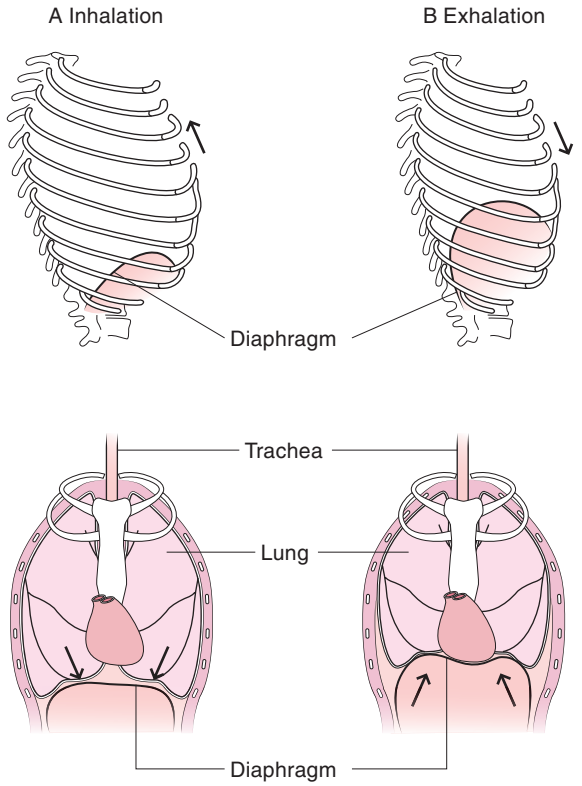


**Figure 25.5** Rib cage and diaphragm positions during breathing

A: At the end of normal inhalation: chest expanded (top left) and diaphragm depressed (bottom left) B: At the end of a normal exhalation: chest depressed (top right) and diaphragm elevated (bottom right)

side to side and front to back. As the chest wall moves up and outwards, the parietal pleura moves with it and, because of the 2 mmHg negative pressure within the pleura, the visceral pleura follows the parietal pleura. This causes stretching of the lungs, which expand to fill the enlarged thorax, and air is pushed into the respiratory passages.

### Exhalation

**Exhalation** is normally a more passive process than inhalation except in exercise and respiratory conditions in which active expiration occurs via internal intercostal and accessory muscles. During exhalation the diaphragm relaxes, thus decreasing the size of the thoracic cavity. The external intercostal muscles also relax, allowing the ribs and sternum to return to their former position, further decreasing the size of the thoracic cavity. The elastic tissue of the lungs allows for recoil, further forcing air out of the respiratory passages.

## Respiration

### External respiration

External respiration is the exchange of gases between air in the alveoli and the blood travelling through the capillaries surrounding the alveoli. Branches of the pulmonary artery bring deoxygenated blood to the capillaries surrounding each alveolus. During **gas exchange**, gases normally diffuse through the semi-permeable walls of the alveoli and capillaries to the area of lowest concentration of each gas, as each gas diffuses independently of other gases, until the pressure is equal on both sides. Thus, oxygen moves from an area of higher concentration in the alveoli to an area of lower concentration in the blood capillaries, while $CO_2$ moves from an area of a higher concentration in blood capillaries to an area of lower concentration in the alveolar air. Pulmonary venules then collect the blood rich in oxygen from the capillaries and unite to form the two pulmonary veins which leave each lung to enter the left atrium of the heart. Table 25.1 illustrates the approximate composition of inspired and expired air.

### Internal respiration

Internal respiration (Figure 25.6) is the exchange of gases between the bloodstream and the tissues. During this exchange, the gases diffuse through the semi-permeable walls of the capillaries to equalise the concentration of gases on both sides. Oxygen moves from the blood into the tissues, down a concentration gradient, to replenish oxygen used in cellular metabolism. Carbon dioxide moves from the tissues into the blood, down a concentration gradient, to rid the tissues of waste produced by cellular metabolism.

**TABLE 25.1 | Composition of inhaled compared with exhaled air**

| | % Oxygen | % Carbon dioxide | % Nitrogen |
|---|---|---|---|
| Inhaled air (atmospheric air) | 20.9 | 0.04 | 79 |
| Exhaled air (alveolar air) | 14.0 | 5.60 | 79 |

*(Soloman 2016)*

### Cellular respiration

The gases that diffuse from the interstitial tissue into cells are used by the cells for metabolism. The metabolism of nutrients uses oxygen and produces $CO_2$, which diffuses from cells into the interstitial tissue. This level of respiration is termed cellular respiration.

## Factors necessary for ventilation and respiration

The passage of oxygen from the atmosphere to the alveoli in the lungs, and the passage of carbon dioxide from the alveoli to the atmosphere, requires an unobstructed airway. In addition, the process of respiration requires:

- Adequate oxygen in the atmosphere
- A patent functioning respiratory tract
- Functioning thoracic muscles and nerves to control the thoracic cage and diaphragm
- Capillaries in close proximity to the cells to allow the exchange of gases
- A functioning cardiovascular system that contains adequate amounts of plasma and normal erythrocytes and haemoglobin to transport the gases (Marieb & Hoehn 2013).

## Transport of oxygen

Oxygen is carried in the blood in two ways:

1. Dissolved in the plasma: only 2–3% of oxygen is carried in this way as oxygen is not very soluble. Oxygen dissolved in plasma is measured as $PaO_2$

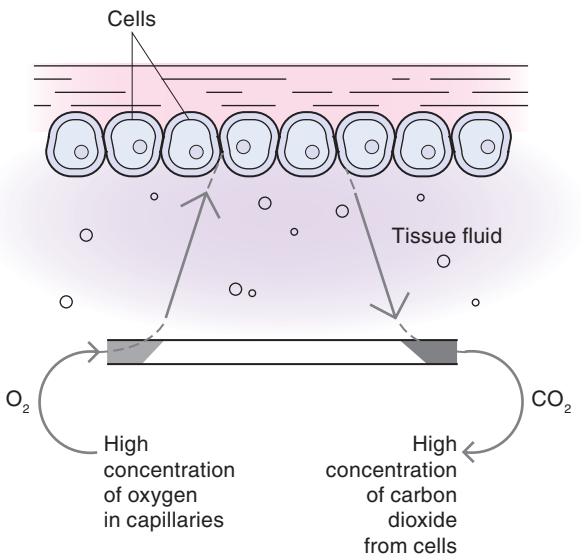


**Figure 25.6** Internal respiration

$$Hb + O_2 = HbO_2$$

(Uncombined or reduced haemoglobin) + oxygen = (oxyhaemoglobin or combined haemoglobin)

**Figure 25.7** Haemoglobin equation

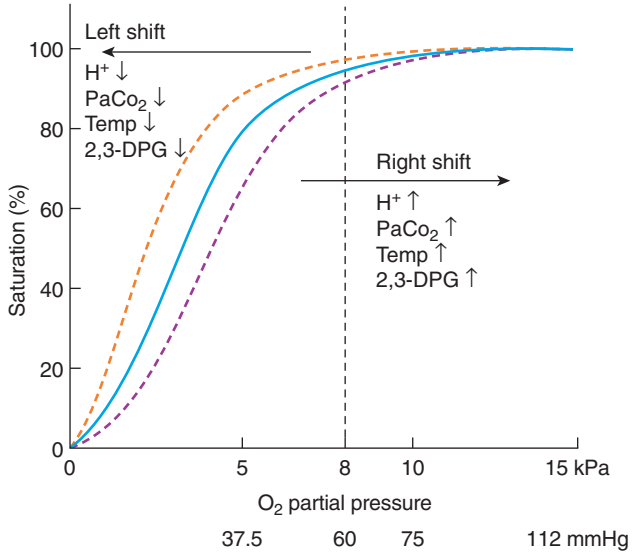


**Figure 25.8** $HbO_2$ dissociation curve

*(Dougherty & Lister 2011:542)*

2. Bound to haemoglobin in the red blood cells: 95–98% of oxygen is carried in this way and is measured by the percentage of oxygen saturated ($SaO_2$).

Haemoglobin is composed of haem (iron) and globulin (protein). Oxygen and haemoglobin combined together form oxyhaemoglobin (Figure 25.7).

Hb that is not combined with oxygen is referred to as reduced haemoglobin. Hb that is completely converted to $HbO_2$ is referred to as fully saturated haemoglobin (Dougherty & Lister 2011). Hb that has a mixture of Hb and $HbO_2$ is referred to as partially saturated haemoglobin. The percentage saturation of haemoglobin is the percentage of $HbO_2$ in the total haemoglobin. The percentage saturation of haemoglobin with oxygen is illustrated in the oxygen–haemoglobin dissociation curve (Figure 25.8).

The bond between haemoglobin and oxygen are affected by various physiological factors that shift the oxygen dissociation curve to the left or to the right. When the $PaO_2$ of blood is high, haemoglobin binds with large amounts of oxygen and is almost fully saturated. When the $PaO_2$ is low, the haemoglobin binds with smaller amounts of oxygen and is partially saturated (Dougherty & Lister 2011).

The assessment of arterial oxygen saturation is commonly performed by using pulse oximetry. This device is non-invasive and can be easily applied by a sensor probe. The principles of pulse oximetry are based on variation in the ratio of the light's absorbance of tissues during systole and diastole (Tin & Lal 2015).

## Factors affecting the release of oxygen from haemoglobin

Several factors affect the amount of oxygen being released from haemoglobin so that the oxygen dissociation curve is said to shift to the left or to the right (Pittman 2013). When a shift occurs to the right there is reduced binding of oxygen to haemoglobin and oxygen is released more easily into the tissues. When a shift occurs to the left there is an increase in the binding of oxygen to the haemoglobin, resulting in oxygen being less easily released into the tissues (Dougherty & Lister 2011). Cellular hypoxia can occur.

### pH

Oxygen is released more readily from haemoglobin in an acid environment. This condition occurs often during an acute illness. During an acute illness an increase in $PaO_2$ is usually present, resulting in a lower pH. This acidic environment allows the oxygen to separate more readily from the haemoglobin allowing the tissues to have more oxygen.

### Temperature

Within limits, the amount of oxygen released from haemoglobin increases as temperature increases, therefore hyperthermia causes a rightward shift while hypothermia causes a leftward shift.

### Organic phosphates

2,3-diphosphoglycerate (DPG) is a primary organic phosphate. It is an intermediate compound formed in red blood cells during the conversion of glycogen to glucose. The production of 2,3-DPG is likely an important adaptive mechanism because the production increases in several conditions where there is diminished peripheral tissue $O_2$ availability, such as hypoxaemia, chronic lung disease, anaemia and congestive heart failure. High levels of 2,3-DPG shift the curve to the right, while low levels of 2,3-DPG cause a leftward shift, seen in states such as septic shock and hypophosphataemia.

### Carbon dioxide excretion

Carbon dioxide is carried through the venous system and breathed out through the lungs. The normal level of carbon dioxide in the blood is 3.5–5.3 kPa. Carbon dioxide has a direct effect on the respiratory centre in the brain. As carbon dioxide levels rise and diffuse from the blood into the cerebrospinal fluid, the $CO_2$ is hydrated and carbonic acid is formed. The role of the respiratory system is to excrete carbonic acid from the lungs during expiration. Carbon dioxide stimulates respiratory rate and so high carbon dioxide levels result in a higher respiration rate.

# STRUCTURE OF THE CARDIOVASCULAR SYSTEM

The structures that make up the **cardiovascular** system are the:

- Heart, which acts as a pump to circulate the blood through the body
- Blood, which carries essential substances to cells and carries wastes away from cells
- Blood vessels, which contain and transport the blood throughout the body
- Lymphatic system, which transports tissue fluid containing electrolytes, proteins and some waste products, recognises and destroys pathogens before they reach the bloodstream and delivers nutrients from the digestive tract into the cardiovascular system.

## The heart

The heart is a hollow, conical muscular organ situated obliquely in the thoracic cavity between the lungs and behind the sternum. One-third of the heart lies to the right, and two-thirds lie to the left of the median plane. Its base is uppermost and points towards the right shoulder, and its apex is below, pointing to the left. The adult heart is about 12 cm × 8 cm × 6 cm and weighs about 300 g.

### Structure of the heart

The heart is divided into a right and a left side by a muscular partition called the septum. Each side is further divided into an upper receiving chamber, the atrium, and a lower distributing chamber, the ventricle (Figure 25.9).

The walls of the heart consist of the pericardium, myocardium and endocardium:

- The pericardium is the outer coat, consisting of two layers of serous membrane. The pericardium secretes a small amount of serous fluid to moisten the surfaces in contact with each other, so that the heart can beat with minimal friction
- The myocardium is the middle muscular layer consisting of cardiac muscle, which is a highly specialised type of muscle tissue present only in the heart. It is of varying thickness, being thicker in both ventricles than in the atria, and thicker in the left ventricle than in the right

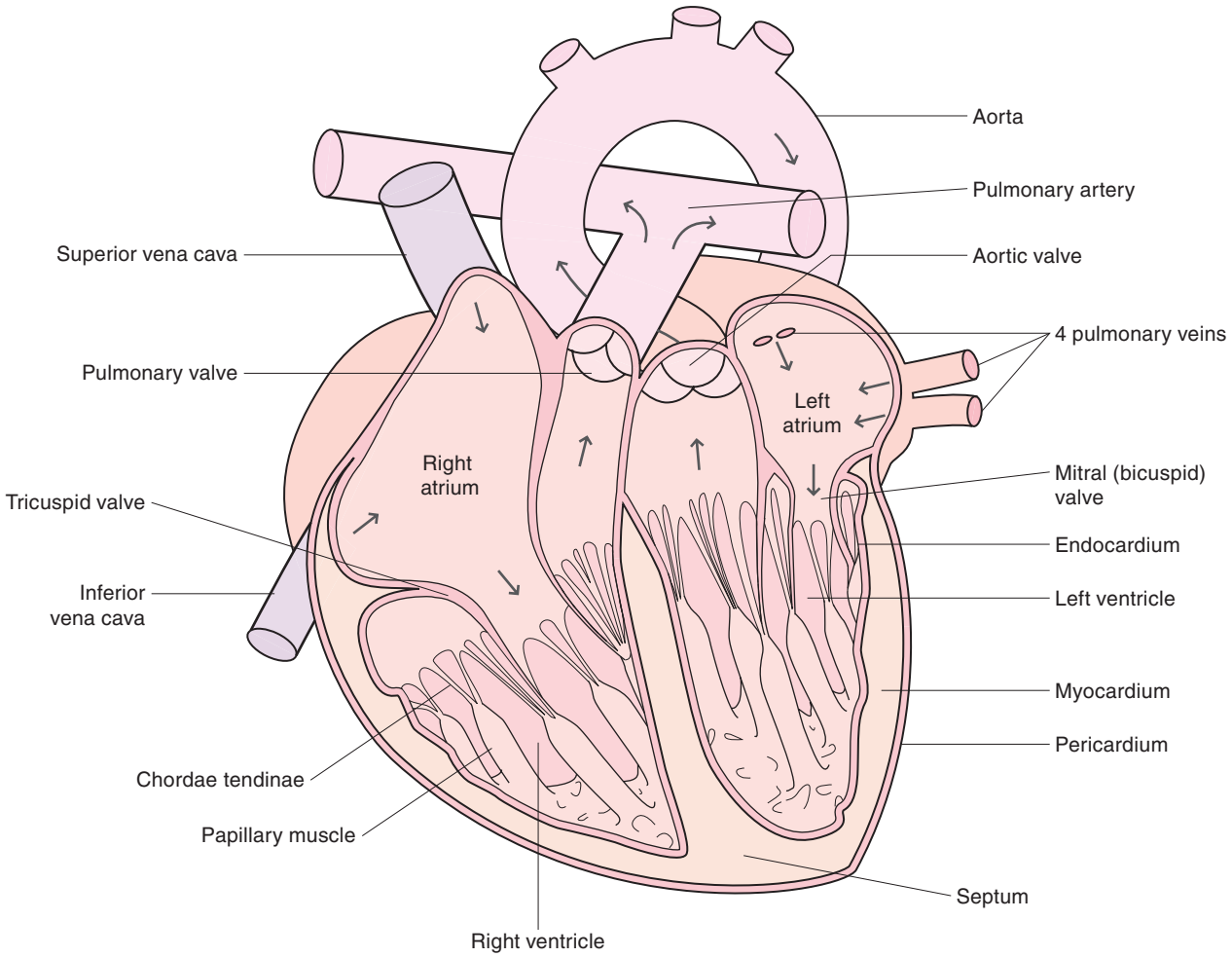


**Figure 25.9** Structure of the heart

- Endocardium is the innermost lining of the heart, and provides a smooth surface for the flow of blood. Folds of endocardium help to form the valves of the heart.

### Valves of the heart

Heart valves consist of flaps of fibrous tissue covered by endocardium, which allow blood to flow in one direction only, thus preventing a backward flow. The valves are the:

- Bicuspid (or mitral) valve, between the left atrium and left ventricle
- Tricuspid valve, between the right atrium and right ventricle
- Aortic valve, between the left ventricle and the aorta
- Pulmonary valve, between the right ventricle and the pulmonary artery.

Fine cords of tendons (chordae tendinae) are attached from the mitral and tricuspid valves to small projections from the muscle walls of the ventricles called papillary muscles. Contraction of the papillary muscles closes the valves, preventing blood from escaping back into the atria.

### Cardiac blood vessels

Several blood vessels either enter or leave the heart. The blood vessels that enter the heart are the:

- Inferior vena cava, which carries deoxygenated blood collected from the lower part of the body to the right atrium
- Superior vena cava, which carries deoxygenated blood collected from the upper part of the body to the right atrium
- Four pulmonary veins, two from each lung, which carry oxygenated blood into the left atrium.

The blood vessels that leave the heart are the aorta, which carries oxygenated blood from the left ventricle for distribution to all the systems and tissues of the body, and the pulmonary artery, which leaves the right ventricle then divides into two branches that carry deoxygenated blood from the heart to each lung. Thus, the right side of the heart deals only with deoxygenated blood, and the left side deals only with oxygenated blood.

### Blood supply to the heart

The heart receives its own supply of blood. As the aorta leaves the heart it gives off two branches called the coronary arteries (right coronary). The coronary arteries divide into smaller and smaller branches, until networks of capillaries are formed in the heart wall. These arteries and their branches supply all parts of the myocardium with blood. Venules collect the deoxygenated blood from the tissues in the heart wall and unite to form a vein (coronary sinus), which opens directly into the right atrium.

### The conducting system of the heart

The heart's conducting system (Figure 25.10) ensures that it contracts in a coordinated and synchronised series of events. The sinoatrial (SA) node is located in the upper part of the right atrium and acts as the pacemaker of the heart, continuously initiating impulses that innervate the rest of the heart. The atrioventricular (AV) node lies in the lower part of the interatrial septum of the heart. The AV node is connected to the bundle of His and is the only natural pathway for the impulse to travel from the atria to the ventricles. The bundle of His divides into the right and left bundle branches, which in turn divide off into tiny fibres termed Purkinje fibres. These fibres rapidly conduct the impulse throughout the myocardium from the apex to the base.

### Functions of the heart

The function of the heart is to act as a pump: it pumps deoxygenated blood to the lungs to excrete carbon dioxide and pick up oxygen, and pumps oxygenated blood to all other parts of the body.

The cardiac cycle is the series of pressure changes, valve actions and electrical potentials that bring about the movement of blood through the heart during one complete heart beat. The cardiac cycle takes about 0.8 of a second and consists of two phases, systole (the contraction phase) and diastole (the relaxation phase). During systole, both atria contract at the same time, emptying their contents into the ventricles. The two ventricles then contract simultaneously, forcing their contents into the aorta and pulmonary artery. Diastole follows after each contraction of the heart.

Cardiac output is the volume of blood pumped out by each ventricle during 1 minute. It is the product of the volume of blood pumped at each beat (stroke volume) and the number of beats during 1 minute (heart rate).

The heartbeat is controlled by the cardioregulatory centre in the central nervous system. The vagus nerve slows it and reduces the force of the beat, while sympathetic nerves quicken the beat and increase its force.

Each cardiac muscle cell is capable of spontaneous, rhythmic self-excitation known as autorhythmia. To be effective as a pump, the action of the whole heart must be coordinated. Coordination of the rhythmic movements is brought about by the specialised cells of the sinoatrial (SA) node (pacemaker).

## Blood

Blood is composed of plasma and formed elements. It is a viscous substance, heavier, thicker and more viscous than water. Despite being a liquid, blood has the unique quality of being able to form solid clots (Rosdahl & Kowalski 2008). Blood composed of a fluid portion (plasma) and formed elements (cells and cell fragments).

Blood is classed as a connective tissue and constitutes about one-twelfth of the weight of the body (Rosdahl & Kowalski 2008). The difference between blood and other connective tissues is that its cells are not fixed but free to move in the liquid portion of the blood, known as plasma (Rosdahl & Kowalski 2008).

Depending on the weight of the individual, the average total volume of blood is about 5–6 L. Blood varies in colour, from bright red when it has a high oxygen content, to dark

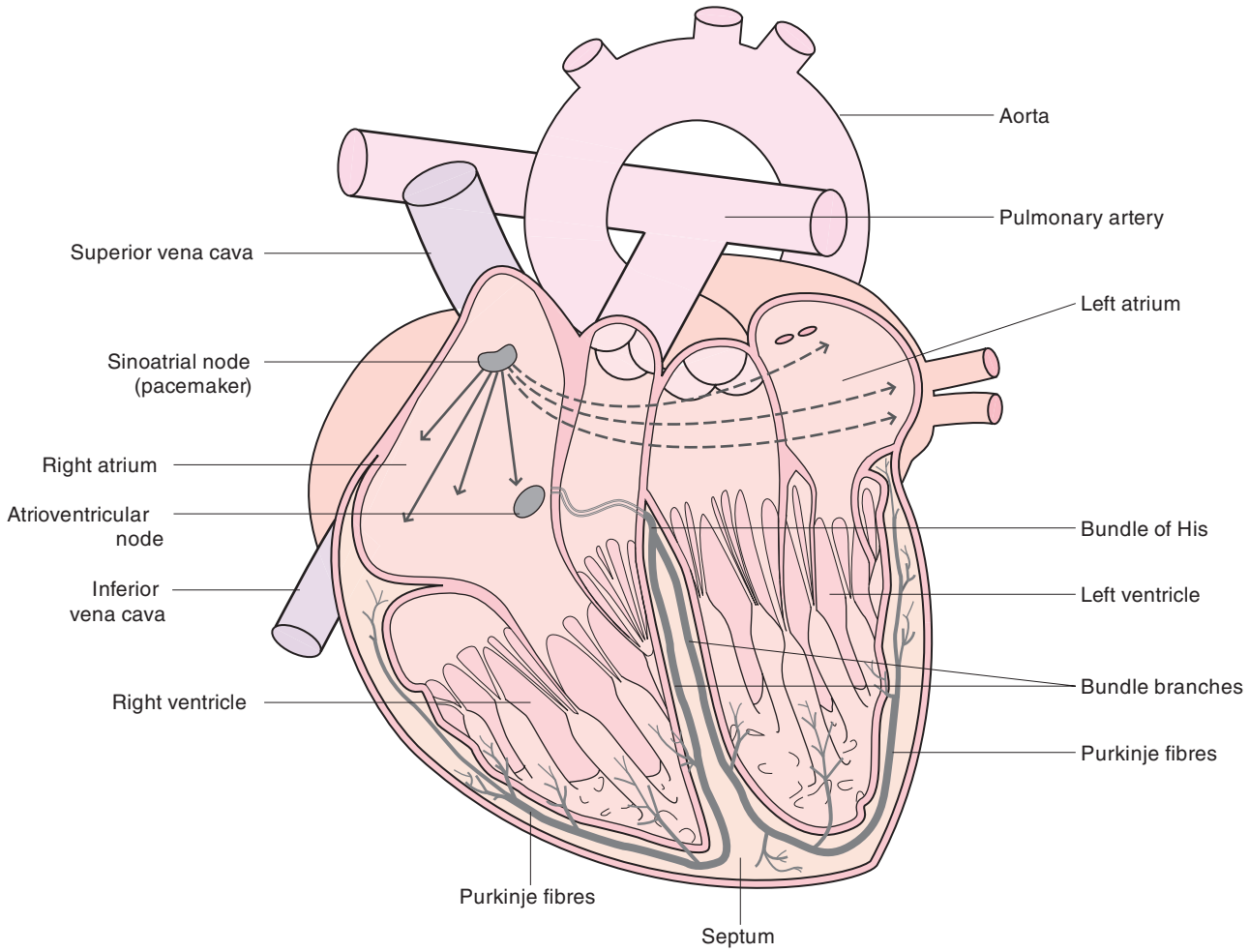


**Figure 25.10** Conduction system of the heart

red when the oxygen content is low. Arterial blood normally has a pH range of 7.35 to 7.45 (Marieb & Hoehn 2013).

## Functions of blood

Blood has the following functions:

- Transporting oxygen, nutrients, water and ions to all tissue cells
- Removing waste materials to excretory organs
- Transporting hormones to cells
- Supplying materials from which cells and glands make their secretions
- Protecting the body against infection by means of the leucocytes and antibodies
- Regulating pH, body temperature and cellular content by distributing heat evenly throughout the body
- Preventing loss of body fluid and blood cells by means of its clotting mechanism (Rosdahl & Kowalski 2008).

## Plasma

Plasma, the fluid part of blood, is a straw-coloured watery fluid in which blood cells are suspended. Plasma forms about 55% of the blood volume and is composed of 90% water (Rosdahl & Kowalski 2008), which is important in the maintenance of all body fluids and in the production of secretions. Plasma contains:

- Proteins: albumin, globulin, fibrinogen, prothrombin and heparin are some of the proteins found in plasma. The liver normally produces proteins, with the exception of serum globulin, which is derived from lymphocytes. Plasma proteins have several important functions: they assist in retaining water in the plasma and interstitial tissue; factors such as prothrombin and fibrinogen are essential for blood clotting; proteins such as heparin help to prevent abnormal clotting of blood in the blood vessels
- Mineral salts: the main mineral salts found in blood plasma are sodium chloride, iodine, potassium, phosphorus, calcium, iron, magnesium and copper. Mineral salts are necessary for the regulation of cellular functioning and electropotentials and maintenance of the blood pH
- Nutrients: those found in blood plasma are numerous and include amino acids, glucose, fatty acids, glycerol and vitamins. They have been reduced to their simplest

form by the digestive processes and absorbed from the alimentary tract into the blood and lymph for circulation to the cells
- Waste products resulting from fat and protein metabolism, including urea, uric acid and creatinine
- Gases, including oxygen, nitrogen and carbon dioxide. Oxygen and nitrogen enter the bloodstream after inhalation of air, and carbon dioxide is an end product of oxidation in the cells
- Hormones: chemical substances secreted directly into the bloodstream by endocrine glands and carried to the areas of the body where they are required to stimulate activity
- Antibodies and antitoxins: complex protein substances produced by the body in response to an invasion by a foreign protein (antigen). They are part of the body's defence mechanism
- Enzymes: produced by the body, which initiate or accelerate chemical reactions (Rosdahl & Kowalski 2008).

## Formed elements

The remaining 45% of blood volume consists of blood cells and fragments suspended in the plasma and is known as formed elements (Rosdahl & Kowalski 2008). The three types of formed elements are erythrocytes, leucocytes and thrombocytes.

***Erythrocytes*** **Erythrocytes** (red cells) are biconcave non-nucleated discs measuring about 7 microns in diameter. In adults, erythrocytes are produced in the red bone marrow of cancellous bone tissue, where they pass through several stages of development (Rosdahl & Kowalski 2008). They begin as large nucleated cells but when mature (after they have produced haemoglobin) they lose the nucleus and are liberated into the circulation. Haemoglobin is a complex protein composed of four different 'haem' chains, each containing a central atom of iron and a globulin protein. It has a strong affinity for both oxygen and carbon monoxide and gives the blood its colour. The normal haemoglobin level is about 14–16 g/100 mL of blood.

The number of erythrocytes is about 5 000 000/mm$^3$ of blood, and their average lifespan is 100–120 days. As their nucleus is absent, they are unable to repair damage and become worn out in circulation, and are destroyed in the spleen and liver. The haemoglobin is split; the liver stores the iron for future use and uses the pigment in the production of bile. The primary function of erythrocytes is to carry oxygen. In the lungs, oxygen combines with haemoglobin to form oxyhaemoglobin, making the blood bright red in colour. As blood circulates through the tissues, the oxygen is released, forming deoxyhaemoglobin, and the blood becomes dark red in colour (Rosdahl & Kowalski 2008).

***Leucocytes*** **Leucocytes** (white cells) measure about 10 microns in diameter. They differ from erythrocytes in that they are larger, possess a nucleus and are less numerous. They also have the power of independent movement, known as diapedis, or emigration, which erythrocytes do not possess. There are two main types of leucocytes: granulocytes and agranular leucocytes (Rosdahl & Kowalski 2008).

**Granulocytes** contain granules of enzymes and are classified as neutrophils, basophils or eosinophils.
- **Neutrophils** are the most numerous of the leucocytes and are important to the body in defence against bacteria, as they have the ability to engulf microorganisims or other foreign particles (phagocytosis) and digest them. Neutrophils also play an important part in the inflammatory response. Injured tissues, and other leucocytes, secrete substances that stimulate the bone marrow to release increased numbers of neutrophils.
- **Basophils** release substances in infected tissue that are toxic to many microorganisms. They also play a part in the allergic response and act to limit the inflammatory response.
- **Eosinophils** are also involved in phagocytosis, as they ingest antigen–antibody complexes and parasites. They also play a role in clot retraction (Rosdahl & Kowalski 2008).
- **Agranular** leucocytes lack granules of enzymes and are classified as monocytes or lymphocytes.
- **Monocytes** have the ability to move into the tissues, where they become macrophages and are capable of phagocytosis. They also secrete a variety of substances involved in the body's defence, and play a role in the immune response.
- **Lymphocytes** are either T lymphocytes or B lymphocytes, both of which divide when stimulated by antigens. T lymphocytes are responsible for cellular immunity, and adhere to cells identified as foreign to the body. They secrete cytotoxic substances that kill the foreign cells. B lymphocytes are involved in humoral immunity, as they produce antibodies and are also responsible for immunoglobulin production. While the lifespan for granular leucocytes is only about 21 days, lymphocytes may survive for up to 100 days.

The total number of leucocytes is about 8000–10 000/mm$^3$ of blood, but this number increases considerably (leucocytosis) when there is any infection in the body. The lifespan of a leucocyte is variable and depends to some extent on the degree of activity.

***Thrombocytes*** **Thrombocytes** (platelets) are the smallest of the formed elements. They are colourless microscopic fragments of the megakaryocyte cell. Measuring about 3 microns in diameter, they do not possess a nucleus. Thrombocytes are produced in the red bone marrow, which is present in cancellous bone tissue. The number of thrombocytes is about 250 000–300 000/mm$^3$ of blood, and the average lifespan of a thrombocyte is 5–9 days. The function of thrombocytes is to play a major role in the clotting of blood to reduce blood loss when a vessel wall is injured. The process involves many substances (clotting factors) which are produced by the liver

and circulate in the plasma, as well as some substances released by the platelets and injured tissues. Normally a blood clot will form within 2–6 minutes after a blood vessel wall has been damaged (Rosdahl & Kowalski 2008).

The mechanism of clotting (haemostasis) involves three phases: vasoconstriction, formation of a temporary platelet plug and formation of a clot. When a small vessel becomes damaged:

- Local vasoconstriction occurs, which reduces blood flow and therefore blood loss
- The vessel wall becomes 'sticky' and platelets adhere to the damaged area
- The platelets release serotonin and adenosine diphosphate (ADP), which attract other thrombocytes, leading to the formation of a temporary platelet plug
- The temporary platelet plug is converted into a clot by the deposition of fibrin, which is formed from fibrinogen. The conversion of fibrinogen to fibrin involves a 'cascade' of reactions that requires a number of plasma factors (numbered I to XIII). A series of reactions culminate in the conversion of prothrombin to thrombin, which converts fibrinogen to fibrin. This conversion requires the presence of platelets, Factor V, Factor X and calcium ions. Vitamin K is also necessary for the conversion of Factors VII, IX and X
- The fibrin forms a meshwork of fibres that traps the erythrocytes and forms the basis of a clot
- The clot plugs the injured blood vessel, drawing the edges together.

The clotting mechanism is a complex one that will not occur if any of the necessary elements are reduced, defective or missing (Marieb & Hoehn 2013).

## Blood group types

Human blood is grouped into four classifications based on immune reactivity. The groups are O, A, B, AB. The Rhesus factor (either negative or positive) is also determined. Eighty-five per cent of the population has Rh antibodies on the surface of the red blood cell (that is, RH positive). The blood of any one group is essentially incompatible with the blood group of another. Therefore blood transfusions should be an exact match to the individual's blood group and Rh factor. When blood transfusions occur with mismatched blood a haemolytic reaction can occur (Daniels & Bromilow 2013). To prevent a mismatch or to recognise a reaction to a transfusion it is important to follow organisational policies and procedures for the preparation, administration and monitoring of individuals undergoing a blood transfusion. See Clinical Skill 25.1 for preparing and monitoring an individual undergoing a blood transfusion.

## Blood vessels

Blood is circulated throughout the body (Figure 25.11) within vessels that form a closed continuous system.

The walls of blood vessels have three layers: an outer coat of fibrous tissue, a thick middle layer of involuntary muscle with elastic fibrous tissue and an inner lining of endothelium to form a smooth surface for contact with blood (Figure 25.12). Blood vessels include the arteries, veins and capillaries.

## Arteries

Arteries carry blood away from the heart (efferent). All arteries carry oxygenated (bright red) blood, with the exception of the two pulmonary arteries which carry deoxygenated (dark red) blood from the heart to the lungs. Arteries vary in size, and large arteries divide to form smaller arteries (Figure 25.13). Further division, or branching, occurs to form the smallest arteries, called arterioles, which divide into capillaries. Arteries and arterioles have the same tissue structure that allows them to stretch and recoil as the heart pumps the blood into them.

## Veins

Veins carry blood towards the heart (afferent). All veins carry deoxygenated (dark red) blood, with the exception of the four pulmonary veins, which carry oxygenated blood from the lungs to the heart. Veins vary in size, and large veins divide

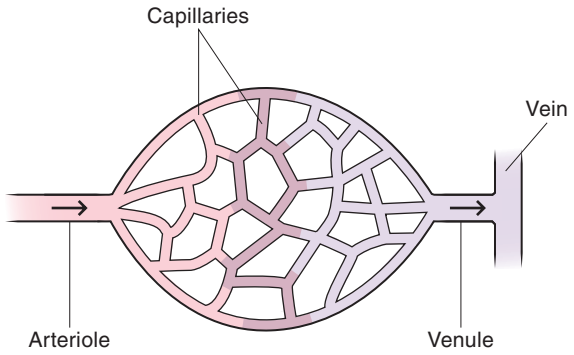


**Figure 25.11** Circulation of blood through the tissues

### DECISION-MAKING FRAMEWORK EXERCISE 25.1

You have been employed as an Enrolled Nurse in a cardiovascular surgical ward for 5 years. On the shift with you tonight there is 1 senior Registered Nurse, 1 recently Registered Nurse and 3 Enrolled Nurses. You have been assigned 3 persons, all are at least 3 days postoperative. During your shift one of your persons requires a blood transfusion.

Using the decision-making framework:

1. Is this within your scope of nursing practice?
2. Are you supported appropriately by other staff members to care for this person?
3. Is this model of care appropriate?
4. What strategies could you consider in this situation?

## CLINICAL SKILL 25.1 Preparing and monitoring an individual undergoing a blood transfusion

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Medical order, fluid order, blood product (packed red cells, whole blood, plasma, platelets, serum albumin, cryoprecipitate), blood infusion giving set, IV pump, fluid balance chart (FBC) and normal saline, transfusion observation form |

| **Skill activity** | **Rationale** |
|---|---|
| Check medical orders/fluid orders to ascertain type, duration and amount of blood product to be administered | Ensures correct product and quantities are given to individual<br>Prevents circulatory overload |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status or previous reactions to blood<br>Verify a signed consent was obtained<br>Instruct the person to report any sudden chills, nausea, dyspnoea, fever, rash, itch, loin/flank pain | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Reduces risk of allergic reaction |
| Measure and record blood pressure and vital signs and record on observation chart pre-transfusion | Provides a baseline of the individual's haemodynamic health status |
| Perform hand hygiene | Prevents cross-infection and contamination of blood and tubing |
| Prepare equipment using aseptic technique: blood infusion line, normal saline (500 mL) and IV pump<br>Prime line with normal saline, including both ports free from air | Prevents the introduction of microorganisms<br>Ensures all equipment ready prior to blood product arriving on ward |
| Establish an IV infusion with normal saline | IV access is established by a medical officer or accredited RN. Normal saline is the solution used during a blood transfusion because it is compatible with blood and does not cause red blood cell lysis |
| Place the equipment in a convenient location near the bedside including:<br>• Equipment for taking vital signs<br>• Blood or blood product (collected from the allocated area within the organisation ensuring it is collected as per policy)<br>• Blood order and requisition form<br>Note: Blood should not exceed the maximum time of 30 minutes away from the fridge; platelets should continue to be agitated by hand prior to administration | Ensures all equipment is at bedside to maximise efficiency, reduces apprehension on the individual's part and increases their confidence in the nurse<br>Abides by facility/organisation policy<br>Reduces the risk of contamination<br>Prevents clumping of platelets |
| Identify the individual and the blood product according to facility/organisation policy<br>Verify the individual's consent (written)<br>Two nurses (one must be a Registered Nurse) check the:<br>• Person's identity according to policy. Check the arm band for name and ID | Two persons check the individual's details and the group and type of blood product to be administered to ensure it matches the order and the correct product is delivered to the correct person<br>Ensures safe administration of the blood product |

## CLINICAL SKILL 25.1 Preparing and monitoring an individual undergoing a blood transfusion—cont'd

| | |
|---|---|
| • Blood product order and requisition form<br>• Information on the blood product and the blood product for evidence of leakage, abnormal colour, clumping<br>• Expiry date<br>Sign the appropriate form/s according to facility/organisation policy<br>Document transfusion on FBC, transfusion form and in healthcare record<br>The two staff members calculate and set the flow rate as prescribed | |
| The blood transfusion must be initiated within 30 minutes from time out of fridge and completed within 4 hours of the product leaving controlled storage (timer often attached)<br>Note: This applies for red cells only | Minimises risk of bacterial infection and contamination |
| Perform hand hygiene and don PPE<br>Initiate the blood transfusion<br>Gently invert the blood product several times<br>Wearing gloves, close clamp on saline infusion and attach blood product to the short tubing on the administrating set using aseptic technique<br>Tip the blood and gently squeeze to fill the filter<br>Place blood on IV stand and open the clamp, squeeze the drip chamber and release it until blood begins to flow | Prevents cross-infection<br>Ensures cells and plasma are mixed<br>Stops the backflow of blood from mixing with the saline<br>Filling the filter prevents air from entering the system<br>Ensures no air bubbles enter the giving set<br>Prevents contamination from microorganisms |
| Remove gloves and perform hand hygiene | Prevents cross-infection |
| Initiate the transfusion slowly (and as per facility/organisation policy)<br>Monitor the person closely (every 5 minutes) for the first 15 minutes after the commencement of the transfusion and ensure close observation throughout the duration of the transfusion. Reassess vital signs after 15 minutes and hourly for the remainder of the transfusion according to facility/organisation policy and individual health status<br>The blood transfusion is completed within 4 hours of the product leaving controlled storage (timer often attached)<br>Note: This applies for red cells only | Most reactions occur within the first 10 minutes. Beginning the transfusion slowly reduces the amount of blood for the system to react against, reducing the severity of the reaction. The rate of the infusion may be increased usually after 15 minutes<br>Vital signs are taken as per facility/organisation guidelines<br>Note: Platelets, plasma (FFP), serum albumin and cryoprecipitate generally do not require regular observations, but refer to facility/organisation policy for further information<br>Minimises risk of bacterial infection and contamination |
| Observe for reactions such as:<br>• Fever, chills, headache, malaise<br>• Flushing of the skin, urticaria, wheezing, itchy rash<br>• Restlessness, anxiety, chest pain, tachypnoea, tachycardia, nausea, shock, haematuria, back pain<br>Stop the blood transfusion if you suspect a reaction<br>Notify RN and medical officer, follow facility/organisation policy<br>Do not discard bag or line, which is returned to blood bank/pathology, and follow blood reaction protocol | Indicates afebrile non-haemolytic or haemolytic reaction or circulatory overload<br>Different actions may be implemented depending on the reaction and medical officer's orders |
| Complete the transfusion<br>Change the giving set as per facility/organisation policy<br>(The individual may require IV frusemide inbetween units, which is often written on the fluid orders) | Ensures individual receives the entire transfusion<br>Decreases risk of bacterial contamination, and retains efficiency of filter<br>Prevents circulatory overload as blood products are colloids (volume expanders) which may lead to pulmonary oedema in patients with cardiac failure |

*Continued*

## CLINICAL SKILL 25.1 Preparing and monitoring an individual undergoing a blood transfusion—cont'd

| | |
|---|---|
| Put on clean PPE and dispose of the blood unit as per facility/organisation policy<br>Remove PPE, perform hand hygiene | Some facilities require all completed blood units (including the giving set) to be returned to blood bank and kept for 24 hours in case of a delayed reaction<br>Others require complete disposal in the infectious waste bin |
| Monitor individual for any adverse effects to the transfusion. Report any significant deviations to Registered Nurse/medical officer<br>Vital signs are often recorded hourly for 4 hours then 4-hourly for 24 hours | Any adverse effects can be managed promptly<br>Individuals can have a delayed reaction to the blood product for up to 24 hours |
| Report and document all relevant information in the healthcare record | Most blood products have a peel-off identification tag that is identical to the blood unit ID number, grouping and Rh factor, so that errors in transcription are avoided. This tab should be removed and placed in the health record as per facility/organisation policy<br>Fractionated plasma products have a batch number sticker on the bottle which is usually peeled off and placed in the health record<br>Medico-legal requirement. Allows for the planning and implementation of care |

*(Australian and New Zealand Society of Blood Transfusion 2011; Australian Commission on Safety and Quality in Health Care (ACSQHC) 2012; 2015; Sparkes et al 2014)*

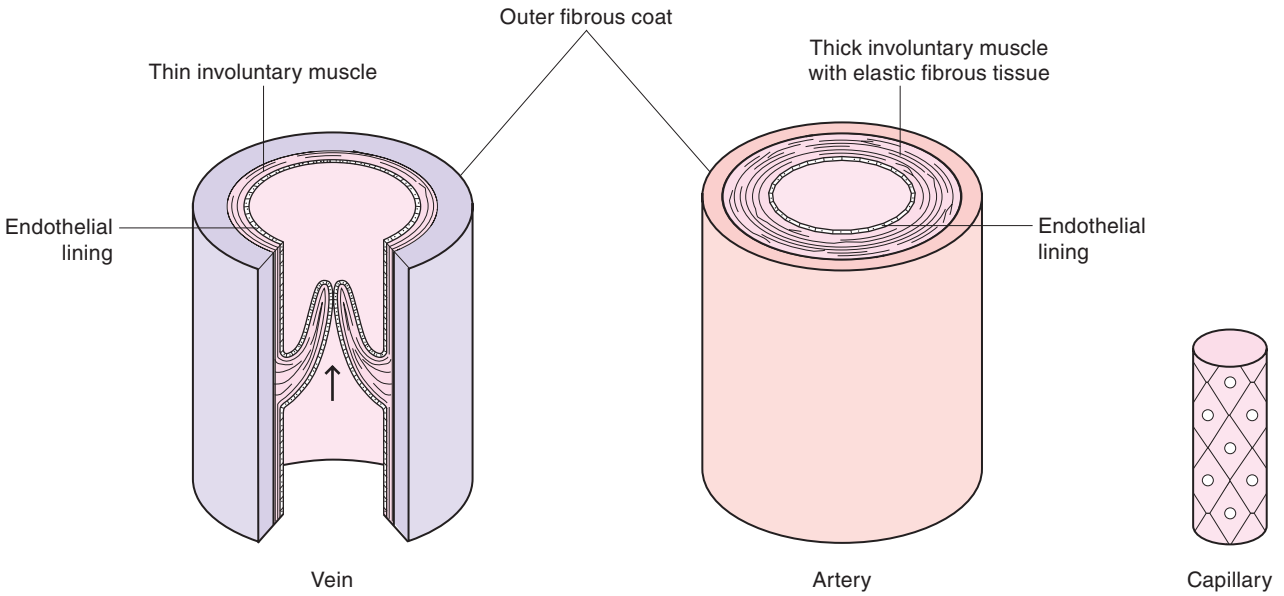


**Figure 25.12** Structure of blood vessels

to form smaller veins. The smallest veins are called venules, which divide into capillaries (Figure 25.13). Venules carry deoxygenated blood away from the capillary beds and unite to form veins. The walls of veins are composed of the same three layers as those of arteries, but the walls are thinner and have less elastic and muscular tissue. Veins join up until the two largest veins are formed—the superior and inferior vena cavae. These two veins empty their contents into the right atrium of the heart.

The larger veins possess pocket-like valves on their inner surfaces. These valves aid the unidirectional flow of blood towards the heart, and prevent a backward flow of blood.

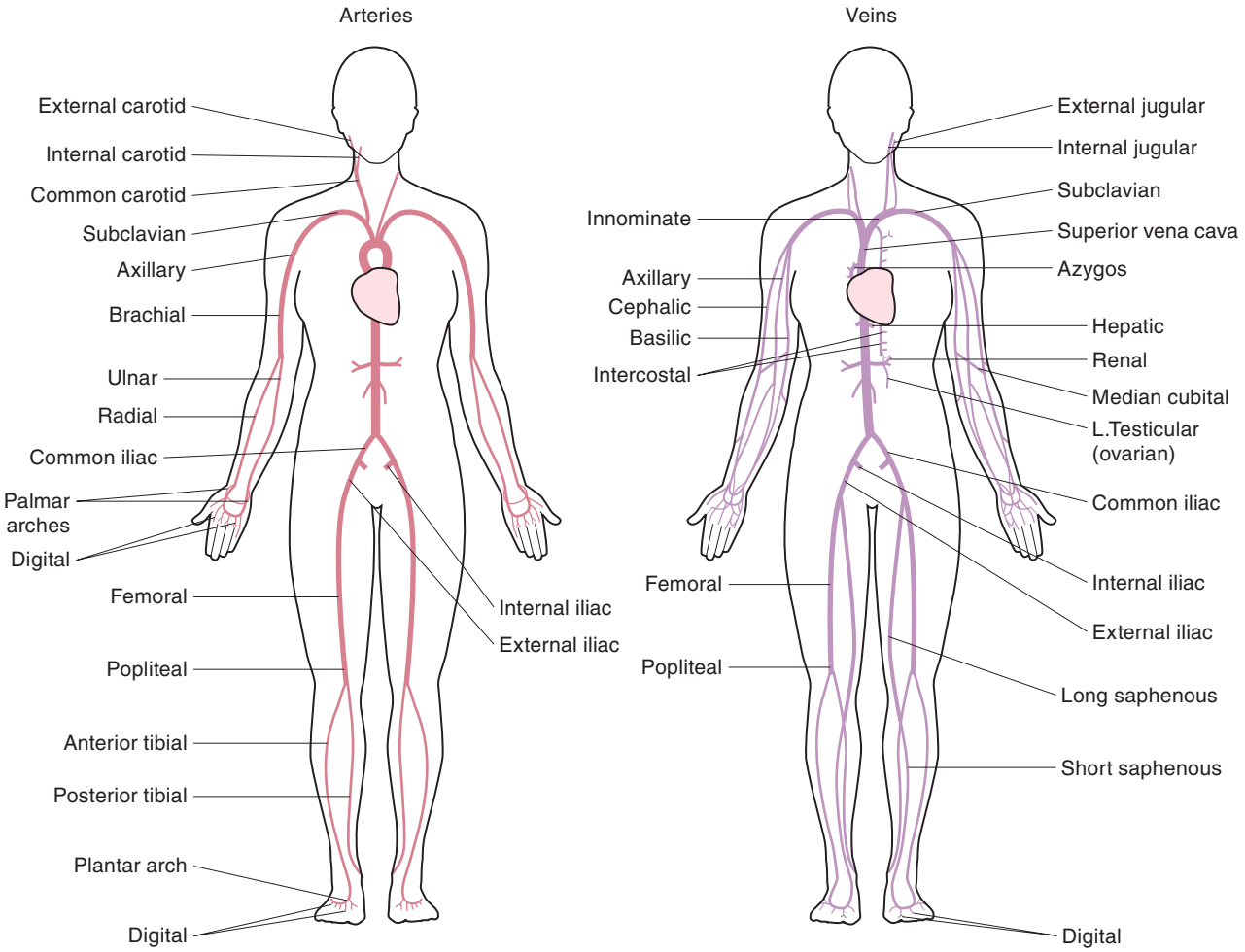


**Figure 25.13** Major arteries and veins

Skeletal muscle activity also helps venous return. As the muscles surrounding the veins contract and relax, the blood is 'milked' through the veins towards the heart.

### Capillaries

Capillaries are microscopic vessels about 5–7 microns in diameter and are composed of a single layer of endothelium, with little surrounding connective tissue. They form closed networks through all tissues and are structurally adapted for their role in the rapid diffusion of substances between the plasma and interstitial fluid. This allows water, oxygen, nutrients and other essential substances to pass rapidly from the blood to the tissue cells, and waste products from the tissue cells pass through the capillary walls to the blood.

### Blood pressure

The term blood pressure refers to the pressure, or force, exerted by blood on the walls of the blood vessels. Pressure is highest in the arteries, which receive blood from the ventricles of the heart at about 120 mmHg. As the vessels divide, their cross-sectional area increases, causing the pressure to progressively reduce so that there is only very slight pressure in the capillaries (about 35 mmHg and 15 mmHg in the venules). Systolic blood pressure is the pressure registered in a large artery as blood is forced out of the ventricle during the contracting period of the cardiac cycle. Diastolic blood pressure is the pressure registered during the relaxing period of the cardiac cycle, when there is no ejection of blood into the arteries. It is therefore lower than the systolic pressure.

## CIRCULATION OF BLOOD

Blood flows continuously around the entire body. The blood vessels (of which there are two circuits—pulmonary and systemic) along with the four chambers of the heart (right and left atrium, right and left ventricle) form this closed circulatory system in which blood flows (Rosdahl & Kowalski 2008). Deoxygenated blood from all body regions is transported via the veins to the superior and inferior vena cavae, which enter the right atrium. The coronary sinus drains venous blood from the myocardium into the right atrium. At first, blood flows passively into the right ventricle as the tricuspid valve is open, then contraction of the right atrium (atrial systole) occurs to empty its entire contents. After the tricuspid valve closes, the right ventricle contracts (ventricular

systole), and blood is ejected through the pulmonary valve into the pulmonary artery.

The pulmonary artery divides into the right pulmonary artery, which carries deoxygenated blood to the right lung and the left pulmonary artery, which carries deoxygenated blood to the left lung. In the lungs, oxygen is exchanged for carbon dioxide from the blood, and the oxygenated blood returns to the left atrium via four pulmonary veins. The left atrium contracts and blood passes through the mitral (bicuspid) valve into the left ventricle. After the mitral valve closes, the left ventricle contracts and blood is ejected into the aorta via the aortic valve. The aorta branches off to supply all areas of the body with oxygenated blood.

## The systemic circulation

The systemic circulation is the distribution of oxygenated blood to all tissues, and the return of deoxygenated blood from all tissues to the heart. When the left ventricle contracts it forces blood into the aorta under pressure. The elastic walls of the aorta distend to receive the blood. When the left ventricle relaxes the walls of the aorta recoil and, with the aortic valve closed, the blood is driven onwards through the aorta. Branches from the aorta also distend and recoil as the blood travels through them, and this wave of distension and recoil is felt as the pulse wherever a superficial artery crosses a hard structure such as a bone.

Arterioles supply networks of capillaries with oxygenated blood, and the hydrostatic pressure behind the blood causes water and other essential substances to be pushed through the capillary walls and wash over the tissue cells to become part of the tissue fluid. Tissue cells allow certain substances they require to enter, and excrete their waste products into the tissue fluid. The pressure within the capillaries will allow only a small amount of the fluid to return through the capillary and venule wall, back into the blood. The remainder of the fluid reaches the blood via the lymphatic system, which is discussed later in this chapter.

### Arteries

The aorta (Figure 25.14) has four sections, each of which has a number of branches. Two coronary arteries to the heart wall branch from the ascending aorta. From the aortic arch branch the left common carotid artery to the head and neck; the left subclavian artery to the left upper limb; and the right innominate artery, which divides into the right common carotid and right subclavian arteries. From the descending thoracic aorta branch the bronchial arteries to the lungs; the oesophageal artery to the oesophagus; and 10 pairs of intercostal arteries to the intercostal muscles. From the abdominal aorta, branch the:

- Phrenic arteries to the diaphragm
- Coeliac trunk, which divides into the gastric artery to the stomach, the hepatic artery to the liver and the splenic artery to the pancreas and spleen
- Superior mesenteric artery to the small intestine
- Renal arteries to the kidneys
- Ovarian or testicular arteries to the ovaries or testes

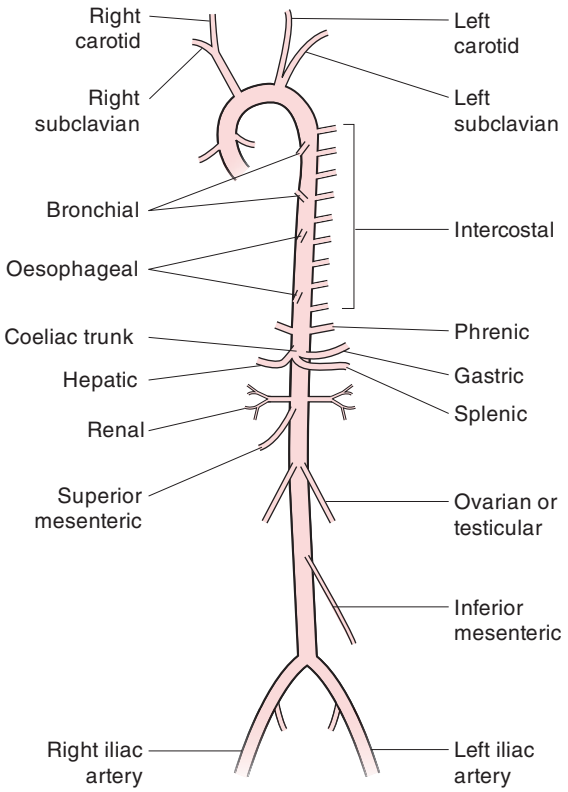


**Figure 25.14** The aorta and its branches

- Inferior mesenteric artery to the large intestine
- Two common iliac arteries to the pelvic organs and the lower limbs.

### Veins

There are two groups of veins: superficial veins, some of which can be seen as bluish lines under the skin; and deep veins, which run beside arteries and often have the same name as the arteries. Veins rely on the squeezing action of skeletal muscles to assist in pushing blood towards the heart, and on respiratory movements, which have a milking effect on the inferior vena cava as it passes through the diaphragm.

## Pulmonary circulation

The pulmonary circulation (Figure 25.15) involves the transport of deoxygenated blood from the heart to the lungs and the return of oxygenated blood from the lungs to the heart. The pulmonary artery leaves the right ventricle and divides into the right and left pulmonary arteries, which carry deoxygenated blood to the lungs. In the lungs, the arteries divide until capillaries are formed. Venules collect the oxygenated blood from the capillaries and unite to form the two pulmonary veins, which leave each lung and enter the left atrium of the heart (Rosdahl & Kowalski 2008).

## Hepatic–portal circulation

The hepatic–portal circulation (Figure 25.16) is a subdivision of the systematic circulation. It is responsible for carrying

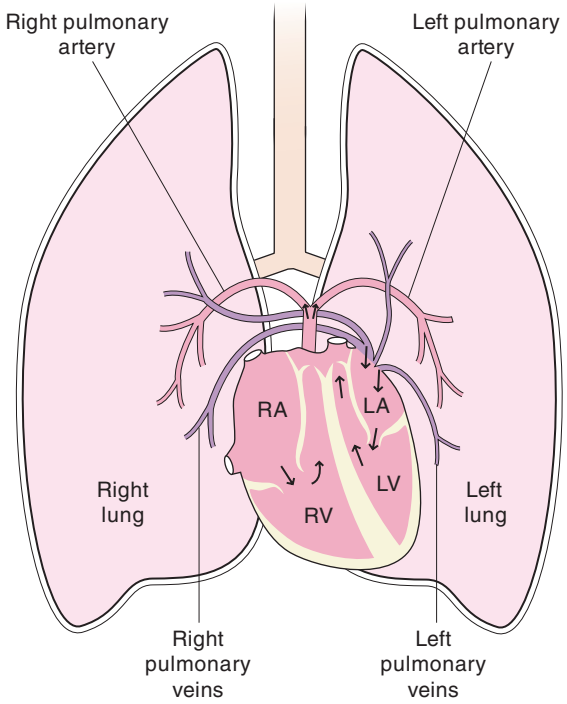


**Figure 25.15** Pulmonary circulation

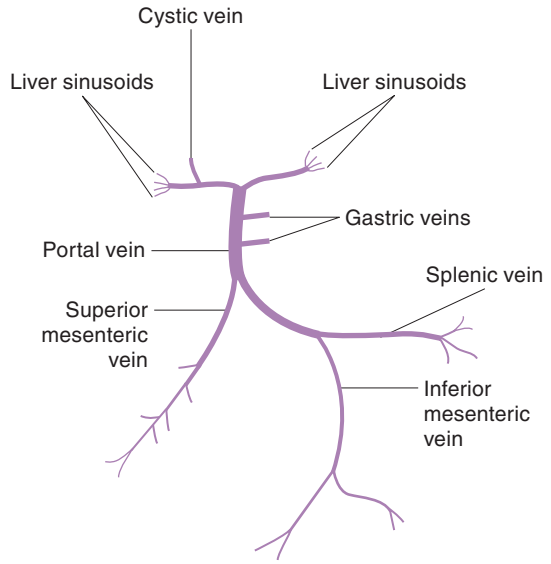


**Figure 25.16** Hepatic–portal circulation

blood that is deoxygenated, but rich in digested nutrients, from some of the abdominal organs to the liver.

The splenic, gastric, inferior and superior mesenteric veins unite to form a large vein called the portal vein, which enters the liver. The liver converts the nutrients brought by the blood into a form to be either used by tissues throughout the body or stored for future use. The liver thus receives blood from two sources: the hepatic artery, which supplies it with oxygenated blood; and the portal vein, carrying deoxygenated blood rich in nutrients. When the oxygen has been extracted from the former and the nutrients from the latter have been processed, the blood leaves via the three hepatic veins (Rosdahl & Kowalski 2008).

## STRUCTURE OF THE LYMPHATIC SYSTEM

The lymphatic system (Figure 25.17) is closely connected with the circulation of blood and consists of an additional set of vessels through which some of the tissue fluid passes before reaching the large veins and entering the blood. Circulation within the lymphatic system is dependent upon the movement of skeletal muscles. Muscular contraction and pressure changes within the thoracic cavity during respiration assist with lymph circulation (Rosdahl & Kowalski 2008). This system consists of lymphatic capillaries, lymphatic vessels, lymphatic nodes and lymphatic ducts. The fluid in the system is called lymph.

The lymphatics serve an important function in preventing oedema, as the tiny vessels collect fluid and proteins from the interstitial spaces and promote their return to the blood

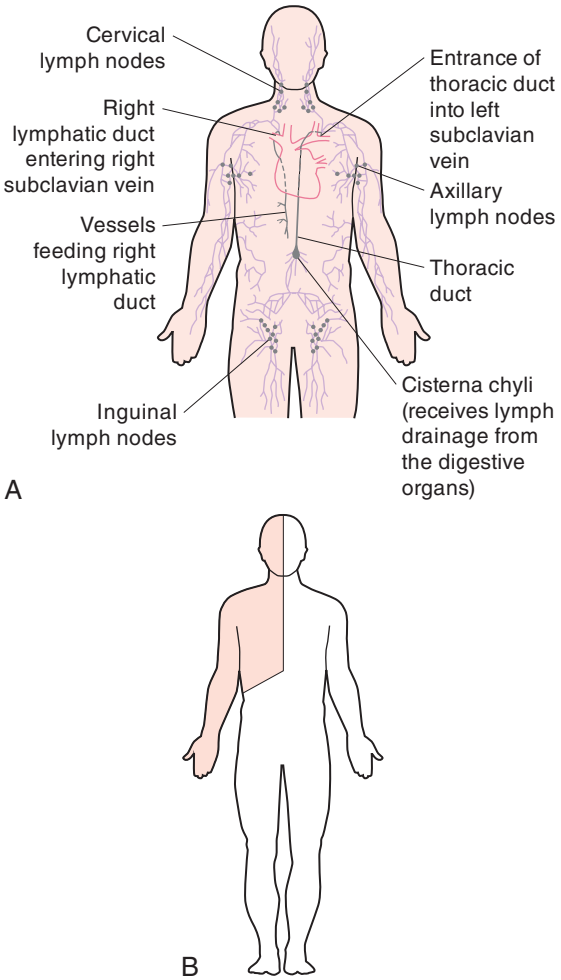


**Figure 25.17** The lymphatic system

A: The distribution of lymphatic vessels and nodes B: Areas drained by the right lymphatic duct (shaded) and the thoracic duct (unshaded)

circulation. They also collect the larger digested fat particles from the digestive system and empty them into the circulation. In addition, the lymphatics play a key role in the body's defence against microorganisms. They collect microorganisms in the interstitial spaces and carry them to the lymph nodes, where the lymphocytes (and macrophages) remove them from the lymph.

## Lymph

When fluid leaks out of the capillaries from the cardiovascular system it accumulates in the tissue spaces. When this fluid is drained from the tissues and collected by the lymphatic system, it is called **lymph** and has a composition similar to the blood plasma. Lymph is normally a colourless fluid, although lymph absorbed from the intestines is saturated with fats and is milky in colour. Lymph travels slowly through the lymphatic system—total lymph flow is about 2–4 L/day.

## Lymphatic capillaries

Lymphatic capillaries are similar in size and structure to blood capillaries. They unite to form larger lymphatic vessels similar in structure to veins and, like veins, they have valves to prevent a backward flow of lymph. All lymphatic vessels pass through one or more lymph nodes. Afferent lymphatic vessels carry lymph to a node. Efferent lymphatic vessels carry lymph away from the node and empty it into the lymphatic ducts.

## Lymph nodes

Lymph nodes are found mainly in groups in many parts of the body, such as the neck, thorax, abdomen, groin and the limbs. Lymphatic nodes vary in size and consist of lymphatic tissue. The functions of lymphatic nodes are to filter and destroy bacteria from the lymph passing through the node; to produce lymphocytes, which are added to the lymph; and to produce antibodies and antitoxins.

## Other areas containing lymphatic tissue

In addition to the nodes already described, lymphatic tissue is found in several other anatomical structures, including the tonsils in the oropharynx, adenoids in the nasopharynx, the appendix attached to the intestines, the thymus gland in the thorax, Peyer's patches in the small intestine and the spleen in the abdomen.

### Tonsils

The tonsils form part of a protective ring of tissue at the entrance to the respiratory and digestive tracts. Lymphatic vessels leave the tonsils and enter the cervical nodes.

### Thymus gland

The thymus gland is a soft grey-pink gland present in the thorax behind the sternum and in front of the heart. It is large in infants and children, reaching its maximum size at puberty. After puberty this gland gradually shrinks, until in adulthood there is only a small piece of tissue left. The thymus gland functions in the production of lymphocytes.

### Spleen

The spleen is a purplish half-moon-shaped organ in the left hypochondriac region of the abdomen. It lies below the diaphragm and behind the lower ribs and is mainly composed of lymphoid tissue enclosed in a fibrous capsule. The functions of the spleen are to:

- Produce lymphocytes, some of which enter the bloodstream to carry out their phagocytic action
- Destroy worn-out erythrocytes, producing bile pigments and iron
- Produce antibodies and antitoxins
- Provide a storage area for erythrocytes needed in emergency situations (if haemorrhage occurs, the spleen vessels contract and empty blood into the circulation in an attempt to restore normal blood volume).

## Lymphatic ducts

The two lymphatic ducts receive the lymph from lymphatic vessels and empty it into the bloodstream via the subclavian vein (Figure 25.17). They are the thoracic duct and the right lymphatic duct.

### Thoracic duct

The thoracic duct, the larger of the two lymphatic ducts, begins in the abdominal cavity at lumbar level as a dilated sac called the cisterna chyli. The duct passes upwards through the aortic opening behind the diaphragm into the thorax, where it empties its contents into the left subclavian vein so that the lymph rejoins the bloodstream. Lymphatic vessels from all parts of the body below the diaphragm, and the left side of the body above the diaphragm, empty their contents into the thoracic duct.

### Right lymphatic duct

The right lymphatic duct is very small (about 1 cm long) and lies in the root of the neck. It receives lymph from the right side of the head and neck, the right side of the thorax and the right upper limb. The right lymphatic duct empties its contents into the right subclavian vein.

# FACTORS AFFECTING THE RESPIRATORY SYSTEM

## Oxygen concentration

Oxygen makes up approximately 21% of the air, which is normally sufficient to meet the needs of the body. A decrease in this amount of oxygen can cause problems. Two instances in which the available oxygen may be deficient are:

- High altitude: the total pressure of all gases in the air decreases as altitude increases. As the total pressure decreases, the oxygen pressure decreases proportionately, and the individual will experience difficulty in maintaining adequate tissue oxygenation (**hypoxia**). Acclimatising is a homeostatic response where initially the ventilatory rate is increased in an

attempt to supply the body with sufficient oxygen, then later the bone marrow is stimulated to increase erythrocyte production (polycythaemia) to carry more oxygen
- Presence of noxious gases: some noxious gases such as carbon monoxide have a higher affinity for haemoglobin than does oxygen, which is displaced by them, causing a reduction in oxygen availability to tissues.

## Regulating mechanisms

Any factor that interferes with the respiratory centres in the brainstem or the nerves that transmit messages to and from them may cause ventilatory difficulties. Respiratory depression can be caused by increased intracranial pressure such as cerebral oedema, due to conditions such as hypercapnia, cerebral bleeds, meningitis, encephalitis, hydrocephalus, tumours, hypoalbuminaemia and keto-acidosis. Clinical Interest Box 25.1 discusses the effect pyrexia (fever) has on oxygen regulation mechanisms. Other factors include certain medications such as analgesics (e.g. morphine), and various anticonvulsant drugs (e.g. clonazepam). Ventilation increases when the pH of the blood is lowered (a respiratory response to rid the body of the excess acid) whereas ventilation decreases when the pH increases (to retain acid). (See respiratory alkalosis and acidosis later in this chapter.)

### CLINICAL INTEREST BOX 25.1 Oxygen requirements and pyrexia

Many respiratory conditions cause pyrexia. Historically individuals have been treated with antipyretics or other methods to cool their skin, such as tepid sponges, fans and removing clothing. Pyrexia is the body's homeostatic mechanism for providing a hostile environment for pathogens and for increasing the immune response. Individuals normally feel hot to touch on the 'up' state of the fever but state that they feel cold, and may shiver, while the 'down' state normally is the reverse.

Cooling an individual's skin may actually increase the pyrexial state, as the body shivers to keep warm. Medical treatment of pyrexia is increasingly aimed at allowing the body's immune system to maintain the pyrexia, without nursing or medical interference, drugs or other care. The pyrexia is still investigated and the cause treated, and antipyretics administered if an individual's other symptoms or past history (e.g. febrile convulsion) deem it safer, or their discomfort may be alleviated by antipyretics.

Most at risk of pyrexial complication are some individuals with congenital or chronic respiratory or cardiac conditions in which they have a diminished 'reserve' or ability for their bodies to supply the extra 10% of oxygen needed per 1°C of body temperature increase. In these individuals not only are antipyretics commonly used but also supplemental oxygen is administered while the pyrexial state exists.

## Exchange of gases during ventilation and respiration

The efficiency of ventilation and respiration can be affected by any factor that interferes with the patency of the respiratory tract or the actions of the ventilatory muscles. For example, an accumulation of secretions may result from respiratory conditions such as asthma, bronchitis or a reduced cough reflex. Ventilations may also be reduced by factors that affect the actions of the ventilatory muscles, such as brainstem or spinal cord injury or motor neuron diseases such as multiple sclerosis or Guillain–Barré syndrome. These conditions can restrict the movements of the diaphragm and/or intercostal muscles. Chest expansion and ventilation can also be affected by deformities of the chest wall or skeleton, such as scoliosis, flail chest (multiple rib fractures causing instability in part of the chest wall and paradoxical breathing movements, the part of the lung underlying the injured area contracts on inspiration and bulges on expiration) and pectus excavatum (a skeletal abnormality of the chest that is characterised by a depressed sternum).

## Diffusion of oxygen and $CO_2$

Any dysfunction of the lungs that affects the alveolar capillary membrane thickness or causes a reduction in their surface area will affect respiratory function. Conditions such as pulmonary oedema, alveolitis, pneumonia or chronic obstructive airways disease may reduce the diffusion of oxygen and $CO_2$. Information on these and other respiratory disorders is provided later in this chapter.

## Transport of oxygen and $CO_2$ to and from the cells

Any condition affecting the efficiency of the heart, blood vessels or blood can interfere with the transportation of oxygen to the cells or $CO_2$ away from the cells. Such conditions include congestive cardiac failure, atherosclerosis, carbon monoxide poisoning and anaemia. Information on these and other cardiovascular disorders is provided later in this chapter.

## Influences on the rate, depth and rhythm of breathing

Several factors influence the characteristics of breathing, such as pyrexia and physical activity. Oxygen requirements are greatest during exertion and least during sleep. The rate and depth of ventilations vary in response to the body's production of $CO_2$; for example, during strenuous exercise the volume of air drawn into the lungs with each breath may be increased from a normal tidal volume of 500 mL to as much as 2300 mL. Changes in mood, emotion and pain may also affect the rate, depth and rhythm of ventilation; for example, the ventilation rate is commonly increased during fear, anxiety or apprehension. Chronic irritation by inhaled irritants such as smoke or dust can also affect breathing and cause short-term effects such as coughing and shortness of breath, or

long-term effects such as severe dyspnoea resulting from emphysema.

### Inadequate ventilation (hypoventilation)

**Hypoventilation** and alveolar hypoventilation is a reduction in the ventilation of the alveoli. The causes are many and varied and include airway obstruction by oedema, inhaled foreign bodies, retained secretions (mucus, casts), polyps, tumours, bronchospasm, emphysema, neuromuscular or skeletal abnormalities and central nervous system disorders. Hypoventilation occurs when the volume of air entering the alveoli is not adequate for the metabolic needs of the body. The reduction in ventilation causes an increase in the partial pressure of $CO_2$ in arterial blood ($PaCO_2$), termed **hypercapnia**, and may also cause **hypoxaemia**, a decrease in the partial pressure of oxygen in arterial blood ($PaO_2$).

### Impaired diffusion

**Diffusion** is the process by which oxygen and $CO_2$ molecules are transported between the alveoli and the capillary network. Diffusion abnormalities can interfere with the passage of oxygen into the blood. Such diffusion abnormalities can result from: a thickening of the alveoli capillary walls, for example, in pulmonary oedema; a reduced amount of functioning lung tissue, such as in emphysema; or fibrosis of the alveolar walls, as seen in alveolitis and pneumonitis.

### Impaired perfusion

Not only is an adequate intake of oxygen by ventilation essential, but for oxygenation of the body tissues to occur, adequate perfusion of lung tissue with blood is essential. Any condition that decreases the circulation of blood to lung tissue may lead to ventilation–perfusion mismatches (V/Q principle) and hypoxaemia. Such conditions include decreased blood volume, pulmonary embolism, cardiac disorders and chronic obstructive pulmonary disease.

In addition to abnormalities of the lungs or respiratory structures, dysfunction of other body systems can adversely affect respiratory function. For example, a disease process that affects the nervous system may adversely affect respirations. When the spinal cord is damaged, the nervous system may greatly impair respiratory function. Cardiovascular dysfunction can affect respiratory function; for example, right-sided heart failure may affect the volume of pulmonary blood circulation. A deformity of the skeletal system, such as scoliosis, may restrict movement of the thoracic cage and thus alter respiratory function. Inadequate lung expansion can also occur after abdominal surgery, as pain in the operation site may inhibit deep breathing and coughing. Not only can abnormalities of other body systems adversely affect the respiratory system, but respiratory abnormalities generally affect all other body systems.

### Additional factors

Numerous other factors can modify the rate and depth of ventilation; for example, involuntary and reflex mechanisms such as exercise, pain, hiccupping, sneezing, sighing and emotions, and conscious voluntary actions such as voluntary breath holding, inhalation and exhalation. Clinical Interest Box 25.2 discusses the alteration to respirations in the older adult. Other factors that affect functioning include:

- Digestive system disorders and diminished appetite, potentiating an alteration in nutritional status
- Changes in renal function, which can affect erythropoietin production
- Osteoporosis
- Circulatory disorders.

These may all combine to affect blood cell production, with subsequent anaemias. In individuals who are more sedentary such combinations of factors and subsequent alveolar hypoventilation increase the risk of primary or secondary infections. To avoid the complications of ageing, all individuals can be educated to:

- Improve their nutritional status, including nutrients and supplementation of additional sources of vitamins as required
- Increase their fluid intake, as permitted
- Perform routine breathing exercises
- Maintain their weight-bearing ability
- Increase their exercise and mobilisation.

## PATHOPHYSIOLOGY RELATED TO THE RESPIRATORY SYSTEM

The signs and symptoms manifested by an individual with a respiratory disorder vary with the location and severity of the disorder. Detailed below are some common clinical features of respiratory disease.

### Chest pain

Disorders of the respiratory system such as pleurisy can result in chest pain. During ventilation, friction occurs between the inflamed pleura. Chest pain may be localised or may be experienced only when the individual breathes deeply, and

#### CLINICAL INTEREST BOX 25.2 Respirations and the older individual

Involutional changes that can occur with increasing age include: loss of elasticity of the lung tissue, costal cartilage calcification, kyphosis, weakening and loss of skeletal muscle fibre, reduction in cilia numbers and beating speed, and thickening of alveolar membranes. These factors and many more diminish the respiratory system's ventilatory capacity and the ability to excrete $CO_2$ and absorb oxygen, increasing the resting respiratory rate from the adult rate of about 20/min to 25/min for an older individual.

*(Williams 2016; Crisp et al 2013)*

can vary from a continuous aching pain to a stabbing knife-like pain. Pain associated with respiratory disorders may be retrosternal, lateral or posterior and is exacerbated by deep inhalation.

## Cough

A cough is a common symptom of many respiratory disorders and may result from irritation or from retained secretions that obstruct some part of the airway. If sputum is swallowed, expectorated or the cough sounds moist, it is described as productive. A non-productive, or dry, cough is one that sounds dry or irritating and no sputum is expectorated or swallowed. Sputum is the result of excessive mucus production and may result from inflammation, infection or congestion.

Haemoptysis (the coughing or expectoration of blood) may occur in some lung diseases. Blood-streaked sputum frequently occurs in some respiratory tract conditions, such as infections (e.g. bronchitis, tuberculosis), pulmonary oedema or bronchogenic carcinoma. The expectoration of bright red or frothy blood indicates a more serious disorder, such as pulmonary embolism or lung abscess.

Voice changes, ranging from hoarseness to aphonia (no speech), may result from numerous causes, including viral upper respiratory tract infections (e.g. laryngitis), vocal cord polyps and laryngeal tumour. Unilateral or bilateral vocal cord paralysis may also result from congenital defects, intubation or other damage to the recurrent nerve; for example, after thyroid or cardiac surgery.

Dyspnoea (difficult or laboured breathing) may result from disorders affecting either the upper or the lower respiratory tract or surrounding structures. Disorders of the upper respiratory tract that may cause dyspnoea include obstruction of the airway by inflammation, a tumour or foreign body. Disorders of the lower respiratory tract that cause dyspnoea include airway inflammations or infections, asthma, pneumonia, pneumonitis, carcinoma of the lung and chronic obstructive pulmonary disease. Any disorder affecting the thorax, such as trauma to the chest wall, commonly causes dyspnoea. Laboured breathing may be accompanied by nasal flaring, the use of the neck and accessory chest muscles and increased ventilation rate.

## Changes in breathing patterns and sounds

Any disorder that affects the respiratory system may produce changes in the pattern of breathing. Examples include **tachypnoea** (increased respiratory rate), **bradypnoea** (decreased respiratory rate) and airway obstruction; for example, due to emphysema, which can result in prolonged forceful **expiration** and pursed-lip breathing. Certain disorders also result in abnormal breathing sounds, such as wheezing or 'grunting' ventilations. Information on abnormal breathing sounds is provided later in this chapter.

## Hypoxia

**Hypoxia** is a deficiency of oxygen in the tissues and may be due to lung disorders that prevent adequate supplies of oxygen from reaching the blood (hypoxaemia). Hypoxia may also be due to hypoventilation, anaemia or impaired tissue utilisation of oxygen. The initial manifestations of hypoxia include tachycardia, tachypnoea, breathlessness, pallor, lethargy or agitation, followed by increasing confusion and deepening cyanosis.

## Thoracic abnormalities

Chronic respiratory system disorders may alter chest configuration; for example, a 'barrel chest' is characteristic of chronic obstructive conditions such as cystic fibrosis and emphysema. Abnormal curvatures of the spine, such as severe scoliosis, and congenital chest deformities such as pigeon chest (Figure 25.18) and pectus excavatum ('funnel chest') (Figure 25.19) may also affect pulmonary ventilation. Asymmetrical chest

**Figure 25.18** Pigeon chest
*(Mir 2003)*

**Figure 25.19** Funnel chest
*(Mir 2003)*

expansion can result from conditions such as flail chest, haemothorax, pneumothorax, retained secretions or inhaled foreign bodies causing atelectasis.

### Other manifestations

Depending on the type and severity of the disorder, other manifestations may be evident. For example, infections of the respiratory tract generally result in pyrexia, headaches, aching muscles and lethargy. Difficulty in swallowing (dysphagia) may be present in disorders such as pharyngitis and tonsillitis. In certain chronic disorders of the respiratory system, clubbing of the fingers (Figure 25.20) may be evident. The distal portions of the fingers are abnormally enlarged by anastamosis of blood vessels in response to peripheral hypoxaemia. The nails have an increased curvature and the angle of the nail bed increases to over 85 degrees.

## SPECIFIC DISORDERS OF THE RESPIRATORY SYSTEM

### Disorders of multiple cause

Certain disorders of the respiratory system have more than one cause and may be related to structural or functional changes, environmental conditions or a combination of factors. It is beyond the scope of this text to provide in-depth information on the various conditions related to the respiratory system. Listed below are some examples of respiratory conditions:

- Rhinitis
- Pleurisy
- Epistaxis
- Sarcoidosis
- Pneumoconioses
- Laryngeal oedema
- Adult respiratory distress syndrome.

**Figure 25.20** Clubbing in a patient with cyanotic congenital heart disease and secondary polycythaemia

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### Infectious disorders

Infectious disorders can be classed as upper or lower respiratory tract infections. Bacteria or viruses cause infections of the upper respiratory tract while a variety of microorganisms can cause lower respiratory tract infections. For more information review the references and further reading list at the end of this chapter.

Clinical Interest Box 25.3 looks at a viral infection, sudden acute respiratory syndrome (SARS) and Clinical Interest Box 25.4 provides an overview of the Ebola virus. Listed below are some examples of respiratory conditions:

- Sinusitis
- Influenza
- Pharyngitis
- Tonsillitis
- Quinsy
- Laryngitis
- Epiglottitis
- Acute bronchitis
- Pneumonia
- Pertussis
- Croup
- Tuberculosis
- Empyema.

### CLINICAL INTEREST BOX 25.3 Sudden acute respiratory syndrome (SARS)

Sudden acute respiratory syndrome (SARS) first appeared in the southern Chinese province of Guangdong in 2002 and by 2003 had been classified as an epidemic by the World Health Organization (WHO 2004). Symptoms of SARS, which is believed to be spread mainly through droplet infection, include pyrexia, rigors, cough, headache, aches and pains and dyspnoea. These same symptoms are common for many other respiratory infections, making the positive diagnosis difficult (WHO 2004).

The number of deaths to June 2003 was about 800 people worldwide, and the number of people infected since 2002 about 8500. In 2002 and 2003 about 14% of those infected died from SARS, usually 5–6 weeks after becoming ill.

The virus was found to be a coronavirus, and the genome was sequenced in April 2003 by the US Centers for Disease Control and Prevention. After relaxation of SARS infection control measures in Canada, a further outbreak occurred, due probably to transmission by an unrecognised SARS carrier, and affected five individuals in a rehabilitation hospital. As a result, infection control departments worldwide have introduced the most stringent infection control policies for medical and paramedical workers seen to date, to limit the spread of SARS.

*(WHO 2004)*

## CLINICAL INTEREST BOX 25.4 Ebola virus disease

Ebola virus is a serious and severe disease, often fatal in humans. It is transmitted to humans from wild animals and then spreads through human-to-human transmission. There is approximately 50% fatality in those who contract the disease with the fatality rates varying from 25% to 90% in past outbreaks (WHO 2015).

The first ebola virus disease outbreaks occurred in remote villages in Central Africa, near tropical rainforests, but the most recent outbreak in West Africa has involved major urban as well as rural areas. The most severely affected countries are Guinea, Liberia and Sierra Leone. These countries are known to have weak health systems and a lack of human and infrastructural resources (WHO 2015).

The key to controlling outbreaks is community engagement. A multistrategy approach is required and consists of a number of interventions, namely case management, surveillance and contact tracing, a good laboratory service, safe burials and social mobilisation (WHO 2015).

It is essential to implement early supportive care to increase the chance of survival. Supportive care involves rehydration and management of symptoms. As yet there is no licensed treatment proven to neutralise the virus but a range of blood, immunological and drug therapies are under development (WHO 2015). There are currently no licensed Ebola vaccines but two potential candidates are undergoing evaluation (WHO 2015).

### NURSING CARE PLAN 25.1

**Assessment:** Chronic obstructive pulmonary disease (COPD)
**Issue/s to be addressed:** Deficient knowledge on condition, treatment plan and self-management
**Goal/s:** Provide information about disease process/prognosis and treatment regimen

| Care/Actions | Rationale |
|---|---|
| Explain the disease process to the individual | Decreases anxiety and can lead to improved uptake of treatment plan |
| Instruct and demonstrate rationale for deep breathing and coughing exercises | Pursed-lip and abdominal or diaphragmatic breathing exercises strengthen muscles of respiration, help minimise collapse of small airways, and provide the individual with means to control dyspnoea |
| Discuss importance of avoiding people with active respiratory infection | Decreases exposure to and incidence of acquired acute URIs |
| Discuss individual factors that may trigger or aggravate condition (excessively dry air, wind, environmental temperature extremes, pollen, tobacco smoke, aerosol sprays, air pollution) | Environmental factors can induce or aggravate bronchial irritation, leading to increased secretion production and airway blockage |
| Review the harmful effects of smoking, and advise cessation of smoking | Cessation of smoking may slow or halt progression of disease |

**Evaluation**

Increased knowledge and understanding of condition.
Adherence to treatment plan.
Ability to self-manage condition.

## Obstructive disorders

Obstructive disorders are lung diseases that cause a persistent obstruction of bronchial air flow. Airway obstruction can also be due to the inhalation of a foreign body, or one or both bronchi may become obstructed by a benign or malignant tumour. Some of the more common types of airways obstruction are grouped under the heading of chronic obstructive pulmonary disease (COPD) or chronic obstructive airways disease (COAD) (see Nursing Care Plan 25.1). Common forms of COAD include asthma, emphysema, bronchiectasis and chronic bronchitis. Asthma and emphysema are discussed briefly here.

### Asthma

Asthma is a chronic, inflammatory disorder of the airways affecting approximately 300 million people worldwide (GINA 2012). Asthma is manifested by difficulty in breathing caused by generalised narrowing of the airways and is characterised by recurring episodes of paroxysmal dyspnoea, wheezing on expiration, coughing and tenacious, mucoid bronchial secretions. A person having an asthma attack commonly experiences anxiety, diaphoresis, tachycardia and elevated blood pressure. The increased effort of breathing can cause extreme fatigue.

## PROGRESS NOTE EXAMPLE 25.1

| | |
|---|---|
| 01/04/2015<br>1430 hrs | Nursing: Mr Jones reported shortness of breath and difficulty breathing. Upon assessment observations were noted to be BP 140/70, HR 96, RR 22, $SaO_2$ 89% on 4 L/min $O_2$. Salbutamol administered via spacer with effect. Deep breathing and coughing exercises performed. Oxygen saturation levels have improved $SaO_2$ to 96% on 4 L/min. Encourage regular fluids as tolerated, administer antibiotics as ordered.<br>***T. Smith*** **(Smith) EN** |

Episodes of asthma may be precipitated by inhalation or ingestion of allergens or pollutants, infection, or it may be exercise-induced or occur in response to changes in air temperature or emotional stress. The severity and duration of asthma attacks vary; treatment may control the attack rapidly, or the symptoms can become increasingly severe and prolonged.

A severe and prolonged asthma attack that resists treatment is referred to as status asthmaticus (indicated by a $PaCO_2$ of over 50%, or extreme exhaustion). Unless treatment reverses the condition, the individual may develop respiratory failure. An example of an entry in progress notes for a patient with breathing difficulties is shown in Progress Note Example 25.1.

### Emphysema

Emphysema (pulmonary) is a chronically progressive disease characterised by over-distension and destruction of alveolar walls, resulting in a loss of lung elasticity and surface area for diffusion. The predisposing causes are the same as those for chronic bronchitis, with cigarette smoking being the major factor. Initially the peripheral bronchioles become inflamed and the subsequent narrowing of the airways traps air in the alveoli. As the disease progresses the alveolar walls become over-inflated and rupture. Because of loss of lung elasticity the terminal bronchioles tend to collapse prematurely during exhalation, making expulsion of air from the lungs more difficult (Forey et al 2011).

Symptoms of chronic emphysema include shortness of breath, dyspnoea, cyanosis and cough (Forey et al 2011). Individuals will commonly exhale through pursed lips to prolong expiration and reduce the tendency of the airways to collapse. As the disease becomes more severe, they may use their accessory muscles to breathe. The anteroposterior width of the chest usually increases because of expansion of the chest wall and loss of lung elasticity, giving the chest a barrel-shaped appearance. Distension of the neck veins may be present, as may clubbing of the fingers. In advanced emphysema, the person fights for every breath of air (see Case Study 25.1).

### CASE STUDY 25.1

Mr Williams, a 76-year-old chronic smoker diagnosed 30 years prior with emphysema, is a long-term individual in your facility. During the previous 2 days his respiratory effort has increased, and his skin colour, previously pink, has now developed central and peripheral cyanosis that appears to be worsening. He has developed diaphoresis, his blood pressure has increased marginally and he is complaining of a headache.

1. What assessments will you need to undertake?
2. What nursing measures will you implement for Mr Williams?
3. Describe the most appropriate oxygen delivery method and flow rate applicable in this situation and what complications may occur as a result of oxygen therapy.

## Neoplastic disorders

*Benign* or *malignant* neoplasms may affect the upper or lower respiratory tract. Tumours can affect the normal functioning of the respiratory tract and, if malignant, can cause extensive tissue damage by infiltration. The signs and symptoms of neoplastic disease vary depending on the location and extent of the lesion.

*Nasal polyps* are masses of hypertrophied mucosa that commonly form in response to recurrent swelling of the nasal mucosa. Obstruction of the nasal passages develops gradually as the benign polyps multiply and enlarge. The individual experiences difficulty in breathing through the nose, and the voice may have a nasal quality.

*Laryngeal polyps* are growths that arise from the mucous membrane of the vocal cords. The major symptom is hoarseness. Laryngeal polyps are usually benign but they may become malignant.

*Laryngeal carcinoma* is a malignant neoplasm arising from or around the vocal cords. Persistent hoarseness is the major symptom, and heavy cigarette smoking is believed to be a major causative factor. If the lesion is large, dysphagia may be present.

Lung cancer commonly affects a bronchus. It arises from the bronchial epithelium and rapidly invades lung tissue, causing parts of the lung to collapse. It may spread through the lymphatic network and bloodstream to form metastases in other parts of the body, such as the liver, bones or brain. The incidence of lung cancer is related to several factors, the most important being the inhalation of cigarette smoke. Other factors include exposure to atmospheric pollution and occupational pollutants.

Unfortunately, the physical manifestations of lung cancer do not generally appear until the disease is well advanced. Symptoms include persistent cough, dyspnoea, purulent or

blood-streaked sputum, chest pain and repeated attacks of bronchitis or pneumonia. Sometimes the initial symptoms are associated with organs that are the sites of metastasis, such as the liver, bones or brain. Cancer of the lung may also occur secondary to a primary malignant tumour elsewhere in the body, as a result of metastasis.

## Traumatic disorders

Injury to part of the respiratory tract can result from a variety of causes.

### Laryngotracheal trauma

Laryngotracheal trauma can be minor and cause hoarseness and some dysphagia, or it may be severe, as a result of laryngeal or cricoid fracture. In a severe injury, oedema of the larynx may occur and be accompanied by signs of respiratory distress.

### Flail chest

Flail chest occurs when multiple rib fractures result in 'floating' of a segment of the rib cage. As a consequence there may be instability in part of the chest wall and paradoxical breathing. Paradoxical breathing is characterised by the injured chest wall collapsing in during inhalation, and moving out during exhalation. The lung underlying the injury contracts on inhalation and bulges on exhalation. If uncorrected, ventilation is impaired, which may lead to hypoxia and respiratory failure. Manifestations of a flail chest are paradoxical motion of the chest wall during breathing, severe pain, dyspnoea, tachycardia and cyanosis.

### Pneumothorax

Pneumothorax is a collection of air in the pleural space causing the lung on the side of the injury to collapse (MacDuff et al 2010). A pneumothorax may be open or closed. In an open pneumothorax, an injury creates an opening in the chest wall, allowing air to flow into the pleural cavity. In a closed, or spontaneous, pneumothorax, the chest wall is intact and air enters the pleural space from an opening on the surface of the lung.

Depending on the severity, a pneumothorax may cause severe dyspnoea, hypoxaemia, tachypnoea and associated pain, along with ipsilateral diminished chest expansion and breath sounds. There may be subcutaneous emphysema in the neck and upper chest, and a 'sucking' sound may be heard in the region of an open pneumothorax. Tracheal deviation to the contralateral side may be observed in severe cases in some individuals (MacDuff et al 2010).

Tension pneumothorax is a particularly severe form that occurs when air escapes into the pleural cavity. As a result, continuously increasing air pressure in the pleural cavity causes progressive collapse of the lung tissue. Emergency aspiration of air from the pleural cavity is necessary. The presence of severe signs and symptoms of respiratory distress suggests the presence of a tension pneumothorax (MacDuff et al 2010).

**CRITICAL THINKING EXERCISE 25.1**

A 23-year-old male is brought into the emergency department by his friends. His friends state that they were involved in a fight and their friend was stabbed in the chest. The young male appears to be having difficulty breathing. Upon assessment you note that he has a rapid respiratory rate, abnormal breathing movement, shortness of breath and is complaining of chest tightness. What nursing procedures would you implement to alleviate his respiratory distress?

### Haemothorax

Haemothorax is the accumulation of blood in the pleural space, usually as a result of trauma. Manifestations of haemothorax include dyspnoea and chest tightness, and may include signs of hypovolaemia if bleeding continues. If not treated, haemothorax can lead to shock from haemorrhage, and severe pain, or respiratory failure (Patrini et al 2015).

Haemopneumothorax is a collection of air and blood in the pleural cavity. Symptoms include those of both pneumothorax and haemothorax.

# FACTORS AFFECTING THE CARDIOVASCULAR SYSTEM

## Changes in cardiac function

Cardiac failure occurs when the heart is unable to maintain an output of blood sufficient to meet the body's requirements and, as a result, the body tissues may become ischaemic.

Cardiac failure may result from mechanical failure due to disease of valves, obstruction to the blood flow, congenital heart disease, arteriosclerosis or hypertension. Cardiac failure can also occur as a consequence of a disease process, such as cardiomyopathy or myocardial infarction, or as the result of normal ageing. Consequently, the heart's ability to pump blood may be diminished.

When the heart fails to meet the requirements of the body, compensatory mechanisms occur in an attempt to improve cardiac output and to maintain the blood pressure. Compensatory responses include the sympathetic response, the renal response and myocardial hypertrophy. The sympathetic response is stimulated by reduced cardiac output and results in increased heart rate, dilation of the coronary and cerebral arterioles and constriction of the renal and skin arterioles. As a result, essential life functions are maintained. The renal response results in the secretion of substances that stimulate the production of aldosterone, causing vasoconstriction and retention of sodium and water. This response causes an increase in blood volume and peripheral resistance, which increases the workload of the heart.

Myocardial hypertrophy results from prolonged increase in myocardial wall tension and, while this initially maintains cardiac output, eventually cardiac output and tissue perfusion are decreased.

## Changes in the blood vessels

Disturbances in the ability of the arteries to stretch and recoil as blood is pumped from the heart, or changes in the ability of the veins to return the blood to the heart, result in ischaemia of the tissues. The ability of arteries to stretch and recoil may be affected by conditions such as arteriosclerosis, obstruction from inflammation or arterial spasms or from excessive external pressure on an artery. When an artery is narrowed or constricted it is unable to transport sufficient blood to the area it supplies, resulting in ischaemia and possible tissue death (necrosis).

The ability of veins to return blood to the heart may be affected by impaired valves, a sedentary lifestyle, reduced skeletal muscle usage that normally assists venous flow or from excessive external pressure on a vein. When blood flow through a vein is impeded, pooling of blood in the vein occurs. The hydrostatic pressure inside the vein increases and causes oedema in the surrounding tissues. Chronic venous insufficiency can result in thrombophlebitis, stasis cellulitis and stasis ulcers.

The formation of an embolus can cause obstruction of an artery or a vein. The most common embolus is a blood clot (thrombus), although an embolus can also consist of air or fat or foreign bodies. When the thrombus, or part of it, becomes dislodged from the vessel wall it travels in the bloodstream until it reaches a blood vessel that is too narrow for its passage. As a result, blood flow beyond that area is obstructed, and the ultimate consequence may be death of the tissues deprived of adequate oxygen and nutrition.

## Changes in the blood

Haemoglobin in the erythrocytes is responsible for transporting oxygen in the bloodstream. Any condition that affects the normal production or function of erythrocytes may decrease the supply of oxygen to the tissues. Conditions that may impede erythrocyte formation or their ability to carry oxygen include smoking, bone marrow aplasia, metabolic abnormalities, nutritional deficiencies, chronic or acute blood loss, drugs, living at high altitudes, flying, toxins, ionising radiation and genetic abnormalities. Tissue hypoxia results in a compensatory increased production of erythrocytes (polycythaemia), which causes the blood to become viscous and increases the risk of thrombi formation.

Leucocytes protect the body from infection through phagocytosis and the production of antibodies. Any disorder that decreases the production or maturation of leucocytes renders the individual susceptible to overwhelming infection. Conditions that may impede leucocyte production or function include inadequate blood cell production, proliferation of immature leucocytes, viruses, drug reactions, radiation, nutritional deficiencies and bone marrow hypoplasia.

Thrombocytes are necessary for the clotting of blood. Any disorder that impairs thrombocyte production or function renders the individual susceptible to bleeding. A decrease or increase in the formation of thrombocytes generally occurs in association with other disorders. Thrombocytopenia (decrease in thrombocyte number) is commonly due to viral infections but may be idiopathic or may result from bone marrow disease. It may also result from a condition that causes thrombocyte destruction, such as cirrhosis of the liver, or drug toxicity or continued bleeding. Thrombocythaemia (increase in thrombocyte number) is frequently idiopathic, but it may also accompany some disorders such as polycythaemia or chronic myeloid leukaemia.

## Changes in the lymphatic system

The lymphatic system removes fluid and particles from the interstitial spaces, filters the lymph and returns it to the circulation. Impaired lymphatic function may result from obstruction or inflammation of the lymphatic vessels or nodes, or from neoplastic disease. When lymphatic function is impaired, fluid accumulates in the interstitial spaces, and oedema results. As the function of lymphocytes is the key factor in immune responses, diseases of the lymphatic system, such as Hodgkin's disease, may seriously impair the immune processes. The individual with immunodeficiency is vulnerable to infection and other pathological processes that would normally be inhibited by a healthy immune system.

# PATHOSPHYSIOLOGY RELATED TO THE CIRCULATORY SYSTEM

The manifestations of disorders of the circulatory system vary depending on whether the disorder is one that affects the heart, the blood vessels or the blood or blood-forming organs.

## Manifestations of cardiac disorders

### Dyspnoea

Dyspnoea (difficult or laboured breathing) is the most common (and often the earliest) symptom of cardiac disease. Typically the dyspnoea occurs with exertion although, as cardiac disease progresses, the individual may experience dyspnoea at rest. Paroxysmal nocturnal dyspnoea, which is associated with congestive cardiac failure, occurs during sleep; the individual wakes suddenly with difficulty in breathing and a sensation of suffocation.

### Chest pain

Chest pain is one of the most common causes for attending an emergency department and a frequent cause for attending a general practice (Parsonage et al 2013). Chest pain (Table 25.2) may result from myocardial ischaemia or from pericarditis. Chest pain can also be caused by conditions not associated with cardiac disease, such as oesophagitis, reflux, pleurisy, musculoskeletal disorders or stress and anxiety. Missed diagnosis can have adverse outcomes when chest pain assessment is based on clinical features alone (Parsonage et al 2013).

Ischaemic pain is the result of a deficiency of blood to the myocardium, caused by a blocked or constricted coronary blood vessel. Angina (pectoris) is pain that results from

**TABLE 25.2 | Typical patterns of cardiac pain**

| Angina | Myocardial infarction |
|---|---|
| Gradual or sudden onset | Sudden onset |
| Episodic and temporary, usually lasting 3–15 minutes | Lasts longer than 15 minutes |
| Substernal or anterior, not sharply localised. Radiates to back, neck, arms and jaw | Substernal, midline or anterior. Radiates to jaw, neck, back, shoulders or one or both arms |
| Sensation of mild to moderate pressure. Described as tightness, squeezing or crushing | Persistent sensation of severe pressure. Described as crushing, heavy, vice-like, squeezing |
| Precipitated by exertion, stress, ingestion of food, exposure to cold | Not necessarily related to exertion or emotion, and may occur at rest |
| Accompanied by dyspnoea, diaphoresis, nausea, apprehension | Accompanied by nausea, vomiting, dyspnoea, apprehension, diaphoresis, a sensation of 'impending doom', pallor, cold clammy skin |
| Individual keeps still to relieve the pain | Individual moves about in search of a comfortable position |
| Relieved by rest and/or glyceryl trinitrate | Not relieved by rest or glyceryl trinitrate |

diminished supply of oxygen to the heart, and is basically a reversible ischaemic process. Acute myocardial infarction represents the point when ischaemia becomes irreversible; blood flow to part of the heart is inadequate and unrelieved by rest, causing cardiac muscle necrosis (O'Gara et al 2013).

### Palpitations

Palpitations are a sensation of fluttering in the chest or an awareness of the heart's action. The person may describe the heart's action as racing, pounding, stopping or skipping beats. Palpitations may be due to rhythm disturbances such as premature contractions (extra heartbeat), but they can also result from anxiety, stress, caffeine or nicotine, cough and cold medications and fatigue.

### Cough

Cough may be associated with certain cardiovascular and most respiratory diseases. If cardiovascular disease is suspected it may be caused by an accumulation of fluid in the lungs (pulmonary oedema) often made worse at night or when lying in bed.

### Fatigue

Fatigue frequently accompanies cardiac dysfunction and is related to inadequate cardiac output resulting in insufficient blood flow to the brain and skeletal tissues.

### Cyanosis

Cyanosis (blue discolouration of the skin or mucous membranes) appears when haemoglobin oxygen saturation is greatly reduced below 92%. Central cyanosis is evident in all areas of the body, particularly in the lips, mucous membranes and nail beds, whereas peripheral cyanosis is evident mainly in the extremities.

### Syncope

Syncope (transient loss of consciousness) may result when cardiac dysfunction causes an inadequate flow of blood to the brain. Sudden loss of consciousness due to heart block is known as Stokes–Adams syndrome. Heart block is defined as 'impairment of conduction in heart excitation; often applied specifically to atrioventricular heart block' (Hawley et al 2012).

### Oedema

Oedema (local or generalised accumulation of fluid in the tissues) may result from certain cardiac diseases. Peripheral or systemic oedema generally develops from right-sided cardiac failure and is first noticed in the lowest, or dependent, parts of the body, such as the legs, fingers, sacral area, periorbital area, in the abdomen (ascites) and intestines (causing constipation). As venous stasis increases, oedema increases. In left-sided cardiac failure fluid accumulates in the lungs (pulmonary oedema). In advanced cardiac failure total body oedema may develop. The severity of the oedema will depend on the degree to which venous return and/or cardiac output are reduced.

### Pulse abnormalities

Pulse rate, volume or rhythm may be abnormal in the presence of cardiac dysfunction. Tachycardia may accompany cardiac failure, while heart block commonly results in bradycardia. A low cardiac output, and therefore a reduced pulse volume, is associated with cardiac failure and acute myocardial infarction (O'Gara et al 2013). Certain cardiac disorders cause arrhythmias accompanied by an irregular pulse.

## Manifestations of peripheral blood vessel disorders

### Intermittent claudication

Intermittent claudication is cramping pain in a muscle of the leg, brought on by exercise but relieved by rest. Commonly the pain is experienced in the calf muscle during walking and is thought to be due to accumulation of lactic acid in the tissues, rather than to ischaemia of the contracting muscle. Generally, it results from blockage of the superficial femoral artery; for example, due to atherosclerosis.

### Rest pain

Rest pain is leg pain experienced even when resting and occurs when chronic arterial occlusive disease is advanced, or when a vessel is blocked by a thrombus or embolus. As a result, the blood supply to the surrounding tissues is diminished, causing ischaemic pain.

### Pale cold extremities

Pale cold extremities indicate impaired blood flow to the limb. If an artery is suddenly occluded by a thrombus or embolus, there will be numbness and absence of distal pulses as well as coldness and pallor.

### Altered peripheral pulses

Altered peripheral pulses may be present when arterial blood flow is impeded. Diminished or absent pulses suggest partial or total occlusion of an artery; for example, if the popliteal pulse is absent, the superficial femoral artery may be occluded.

### Gangrene

Gangrene, which causes death of tissue, may occur as a result of chronic arterial insufficiency and is the consequence of severe and prolonged ischaemia. Gangrene first develops in the most distal parts of the lower limbs.

### Leg ulcers

Leg ulcers or cellulitis may be present. Chronic occlusion of arterioles and small arteries results in ischaemia, skin breakdown and ulceration. Pooling of venous blood in the tissues of the extremities, for example, as a result of varicose veins, may lead to venous stasis ulcers. Aching or a feeling of fullness or heaviness in the legs is associated with venous insufficiency or valve incompetence. Homans' sign may be positive in the presence of thrombophlebitis. A positive Homans' sign is present when dorsiflexion of the foot (with the knee bent) produces pain in the calf. Tenderness, firmness and swelling in the calf are also suggestive of deep-vein thrombophlebitis.

## Manifestations of blood and blood-forming organ disorders

### Bruising and bleeding

Bruising and bleeding may occur when there is abnormal thrombocyte production or function or reduced levels of clotting factors in the plasma. The appearance of any bruising or haemorrhagic spots in the absence of injury is suggestive of a blood disorder. Types of bruising and bleeding include:

- Purpura: haemorrhagic areas under the skin and in the mucous membranes. If the haemorrhages are small they are termed petechiae; larger purpuric areas are called bruises or ecchymoses
- Petechiae: red-brown pinpoint haemorrhages in the skin. Petechiae can occur over any part of the skin but are most common where pressure has been applied to a body part; seen in meningococcal meningitis and anthrax as well as common viral infections
- Ecchymoses: haemorrhagic spots larger than petechiae. They may be precipitated by an injury or may occur spontaneously
- Gastrointestinal bleeding: which appears as haematemesis and/or melaena and may occur in certain disorders of the blood such as thrombocytopenia, but may also occur as a result of liver failure, oesophageal varices, gastrointestinal ulcerations and drug therapies
- Menorrhagia: which may occur in haemorrhagic disorders as well as gynaecological disorders
- Haematuria: which may occur in haemorrhagic disorders as well as renal disorders
- Neurological changes (e.g. headaches, blurred vision, disorientation or altered consciousness): which may occur if there is bleeding within the central nervous system.

Changes in the skin may accompany disorders of the blood or blood-forming organs. Changes that may occur include pallor, rudor, jaundice, pruritus, thickened nails and ulcerations.

### Fatigue

Fatigue or weakness are common manifestations of many haematological disorders, such as anaemia and leukaemia. An individual with anaemia may also experience shortness of breath, particularly on exertion.

### Enlarged lymph nodes

Enlarged lymph nodes may be present in disorders such as Hodgkin's disease or leukaemia. Pain may be experienced in many haematological disorders; for example, bleeding into a joint may result in joint pain, and bone pain can occur in leukaemia or lymphoma.

# SPECIFIC DISORDERS OF THE CIRCULATORY SYSTEM

Cardiovascular diseases account for approximately one third of mortality worldwide and is responsible for a significant number of disabilities (Nascimento et al 2014). Disorders of the circulatory system may be congenital or due to multiple causes, pathogens or chemicals, or they may be drug related, neoplastic, obstructive, degenerative or the result of trauma. Understanding these conditions and factors that affect the cardiovascular system is imperative to assist with reducing the burden to healthcare these diseases are causing.

It is beyond the scope of this text to provide in-depth information on the various conditions related to the circulatory system. Listed below are some examples of circulatory system conditions.

## Congenital disorders

Congenital disorders are conditions that exist and are which are 'present at and existing from the time of birth' (Hawley et al 2012). These disorders include: ventricular septal defect; atrial septal defect; coarctation of the aorta; patent ductus

arteriosus; tetralogy of Fallot; transposition of the great vessels; thalassaemias (sickle-cell anaemia); and bleeding disorders (haemophilia A, haemophilia B, von Willebrand's disease).

## Disorders of multiple cause

It is beyond the scope of this text to provide in-depth information on the various conditions related to the disorders of multiple causes; only a few of the most common conditions are briefly discussed here.

### Hypertension

Hypertension is strongly associated with increasing rates of cardiovascular disease and is responsible for more death and disease than any other biomedical risk factor (National Heart Foundation of Australia 2010). It is a major risk factor for coronary heart disease and stroke and a contributing factor to the disease progression of chronic heart failure and chronic kidney disease (National Heart Foundation of Australia 2010). Hypertension is frequently asymptomatic until the individual experiences a major problem such as cerebral haemorrhage, renal failure or myocardial infarction. Symptoms that may be due to hypertension include dizziness, chest pain, palpitations, epistaxis, headaches and brief episodes of memory loss (transient ischaemic attacks).

Hypertension should not be diagnosed from one single blood pressure measurement but rather be based upon multiple blood pressure measurements taken on several separate occasions (National Heart Foundation of Australia 2010).

High arterial blood pressure over 135/85 mmHg is generally classified as either primary ('essential') or secondary hypertension. Primary hypertension is the most common form and, while the cause is often unknown, many factors have been implicated as contributing to its development, including high sodium intake, obesity, diabetes, hypercholesterolaemia, genetic factors, alcohol, cigarette smoking and psychosocial factors. Antihypertensive drug therapy may be prescribed to hypertensive persons and evidence shows that these therapies should be implemented in a stepped care approach until target blood pressure levels are achieved (Glynn et al 2010).

Secondary hypertension is caused by either disease or certain medications. Diseases that result in secondary hypertension include those in which renal, vascular, endocrine or neurological mechanisms are involved, such as renal artery stenosis or intercranial lesions. Medications that may lead to secondary hypertension include oral contraceptives, corticosteroids and monoamine oxidase inhibitors. If secondary hypertension is suspected, a specialist referral should be considered (National Heart Foundation of Australia 2010).

Malignant hypertension is the term used to describe primary hypertension when there is a rapid rise of blood pressure to a very high level, such as 250/150 mmHg. It is accompanied by severe headache, visual disturbances and oliguria. If untreated, death may occur rapidly from cardiac or renal failure or cerebrovascular accident.

**CRITICAL THINKING EXERCISE 25.2**

Mrs Phillips, 64, has chronic hypertension. Management of this condition requires her to take one Lasix (frusemide) daily to promote diuresis and limit her daily fluid intake. Mrs Phillips is having difficulty keeping to her limited fluid intake, stating that she feels thirsty. Upon assessment you notice that her lower peripheries are oedematous. Consider what nursing measures you could implement to assist Mrs Phillips.

### Coronary artery (ischaemic heart) disease

This is a disorder in which the arteries that supply blood to the heart muscle become diseased and fail to supply the heart with sufficient blood. Arteriosclerosis is the most common cause of coronary artery disease, causing disturbances of blood flow within the coronary arteries that give rise to altered myocardial perfusion and disruption of the electrical cycle controlling heart rhythm. Atherosclerosis is one type of arteriosclerosis in which narrowing of the arteries occurs as a result of deposits of lipids in and around the smooth muscle, roughening of the endothelial lining and loss of elasticity, with fibrosis and calcification. Eventually the artery becomes occluded, inelastic and incapable of dilating.

Although the precise cause of arteriosclerosis and coronary artery disease is unclear, there is general agreement that many factors contribute to its development, including genetic influences, gender (males are more commonly affected), hypertension, lack of exercise, cigarette smoking, stress, metabolic or endocrine disorders, obesity, diabetes mellitus, hypercholesterolaemia and dietary factors. The dietary factors that are considered to contribute to coronary artery disease are salt, saturated fats and lack of dietary fibre. Coronary artery disease may be asymptomatic until the individual experiences angina or a myocardial infarction, which may result in sudden death.

### Myocardial infarction

Myocardial infarction is the death of part of the myocardium as a result of severe or total deprivation of its blood supply. Blood flow to the myocardium may be obstructed by arteriosclerosis (narrowing or clogging of arteries with deposits of fat, cholesterol and other substances) or by thrombus formation within an atheromatous coronary artery (Nordmann et al 2005). The most common site of infarction is the anterior surface of the left ventricle, resulting from occlusion of the left coronary artery. An infarction may affect some or all of the layers of the heart.

The major complications of a myocardial infarction are left ventricular failure, pericarditis and arrhythmias, which together account for a large percentage of deaths following myocardial infarction. It is generally recognised that the risk of death is greatest in the first few hours after myocardial infarction, with the risk decreasing after that time. Depression is common after recovery from the infarction and can result

in non-compliance with treatment regimens and further infarctions.

A myocardial infarction may be asymptomatic (a silent myocardial infarction). More commonly, it may manifest with pain in the centre of the chest, arms, neck, jaw or back lasting longer than five minutes, pallor, sweating, anxiety, shortness of breath, nausea or vomiting or sudden collapse.

Early and accurate identification as to whether the chest pain is a myocardial infarction event is essential to ensure emergency reperfusion therapy is provided (Parsonage et al 2013). Primary stenting and balloon angioplasty are two methods used to open narrowed or clogged arteries. A systematic review of the evidence found both methods to be equally effective at preventing mortality but the use of stents was associated with fewer arteries needing to be re-cleared (Nordmann et al 2005). Stenting was also found to have a more reduced risk of reinfarction than balloon angioplasty (Nordmann et al 2005).

Other disorders of multiple cause include: arrhythmias, valvular heart disease, heart failure, cardiogenic shock, cardiac arrest, Raynaud's disease, disseminated intravascular coagulation, idiopathic thrombocytopenic purpura, agranulocytosis and Buerger's disease.

### Anaemias

Anaemias are a group of disorders characterised by reduced oxygen-carrying capacity of the blood. Causes of anaemia are numerous and are related to the altered production or destruction of erythrocytes, and to blood loss. Anaemias can thus be classified as due to haematopoietic, haemolytic or haemorrhagic causes.

Aplastic anaemia is caused by injury or destruction of the haematopoietic cells in bone marrow, resulting in reduced or abnormal erythrocyte production. In this disorder the normal haematopoietic tissue is replaced by fatty bone marrow. Aplastic anaemia may be idiopathic or it may be caused by medications, toxic agents, radiation or immunological factors. Manifestations of aplastic anaemia are related to pancytopenia (abnormal depression of the cellular components of blood). They include pallor, tiredness, repeated infections and bleeding tendencies. Bleeding may present as petechiae, ecchymoses, haemorrhage from the mucous membranes, such as the gums, or gastrointestinal haemorrhage.

Pernicious anaemia is characterised by a metabolic defect involving the absence of intrinsic factor, which is secreted by the parietal cells of the gastric mucosa and is essential for vitamin B absorption in the terminal ileum. Pernicious anaemia is thought to result from an autosomal dominant defect. Other causes include gastric cancer, gastrectomy and malabsorption disorders involving the ileum. Manifestations of pernicious anaemia include pallor, tiredness, sore tongue and numbness and tingling in the extremities. Because of vitamin B deficiency, demyelination of nerves and degeneration of nerve tissue occurs, producing neurological effects such as ataxia, altered vision, poor memory, depression and paralysis.

Iron-deficiency anaemia is characterised by small and pale erythrocytes because of reduced haemoglobin concentration. The two most common causes of iron-deficiency anaemia are chronic blood loss and an inadequate dietary intake of iron. Manifestations include pagophagia (craving for ice), pallor, chronic tiredness, tachycardia and shortness of breath on exertion.

Folate deficiency anaemia results from an inadequate dietary intake of folate, a disorder of the small intestine, where folate is absorbed, or from altered metabolism. Manifestations are similar to those associated with pernicious anaemia.

Acute blood-loss anaemia is a condition that results from sudden loss of erythrocytes and, consequently, depletion of haemoglobin and iron. Acute blood-loss anaemia may result from severe trauma, postoperative haemorrhage, invasive neoplasm, ruptured peptic ulcer, ruptured aneurysm or coagulation defects. Acute blood loss itself produces features associated with hypovolaemia and hypoxia, such as pallor, faintness, restlessness, anxiety, hypotension and a weak rapid pulse.

If anaemia is persistent and the individual's haemoglobin levels decrease, the individual may require a transfusion of blood.

## Neoplastic and obstructive disorders

Tumours may occur in any of the chambers of the heart and may affect one or all of the layers of the heart. Secondary metastatic tumours that infiltrate the heart are more common than primary cardiac tumours. Manifestations are related to which part of the heart is affected, and include signs of heart failure, arrhythmias, angina, heart block and infarction. It is beyond the scope of this text to provide in-depth information on the various conditions related to neoplastic and obstructive disorders and only a few of the most common conditions are briefly discussed here.

### Leukaemia

Leukaemia is a neoplastic disorder characterised by an accumulation and proliferation of abnormal cells in the bone marrow. Cells fail to develop and are unable to function normally, and the accumulation of leukaemic cells in the bone marrow prevents normal haematopoiesis. The precise cause of leukaemia is unknown but several factors have been implicated in its development including chromosome abnormality, exposure to radiation from power lines, viruses or chemicals, such as certain weed killers or insecticides. Leukaemia occurs either in acute forms, which involve the proliferation of immature cells, or in chronic forms which involve the proliferation of mature cells. The four most common forms of leukaemia are acute myeloid, chronic myeloid, acute lymphocytic and chronic lymphocytic.

Although manifestations of leukaemia vary according to the particular form of the disorder, there is a similarity in the signs and symptoms, which are related to the lack of normal haematopoiesis in the bone marrow. Bone marrow dysfunction results in:

- Anaemia, which may present as pallor, lethargy and shortness of breath

- Thrombocytopenia, which commonly manifests as petechiae, easy bruising, bleeding gums and haemorrhage (e.g. as occult haematuria)
- Leucopenia, which renders the individual susceptible to recurrent infections. There is generally splenic enlargement, lymphadenopathy and bone pain.

Central nervous system involvement may be present in any of the leukaemias, giving rise to symptoms such as nausea and vomiting, irritability, headache and blurred vision.

### Hodgkin's disease

Hodgkin's disease is a malignant disorder of the lymph node macrophages, characterised by painless and progressive enlargement of the lymph nodes, spleen and other lymphoid tissue. Untreated, Hodgkin's disease metastasises via the lymphatics to sites outside the lymphatic system. The precise cause of the disorder is unknown, but both genetic and environmental factors seem to be implicated in its development. Manifestations of Hodgkin's disease are painless enlargement of the lymph nodes, especially the cervical nodes, pruritus, night sweats, malaise and weight loss. Other symptoms depend on the degree and location of systemic involvement.

Other conditions related to neoplastic and obstructive disorders include: arteriosclerosis obliterans, acute arterial obstruction, thrombophlebitis, chronic venous insufficiency, Burkitt's lymphoma, multiple myeloma and malignant lymphomas.

## Degenerative disorders

### Cardiomyopathy

Cardiomyopathy results from extensive damage to the myocardial muscle fibres, causing hypertrophy of the entire heart, especially of the septum. Although the heart is enlarged, the ventricular chambers are small and are resistant to filling during diastole. Cardiomyopathy leads to congestive cardiac failure, arrhythmias and, frequently, sudden death.

The cause of most cardiomyopathies is unknown but the condition is thought to be genetically transmitted. Some forms of cardiomyopathy result from hypertension, congenital defects and myocardial destruction by toxic, infectious or metabolic agents. The most common manifestation of cardiomyopathy is dyspnoea, as a result of congestive cardiac failure. Angina, fatigue and syncope may occur because of inadequate cardiac output. As cardiac failure progresses, peripheral cyanosis, oedema, liver enlargement and jugular venous distension become evident.

### Aortic aneurysm

Aortic aneurysm is a dilation of the wall of the aorta. There are several types of aneurysm:

- Saccular: an outpouching of one side of the arterial wall
- Fusiform: a spindle-shaped enlargement of the entire circumference of the artery
- Dissecting: a haemorrhagic separation between the medial and internal layers of the artery.

The most common cause of an aneurysm is arteriosclerosis, which weakens the aortic wall and gradually distends the lumen at the weakened area. Other causative factors include congenital defects, infection, hypertension and trauma.

Manifestations of an aortic aneurysm depend on its location, and may not develop until enlargement of the aneurysm exerts pressure on nearby structures. Depending on the location, an aortic aneurysm may manifest as dyspnoea; chest pain; dysphagia; dilated superficial veins on the chest, neck and arms; prominent abdominal pulsation; or dull abdominal or low back pain. A dissecting aneurysm may produce a sudden 'tearing' pain accompanied by pallor, shortness of breath, sweating and syncope. The main complication of an aortic aneurysm is rupture and, without immediate surgical intervention, the individual may bleed to death.

### Varicose veins

Varicose veins are dilated, tortuous branches of the saphenous veins. They result from incompetent valves, which cause a back-flow of venous blood. Varicose veins may result from congenital weakness of the valves, from injury or thrombophlebitis, or from conditions that produce venous stasis, such as pregnancy or occupations that necessitate standing for long periods. Superficial varicose veins may be unsightly but produce no symptoms. Deeper varicose veins may produce mild to severe leg symptoms, such as a feeling of heaviness, cramps, dull aching and discomfort that increases with prolonged standing. Over time, dilation of the veins results in venous stasis, with oedema and changes in skin pigmentation. Visible and palpable protrusions frequently occur along the veins, resulting in disfigurement of the leg(s).

## Infectious and inflammatory disorders

### Pericarditis

Pericarditis (inflammation of the pericardium) may be an acute or chronic condition. Acute pericarditis may be accompanied by a purulent, serous or haemorrhagic exudate, which can produce further complications. Chronic pericarditis is characterised by fibrous pericardial thickening. As well as being caused by infection, pericarditis may result from trauma, radiation, neoplasms, cardiac surgery or myocardial infarction. The prime manifestation is chest pain that increases with deep inhalation, and decreases when the person sits up and leans forward. Other manifestations include dyspnoea and the signs of a systemic infection.

### Myocarditis

Myocarditis (inflammation of the myocardium) may be an acute or chronic condition. Myocarditis may result from viral or bacterial infections, radiation, chemicals or metabolic disorders. Infective myocarditis usually causes non-specific symptoms that reflect a systemic infection. Myocarditis sometimes produces manifestations of severe congestive cardiac failure.

### Endocarditis

Endocarditis (inflammation or infection of the endocardium) may result from invasion by microorganisms or from

non-infective injury to the lining of the heart, or via intravenous (IV) cannulas, dental surgery or any other invasive procedure. Infective endocarditis involves the endocardium of the heart valves more frequently than the endocardium lining the heart chambers. The microorganisms stimulate the deposit of fibrin around them, producing vegetative growth on the endocardium.

Early manifestations are commonly non-specific, and the symptoms of acute endocarditis resemble those associated with influenza: pyrexia, sweats, anorexia, headaches and musculoskeletal aches. If a heart murmur develops, the pulse rate may be rapid and, if vegetations become dislodged, there may be manifestations of embolisation, producing the features of splenic, renal, cerebral, pulmonary or peripheral vascular occlusion.

### Rheumatic heart disease

Rheumatic heart disease refers to the cardiac manifestations of rheumatic fever and includes pericarditis, myocarditis, endocarditis and chronic valvular disease. Rheumatic fever is associated with the type A beta-haemolytic streptococcus and is thought to be immunological in origin. It may be as long as 10 years after an attack of rheumatic fever before signs of heart valve disease become evident. The end result of the disease progression is stenosis of a heart valve, inability of the valve to close properly, or valve incompetence, which leads to regurgitation of blood through the valve during systole. Manifestations of rheumatic heart valve disease depend on the valve affected and on the degree of valve dysfunction. There may be signs of reduced cardiac output, pulmonary congestion, cardiac enlargement, heart failure and the presence of heart murmurs.

### Lymphangitis

Lymphangitis is an acute or chronic inflammation of the lymphatic vessels, which generally results from a streptococcal infection of an extremity. The accompanying lymph node enlargement (lymphadenopathy) may be localised or generalised. Lymphangitis is characterised by red, warm, tender streaks spreading up a limb from a focal point of infection. The regional lymph nodes become enlarged and tender, and the individual experiences pyrexia and malaise.

## RESPIRATORY DIAGNOSTIC TESTS

Certain tests may be used to assist or confirm the diagnosis and severity of respiratory disorders.

### Pulmonary function studies

These studies are used to determine the presence and degree of respiratory dysfunction and are a measure of the functional ability of the lungs. Spirometry or plethysmography is used to assess the individual's lung volume by measuring and recording the volume of inhaled and exhaled air. The values are then compared with the normal values against predicted values for an individual of the same sex, weight, height and age. Table 25.3 lists types of pulmonary function tests and the normal expected values.

### Polysomnography

This test is used to measure upper obstruction and pattern of respirations during sleep, using various pieces of equipment.

### Chest x-ray

A chest x-ray is one of the most common procedures used to evaluate the lungs, and generally involves posterior, anterior and lateral views. Abnormal findings that may be evident on a chest x-ray include areas of density, presence of a mass or accumulation of fluid.

### Ventilation/perfusion scan

A ventilation/perfusion scan involves the administration of a radioactive gas. The radioactive particles are distributed and trapped in the pulmonary capillary bed, and the lung scan produces a visual image of pulmonary blood flow. Tissue that does not pick up the radionuclide will show light coloured area, indicating lack of adequate lung perfusion. Conditions such as pulmonary oedema, lung cancer or COPD may cause abnormal perfusion.

**TABLE 25.3 | Pulmonary function tests**

| Tests | Explanation | Normal value |
|---|---|---|
| Tidal volume | Amount of air inhaled or exhaled during normal breathing | 500 mL |
| Total lung capacity | Total volume of the lungs when maximally inflated | 6000 mL |
| Vital capacity | Total volume of air that can be forcibly exhaled after a maximum inhalation | 3000–6000 mL |
| Functional residual capacity | Amount of air remaining in the lungs after normal exhalation | 2400 mL |
| Inspiratory capacity | Amount of air that can be inhaled after normal exhalation | 3600 mL |
| Expiratory reserve volume | Amount of air that can be exhaled after normal exhalation | 1200 mL |
| Forced expiratory volume (in one second ($FEV_1$)) | Maximal amount of air that can be forcibly exhaled, in one second, after full inhalation | 3000–5000 mL |
| Residual volume | Amount of air remaining in the lungs after a maximal forced exhalation | 1200 mL |

*(Berman et al 2015; Crisp et al 2013)*

### Cultures

A specimen of secretions is obtained, for example, via a nose swab or nasopharyngeal aspirate or throat swab. Care must be taken to ensure that only the back of the throat is swabbed, which represents microorganisms in the respiratory tract. Samples are sent to the laboratory so that any microorganisms present can be identified by use of a special growth medium (the culture). Sensitivity studies may then be done to determine which drug is effective against the specific microorganism.

### Sputum cytology

A specimen of sputum is obtained and sent to the laboratory, where it is examined to detect the presence of pus, pathogenic microorganisms or malignant cells. See Clinical Skill 25.4 and Chapter 22.

### Skin tests

A common skin test performed is the Mantoux test, used in the detection of tuberculosis (TB). A medical officer or registered nurse (RN) qualified in intradermal administration injects intradermally 0.1 mL of solution containing old tuberculin. A positive reaction may be defined as an area of redness or induration of at least 5 mm in diameter appearing within 48–72 hours. The greater the reaction size the greater the exposure to antibodies to the tubercle bacillus.

### Bronchoscopy

Bronchoscopy involves the direct viewing of the trachea and bronchi by means of an instrument called a bronchoscope. A bronchoscopy is used in the diagnosis of respiratory tract disorders and may be used to remove foreign bodies or flush out secretions in the airways and to obtain a specimen of secretions or tissue for microscopic examination.

### Thoracentesis

In thoracentesis the thoracic wall is punctured with a needle to obtain a specimen of pleural fluid for analysis. The procedure may also be performed to relieve pulmonary compression caused by a pleural effusion. A local anaesthetic is injected into the skin before the needle is inserted.

### Arterial blood gas analysis

Blood gas analysis shows how well an individual's lungs are delivering oxygen to the bloodstream and eliminating carbon dioxide. Blood is collected for analysis of pH, $PaCO_2$, $PaO_2$, bicarbonate and base levels.

### Capillary acid–base balance

This analysis is performed by a finger prick. Blood is collected in a glass capillary tube to analyse the acid–base balance and $PCO_2$.

### Other tests

Blood microscopy and culture or viral tests may also be carried out to detect and identify the source of bacterial or viral infections. Other diagnostic tests that may be performed include fluoroscopy, tomography, bronchography and pulmonary angiography.

**CRITICAL THINKING EXERCISE 25.3**

Mr Mula has recently migrated to Australia to join his family. He has presented at the local medical clinic because he has become increasingly tired, has had a persistent cough and has been losing weight without trying. Consider the types of questions that would be important to ask when conducting the nursing history.

## CARDIOVASCULAR DIAGNOSTIC TESTS

Assessment of the individual with a suspected circulatory system disorder, or evaluation of the progress of a disorder, requires that certain cardiovascular tests be performed.

### Assessment of cardiac function

### Electrocardiography (ECG)

Electrocardiography (ECG) (Figure 25.21) provides a graphical record, or trace, that represents the heart's electrical action. Cellular activity of the cardiac muscle generates electrical impulses that flow through the heart. This electrical activity can be measured by a system of electrodes placed at specific points on the body surface (Higgins 2011; Hampton 2013; Perry et al 2012). The ECG displays the electrical activity as waveforms, which are named P, Q, R, S and T waves. The ECG recording illustrates the rate and rhythm of electrical conduction and cardiac contractions through the heart (Higgins 2011; Hampton 2013; Perry et al 2012). Abnormalities indicate enlargement of the chambers, inflammation of the pericardium or damage to the myocardium. Exercise electrocardiography (stress test) measures the cardiovascular effects of controlled physical stress, such as treadmill walking. Ambulatory (Holter) electrocardiography records the heart's electrical activity for a specified time (e.g. 24 hours) as the individual performs their usual activities. See Clinical Skill 25.2 for performing an ECG.

### Echocardiography

Echocardiography is a painless non-invasive test that directs ultra-high-frequency soundwaves through the chest wall into the heart, which then reflects those waves to a transducer and a recording device. As the sound transects the various heart structures, echoes are produced and recorded. Echocardiography evaluates cardiac structure and function and can reveal valve deformities, septal defects, cardiomyopathy and pericardial effusion.

### Nuclear cardiology

Nuclear cardiology involves the use of radioactive tracers to evaluate myocardial blood flow and the status of myocardial cells. An IV injection, for example of the radioisotope thallium-201 or gallium, is administered to the individual while they are exercising, and a scan performed to detect thallium uptake. Healthy myocardial tissue absorbs the radioisotope, but ischaemic or necrotic tissue does not.

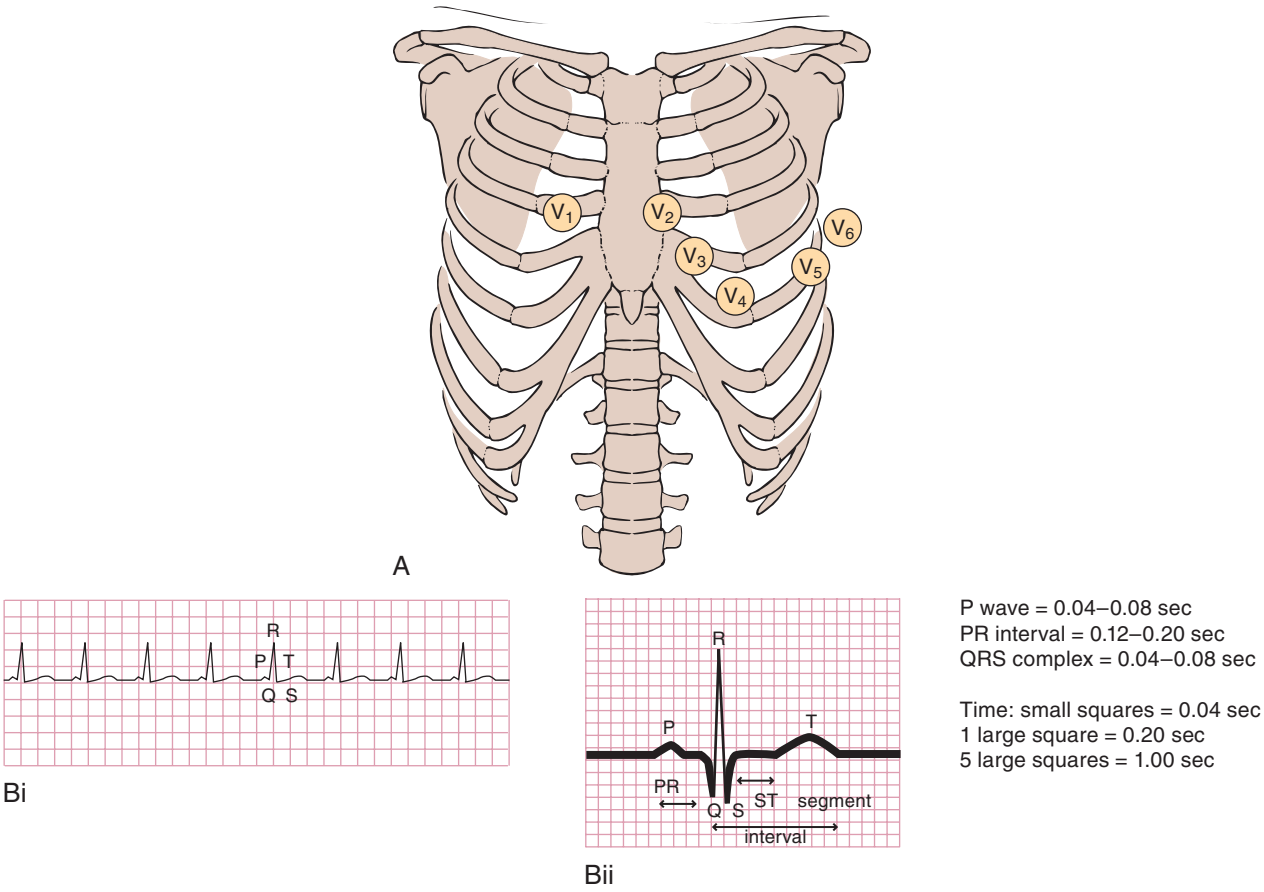



**Figure 25.21** Electrocardiogram (ECG)

A: Placement of the chest leads B: A normal ECG (i) Regular sinus rhythm. (ii) Detail of an ECG (A: *Lewis et al 2014*)

## CLINICAL SKILL 25.2 Performing an ECG

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | ECG machine<br>Electrodes<br>Gauze squares/tissues<br>Razor/hair clippers<br>Conduction gel<br>Covering to maintain privacy/modesty |
| **Skill activity** | **Rationale** |
| Confirm request of ECG in healthcare record or verbal request | Safety check that ECG has been requested, and is not performed unnecessarily |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications: check allergy status (adhesives) | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |

## CLINICAL SKILL 25.2 Performing an ECG—cont'd

| | |
|---|---|
| Assist the individual to assume an appropriate position of comfort<br>Ensure individual is pain free, positioned in supine position, head supported. Make note if the person has chest pain<br>Promote independence and involvement if possible<br>Assess the individual's tolerance to procedure<br>Loosen or remove clothing above the waistline<br>Remove jewellery (including piercings)<br>Provision of privacy<br>Note: If the individual has breathing difficulties position in the semi-Fowler's position<br>Obtain additional assistance if required | Ensures individual is comfortable and an accurate ECG can be taken, and helps reduces the amount of artifact<br>Privacy reduces risk of embarrassment as chest is exposed during the procedure<br>Assistance is available when required |
| Perform hand hygiene | Prevents the spread of infection |
| Place the equipment in a convenient location near the bedside. Assemble the required equipment | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |
| Attach limb leads to clean, hair-free sites on arms and legs | Area chosen should be over fleshy, not bony, tissue<br>Skin needs to be clean to ensure the best conduction of electrical impulses. If skin is unclean or wet, use an alcohol swab or soap and water to clean and dry the sites for electrode placement<br>Excess hair is removed as it prevents adequate contact with the skin |
| Determine chest sites and attach electrodes to clean, dry, hair-free sites<br>$V_1$—4th intercostal space, right sternal border<br>$V_2$—4th intercostal space, left sternal border<br>$V_3$—5th intercostal space, left sternal border<br>$V_4$—5th intercostal space, left mid-clavicular line<br>$V_5$—5th intercostal space, left anterior axillary line<br>$V_6$—5th intercostal space, left mid-axillary line | Note: Care must be taken that the electrodes are accurately placed, since errors in diagnosis can occur if the electrodes are incorrectly placed<br>If the individual has large breasts, place under the breasts |
| Attach lead wires to all electrodes | Attaching the electrodes to the leads ensures the electrical activity is conducted to the ECG machine |
| Follow manufacturer's instructions for calibrating and preparing the ECG machine | Machines may be single channel or multichannel. Familiarity with the machine will increase accuracy of recording and decrease individual and nurse stress |
| Ask the individual to relax, refrain from moving and breathe normally. Record ECG and report to experienced RN and medical officer | Lack of experience and ability in interpreting an ECG recording might lead the nurse to overlook changes that are significant. RN can also compare ECG to any previous ECGs |
| Remove electrodes and conduction gel | Increases comfort |
| Clean used equipment and store appropriately | Minimises cross-contamination and stored in correct place for other colleagues to use |
| Make individual comfortable, inform them of how procedure went | Reduces anxiety of individual and supports nurse-to-person relationship |
| Perform hand hygiene | Minimises cross-contamination |

*Continued*

| CLINICAL SKILL 25.2 Performing an ECG—cont'd | |
|---|---|
| Document on ECG (include actual recording, noting name, medical record number, doctor, date and time. Some machines have the ability to program this information so that it is printed out on the ECG recording)<br>Document in the healthcare record<br>Document assessment findings, and/or any abnormalities found<br>Document if individual was pain free or had chest pain during procedure<br>Report the ECG to a Registered Nurses and/or medical officer | Medico-legal requirement. Allows for the planning and implementation of care |
| Reassess individual to make sure no adverse effects from procedure | Ensures individual is comfortable and nil adverse effects have occurred post procedure |
| *(deWit & Williams 2014; Perry et al 2012; Higgins 2011; Kumar 2008; Parsonage et al 2013; O'Gara et al 2013; Hampton 2013; ACSQHC 2012)* | |

### Cardiac catheterisation

Cardiac catheterisation involves the insertion of a catheter into the right or left side of the heart to obtain information on cardiac pressures, cardiac output, oxygenation and heart valve function. The catheter is inserted through a vein in the arm or the groin and advanced into the vena cava; the passage of the catheter is observed on a fluorescent screen and x-ray films are taken. A contrast medium may be injected through the catheter and x-ray films taken (angiography). For coronary angiography, the catheter is advanced into the aortic arch and positioned into a coronary artery; a contrast medium is then injected to outline the coronary arteries as a series of x-ray films is taken.

### Digital subtraction angiography

Digital subtraction angiography is less invasive than conventional angiography and involves injecting contrast dye into the venous system rather than directly into an artery. As the dye circulates through the heart and arterial system, a fluoroscopic image intensifier displays the vessels and focuses the image. A computer then converts the images into numbers. Several vessels can be evaluated with one injection of contrast dye.

### Phonocardiography

Phonocardiography graphically records heart sounds produced as blood flows through the heart and great vessels. Microphones are placed on the chest, usually at the apex and base of the heart, and the sounds are picked up and converted into electrical impulses. The impulses are relayed to a recorder, which provides a graph of the heart sounds in wave form.

### Central venous pressure

The central venous pressure test measures the functioning of the right atrium. A catheter, which is threaded through the subclavian or jugular vein into or near the right atrium, is connected to a manometer. This procedure enables accurate determination of right atrial blood pressure, which reflects right ventricular pressure. This test is also used to assess blood volume.

### Intracardiac pressure monitoring

This test involves the insertion of a balloon-tipped flow-directed catheter, such as the Swan–Ganz catheter, into a large vein and then advancing it until it reaches the right atrium. Once the balloon is inflated, the flow of blood carries the catheter into the pulmonary artery. The procedure permits measurement of both pulmonary artery pressure (PAP) and pulmonary artery wedge pressure (PAWP). In addition, this procedure evaluates pulmonary vascular resistance and tissue oxygenation.

### Blood tests

Blood tests may be performed to measure cardiac enzyme levels, which help to assess myocardial function or cell death. Cardiac enzyme measurements help detect myocardial infarction, evaluate possible causes of chest pain and monitor the severity of myocardial ischaemia.

## Assessment of peripheral blood vessels

### Skin temperature studies

Skin temperature studies may be performed to evaluate skin temperature of the extremities, which helps determine adequacy of blood circulation in arterial disease. Direct skin temperature readings are taken; in arterial disease the temperature in the extremities may be lower than in other body areas. The cold stimulation test may be used to demonstrate Raynaud's syndrome by recording temperature changes in the individual's fingers before and after their submersion in ice water. Normally digital temperature returns to pre-test level

within 15 minutes, but with Raynaud's syndrome return to pre-test level takes longer than 20 minutes.

### Doppler ultrasonography

Doppler ultrasonography involves the transmission of sound waves through the skin, which are reflected from moving blood cells in underlying blood vessels. This test evaluates blood flow in the major veins and arteries in the limbs, and helps to detect peripheral vascular aneurysms and deep vein thrombosis (DVT).

### Arteriography

Arteriography (angiography) is the radiographic examination of one or more arteries after injection of a contrast medium into a major artery, usually the femoral artery. Arteriography can demonstrate blood flow status, collateral circulation, vascular anomaly and tumour and aneurysm formation.

### Lower limb venography

Lower limb venography is the radiographic examination of a vein after an injection of contrast medium and is often used to assess the condition of the deep leg veins. Venography is the definitive test for DVT but may also be used to distinguish clot formation from other forms of venous obstruction or to locate a suitable vein for arterial bypass grafting.

### Impedance plethysmography

Impedance plethysmography is a non-invasive test for measuring venous flow in the limbs and is helpful for detecting DVT. Electrodes are applied to the leg to measure changes in electrical resistance that result from blood volume variations.

## Assessment of haematological status

### Red blood cell (RBC) count

Red blood cell (RBC) (erythrocyte) count is the measurement of the number of erythrocytes found in a microlitre of blood. Together with haematocrit and haemoglobin determinations, this test is most often used to calculate mean corpuscular volume, mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration.

### Haematocrit

Haematocrit is a blood test used to measure the percentage of a given volume of blood occupied by erythrocytes.

### Erythrocyte indices

Erythrocyte indices involve examination of the size, weight and haemoglobin content of the average erythrocyte (mean corpuscular haemoglobin and mean corpuscular haemoglobin concentration).

### Total haemoglobin

Total haemoglobin measures the grams of haemoglobin (Hb) in 100 mL of whole blood.

### Stained red cell examination

Stained red cell examination determines abnormalities in the size, shape or structure of erythrocytes.

### Reticulocyte count

Reticulocyte count measures the number of reticulocytes present in a sample of blood, which is then expressed as a percentage of the total RBC count. (Reticulocytes are immature erythrocytes.)

### Erythrocyte sedimentation rate (ESR)

ESR measures the time required for erythrocytes, in a sample of whole blood, to settle to the bottom of a vertical tube.

### Erythrocyte osmotic fragility

Erythrocyte osmotic fragility measures red cell resistance to haemolysis when exposed to a hypotonic solution.

### White blood cell (WBC) (leucocyte) count

WBC count is the measurement of the number of white cells found in a microlitre of whole blood. A differential WBC count determines the distribution and morphology of the various WBCs and provides more information about the immune system than the WBC count.

### Coagulation

Coagulation function is measured by a wide variety of tests, including:

- Platelet count, which measures the number of circulating thrombocytes (platelets)
- Bleeding time, which measures the duration of bleeding after a standardised skin incision, commonly two small punctures made on the forearm
- Capillary fragility test, which measures the ability of capillaries to remain intact under increased intracapillary pressure. A blood pressure cuff is placed around the upper arm and inflated to midway between the systolic and diastolic pressures. After 5 minutes of sustained pressure, the number of petechiae on a selected area of the forearm are counted
- Clot retraction test, which estimates the quantity and quality of thrombocytes and fibrinogen
- Prothrombin time (PT), which measures the time required for a fibrin clot to form in a citrated plasma sample
- Partial thromboplastin time (PTT), which evaluates the entire coagulation system with the exception of Factors VII and XIII
- Factor VIII activity test, which measures the amount of Factor VIII in the blood and identifies a deficiency of that factor (e.g. as in haemophilia).

## Immunoglobulin studies

Immunoglobulin studies evaluate the amount and types of immunoglobulins present.

### Serum ferritin

Serum ferritin measurements evaluate the amount of iron stored in body tissues.

### Total iron-binding capacity (TIBC)

TIBC measures the amount of available transferrin (a protein that binds with iron) in the blood.

### Sickle-cell test

Sickle-cell test detects the presence of haemoglobin S in suspected sickle-cell anaemia.

### Gastric fluid analysis

Gastric fluid analysis involves measuring the acidity of secretions in the stomach and is used in the diagnosis of pernicious anaemia.

### Bone marrow examination

Bone marrow examination provides information about the character, integrity and production of erythrocytes, leucocytes and thrombocytes in the marrow. Bone marrow can be removed by aspiration or needle biopsy. Aspiration of bone marrow involves the removal of a small amount, generally less than 5 mL. Biopsy, performed under local anaesthesia, is done when a larger amount of bone marrow is required. A needle is inserted through the skin and tissue, for example, over the iliac crest, until it reaches bone. The needle is then directed into the marrow cavity, and a sample of bone marrow is withdrawn.

## Assessment of the lymphatic system

Lymphangiography is the radiographic examination of the lymphatic system after the injection of a contrast medium into a lymphatic vessel in each foot. X-ray films are taken to demonstrate the filling of the lymphatic vessels and, 24 hours later, to visualise the lymph nodes. Clinical Interest Box 25.5 outlines additional nursing assessment of oxygenation status.

# NURSING AN INDIVIDUAL WITH A RESPIRATORY AND/OR CARDIAC SYSTEM DISORDER

A holistic approach to nursing care should be delivered to individuals with a respiratory or cardiac system disorder.

### CLINICAL INTEREST BOX 25.5 Nursing assessment—oxygenation status

- Nursing assessment of oxygenation status includes a history, physical examination and review of relevant diagnostic data
- Nursing assessment should include the individual's perception of the therapy and their health values and cultural beliefs.

*(Berman et al 2015)*

Specific nursing actions and medical management will vary depending on the disorder; however, the main aims of nursing care are to:

- Maintain airway patency
- Maintain fluid and nutritional status
- Facilitate normal and effective breathing
- Promote efficient gas exchange
- Promote comfort and relieve pain
- Provide psychological support
- Maintain skin integrity
- Promote and maintain mobility
- Prevent infection
- Administer prescribed medication
- Provide care before, during and after a diagnostic test.

An individual with a respiratory system disorder will commonly experience problems such as a change in breathing pattern and discomfort associated with breathing. Individuals with cardiac disorders may experience multi-system problems associated with circulation, including pain or discomfort with exercise, difficulty breathing, palpitations and fatigue. Nursing activities include alleviating discomforts associated with exercise and breathing, administering oxygen, positioning, monitoring the individual and their vital signs and helping the individual with cardiovascular and breathing exercises. As well as planning care to meet specific needs, nurses must also consider the individual's other needs, such as nutrition, fluid intake, skin integrity, elimination and the need for comfort (deWit & Williams 2014).

## Promoting a clear airway

One of the most important aspects of care is the maintenance or restoration of a clear airway, which includes measures directed at removing secretions. Commonly an inflammatory respiratory tract disorder results in the production of excessive secretions, made more tenacious by dehydration caused by tachypnoea, mouth breathing and pyrexia. The individual may experience difficulty in maintaining a patent airway; some of the following steps may assist them in expectorating secretions.

## Adequate hydration

Dehydration can make secretions more viscous and difficult to expectorate, so an adequate fluid input is important. Unless contraindicated, the individual should be encouraged to drink at least 2–3 L a day. In certain conditions such as cardiac failure fluid may need to be restricted to 1500 mL or less. The nurse should assess fluid balance by measuring fluid input and output and by observing for signs of oedema. Weighing the individual, for example, each day, is another way of assessing their fluid status. If they are unable to tolerate sufficient fluids orally because of dyspnoea, nausea and/or vomiting or the presence of an oxygen mask that can make drinking more difficult, alternative fluids may be administered by the IV route if necessary.

## Maintaining nutritional status

Commonly an individual with a cardiovascular disorder will be prescribed a diet that aims to reduce serum cholesterol and

triglyceride levels. Sodium intake may also be reduced, for example, in the control and prevention of hypertension. If the individual with either a respiratory or a cardiovascular disorder is obese, a weight-reduction diet is generally prescribed. The diet generally should be low in total fat content, particularly saturated fats, and low in sodium. Kilojoules may be reduced to correct or prevent obesity, and alcohol should be restricted, as it can raise kilojoule intake and serum lipid levels. Beverages and foods containing caffeine should be restricted, as caffeine is a metabolic stimulant that can worsen tachycardia, hypoxaemia and arrhythmias.

In specific blood disorders the individual may be prescribed a diet high in one or more nutrients; for example, a diet high in iron is generally prescribed in the treatment of iron-deficiency anaemia. When a specific diet is prescribed the dietitian consults with the individual to plan the diet and to ensure that they understand any dietary modifications or restrictions.

It is important that nurses are aware of the type of diet that has been prescribed and ensure that the individual receives the correct tray at mealtimes. Nurses encourage the individual to follow the diet and may need to assist at mealtimes, for example, if the individual is unable to eat meals independently. (Information on assisting at mealtime is provided in Chapter 30.)

## Cessation of smoking

If the individual is a smoker, they should be encouraged to stop smoking. Cigarette smoke impairs function of the cilia, and smoking generally aggravates any existing respiratory and cardiac disorder (see Case Study 25.2). Research indicates potential benefits of smoking cessation with advice and/or counselling given by nurses (Rice et al 2013).

## Nebulisation and humidification

As well as drinking adequate fluid, additional fluid may be administered directly into the airways by means of humidifiers, inhalations or nebulisers. Nebulisation or humidification reduces the viscosity of secretions, facilitating easy expectoration. Physiotherapy may be used concurrently. (Information on the use of humidifiers and nebulisers is provided later in this chapter.)

### CASE STUDY 25.2

My dad was a heavy smoker—two packets a day. Then he had a pulmonary embolism (PE) which caused him to collapse 4 days after an emergency appendectomy. Dad spent 7 days in intensive care. Smoking was considered a major cause of the PE. This was such a shock to both Dad and the family that he made the decision to give up smoking. While in hospital Dad was commenced on warfarin and told to wear anti-embolic stockings. He has vowed never to smoke a cigarette again.

1. Describe the purpose of wearing the anti-embolic stockings.
2. Why would warfarin be prescribed?

## Positioning

If an individual with a respiratory condition experiences dyspnoea, they should be assisted into a more upright position. This facilitates alveolar expansion, as gravity allows more blood to perfuse the bases of the lung, improving the ventilation/perfusion (V/Q) ratio. Nurses should ensure that sufficient pillows are placed so that the individual's back, neck, head and arms are well supported, or that the head of the bed is elevated.

## Medication

Medications may be prescribed to reduce pain, loosen secretions, relieve bronchospasm, increase cilia beating speed, combat infection, increase or decrease coughing, relieve pulmonary oedema, alter blood pressure and cholesterol levels or correct arrhythmias. Medications may be given by inhalation, orally or by intramuscular or IV routes. The types of medications prescribed may include analgesics, decongestants, antihistamines, antibiotics, bronchodilators or expectorants. Evidence demonstrates that in the management of acute asthma in both adults and children, the outcomes produced when administering beta$_2$-agonists via nebulisation are no better that when administered via a spacer (Cates et al 2013).

## Oronasopharyngeal suction

If coughing is ineffective in removing secretions, suction may be necessary. Oronasopharyngeal suction removes secretions from the pharynx by means of a suction catheter inserted through the mouth or nostril. This technique is used to maintain a patent airway and is indicated for an individual who is unable to clear their airway effectively with coughing and expectoration.

## Chest physiotherapy

Chest physiotherapy assists the individual to mobilise and eliminate secretions, re-expand airways and alveoli and promotes the efficient use of the muscles of ventilation. Chest physiotherapy includes postural drainage, chest percussion and vibration, coughing and deep-breathing exercises.

### Postural drainage

Postural drainage (Figure 25.22) encourages pulmonary secretions to empty by gravity into the bronchioles, bronchi or trachea, so that they may be expectorated (Potter et al 2013). The individual with a respiratory disorder is assisted to assume positions that promote drainage from the affected parts of the lungs. Effectiveness of the technique largely depends on positioning that allows drainage by gravity. Postural drainage should be avoided immediately before or after meals, to prevent nausea and aspiration of food or vomitus (Potter et al 2013).

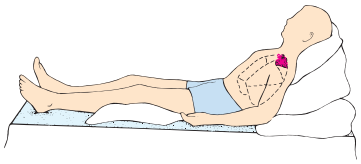
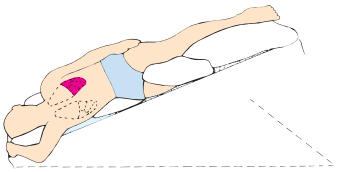
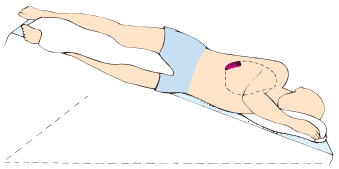
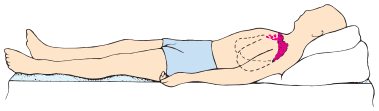
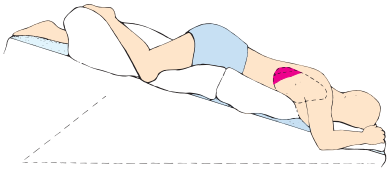
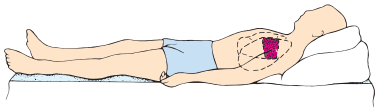
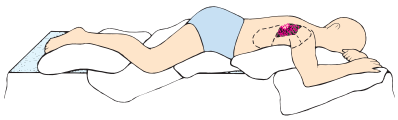
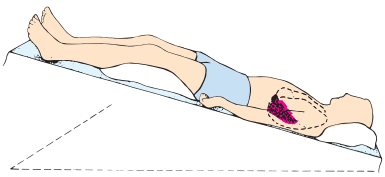
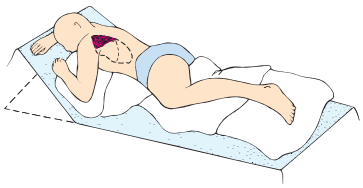
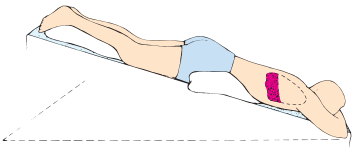
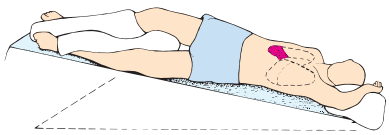
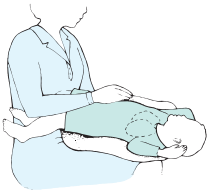
| LUNG SEGMENT | POSITION OF PATIENT | LUNG SEGMENT | POSITION OF PATIENT |
|---|---|---|---|
| **Adult** | | | |
| Bilateral  | High-Fowler's | Left lower lobe—lateral segment  | Right side-lying in Trendelenburg's position |
| Apical segments | Sitting on side of bed | Right lower lobe—lateral segment  | Left side-lying in Trendelenburg's position |
| Right upper lobe—anterior segment  | Supine with head elevated | Right lower lobe—posterior segment  | Prone with right side of chest elevated in Trendelenburg's position |
| Left upper lobe—anterior segment  | Supine with head elevated | Right middle lobe—posterior segment | Prone with thorax and abdomen elevated |
| Right upper lobe—posterior segment  | Side-lying with right side of chest elevated on pillows | Both lower lobes—anterior segments  | Supine in Trendelenburg's position |
| Left upper lobe—posterior segment  | Side-lying with left side of chest elevated on pillows | Both lower lobes—posterior segments  | Prone in Trendelenburg's position |
| Right middle lobe—anterior segment  | Three-fourths supine position with dependent lung in Trendelenburg's position | | |
| **Child** | | | |
| Bilateral—apical segments | Sitting on nurse's lap, leaning slightly forwards flexed over pillow | Bilateral lobes—anterior segments  | Lying supine on nurse's lap, back supported with pillow |
| Bilateral—middle anterior segments | Sitting on nurse's lap, leaning against nurse | | |

**Figure 25.22** Postural drainage

*(Potter et al 2013)*

### Percussion and vibration

Percussion and vibration are employed to help loosen respiratory secretions and are commonly used in conjunction with postural drainage. Percussion is performed by rhythmic tapping using cupped hands over the affected segments of the lungs. Care should be afforded to individuals with osteoporosis, fractures or recent surgery. Vibration is performed by placing the hands over the affected area and shaking, so that the chest wall is vibrated while the individual is forcibly exhaling. To ensure sufficient force is being used the individual can be asked to vocalise and a vocal fremitus should be heard.

After postural drainage, percussion and vibration, the individual should be asked to cough to remove the loosened secretions. This is performed by a physiotherapist or allied health assistant. Oral hygiene should be attended to after the procedure because the expectorated secretions may have an offensive taste or odour.

## Promoting comfort and relieving pain

In many disorders of the circulatory system the aim is to increase the individual's activity progressively without pain. Comfort is promoted if the individual is provided with a bed made to meet their specific needs.

The individual may experience pain, for example, as a result of myocardial infarction or peripheral vascular dysfunction, so relief of pain is an important aspect in the promotion of comfort. In certain respiratory conditions such as pleurisy, severe pain may increase on inspiration. The presence of indwelling tubes, wires or cannulas all contribute to further discomfort. Pain-relieving measures such as the administration of adequate analgesic medication are implemented so that the individual is able to rest comfortably, sleep without discomfort and perform the activities of daily living without experiencing pain or significant side effects of the medication. The individual is also advised on what precautions to take to avoid pain, which includes identifying any precipitating factors such as physical exertion or emotional stress. The incidence of pain can generally be reduced by careful planning of activity, modifying risk factors and use of prophylactic measures.

## Providing psychological support

Anxiety and fear are common responses to hospitalisation. An individual who is experiencing a major respiratory or cardio-vascular dysfunction, such as myocardial infarction, pneumonia or blood dyscrasias, often becomes extremely anxious, apprehensive and depressed about dyspnoea, pain, disability, loss of independence and dying. The individual and their significant others may experience great concern about the alterations in lifestyle imposed by their disorder. Nurses provide psychological support by establishing and maintaining a trusting relationship with the individual and their significant others and by encouraging them to express their feelings and concerns. They should be encouraged to discuss any lifestyle adjustments that may be necessary and they should be offered guidance on how to cope with change.

Stress and anxiety can be reduced if the individual's symptoms, such as pain or dyspnoea, are alleviated, and the nurse should try to provide an environment that is as stress-free as possible. The individual should be provided with sufficient information about their illness, as knowledge helps to diminish anxiety and apprehension and assists them to develop effective coping skills. All procedures, treatments and monitoring techniques being implemented are explained so that the individual understands the treatment. The individual should be encouraged to participate in their care as much as possible and, when appropriate, to gradually assume responsibility for self-care to prevent loss of independence. The individual should be informed about support groups and community resources such as rehabilitation classes, which may be helpful after they are discharged from hospital.

## Maintaining skin integrity

An individual with a respiratory, cardiac, peripheral vascular, blood or lymphatic disorder is at risk of impaired skin integrity. Decreased peripheral perfusion and oxygenation can result in skin breakdown. With poor arterial circulation the tissues lack adequate oxygen and nutrients and this can lead to cellulitis, ulcers, poor wound healing and necrosis. Maintenance of skin integrity includes:

- Assessing the skin for any signs of breakdown
- Keeping the skin clean and dry
- Protecting the extremities from exposure to extremes of temperature and from trauma
- Position changes to avoid prolonged pressure on the skin
- The use of accessories (e.g. a sheepskin) to reduce pressure, and promoting mobility.

Preventing skin breakdown includes keeping the feet clean and dry, avoiding rough drying movements, using creams or lotions that prevent drying and cracking, avoiding scratching itchy areas on the legs or feet, providing nail care by a podiatrist and protecting the feet with socks, slippers or well-fitting shoes.

## Promoting and maintaining mobility

Maintenance of mobility is necessary to prevent the complications of immobility, such as decubitus ulcers, venous stasis and pulmonary complications. Problems of immobility should be counteracted with position changes, range-of-motion (ROM) exercises and coughing and deep-breathing exercises. Ambulation of the individual as soon as possible is important to prevent the complications of immobility.

In the initial stages of illness, such as immediately after myocardial infarction, the individual's level of activity may be reduced to a minimum. As their tolerance increases, their level of physical activity gradually increases. The individual should understand the importance of adequate physical exercise, which provides the necessary muscle contraction for movement of arterial blood and lymph to and from the peripheral areas of the body. Exercise or activity programs are generally implemented gradually, and the individual is encouraged to rest after the exercise periods. As the individual's condition

improves, moderate exercise is encouraged as long as pain is not induced.

## Preventing infection

An individual with any of the disorders mentioned previously may be susceptible to infection as a result of nosocomial infections, altered nutritional status, medications such as steroids, invasive procedures and changes in immune status. Measures to prevent infection must be implemented, such as good handwashing techniques, and aseptic techniques for any procedure. Precautions must be taken to prevent damage to the skin or mucous membranes, as injured tissues create a portal for bacterial invasion. If the individual's WBC count is low (leucopenia), it may be necessary to use protective isolation techniques to protect them against infection. The individual must be monitored closely to detect the early manifestations of infection so that appropriate treatment can be prescribed.

## Promoting effective breathing and aeration

In addition to the measures employed to promote a clear airway, other measures may be necessary to maintain adequate ventilation. Breathing exercises may be used by the individual to promote and maintain optimal pulmonary ventilation, and oxygen may be prescribed to supplement that being obtained from the atmosphere.

### Breathing exercises

When respiratory system disorders produce ineffective breathing patterns and inadequate ventilation, the individual may be educated to perform deep-breathing exercises or airway clearance techniques (Osadnik et al 2012).

***Deep breathing*** Deep, or diaphragmatic, breathing uses the diaphragm and abdominal muscles to fully ventilate the lungs. The individual should be assisted into a sitting position to promote optimal alveolar expansion. One hand is placed on the chest and the other hand is placed on the abdomen. If the individual is breathing correctly the hand on the abdomen should rise with inhalation and fall with exhalation; the hand on the chest should remain still. The individual is educated to inhale deeply and slowly, pushing the abdomen out, to promote optimal distribution of air to the alveoli. Individuals may also be educated to exhale through pursed lips, while contracting their abdomen. Exhalation through pursed lips improves ventilation pressures and encourages a slow deep-breathing pattern. Abdominal contraction pushes the diaphragm upwards, exerts pressure on the lungs and helps to empty them.

Breathing exercises are performed according to the individual's condition; for example, short sessions may be indicated if the individual becomes fatigued easily. The duration and frequency with which deep-breathing exercises are performed vary; they may, for example, be performed for 1 minute, with gradual progression to a 10-minute exercise period four times daily.

**Figure 25.23** Spirometry
*(Potter et al 2013)*

***Incentive spirometry/peak flow*** Incentive spirometry (Figure 25.23) uses a breathing device to encourage the individual to achieve maximal ventilation. The device measures peak respiratory flow or respiratory volume, and induces the individual to take a deep breath and hold it for several seconds. Incentive spirometry benefits the individual, as it establishes alveolar hyperinflation for a longer time than is possible with a normal deep breath (Rodman 2014). See Clinical Skill 25.3 for incentive spirometry/peak flow.

### Oxygen therapy

An individual with a respiratory system disorder may be prescribed supplemental oxygen to be administered intermittently or continuously. The administration of oxygen is discussed in more detail later in this chapter.

## Promoting efficient gas exchange

Any disorder of the respiratory system may result in impaired gas exchange. Depending on the extent to which it interferes with ventilation and perfusion, hypercapnia, hypocapnia and/or hypoxaemia may develop. The aim of management of these conditions is to maintain adequate oxygenation and removal of carbon dioxide. In addition to the measures already described, which promote a clear airway and effective breathing, other measures may be necessary, including the insertion of an artificial airway and/or mechanical ventilation. (Information on both these topics is provided later in this chapter.) The nurse must observe the individual for the signs and symptoms of impaired gas exchange (see Table 25.4). Clinical Interest Box 25.6 outlines the cardiopulmonary health promotion for young to older adults.

## CLINICAL SKILL 25.3 Incentive spirometry

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Incentive spirometer<br>Disposable mouthpiece/tube |

| **Skill activity** | **Rationale** |
|---|---|
| Check medical order and reason for incentive spirometry | Ensures indication established for safe intervention and abides by legal and organisation policies and procedures |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Sit individual into an upright position (if able) and lean forwards either on side of the bed or in a chair | Facilitates breathing and lung expansion |
| Instruct the individual to practise inhaling and exhaling 3 times, letting all of their last breath out<br>Ask them to place their lips over the mouthpiece of the spirometer | Enables the person to practise inhaling and exhaling<br>Allows for more accurate results |
| Instruct the individual to inhale slowly (elevating the balls or cylinder) and hold their breath for 2–3 seconds, then exhale slowly | Slow breathing prevents or minimises pain from sudden pressure change in the chest<br>Holding their breath and slowing exhalation helps to maintain maximal inspiration and reduces the risk of progressive collapse of individual alveoli<br>Prevents anxiety |
| Ask the person to remove the mouthpiece, and relax and breathe slowly for a few seconds | Alleviates anxiety and relaxes chest |
| Repeat for a total of 10 times every hour or as indicated by the doctor/physiotherapist<br>If they feel lightheaded or dizzy ask the individual to slow down their breathing and wait longer intervals between cycles<br>Once 10 cycles have been completed ask the individual to cough up and expectorate any sputum<br>Document the results in the healthcare record and report any changes | Allows for chest clearance and proper expansion of the lungs and prevents atelectasis. Coughing can facilitate removal of any secretions<br>Feeling lightheaded and dizzy is a normal reaction; provide reassurance to alleviate anxiety<br>Prevents infection<br>Appropriate care can be planned and implemented |

*(Crisp et al 2013; Rodman 2014; Sydney Cancer Centre: Sydney Gynaecological Oncology Group 2014; ACSQHC 2012; 2015; Sparkes et al 2014)*

**TABLE 25.4 | Impaired gas exchange**

| Condition | Possible cause | Manifestations |
|---|---|---|
| Respiratory acidosis (hypercapnia) | Hypoventilation as a result of chronic obstructive pulmonary disease, pneumonia, drugs or trauma | Flushed warm skin, hypertension, tachycardia, headaches, drowsiness, confusion, irritability, coma |
| Respiratory alkalosis (hypocapnia) | Hyperventilation as a result of acute asthma, cerebral trauma or congestive cardiac failure | Diaphoresis, pallor, tachypnoea, tingling and numbness in the limbs, or around the mouth, carpopedal spasm (tetany) and convulsions |
| Hypoxia | Obstructive lung diseases, and restrictive lung diseases (e.g. chronic bronchitis, emphysema, sarcoidosis) | Pallor or cyanosis, tachypnoea, tachycardia, breathlessness, headaches, irritability, confusion |

**CLINICAL INTEREST BOX 25.6**
**Cardiopulmonary health promotion for young to older adults**

- Maintain ideal body weight
- Eat a low-fat, low-salt, kilojoule-appropriate diet
- Monitor cholesterol and triglyceride levels
- Engage in regular aerobic exercise
- Use stress-reduction techniques
- Be smoke free
- Avoid second-hand smoke and other pollutants
- Use a filter mask when exposed to occupational hazards
- Monitor blood pressure
- Get an annual influenza vaccine if at risk of developing influenza
- Get a pneumococcal vaccine if appropriate
- Reduce exposure to secondary infections

*(Nascimento et al 2014)*

## Specific interventions

Specific nursing interventions relevant to caring for an individual with a respiratory system disorder include:

- Collecting specimens of sputum
- Obtaining nasal or throat swabs
- Administering oxygen
- Suction via the oral, nasal or tracheal routes
- Inhalation therapy.

### Collecting sputum

Sputum is a mucus secretion produced by the mucous membranes that line the respiratory tract. Mucus secretion increases in response to inflammation, infection or congestion. Laboratory examination of sputum may be necessary to determine whether any microorganisms, blood or malignant cells are present. The nurse should observe the sputum, noting the amount, consistency, colour and presence of blood or odour. Sputum is normally clear in colour but may turn white if the individual smokes or has a viral infection; yellow, rust-coloured or green to dark-brown sputum may indicate the presence of an infection. It may be tinged with blood or contain streaks of blood that can suggest inflammations, dryness or infections or conditions such as pulmonary oedema or carcinoma. The consistency varies from watery to mucoid to tenacious.

When a specimen of sputum is required it is best collected early in the morning before any food or fluid is given, as this ensures that there is an accumulation of secretions to be obtained. To avoid the risk of cross-infection with airborne microorganisms the nurse should stand beside rather than in front of an individual when collecting the sputum specimen. Sputum for laboratory testing should be free of saliva and food particles (see Clinical Skill 25.4 for collection of sputum).

### Nasopharyngeal and throat swabs

Laboratory examination of secretions from the nasopharynx or throat may be necessary to determine the presence of pathogenic microorganisms. Collection of a specimen involves swabbing the inflamed tissues and collecting any exudate with a sterile cotton-wool-tipped swab. The nurse should refer to the healthcare institution's policy manual for information about the type of applicator, culture tube and transport medium to use (see Clinical Skill 25.5 for collecting a nasopharyngeal swab).

### Oronasopharyngeal suction

Oronasopharyngeal suction may be required when secretions or foreign substances are causing an obstruction to the individual's airway. Suction is indicated for the individual who is unable to clear the airway effectively with coughing and expectoration, such as the severely debilitated or unconscious individual. The removal of excess secretions and mucus from the airway aids breathing, promotes pulmonary gas exchange and prevents the accumulation of secretions that may cause secondary atelectasis or pneumonia. Suctioning is achieved by means of a catheter, which is introduced through the mouth or nose into the pharynx.

The basic equipment consists of:

- Wall suction or portable suction apparatus
- Collection bottle
- Connecting tubing
- Water suitable for flushing the catheter and tubing in a small container
- Sterile suction catheters

## CLINICAL SKILL 25.4 Collection of sputum

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Disposable gloves<br>Sterile specimen container<br>Tissues<br>Biohazard bag<br>Pathology form—completed by the medical officer<br>Mouth care equipment |
| **Skill activity** | **Rationale** |
| Check the medical officer's orders<br>Check the pathology form ensuring that it is completed and verify details with the individual | Ensures need for the procedure and prevents errors |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Perform hand hygiene and don gloves (other PPE may also be required) | Prevents cross-infection |
| Assist the person to a sitting position<br>Offer mouth care/rinse out the mouth with water<br>Ask the person to start deep breathing and coughing to help facilitate sputum expectoration | Reduces contamination of the specimen with any debris in the mouth<br>Facilitates coughing and expectoration<br>A normal saline nebuliser (if ordered) may be required to help loosen sputum and facilitate expectoration |
| Instruct the person to cough and to expectorate 15 to 30 mL of sputum into a sterile specimen container | A sterile container ensures that the specimen is not contaminated |
| Place the lid on the container, wipe the outside of the container if contaminated, remove gloves/PPE and perform hand hygiene | Prevents cross-infection |
| Ensure that the container is clearly labelled with the relevant information. Dispatch the specimen in a sealed biohazard bag, together with the request form, to the laboratory as soon as possible | Proliferation of microorganisms occurs if the specimen is not dispatched as soon as possible after collection<br>Ensures the correct person's sputum is tested to avoid errors |
| Offer/perform oral hygiene using a mouth swab and/or mouth rinse<br>Document in the individual's healthcare record. Include the amount, colour, consistency, any odour<br>Report findings to Registered Nurse and medical officer | Reduces bad taste or halitosis in mouth<br>Clears the mouth of residual secretions<br>Informs others of which specimen was obtained and when<br>Medico-legal requirement. Allows for the planning and implementation of care |

*(Sparkes et al 2014)*

- Protective glasses
- Disposable gloves
- Tongue depressor.

Suction equipment is usually kept in readiness at the bedside if there is an indication that it may be needed frequently, as an emergency measure or as part of the healthcare institution's policies. In general the pressure is set at 80–120 mmHg for an adult (and considerably lower for a child), depending on the diameter of the catheter and the viscosity of the secretions. The medical officer will prescribe the level of suction to be used. If using the nasal route, suctioning should be alternated between the left and right

## CLINICAL SKILL 25.5 Collecting a nasopharyngeal (nasal) or nasalpharynx (throat) swab

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Disposable gloves<br>Pathology form completed by medical officer<br>Tissues<br>Biohazard bag<br>Normal saline<br>Penlite torch<br>Tongue depressor<br>Throat swab |

| **Skill activity** | **Rationale** |
|---|---|
| Check the medical officer's orders<br>Check the pathology form ensuring that it is completed and verify details with the individual | Ensures need for the procedure and prevents errors |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, gather the necessary equipment<br>Ensure therapeutic interaction<br>Inform the individual that they may experience the urge to sneeze or gag during the swabbing. Label the container appropriately<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Assist the person, if possible, to a sitting position | Facilitates collection of the specimen |
| Perform hand hygiene and don gloves/PPE | Prevents cross-infection |
| **For a nasopharyngeal (nose) swab**<br>Request the person to blow their nose<br>If the nasal passage is dry, dip the tip of the swab into the normal saline<br>Request the individual to tilt their head back<br>Insert the swab 2 cm into each nostril, rotating against the anterior nasal mucosa | Clears the nasal passages<br>Prevents trauma<br>Normal saline prevents degradation of viruses or bacteria<br>Facilitates collection of the specimen |
| **For a swab of the nasopharynx (throat)**<br>Request the individual to open their mouth, depress the tongue with a tongue depressor and use a torch to illuminate the throat<br>If the throat is dry dip the tip of the swab into normal saline<br>Ask the person to say 'ah'. Pass the swab over the tonsils, posterior pharyngeal wall and posterior edge of the soft palate | Gentle insertion prevents tissue damage<br>Do not force the swab<br>Facilitates access and visualisation<br>Prevents trauma and facilitates the collection of microorganisms<br>Normal saline prevents degradation of viruses or bacteria<br>Raises the uvula to expose proper site of collection |
| Place the swab in the culture tube/container ensuring the correct medium (viral or bacterial) immediately and close the end of the tube/container<br>Remove and dispose of gloves/PPE and perform hand hygiene | Prevents cross-infection and contamination of the specimen<br>Ensures the correct test is performed to obtain an accurate result |
| Dispatch the specimen in a sealed biohazard bag, together with the request form, to the laboratory as soon as possible. Ensure that the container is clearly labelled with the relevant information<br>Document in the individual's healthcare record and report any findings to the Registered Nurse/medical officer | Proliferation of microorganisms occurs if the specimen is not dispatched and refrigerated as soon as possible after collection<br>Informs others of which specimen was obtained and when<br>Medico-legal requirement. Allows for the planning and implementation of care |

*(ACSQHC 2012; 2015; Sparkes et al 2014)*

nostrils to reduce trauma to the one nostril. It may also be necessary to lubricate the tip of the catheter with a sterile water-soluble lubricant before insertion into the nostril. (See Clinical Interest Box 25.7 and Clinical Skill 25.6.)

## Inhalation therapy

Various forms of inhalation therapy may be prescribed for an individual with a respiratory disorder, including humidified air or oxygen, and nebulised air or oxygen. These can be administered by aerosol devices, electric nebulisers and humidifiers or an intermittent positive-pressure ventilator.

***Electrical humidifiers and nebulisers*** Water vapour may be provided by means of a humidity cot, tent or via a mask or tube attached to the individual. Various electrical devices can provide both humidification and nebulisation, depending on the fitting used. The device has water fed by a sterile container to an electrically warmed core that heats up the fluid contained in it as it passes through a chamber. The warmed water vapour is delivered to the individual via large-bore corrugated tubing and the oxygen concentration can be regulated from room air to 100% oxygen by means of an oxygen venturi-type diluter. The individual inhales the vapour through a nebuliser-type mask.

Nebulisation provides a very visible mist of large water droplets that are delivered into the airways. Nebulisation is used to treat atelectasis and airway infections and to loosen and decrease the viscosity of secretions to facilitate

### CLINICAL INTEREST BOX 25.7 Suctioning and older adults

Older adults often have cardiac and/or pulmonary disease, which increases their susceptibility to hypoxaemia related to suctioning. Watch closely for signs of hypoxaemia. If observed, stop suctioning and hyperoxygenate.

*(Perry et al 2012)*

### CLINICAL SKILL 25.6 Oronasopharyngeal suction

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Suction catheter<br>Suction apparatus<br>Suction tubing<br>Yankauer suction catheter<br>Disposable gloves<br>Oronasopharyngeal tube<br>Sterile water and infectious waste bag<br>Waterproof pad<br>Goggles or face shield (if appropriate) |
| **Skill activity** | **Rationale** |
| Check the medical officer's orders | Ensures need for the procedure and prevents errors |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Perform an assessment of the individual ensuring their vital signs are stable and their oxygen saturations are adequate to allow for the suctioning<br>If possible, position the individual in a sitting position or with the neck extended<br>Place a waterproof pad across individual's chest<br>Remove oxygen mask or nasal cannulae if in situ | Ensures the individual is stable so as to prevent complications<br>A burst of oxygen or normal saline nebuliser may be required prior (if ordered) to help loosen secretions and allow for better clearance of mucus during suctioning<br>Promotes lung expansion and effective coughing. Facilitates catheter insertion<br>Note: If suctioning required due to a mucus plug this will facilitate better oxygen saturations |

*Continued*

| CLINICAL SKILL 25.6 Oronasopharyngeal suction—cont'd | |
|---|---|
| Place the equipment in a convenient location near the bedside. Assemble the required equipment | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |
| Perform hand hygiene and don gloves. Other PPE may also be required | Prevents cross-infection |
| Attach collection bottle to the suction unit, attach connecting tubing, connector and catheter | Equipment must be assembled and checked for function before the procedure starts |
| Turn on the suction and dip the tip of the catheter into sterile water | Lubricates the catheter to facilitate insertion<br>Prevents the introduction of microorganisms |
| With the suction off (e.g. by using the Y-connector), gently introduce the catheter into the mouth or nostril. If the oral route is used, the individual's tongue may be depressed with a tongue depressor | Suction during insertion may damage the mucosa. Facilitates insertion of the suction catheter<br>Do not put the catheter into the nose and then the mouth, ensure it is cleaned between suctions |
| Ensure that suction pressure is below 120 mmHg. Apply suction as the catheter is withdrawn, rotating the catheter as it is being withdrawn | Pressure above 120 mmHg may damage the mucosa. Rotating motion prevents tissue trauma and obtains maximal volume of secretions<br>Note: Do not force the catheter into the nasal cavity as this can cause trauma<br>When suctioning neonates, infants or children ensure correct measurement is obtained of their nasal cavity to ensure the catheter is not inserted too far, which may cause irreversible damage |
| Apply suction for a maximum of 5–10 second intervals, or less in the young or critically unwell individual, then remove from the airway. Allow the individual time to rest (30 seconds) between suctioning | Suctioning for longer than 10 seconds can cause tissue trauma and hypoxia<br>Allows the individual time to rest and replace oxygen until the next suction |
| If secretions are tenacious, dip the tip of the catheter into the sterile water and apply suction. If a specimen is required for virology or bacterial studies, use of normal saline is recommended | Clears the lumen of catheter<br>Normal saline prevents degradation of viruses or bacteria |
| Repeat the procedure, if necessary, until the mucus obstruction has been removed | Promotes a clear airway |
| After suctioning, instruct the individual (if able) to take several slow deep breaths | Relieves hypoxia and promotes relaxation<br>Facilitates coughing |
| Dip the catheter into the sterile water and apply suction | Clears catheter and connecting tubing<br>Prevents the reintroduction of microorganisms and contamination |
| Discard the catheter, sterile water and gloves. Attend to the rest of the equipment. Perform hand hygiene | Prevents cross-infection |
| Assist the individual into a position of comfort<br>Ask the individual to report any complications during and post procedure if able | Promotes rest and relaxation, monitors for adverse effects |
| Document the time of suctioning, the type and amount of aspirate and the individual's response<br>Report the procedure and any abnormal findings to Registered Nurse/medical officer | Appropriate care can be planned and implemented |
| *(ACSQHC 2012; 2015; Rebeiro et al 2013; Sparkes et al 2014)* | |

expectoration. It can be delivered through a mask or tracheotomy tube. Humidification provides water vapour in an almost invisible fine mist of small droplets that can travel further into the airways than by nebulisation by virtue of the droplet size and weight. Humidification is used to provide humidity to prevent stasis of mucus, tissue dehydration and to reduce drying, inflammation and irritation of the air passages. These devices provide precise control of oxygen delivery and protection against cross-contamination by means of a sterile pre-filled container of solution, such as sterile water or normal saline.

Other similar devices are used in positive-pressure ventilators, such as Bird or Bennet ventilators, to deliver humidity or medication to an individual on a ventilator or during intermittent positive-pressure breathing therapy. Nurses should know their role and responsibilities regarding inhalation therapy and administration of medications, and should be familiar with the healthcare facility's infection control guidelines. The nurse should check the devices hourly for leaks, cracks and oxygen concentration. Bedding and clothing are changed as soon as they become damp. Care should also be taken to observe the skin surrounding the mask for signs of breakdown.

Mechanical and electrical nebulisers are used to deliver moisture or medication as a fine mist into the airways of individuals with conditions such as asthma or emphysema. Bronchodilators are commonly prescribed in the management of asthma. The devices operate off mains or 12-volt power and are generally used by individuals at home, commonly in individuals with airways disease due to the hypoxic drive effect. Care must be taken to ensure that the device is placed on a stable surface, and regular maintenance of the filters is required.

Gas-driven nebulisers are used with compressed air or oxygen to deliver nebulised vapour or medication. The prescribed solution is inserted into the nebuliser, either alone or together with a prescribed amount of sterile water or saline, and one end of the oxygen tubing is attached to the nebuliser, which is directly connected to a nebuliser mask. The other end of the tubing is attached to an oxygen regulator and then to the pressurised gas source, which is turned on to check for proper misting. To produce particles of the correct size and to better ensure their arrival at the most distal airways, a flow rate of 6–10 L/min is generally recommended. The individual is instructed to breathe deeply, slowly and evenly through the mouthpiece or mask and to hold their breath for 2–3 seconds at the end of inhalation to receive the full benefit of the medication. The individual should be encouraged to cough and expectorate.

Steam inhalations are not generally used because of the risk of burns and the improved effectiveness in providing fluids by other means.

***Mechanical ventilation*** Mechanical ventilation is sometimes indicated for an individual with a respiratory system disorder. Mechanical ventilation artificially assists or controls respiration and it is indicated to correct or prevent gas transport abnormalities. To maintain adequate pulmonary blood gas exchange, an endotracheal or tracheostomy tube is inserted (see below) and connected to the ventilator.

A variety of ventilators are available, which may be one of two main types: pressure controlled or volume controlled. With the pressure-controlled ventilator the gas is delivered to the lungs until a predetermined pressure is reached, then inspiration is terminated. With a volume-controlled ventilator a set volume of gas is delivered with each inspiration. The ventilation rate may be preset, controlled by the individual, or may be a combination of both.

Care of an individual receiving mechanical ventilation should be provided by nursing staff who are qualified and experienced to provide it. An individual who requires mechanical ventilation is generally nursed in an ICU, as they require constant physical attention and emotional support.

## THE INDIVIDUAL WITH AN ARTIFICIAL AIRWAY

The placement of an artificial airway is indicated to relieve obstruction, to facilitate suctioning of the lower respiratory tract, to prevent aspiration or to allow for mechanical ventilation. Artificial airways include the oropharyngeal airway, the endotracheal tube and the tracheostomy tube.

### Oropharyngeal airway

An oropharyngeal airway (Figure 25.24) is a curved rubber or plastic device inserted into the mouth to the posterior pharynx to establish or maintain a patent airway (Potter et al 2013). The airway allows air to pass around and through the tube and facilitates oropharyngeal suctioning. It is used for the short term only, such as in the immediate post-anaesthetic period. If an individual requires respiratory assistance for a longer period, an endotracheal or tracheostomy tube is generally used.

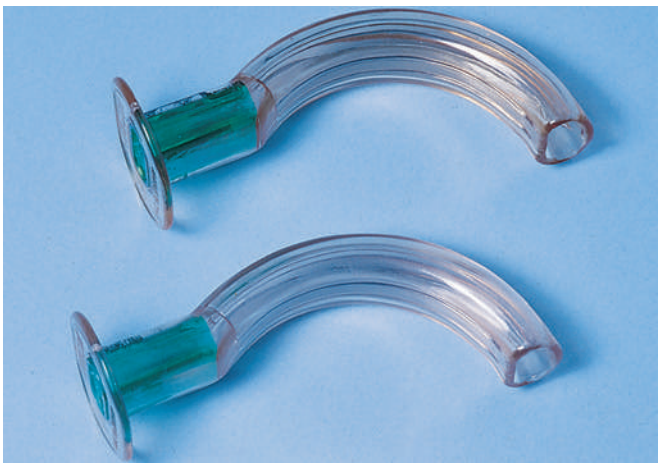


**Figure 25.24** Oropharyngeal airway
*(Potter et al 2013)*

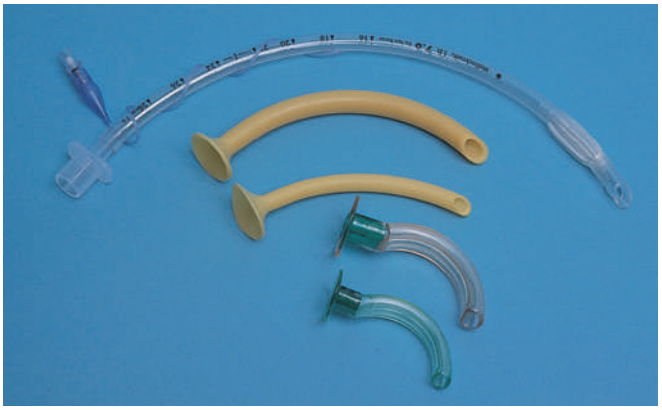


**Figure 25.25** Endotracheal tube (top) compared with nasal and oropharyngeal tubes
*(deWit & Williams 2014)*

**Figure 25.26** Tracheostomy tube
*(Potter et al 2013)*

## Endotracheal tube

An endotracheal tube is a flexible cuffed tube inserted via the mouth or nostril through the larynx into the trachea (Figure 25.25). Endotracheal intubation establishes and maintains a patent airway, prevents aspiration by sealing the trachea off from the digestive tract, facilitates the removal of tracheobronchial secretions and provides a means whereby optimal ventilation can be achieved. Endotracheal intubation may be required in an emergency or may be required for a short or long term.

The tube is inserted by a medical officer, who uses a laryngoscope to visualise the trachea and facilitate the passage of the tube. Most endotracheal tubes in adults have a cuff, which is inflated with air to provide a seal that prevents the leakage of air around the tube when the individual is ventilated. Uncuffed tubes are generally used in infants and children unless there is excessive leakage of air past the tube. To avoid inadvertent removal or displacement of the tube, string and tape may be applied to secure the tube in position. Continuous expert care is required after endotracheal intubation to ensure airway patency and to prevent complications (Pedersen et al 2009). An individual who has been intubated is generally nursed in an ICU and receives constant physical attention and emotional support.

## Tracheostomy

A tracheostomy (Figure 25.26) is a surgical creation of an external opening into the trachea, and may be performed as an emergency temporary measure, a permanent measure or during prolonged mechanical ventilation (Andriolo et al 2015). A tracheostomy tube may be inserted into the tracheostomy to provide a patent airway, prevent aspiration of secretions, allow removal of tracheobronchial secretions by suction and permit the use of a mechanical ventilation device (Dawson 2014). A tracheostomy tube is a short curved tube fitted with a flange that assists in stabilising the tube. Tracheostomy tubes are available in a range of styles, materials and sizes, and some are fitted with an inflatable cuff (Dawson 2014).

# NURSING AN INDIVIDUAL WITH AN ARTIFICIAL AIRWAY

The care of an individual with an artificial airway—whether it has been inserted for a short or long term—involves many physical actions and the provision of emotional support. The main aspects of care include:

- Continued assessment of airway status
- Maintenance of correct cuff pressure to prevent tissue ischaemia and necrosis
- Continued monitoring for complications
- Keeping the tube free of mucus to ensure airway patency
- Preventing infection
- Providing psychological support.

## Nursing a person with a tracheostomy

When caring for a person with a tracheostomy Dawson (2014) describes 12 essential principles of care:

1. Infection control
2. Humidification
3. Cuff management
4. Suctioning
5. Management of the inner cannula
6. Dressings
7. Oral hygiene
8. Communication
9. Swallowing
10. Weaning
11. Decannulation
12. Tube changes.

In the event of an emergency including accidental dislodgement or obstruction of the tube the following should always be available at the bedside (Joanna Briggs Institute 2013):

- Spare sterile tracheostomy tube or inner tube
- Tracheal dilator
- Scissors
- Syringe for a cuffed tube
- Oxygen and sterile 'Y' suction catheters.

A person with an artificial airway will be apprehensive about asphyxiation or choking, which can be further increased by an impaired ability to communicate their needs to others. The individual's ability to effectively remove secretions by coughing may be grossly impaired. When unable to cough or expectorate secretions, suctioning must be performed. In the first few days after the insertion of a tracheostomy tube the procedure is uncomfortable and frightening, and the individual must be provided with an explanation of the suctioning technique before it is performed. The nurse should be aware of their role in, and the regulations and the healthcare facilities, procedures and policies regarding, tracheostomy suctioning. A suggested method of tracheostomy suctioning is outlined in Clinical Skill 25.7.

The basic equipment for tracheostomy suctioning is:

- Sterile 'Y' suction catheters
- Wall or portable suction apparatus

## CLINICAL SKILL 25.7 Tracheostomy suctioning and tracheal stoma care

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator.<br>**Tracheostomy suctioning and tracheal stoma care is an advanced skill for an Enrolled Nurse.** | Sterile gloves, disposable gloves, plastic apron, protective eyewear, waterproof pad, sterile dressing pack, sterile gauze squares, sterile cotton tip applicators, normal saline, clean tapes cut to the correct length, suction apparatus, suction catheter, sterile water, Swedish nose or equivalent humidification filter and inner tube |
| **Skill activity** | **Rationale** |
| **Tracheostomy suctioning** | |
| Check the medical officer's orders | Ensures need for the procedure and prevents errors |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Perform an assessment of the individual ensuring their vital signs are stable and their oxygen saturations are adequate to allow for the suctioning<br>Explain the procedure and provide privacy. The individual should be informed that suctioning may cause transient coughing or gagging | Ensures the individual is stable so as to prevent complications<br>A burst of oxygen or normal saline nebuliser may be required prior (if ordered) to help loosen secretions and allow for better clearance of mucus during suctioning<br>Reduces anxiety and embarrassment<br>Ensures consent and cooperation for the procedure<br>Note: If suctioning required due to a mucus plug this will facilitate better oxygen saturations |
| Place the equipment in a convenient location near the bedside. Open procedure pack using corners. Assemble the required equipment, using aseptic technique. Drop sterile equipment into sterile field<br>If possible, position the individual in a sitting position or with the head hyperextended<br>Place a waterproof pad across individual's chest | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed<br>Prevents contamination of sterile items<br>Reduces stimulation of gag reflex, assists secretion drainage<br>Reduces transmission of microorganisms |

*Continued*

| CLINICAL SKILL 25.7 Tracheostomy suctioning and tracheal stoma care—cont'd | |
|---|---|
| Remove any humidification (or ventilation) device (i.e. Swedish nose)<br>Inner tube may also need to be removed and cleaned prior to suctioning | Allows access to the tracheostomy tube<br>Prevents a mucus plug from forming and allows for proper removal of secretions |
| Perform hand hygiene and don gloves/PPE | Prevents cross-infection |
| Attach the catheter to the suction tubing and set suction pressure to 80–120 mmHg<br>Catheter size must be smaller than the diameter of the tracheostomy/inner tube | Pressure above 120 mmHg may damage the tracheal mucosa<br>Prevents obstruction of airway |
| Ask the individual to cough and breathe slowly and deeply | Coughing helps loosen secretions, and deep breathing helps to minimise hypoxia |
| If necessary, or prescribed, the individual's lungs are hyper-oxygenated before aspiration | Helps to prevent hypoxia |
| Insert the catheter without suction into the tracheostomy tube just past the correct length of the tracheostomy tube | Prevents hypoxia and tracheal mucosa trauma<br>Suctioning to the xiphoid process can cause trauma and permanent damage to the cartilage, especially in neonates, infants and children; also prevents discomfort |
| Apply suction and withdraw the catheter, rotating it gently. Suction for no longer than 5–10 seconds at a time. Allow the individual to take 4–5 breaths between each aspiration. If secretions are thick, dip the catheter into sterile water and apply suction | Rotating motion avoids tissue trauma<br>Short-term suctioning limits the amount of oxygen removed and prevents hypoxia<br>Helps to clear the lumen of the catheter<br>Note: In neonates and infants do not rotate catheter but simply insert in and out to the required measurement |
| Report immediately if there is any difficulty in inserting the catheter into the tube | The tube may be partially blocked with secretions |
| When suctioning is completed, the individual may need to be hyper-oxygenated again. Replace any humidification device (unless tracheal stoma care/dressing to be performed)<br>Reinsert the clean inner tube<br>Clear suction catheter and tubing with sterile water | Prevents hypoxia and promotes relaxation. Re-establishes delivery of humidity<br>Prevents the reintroduction of microorganisms<br>Note: Suction catheters can be used for up to 24 hours prior to disposal if cleaned thoroughly after use |
| **Tracheal stoma care** | |
| Remove and discard the tracheostomy dressing into a suitable waste receptacle<br>Ensure ties secure around tracheostomy tube | Correct disposal prevents cross-infection and abides by infection prevention policies and procedures<br>Prevents dislodgement of tracheostomy tube |
| Perform hand hygiene<br>Put on sterile gloves<br>For a newly formed stoma, use a sterile drape around the tracheostomy site | Prevents cross-infection<br>Provides a sterile field around the stoma |
| Cleanse the skin around the stoma and the flanges of the tube using gauze and normal saline. Take care not to let normal saline or strands of gauze enter the tube or stoma<br>Use cotton tip applicators dipped in normal saline for hard-to-reach areas of the stoma | Removes accumulated secretions and crusts<br>Prevents aspiration and the risk of infection |

## CLINICAL SKILL 25.7 Tracheostomy suctioning and tracheal stoma care—cont'd

| | |
|---|---|
| Inspect the surrounding area and stoma site for inflammation or skin breakdown<br>Inspect for the formation of a granuloma especially in older tracheostomy stoma sites | Signs of impaired healing or infection require immediate attention<br>Granulomas are generally a collection of macrophages forming a nodular area around the stoma site. These are quite common, especially in older stomas, and can be treated with silver nitrate |
| Apply a sterile tracheostomy dressing using aseptic non-touch technique | Protects the stoma site and reduces transmission of microorganisms |
| Replace the tracheostomy tapes if they are soiled or loose<br>Two people are required to change the tapes (one must be an RN who has achieved competency; the EN would assist with the procedure) | Tracheostomy tube must be secured in position. Soiled tapes predispose the person to infection. Prevents accidental dislodgement of the tube |
| Replace any humidification device (Swedish nose)<br>Change to a new one if the old one soiled | Re-establishes delivery of humidity and helps filter the air to prevent the introduction of microorganisms |
| Remove gloves/PPE, dispose of the equipment appropriately, perform hand hygiene | Prevents cross-infection<br>Abides by infection prevention policies and procedures |
| Assist the individual into a position of comfort.<br>Ask the individual to report any complications during and post procedure (if able) | Promotes rest and relaxation, monitors for adverse effects |
| Document the time of suctioning, the type and amount of aspirate and the individual's response<br>Document and report on the dressing change<br>Report the procedure and any abnormal findings to Registered Nurse/medical officer | Appropriate care can be planned and implemented |

*(Royal Children's Hospital Clinical Practice Guidelines 2014; Joanna Briggs Institute 2014b; Berman et al 2015; Crisp et al 2013; ACSQHC 2012; 2015; Sparkes et al 2014)*

- Connecting tubing
- Disposable gloves
- Container of sterile or tap water for clearing the catheter (depending on the institution's policy)
- Bag or container for contaminated catheters.

Care of the tracheostomy and tracheostomy tube is performed to minimise contamination and to decrease the possibility of obstruction by secretions (Caparros 2014). Tracheostomy care, which is performed using sterile equipment and aseptic technique to prevent infection, involves cleansing of the inner cannula and the area around the stoma. The frequency with which the care is provided may vary depending on the amount of secretions present, and may be as frequent as every half hour to 1 hour or may only be required once every 8 hours.

Some tracheostomy tubes have an inner replaceable tube that can be changed as part of routine daily care (e.g. 4-hourly to daily). It is essential that a spare inner tube is kept close at hand and replaced if the inner tube becomes blocked. The inner tube is cleaned using a suitable solution and dried and made accessible for future use. Many tracheostomy tubes are fitted with an inflatable cuff. Regular deflation of a cuffed tube is performed to prevent tracheal necrosis and stenosis. The frequency and length of time for cuff deflation varies depending on the type of tube used and the condition of the individual.

To prevent the trachea or lower airways from drying and bleeding, a humidification connector, a 'Swedish nose', may be applied. It consists of a single or dual barrel that encloses the tube's orifice; humidity is provided by rolled absorptive paper filters pre-moistened with normal saline. If secretions are present on the outside of the suction catheter, additional sterile saline may be required to be instilled into the tracheostomy tube to loosen secretions and maintain the patency of the tracheostomy tube.

Communication is a significant problem and to alleviate anxiety and apprehension an alternative means of communication should be provided. A pad and pencil should be available, the individual's call bell or buzzer must always be within easy reach and must be answered promptly. If unable to write, the individual can be educated to use a series of gestures or sign language as an alternative method of communicating their needs. Alternatively, for individuals with uncuffed tubes a speaking valve can be employed, or they can be educated

how to cover the tube with their finger to occlude the airway on expiration and allow for limited communication. If the artificial airway is a temporary measure, the individual should be informed that their voice will recover when the tube is removed. Before deflation, the tube and oronasopharynx are aspirated. When the cuff is inflated, only sufficient air is inserted to occlude the escape of air from around the sides of the tube.

The individual should be provided with information about their progress and any procedures that are to be performed. They should be encouraged to participate in their own care as much as possible to reduce any sense of dependency, and the significant others should be involved in the care. The individual may be discharged from hospital with a tracheostomy tube in situ. As soon as possible, they and the significant others are educated in self-care so that they feel comfortable and confident about caring for their tracheostomy. The individual should be provided with information about relevant support groups such as tracheostomy associations that they may wish to contact.

Before the permanent removal of a tracheostomy tube the individual will require sufficient information and emotional support, as they may feel that they will not be able to breathe without the tube. The tube may be removed when the individual is able to maintain independent respiratory function, is able to breathe through the upper respiratory tract and has satisfactory protective reflexes such as the cough reflex.

To prepare the individual for permanent removal of the tracheostomy tube a fenestrated tube may be inserted. This type of tube has an opening in the outer cannula that allows the individual to breathe around as well as through the tube. Thus, they are able to adjust gradually to removal of the tube. Alternatively the tube may be occluded or 'corked' by an adhesive tape to determine the individual's ability to cope without the tube. With uncuffed tubes this is routinely achieved to enhance communication by allowing the individual to occlude the tube with their fingers while speaking. By covering the tube, they may be able to speak, breathe normally through the upper airway and expectorate secretions.

Before the tube is removed, suction is applied to remove tracheal and pharyngeal secretions. The cuff is then deflated and the tube removed. Generally a dry occlusive dressing is placed over the stoma and the individual closely monitored for the first 24 hours. Healing and reduction in the tracheostomy can take 12 months or longer and care must be taken during this time to prevent aspiration and infections. After a period of time, when the individual's airway is stable, the stoma can be surgically sutured together (see Clinical Skill 25.7 for tracheal stoma care).

### Complications of tracheostomy

The insertion of an artificial airway can result in several complications:

- Infection due to altered ciliary function or colonisation of the airway with bacteria
- Tracheal necrosis and stenosis due to excessive pressure on the trachea from the cuff
- Tracheo-oesophageal fistula
- Partial or complete airway obstruction (e.g. due to an accumulation of secretions in the tube)
- Subcutaneous emphysema
- Psychological effects, such as frustration at being unable to communicate as usual.

## THE INDIVIDUAL WITH THORACIC DRAINAGE TUBES

Insertion of chest drainage tubes (Figures 25.27 and 25.28) permits the drainage of air or fluid from the pleural space which, if not removed, alters intrapleural pressure and causes lung collapse (Durai et al 2010). Ventilation is adversely affected by any disruption of the intrapleural pressure, which may be caused by surgery, trauma or pulmonary disease. Insertion of chest tubes drains the excess air or fluid and enables the lungs to function normally (Durai et al 2010).

Chest drainage tubes may be inserted at the time of surgery while an individual is anaesthetised, or they may be inserted using local anaesthetic. Because the procedure is painful, a conscious individual is generally given analgesic medication about 30 minutes before tube insertion. The procedure is performed by a medical officer, using sterile equipment and aseptic technique. The insertion site is selected according to the individual's condition, and one or more tubes may be inserted at the same time. See Clinical Skill 25.8 for care of chest tube/drainage.

### Underwater seal drainage

After insertion the chest tube is connected to a drainage system that permits drainage out of the pleural space and prevents back-flow into that space. The tubing leads to

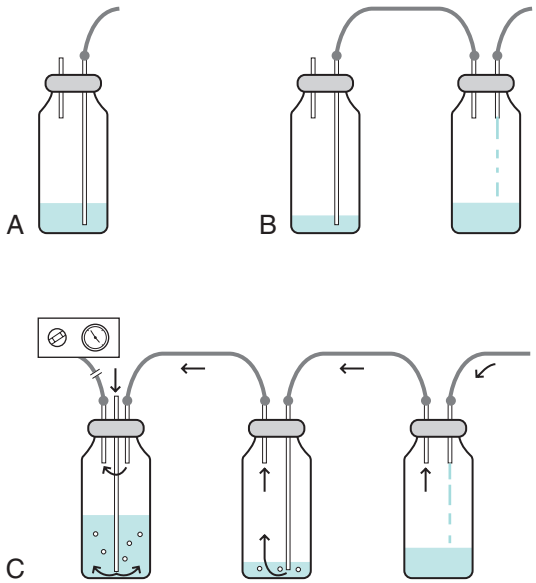



**Figure 25.27** Chest tube drainage A: One-bottle system B: Two-bottle system C: Three-bottle system with suction *(Potter et al 2013)*

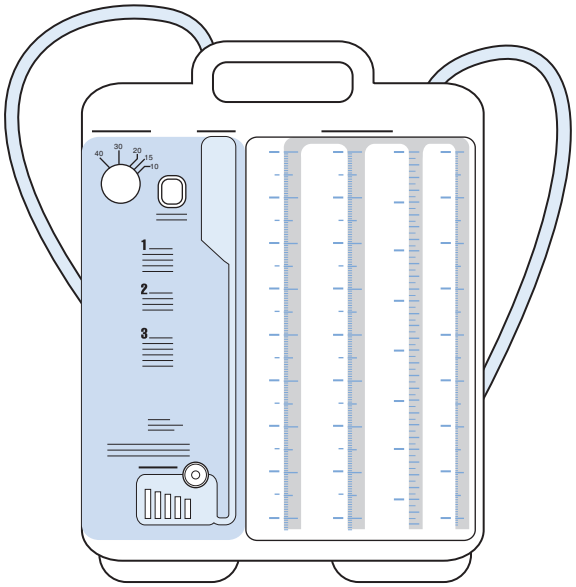


**Figure 25.28** Disposable, commercial chest-drainage system

a collection system positioned well below the level of the individual's chest. This dependent position facilitates the removal of air or fluid from the pleural cavity and prevents backflow. To prevent the entry of air into the pleural cavity the distal end of the tubing is submerged underwater. This provides a closed water-seal drainage system. The depth of water that the tube is placed under determines the water pressure used to create a seal (e.g. 5 cm) and is ordered by a medical officer.

Some commercially available systems of underwater seal drainage (e.g. the Pleur-evac® system) are available already assembled and are disposed of after use. Other types of thoracic drainage systems include the one-, two- or three-bottle systems. The one- and two-bottle systems are primarily gravity systems, which can be provided with suction to facilitate drainage. Such systems provide a water seal and can be connected to suction. A medical officer is required to order the application of suction, which is used to facilitate faster drainage of air or fluids. A low-flow suction regulator device is used to ensure that the suction provides a minimal bubbling effect.

## CLINICAL SKILL 25.8 Care of chest tube/drainage and dressing change

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Disposable and sterile gloves<br>Sterile dressing pack<br>Approved antiseptic solution (2% chlorhexidine gluconate in 70% isopropyl, 10% povidone-iodine or 70% alcohol)<br>Normal saline 0.9%<br>Split dressing/gauze<br>Occlusive dressing<br>Fluid balance chart or chest drain observation chart<br>2 artery forceps |

| **Skill activity** | **Rationale** |
|---|---|
| **Care of chest tube/drainage** | |
| Check the medical officer's orders | Ensures need for the procedure and prevents errors |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment | Ensures consent<br>Ensures efficiency |
| Ensure therapeutic interaction | Reduces the incidence of performing an activity on the incorrect individual |
| Assess for any contraindications | Reduces anxiety/apprehension and gains trust and cooperation |
| Ensure the individual is nursed in a semi-Fowler's or high Fowler's position | Promotes participation in care and understanding of health status |
| Ensure privacy | Ensures correct procedure is about to take place |
| Perform an assessment of the individual ensuring their vital signs are stable and their oxygen saturations are within range as specified by the medical officer | Allows for adequate chest expansion and better respiration. Semi-Fowler's position is preferred for pneumothorax to evacuate air. High-Fowler's is preferred for haemothorax to drain fluid. Reduces anxiety and embarrassment |
| Assess for any pain during inspiration or expiration and/or at the insertion site | Ensures individual is stable so as to prevent any complications |
| Check for bilateral rise and fall of the chest and that there is no respiratory distress | |

*Continued*

## CLINICAL SKILL 25.8 Care of chest tube/drainage and dressing change—cont'd

| | |
|---|---|
| Provide two artery forceps for each chest tube | Ensures comfort of person and adequate respirations and oxygenation—analgesia may need to be administered<br>Note: The individual may need to be on oxygen as ordered by the medical officer |
| Perform hand hygiene and don PPE as required | Prevents cross-infection |
| Assess the drain tube and drainage for any bubbling, swing and drainage. Observe the tubing for kinks, clots or dependent loops<br>Check wall suction and connection to UWSD is intact<br>Fill the water chamber of the UWSD to the required level with sterile water<br>Ensure the UWSD is upright and below the level of the chest | Increased bubbling indicates an air leak, which may mean the connection to the patient and the tube is faulty. This can lead to a pneumothorax if not sealed properly. Swing refers to oscillation of the fluid in the tubing. Ensures the tubing is patent<br>Wall suction should be set at >80 mmHg with the suction on the UWSD unit being set at 20 $cmH_2O$ for adults (5 $cmH_2O$ for neonates and 10–20 $cmH_2O$ for children) or as prescribed by the doctor<br>Suction helps facilitate the reinflation of the lung<br>Prevents the introduction of microorganisms<br>Prevents fluid from flowing back into the pleural cavity |
| Assess drain tube insertion site for any signs of infection and ensure the dressing is dry and intact<br>Report any signs of infection to the Registered Nurse/ medical officer | Prevents complications from arising and prevents the introduction of microorganisms<br>Appropriate care can be planned and implemented |
| Document observations, pain, drain tube assessment and drainage hourly as per policy and procedure on the relevant observation and/or fluid balance chart<br>Report any abnormal findings/complications to the Registered Nurse/medical officer | Ensures the safety of the individual<br>Abides by facility/organisation policy<br>Monitors for any complications and excessive drainage<br>Appropriate care can be planned and implemented<br>Note: The individual may be on a PCA infusion for analgesia maintenance, which will also need to be documented hourly as per policy |
| **Chest tube dressing change** | |
| Perform hand hygiene | Prevents cross-infection |
| Explain the procedure to the individual and ensure privacy | Reduces anxiety and embarrassment<br>Reinforces consent and cooperation for procedure |
| Place the equipment in a convenient location near the bedside. Open procedure pack using corners. Assemble the required equipment, using aseptic technique. Drop sterile equipment into sterile field | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the dressing is being performed<br>Prevents contamination of sterile items<br>Reduces transmission of microorganisms |
| Perform hand hygiene and don gloves/PPE | Prevents cross-infection |
| Gently remove the old dressing ensuring that there is a little slack on the tube | Prevents the accidental dislodgement of the tube<br>Tautness of the tube can cause discomfort and pull on the sutures causing trauma to the area<br>Note: Chest tubes are usually sutured in place |
| Perform hand hygiene and don sterile gloves<br>Use normal saline 0.9% to cleanse area, ensuring the tubing is also cleaned well | Prevents cross-infection and the introduction of microorganisms |
| Apply approved skin antiseptic solution and allow to dry. 2% chlorhexidine gluconate in 70% isopropyl is the preferred choice, or 10% povidone-iodine or 70% alcohol as the alternative | Prevents cross-infection and eliminates the introduction of microorganisms |

## CLINICAL SKILL 25.8 Care of chest tube/drainage and dressing change—cont'd

| | |
|---|---|
| Apply split gauze around the insertion site and then place a sandwich dressing over the area (2 large pieces of occlusive dressing) | Helps collect any exudate<br>Ensures the insertion site and surrounding skin can be seen readily and secures tubing to prevent irritation |
| Remove gloves/PPE, dispose of the equipment appropriately, perform hand hygiene | Prevents cross-infection<br>Abides by infection prevention policies and procedures |
| Assist the individual into a position of comfort<br>Ask the individual to report any complications during and post procedure (if able) | Promotes rest and relaxation, monitors for adverse effects |
| Document the respiratory status of the individual, the amount, colour and consistency of drainage, the presence of swinging and bubbling<br>Document in the individual's healthcare record and report any findings to the Registered Nurse/medical officer | Appropriate care can be planned and implemented |

*(Durai et al 2010; Royal Children's Hospital Clinical Practice Guidelines 2013a; Joanna Briggs Institute 2015; ACSQHC 2012; 2015)*

## NURSING A PERSON WITH A CHEST DRAIN

The aim of closed-chest underwater seal drainage is to maintain respiratory function and haemodynamic stability by facilitating drainage of air, blood and/or other fluids (Joanna Briggs Institute 2014a). Care of the person includes:

- Nursing them in an upright position when possible, to facilitate optimal lung expansion and to promote drainage by gravity
- Providing adequate explanation and emotional support to reduce anxiety. The individual may tend to restrict their breathing and movement for fear of dislodging the tube, so it is essential to explain that the tube is secured in position with tape and/or sutures
- Administering adequate analgesic medication to decrease discomfort. It may be necessary to administer analgesic medication 30–45 minutes before physiotherapy, to promote pain relief and relaxation
- Encouraging the individual to breathe deeply and cough frequently (e.g. hourly, to help drain the pleural space and expand the lungs)
- Regularly assessing the individual's respiratory status. The individual should be observed for discomfort and any difficulty in breathing, and it is important to observe whether their chest is expanding symmetrically. The ventilations are assessed at regular intervals (e.g. hourly, for rate, rhythm and character)
- Maintaining the water seal and preventing air leakage, which is essential to prevent entry of air into the pleural space. The fluid level in the drainage bottle should be checked frequently (e.g. hourly) and sterile water added if necessary to ensure that the distal end of the water seal tube remains submerged at the ordered level
- Taking precautions to prevent separation of the connections, such as taping the joints and securing the tube to the individual's clothing. Care must be taken to ensure that the underwater seal system remains below the individual's chest to prevent fluid or air re-entering the pleural cavity, which can cause subsequent pneumothorax or empyema

Securing the drainage system to the bed or placing it securely on the floor to protect it from toppling over and from accidental breakage. If the system is accidentally disconnected or broken, air will enter the pleural space and the lungs may collapse. It is general practice to have two chest clamps in plain view at the bedside for any individual with a chest drain; in the event of disconnection, the two clamps are applied immediately to the chest tube, and assistance is summoned immediately.

There is some controversy surrounding this emergency measure, as some authorities believe that clamping a chest tube could result in a tension pneumothorax. It is essential that the nurse be aware of the healthcare institution's measures to be taken should accidental disconnection of the system occur. If a chest tube is accidentally dislodged or falls out, the individual is asked to exhale forcefully and the opening on the skin surface is sealed with an airtight dressing until the tube can be reinserted.

- Maintaining patency of the drainage system, which is essential to facilitate expansion of the lung. The system must be checked hourly for loose connections and for fluctuation in the water-seal bottle. As the individual inhales, the fluid should rise in the water-seal tube, and as they exhale the level should fall back (this is termed 'swinging')

- Ensuring that, if the system is connected to suction, the fluid line in the water-seal tube remains constant. During exhalation, bubbling is normally present in the water-seal bottle. Gently bubbling in a suction control bottle indicates that the correct level of suction has been achieved
- Observing the tubing for, and keeping it free from, kinks. Kinking of the tubing will obstruct the flow of air or fluid. To prevent kinking, or dependent loops of tubing, the tubing should be coiled flat on the bed and may be attached to the edge of the bed with tape and a safety pin. The tubing should fall in a straight line from the coil to the drainage bottle, to facilitate flow. The nurse should ensure that the individual is able to move freely without pulling or lying on the tubing
- Double-clamping the chest tube near the site of insertion when it is necessary to replace a drainage system bottle. The bottle, and, if necessary, the connection tubing, is replaced and the clamps removed. The tubes should not be clamped for longer than 2 minutes, as a tension pneumothorax may result when air or fluid is prevented from escaping. As a safety precaution, two nurses should be present whenever a drainage bottle or system is being replaced
- Protecting the insertion site by an occlusive dressing (e.g. Opsite). Using sterile equipment and aseptic techniques to prevent infection, the dressing is renewed in accordance with the healthcare institution's policy
- Assessing and documenting the colour, volume and type of drainage. Any alteration in the amount, colour or flow of drainage must be reported immediately. Sudden cessation of flow of drainage may indicate a malfunction of the system or disconnection of the tubing. A gradual reduction in flow may indicate occlusion by blood or proteins, that the tube position has moved in the pleural cavity or that the chest has reinflated.

Removal of a chest drain tube is very painful and individuals require adequate analgesia and preparation time (Bauman & Handley 2011). Chest drain removal must be performed by a qualified Registered Nurse or medical officer. Generally the tube is clamped for up to 24 hours before removal, and a chest x-ray is performed immediately beforehand to determine lung expansion. If the individual develops respiratory distress or a pneumothorax, the clamps are removed and the tube left in place. Analgesic medication is usually administered 30–45 minutes before tube removal. The tube is removed swiftly and immediately covered with an occlusive dressing to provide an airtight seal. In some cases the site is closed with purse string sutures that are tightened during removal.

One hour after the removal of the tube an x-ray is taken to ensure that there has been no ingress of air during or after the removal. The insertion site is checked regularly for sounds of air leakage and the individual is observed for manifestations of pneumothorax, infection, subcutaneous emphysema and respiratory distress.

## NURSING PRACTICE AND OXYGEN ADMINISTRATION

Nursing staff must be educated to adequately administer oxygen therapy. Oxygen therapy is the delivery of oxygen to the individual by some device or equipment in concentrations greater than that found in normal room air (room air is 21%). Oxygen therapy is not a cure and does not remove the underlying disease or condition but aims to decrease the workload of the cardiopulmonary system and to protect the individual from tissue hypoxia. Regardless of the mode of delivery the individual must be able to maintain a patent airway, or an artificial airway must be established.

It is important for nursing staff to assess, initiate and monitor oxygen delivery systems within the prescribed parameter. An exception to this would be in an emergency when no individual should be denied adequate oxygenation. In such cases oxygen should be given first and documented later.

### Assessment

An individual's respiratory status is assessed to ascertain whether they are receiving an adequate supply of oxygen and excreting sufficient carbon dioxide to meet their body's needs. A respiratory assessment should consider the following:

- Observing the individual for signs and symptoms of hypoxaemia and respiratory distress
- Identifying any deviations from normal and by assessing their ventilations.

Assessing the respiratory status and identifying any actual or potential problems is assisted by obtaining information from the individual regarding:

- Allergic reactions such as coughing, watery eyes, sneezing or shortness of breath that may occur as a result of exposure to allergens such as dust mites, pet hair or pollen
- Exposure to environmental air pollutants such as chemical wastes, smoke or dust
- History of tobacco and inhaled recreational drugs
- Presence of a cough and the volume, quality and quantity of sputum
- Chest pain.

#### Signs and symptoms of hypoxaemia and respiratory distress

The person should be observed for signs and symptoms of hypoxaemia which is defined as a diminished availability of oxygen to the body tissues. Hypoxaemia may result from disorders that limit the volume of air entering the lungs, or from obstructive lung diseases such as asthma and emphysema. The signs and symptoms of hypoxia and respiratory distress include:

- Cyanosis. Cyanosis is a bluish discolouration of the skin and mucous membranes due to inadequate

oxygenation, and can be either peripheral or central. Peripheral cyanosis results in local vasoconstriction and is usually visible in the nail beds and the lips. Central cyanosis is the result of more severe hypoxia and affects all body organs. It is most visible in highly vascular areas such as the lips, nail beds, tip of the nose, the external ear and the underside of the tongue. In people with naturally dark brown or black skin, cyanosis is most accurately detected by inspecting the mucosa inside the mouth
- Elevated blood pressure and pulse rate
- Shortness of breath (dyspnoea), fatigue and intolerance to exercise
- Abnormal respiratory rate, depth or rhythm
- Sighing, gasping, breath holding
- Flaring of the nares
- Use of accessory muscles during breathing (e.g. substernal recession, tracheal tugging, shoulder shrugging and intercostal muscles during expiration)
- Apprehension, aggression, non-compliance or agitation
- Confusion or reduced level of consciousness
- Visible or excessive perspiration (diaphoresis) (Gillies et al 2012).

### Assessment of an individual with chronic respiratory disorder

A person with a chronic respiratory disorder should also be assessed for a barrel-shaped chest, which is an increase in the anteroposterior diameter of the chest wall, commonly associated with air trapping, as in atelectasis or chronic obstructive airways disease. Individuals with chronic hypoxaemia may experience the same symptoms as above but may have clubbing of the fingers, where the angle of the nail bed increases to over 85 degrees, caused by an increase in capillary numbers to supply poorly perfused tissue, with subsequent increase in size.

## Meeting an individual's need for oxygen

Breathing is an automatic activity, but rate and depth can be changed voluntarily. Normally room air at normal atmospheric pressure, such as at sea level, provides sufficient oxygen to meet metabolic needs of the body. However, admission to hospital, or a respiratory condition, may affect an individual's normal pattern of breathing. For example, if a person has an infection or is apprehensive or anxious, they may experience temporary breathing difficulties. In these instances measures to promote the return of normal breathing are performed. Nurses provide individuals with adequate information to allay some of the anxiety relating to their condition, investigations and hospitalisation. The nurse should also attempt to ensure that the room is ventilated adequately and at a comfortable temperature (deWit & Williams 2014).

Individuals who experience breathing difficulties due to a clinical condition may require assistance to meet any increase in either oxygen demands or carbon dioxide retention. Some methods include, for example, positioning in a more upright position, nebulisation, humidification, physiotherapy (which may include deep-breathing and coughing exercises) and mobilisation. Individuals who suffer from an oxygen deficiency will commonly require administration of oxygen to supplement that being obtained from the atmosphere. See Clinical Skill 25.9: Oxygen therapy—nasal, mask.

## Administering oxygen

To prevent or reverse hypoxia and to improve tissue oxygenation, oxygen may be administered via a number of devices. Oxygen is a drug; it is prescribed by a medical officer who determines the concentration, route and length of time that it is to be administered. To promote the safety and comfort of the individual receiving oxygen therapy, the nurse should be aware of certain principles relevant to the administration of oxygen (deWit & Williams 2014):
- Hypoxaemia can result from insufficient oxygen flow or delivery. Equipment and connections must be checked at regular intervals (e.g. hourly) to ensure that it is functioning properly. If signs or symptoms of hypoxaemia occur they must be reported immediately, as adjustment to the concentration being administered may be necessary, or alternative investigations or treatment implemented
- Although oxygen is not normally combustible, it does support combustion and it is essential to implement safety precautions to reduce the risk of fire. Smoking is prohibited in the vicinity, and measures are taken to prevent sparks, which may be given off by electrical or mechanical items. Inflammable substances such as oil or alcohol should not be used near or on the oxygen equipment
- Administration of any gas can dry and irritate mucous membranes; this is particularly so with nasal prongs. In some healthcare institutions the gas is humidified by passing it through a sterile water humidification system before administration
- Oxygen is colourless and odourless, so accurate gauges on gas cylinders and oxygen concentrators are used to indicate the volume of oxygen remaining or rate of flow. An oxygen regulator limits the flow of the gas. Care must be taken to ensure that connections on the regulator are tight, otherwise a reduced volume or concentration will be administered
- Oxygen toxicity is a hazard with prolonged administration or concentrations over 50%. The individual's capillary, venous or arterial blood gases are commonly measured during oxygen therapy and the concentration of oxygen or method of delivery can be adjusted. Damage and inflammation to airways, blood vessels and nervous tissue may result in acute respiratory distress syndrome (ARDS)
- Nosocomial infections can occur using oxygen therapy, particularly with the use of non-sterile oxygen bubble humidifiers. Masks, tubing, cannulae and catheters are for single individual use and are discarded on discharge. Care must be taken to clean the mask or nebuliser regularly (e.g. every 8 hours).

## CLINICAL SKILL 25.9 Oxygen therapy—nasal, mask

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Oxygen source (wall outlet, cylinder)<br>Flow meter<br>Humidifier and sterile water (if indicated)<br>Oxygen tubing<br>Oxygen delivery system (if $FiO_2$ required)<br>Nasal cannula<br>Oxygen mask (or required mask)<br>Pulse oximeter |
| **Skill activity** | **Rationale** |
| Check the medical officer's orders regarding oxygen therapy for the person and/or inform nurse-in-charge re initiation of oxygen therapy | Ensures need for the procedure and prevents errors<br>Abides by legal parameters and facility/organisation policies |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Perform an assessment of the person ensuring their vital signs and oxygen saturations<br>Assess indications for oxygen requirement:<br>• dyspnoea, tachypnoea, bradypnoea, apnoea<br>• pallor, cyanosis<br>• lethargy or restlessness<br>• use of accessory muscles: nasal flaring, intercostal or sternal recession, tracheal tug | Baseline observations attended to assess for initiation of oxygen therapy<br>Enables safe administration of oxygen therapy |
| Sit person into an upright or semi-Fowler's position (if able) | Facilitates breathing and lung expansion |
| Attach oxygen delivery device to oxygen tubing and attach to oxygen source at prescribed rate. Apply the appropriate delivery device to the individual | Oxygen delivery devices change the amount and the concentration of oxygen being delivered:<br>• Nasal cannulae: 2–4 L/min (26–32%)<br>• Hudson mask: 5–6 L/min (35–50%), 6–10 L/min (50–60%), 10–12 L/min (60–65%)<br>• Non-rebreather: 15 L/min (>60%)<br>• Venturi system (used in high flow oxygen): $FiO_2$ and amount of oxygen determined as per dialled amount<br>Note: High-flow oxygen requires humidification due to drying out oral and nasal mucosa<br>High-flow oxygen can be via the appropriate nasal cannulae or mask |
| Monitor the individual's response to oxygen and their observations as indicated by the medical officer until stable (usually every 15 minutes to hourly)<br>Ensure tubing is not kinked, check mask or cannula stay in correct position<br>Ask the individual to report any complications during and after the procedure, if able | Prevents complications and ensures treatment is working |

| CLINICAL SKILL 25.9 Oxygen therapy—nasal, mask—cont'd | |
|---|---|
| Document in the healthcare record and report any changes to condition | Appropriate care can be planned and implemented |
| Offer/perform oral hygiene using a mouth swab and/or mouth rinse<br>Wash face masks daily with warm soapy water<br>Observe the nares and top of the individual's ears for skin breakdown | Reduces bad taste or halitosis in mouth<br>Provides comfort and maintains moist mucosa<br>Oxygen therapy can dry the nares and the cannula tubing or elastic can cause skin irritation |
| *(Royal Children's Hospital Clinical Practice Guidelines 2013b; Bersten & Soni 2009; Kernick & Margarey 2010; ACSQHC 2012; 2015)* | |

**TABLE 25.5 | Oxygen equipment**

| Type | Oxygen concentration flow rate | Indication |
|---|---|---|
| Nasal cannula/ catheter | $FiO_2$: 24–38%, flow 1–2 L/min<br>$FiO_2$: 30–35%, flow 3–4 L/min<br>$FiO_2$: 38–44%, flow 5–6 L/min | This device is well tolerated by most individuals. The fraction of inspired oxygen varies depending upon the flow of oxygen (L/min) and the rate and depth of the individual's breathing |
| Simple face mask | $FiO_2$: 35–65%, flow 8–12 L/min | High flow of oxygen is required to prevent the rebreathing of carbon dioxide |
| Oxygen mask with reservoir bag (non-rebreather) | $FiO_2$: 60–100%, flow 6–15 L/min | This device allows for a higher $FiO_2$ to be administered. A valve closes during expiration so that exhaled air does not enter the reservoir bag and be rebreathed. Never remove the one-way valve |
| Venturi mask | $FiO_2$: 60–100%, flow 4–15 L/min | This device is one of the most accurate ways to deliver oxygen. Different-sized adapters are used to deliver a fixed or predicted $FiO_2$. It is ideal for $CO_2$ retainers or hypoxic drive individuals |
| Head box | $FiO_2$: 21–100%, low 0.25–3 L/min | A transparent plastic box that fits over the head or shoulders of an infant. The infant can be observed easily, and high concentrations of oxygen can be administered |

The nurse must know how to check that the equipment is functioning correctly and that all connections are secure and do not leak. Cleaning and disposal of equipment is done as per the individual healthcare institution's infection control guidelines.

## Oxygen delivery equipment

Oxygen is often piped to a wall outlet or, less commonly, is supplied via a portable cylinder or oxygen concentrator and may be delivered to the individual via an oxygen regulator using one of several devices. Oxygen is prescribed in litres per minute or in percentage as $FiO_2$ (fraction of inspired oxygen). The mode chosen for the delivery of oxygen is dependent on the individual's clinical condition, concentration of oxygen required, degree of ventilatory support required and the individual's ability to comply with the therapy (see Table 25.5 for description of oxygen delivery equipment and concentration).

### Nasal cannula

A nasal cannula (nasal prongs) (Figure 25.29) is made from a soft plastic material and contains two short prongs that fit into the nostrils. It may be secured in position by an adjustable ring or strap around the back of the head or taped onto the cheeks to prevent dislodgement. Because it does not enclose the nose or mouth, the cannula is comfortable and convenient for the person and there is less risk of aspiration of vomitus than a mask. The cannula is connected to the oxygen supply and the oxygen turned on at a low flow rate, with the flow checked before positioning it in the nares. The prongs are inserted following the natural curve of the nostrils, and the tubes are positioned over each ear and around the back of the head. The ring or strap is adjusted to maintain the position of the prongs, and care is taken to ensure that the strap is not too tight. An over-tight strap can cause pressure on the nostrils, the nose, the upper lip and cheeks. When the cannula has been positioned correctly, the flow of oxygen

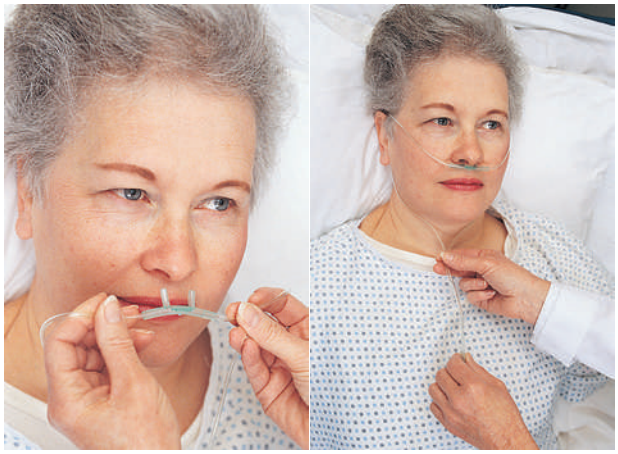


**Figure 25.29** Applying a nasal cannula

*(Potter et al 2013)*

**Figure 25.30** Intranasal oxygen catheter

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is adjusted to the prescribed rate. Minimum flow is 0.25 L/min to a maximum of 6 L/min, but this will often cause nasal dryness and can be uncomfortable. Flow rates of 1–4 L/min are most commonly used, equating to a concentration of approximately 24–40% oxygen. Higher volumes increase irritation and drying of the nasal mucosa. The oxygen concentration that the individual receives is indeterminable and is reduced if the individual mouth breathes, eats or drinks.

## Nasal catheter

An intranasal oxygen catheter (see the Teleflex® catheter, Figure 25.30) is made from a soft plastic material and contains a series of holes at the distal ends. The approximate length to be inserted is estimated by holding the catheter in a straight line from the tip of the individual's nose to their earlobe, and marking the catheter with an indelible pen to ensure that the insertion length can always be seen. The tip of the catheter may be lubricated with sterile water or a water-soluble lubricant to facilitate insertion. Before insertion, the catheter is connected to the oxygen supply and the oxygen turned on at a low flow rate. As with nasal prongs, oxygen concentration varies with factors such as mouth breathing. The catheter can induce gastric distension if forced into the stomach.

The catheter is gently inserted through one nostril into the nasopharynx to the pre-measured length. Using hypoallergenic tape, the catheter may be secured to the nose or cheek, avoiding traction on the nostril, which could cause skin breakdown. When the catheter has been positioned correctly, the flow of oxygen is adjusted to the prescribed rate. As it is an invasive device, the catheter may cause irritation of the mucosa, so it is usual to remove it after about 8 hours and insert a clean one into the other nostril. Rotating the site reduces the risks of mucous membrane irritation and skin breakdown at the tip of the nose.

## Face mask

Face masks (Figure 25.31) are available in several styles and sizes. They are made from a lightweight vinyl material and are designed to fit over the nose and mouth, secured in position by an elastic band around the head. As the mask covers both the nose and the mouth, it is confining and impedes activities such as eating, drinking and communication as well as potentiating the risk of aspiration of vomitus.

Minimum flow rate for masks is normally 5 L/min, as a lower flow rate is not adequate to clear the mask of exhaled carbon dioxide and can cause hypercapnia ($CO_2$ retention). Depending on the style, a mask can deliver oxygen from 28% at 4 L/min to 100% concentration at higher flow rates. A mask is commonly used when the individual requires higher concentrations and more accurate amounts of oxygen, such as when the individual is mouth breathing, eating, talking or is able to breathe only through the mouth. Oxygen masks are recognisable by the presence of multiple small holes on the sides of the mask, as opposed to nebuliser masks, which have one large-diameter hole each side.

The style and size of a mask is assessed by measuring from the chin to the top of the nose, and an appropriate size is selected. The mask is connected to the oxygen supply via a flexible plastic tube, and the oxygen turned on to check that there are no leaks at a low flow rate. The mask is placed over the nose, mouth and chin, and the elastic strap secured around the back of the head; some masks have pliable metal straps that can be used to mould the mask to the individual's face shape. The strap is adjusted to ensure that the mask is firmly positioned but not uncomfortable, and the flow of oxygen adjusted to the prescribed rate. It is important that the mask fits closely but is not uncomfortable, and the nurse should ensure that there is no leakage of oxygen from the top of the mask. Leakage of oxygen from the top of the mask can flow across the eyes, causing dryness and irritation of the delicate tissues. Masks can create pressure areas on the skin and can be made more comfortable by applying self-adhesive foam to the edges in contact with skin.

***Non-rebreather*** A non-rebreather mask with an oxygen reservoir bag can be used to deliver high concentrations of oxygen to an individual who can breathe spontaneously. A

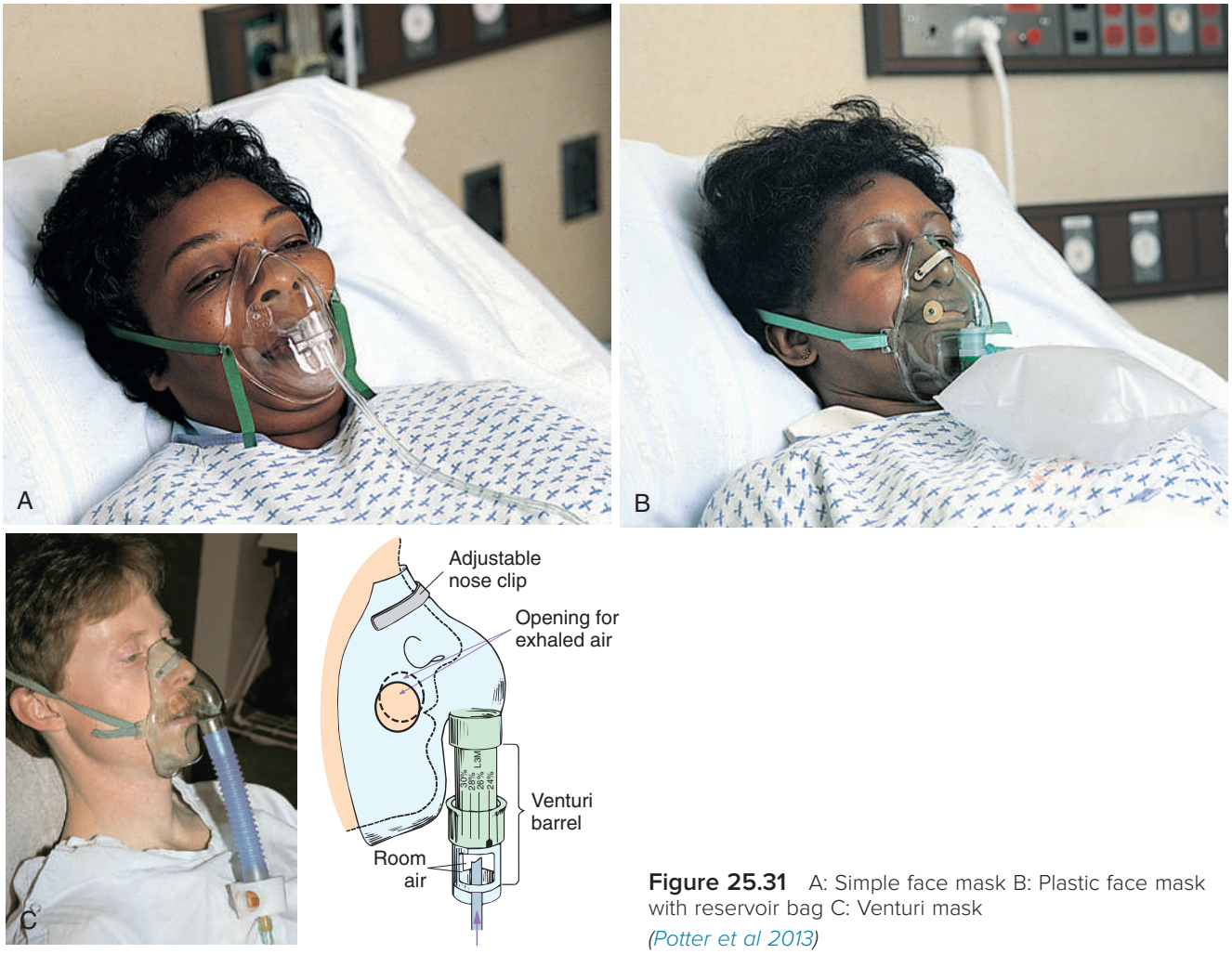


**Figure 25.31** A: Simple face mask B: Plastic face mask with reservoir bag C: Venturi mask
*(Potter et al 2013)*

one-way valve on the mask closes during expiration so that exhaled air does not enter the reservoir bag to be rebreathed. The reservoir bag also helps increase the inspired oxygen concentration by preventing the patient from breathing room air upon inspiration.

***Venturi face mask*** This device mixes oxygen with room air, delivering a predetermined high-flow enriched oxygen concentration. This device is one of the most accurate ways to deliver oxygen. Different-sized adapters are used to deliver a fixed or predicted $FiO_2$. It is ideal for $CO_2$ retainers or hypoxic drive patients.

### Head box

A head box may be used to deliver oxygen to an infant and consists of a transparent plastic box that fits over the head or shoulders. The infant can be observed easily, and high concentrations of oxygen can be administered.

The concentration of oxygen to be delivered to the individual will be specified by the medical officer and depends on the delivery device used and the rate at which the oxygen flows. Oxygen can be delivered from concentrations of 21% to 100%, and the flow rate adjusted by oxygen regulators from 0.25 L/min (low flow) to 3 L/min (high flow). The flow rate is adjusted by turning the valve on the flow meter (Figure 25.32) and observing the ball or dial that indicates the number of litres per minute at which the oxygen is flowing.

Whenever oxygen is to be administered the nurse should refer to the directions that accompany the device, to ensure that the correct concentration of oxygen is delivered to the individual.

## Mechanical ventilation

In specific situations an individual may require oxygen to be administered via a mechanical ventilator. These devices may use either positive or negative pressure.

### Positive pressure

Intermittent positive-pressure ventilation (IPPV) devices push atmospheric or oxygen rich air into the individual's airways to promote adequate lung expansion. Commonly, IPPV is performed via an endotracheal or tracheostomy tube and allows effective control of ventilation and oxygenation. The flow of air to the lungs is set at a predetermined pressure

**Figure 25.32** Oxygen regulators A: An example of an Australian standard regulator B: An example of a New Zealand standard regulator

*(Images of Carnét® Oxygen Pressure Regulators (AS and BS) courtesy of BOC Limited, a member of the Linde group)*

and, as the pressure is attained, the flow is stopped, pressure is released and the person exhales. Types of IPPV devices include:

- Positive end-expiratory pressure (PEEP): maintains a positive pressure in the lungs at the end of the individual's respiratory cycle, by increasing pressure within airways
- Continuous positive airway pressure (CPAP) is a device that maintains a certain amount of pressure to maintain the patency of large and small airways and alveoli. CPAP devices are commonly used in individuals with sleep apnoea. It can be administered with a tight-fitting face mask or over a tracheostomy and is often used to slow or prevent the need for mechanical ventilation.

### Negative pressure

Negative pressure chambers use a negative pressure to maintain inflation of the lung and can be used to administer high volumes of oxygen. Examples include the iron lung and barochamber.

## Measures to promote the comfort and safety of the individual receiving oxygen

There are a number of measures that nurses should consider when caring for an individual receiving oxygen. Such measures include:

- Reducing any anxiety the individual or their significant others experience related to the administration of oxygen. Some people may feel that the administration of oxygen is a sign that the individual's condition is deteriorating, and individuals using face masks may experience anxiety related to having both their nose and their mouth covered. The nurse should explain the purpose of the oxygen and the equipment that is being used. Some people may be educated to use the equipment independently and thus feel they have some control over the situation. Frequent visits to the individual, prompt attention to their needs and efficient handling of the equipment will help to reduce their anxiety
- Constantly monitoring the equipment to ensure that it is functioning correctly. The nurse should check the flow rate and ensure that the prescribed concentration of oxygen is being delivered to the individual. Connections on regulators, concentrators and humidifiers should be checked to ensure their tightness and that they are free of leaks. Measures should be taken to prevent the oxygen tubing becoming twisted, kinked or disconnected, to facilitate a free flow of oxygen to the individual
- Informing the individual of the importance of maintaining the delivery device in the correct position, as changing its position may alter the amount of oxygen being delivered
- Prevention of infection. In the past, oxygen that was delivered by an oxygen mask, nasal cannula or nasal

catheter was humidified to prevent drying of the mucous membranes. Normal practice in most healthcare agencies is to use only sterile methods of humidification and dispose of the equipment according to infection control or manufacturer's guidelines to reduce the potential for nosocomial infections. Oxygen masks and cannulas provide sufficient atmospheric water to humidify the oxygen
- Assisting the individual to meet their hygiene needs. The skin under the tubing, elastic straps or mask should be kept dry to promote comfort and to reduce the risk of skin breakdown caused by humidity or perspiration. Both the individual's face and the face mask should be wiped dry at least every 2 hours, and the skin under the delivery device checked for signs of pressure or irritation. Oral and nasal hygiene needs should be met and a water-based cream or balm may be applied to the lips or nares to prevent dryness and discomfort
- Replacing the mask with a nasal cannula if necessary, while the individual is eating or having their oral hygiene needs met
- Measuring the individual's temperature by the tympanic or axillary route rather than the oral route, as placement of the thermometer in the mouth may cause further ventilatory distress
- Monitoring the individual's condition constantly to assess the effectiveness of the treatment. The individual should be observed for signs of hypoxia or oxygen toxicity. Hypoxia may occur if the oxygen concentration is inadequate or if the equipment is not functioning properly. Oxygen toxicity is more likely to occur if the individual is receiving high concentrations (e.g. over 50%), which can be detrimental to the central nervous system. Manifestations of oxygen toxicity include nausea, muscle twitching, dizziness, restlessness and irritability, convulsive seizures and coma. Prolonged administration of high concentrations of oxygen may also cause damage to the linings of the bronchi and alveoli, resulting in pulmonary congestion or collapse of lung tissue. Any indications of hypoxaemia, hypercapnia ($CO_2$ retention) or toxicity must be reported immediately, as the concentration of oxygen being administered may need to be adjusted. It should also be noted that people with chronic obstructive airways disease, such as emphysema, may have an 'oxygen drive', in which their respiratory rate is controlled by decreasing levels of oxygen, as opposed to the normal regulation of respiratory rate, which is due to an increasing $CO_2$ level. These individuals are never prescribed high-flow oxygen, as it reduces their respiratory drive and rate and increases hypercapnia
- Observing the individual closely after oxygen therapy has been discontinued, as the therapy may need to be resumed if signs of hypoxia become evident
- Handling the oxygen equipment. The equipment used to deliver oxygen to the person should be cared for in the manner specified in the healthcare institution's policy manual. Most of the delivery devices are disposable, which reduces the risk of cross-infection.

## EDUCATION

Planning for an individual's discharge from hospital is of particular importance if their respiratory disorder is chronic or recurrent. The individual must be provided with sufficient information because, by understanding their condition and how to manage the symptoms, they will be better able to cope with chronic respiratory disease. The individual should be encouraged to pursue as normal a lifestyle as possible and should be given information about:
- The importance of avoiding factors that may precipitate or exacerbate their condition, such as extremes of temperature, exposure to allergens or environmental irritants, fatigue or emotional stress
- The importance of avoiding close contact with individuals who have a respiratory tract infection
- The importance of contacting their medical officer at the first sign of a respiratory tract infection
- The nature and correct use of any prescribed medications, nebulisers or aerosol therapy
- Public health education about smoking and its relationship to lung cancer and chronic obstructive pulmonary disease; the means of preventing droplet-spread infection; and the effects of air pollutants on the respiratory tract
- Immunisation against infections such as pertussis, influenza and TB
- How and when to use oxygen, which an individual may need to have immediate access to at all times
- When to contact their medical officer or go to hospital (e.g. if the measures implemented at home fail to sufficiently control their symptoms).

## Summary

The human body requires oxygen and nutrients in order to survive. The circulatory system is the means by which every cell in the body is supplied with oxygen and nutrients, and the means by which the cells' waste products are transported to various organs for excretion. The circulatory system consists of the cardiovascular and the lymphatic systems. The cardiovascular system is composed of the blood, the blood vessels and the heart. The lymphatic system consists of lymph, lymphatic capillaries, vessels, nodes and ducts.

*Continued*

## Summary—cont'd

Blood is a viscous substance composed of a fluid (plasma) in which three types of formed elements are suspended—erythrocytes, leucocytes and platelets—each of which has specific functions. The overall functions of blood are to transport oxygen, nutrients and other substances to the cells, transport wastes away from the cells, protect the body against infection, distribute heat evenly throughout the body and prevent a loss of blood by means of a clotting mechanism. Blood is pumped by the heart into the major arteries, which then form increasingly smaller arteries and eventually arterioles. Arterioles are continuous with a network of minute vessels called capillaries. Blood then enters small veins or venules, which join to form veins. The veins unite to form the major veins, which transport the blood back to the heart. Blood is in constant circulation around the body, in the systemic, pulmonary or portal circulation. The lymphatic vessels pass through one or more nodes, the functions of which are to filter and destroy microorganisms and to produce lymphocytes, antibodies and antitoxins.

The heart is a hollow muscular organ situated in the thoracic cavity. It pumps deoxygenated blood to the lungs, and oxygenated blood to all parts of the body.

The act of breathing allows the passage of oxygen and carbon dioxide to and from the lungs, while the cardiovascular system transports these substances to and from the cells. Ventilation is controlled by centres in the brainstem that are sensitive to $CO_2$ level, while certain factors such as an individual's clinical condition, disease, physical activity or emotions affect the rate, rhythm and depth of breathing. Diffusion is the process by which oxygen and $CO_2$ molecules are transported between the alveoli and the capillary network, and into and out of cells. Diffusion abnormalities can result from cardiac abnormalities such as cardiac failure causing pulmonary oedema, or respiratory disorders that cause a reduction in the amount of functioning lung tissue or fibrosis of the alveolar walls.

Respiratory dysfunction results from inadequate ventilation, from abnormalities of diffusion through the pulmonary membrane or inadequate transport from the lungs to the tissues. In addition to abnormalities of the lungs or respiratory structures, dysfunction of other body systems such as the cardiac system can adversely affect respiratory function, and vice versa. The major manifestations of respiratory system disorders are chest pain, cough, voice change, dyspnoea, altered ventilations, hypoxia and thoracic skeletal abnormalities. Disorders of the respiratory system can be classified as those occurring from multiple causes, from infection, as a result of neoplasms or obstruction or as a result of injury. Specific diagnostic tests used to assess function of the systems include full blood examinations, urea and electrolytes, ultrasound, pulmonary function tests, oximetry, chest x-ray, lung scan, blood gas analysis, cultures, sputum cytology, skin tests, bronchoscopy and thoracentesis.

Care of the individual with a respiratory system disorder includes promoting a clear airway, promoting local hydration, proper positioning, administration of medications, oronasopharyngeal suction, chest physiotherapy and the administration of oxygen. The nurse may be required to obtain a specimen of sputum for laboratory examination, to obtain a nasal or throat swab or to administer inhalation therapy. An individual with a specific disorder of the respiratory system may require the insertion of an artificial airway, and/or mechanical ventilation. The insertion of chest tubes may be necessary to promote the drainage of air or fluid from the pleural space. Care of individuals with cardiac or lymphatic disorders include similar care to that of a respiratory individual but may also include fluid restrictions, weighing and attention to chest or limb pain and skin integrity. Specific disorders of the circulatory system may require surgical intervention.

Some individuals require the administration of oxygen, which can be delivered using one of the various devices available. Whenever oxygen is being administered, the nurse must promote the individual's safety and comfort as part of assisting them to meet their need for oxygen.

## Review Questions

1. Name the various parts of the respiratory tract.
2. Discuss the structure and function of the respiratory system.
3. Discuss the structure and function of the cardiovascular system.
4. What are the common causes of upper respiratory problems?
5. What is the significance of respiration?
6. Explain the process of ventilation.
7. How is oxygen transported?
8. What is oxyhaemoglobin and how is it formed?
9. Identify the four blood groups and the Rh factors.
10. List some of the common clinical features of respiratory disease.
11. List some of the most common manifestations of cardiovascular disease.
12. Describe the differences in cardiac pain for angina and myocardial infarction.

13. What are the main aims of nursing care for an individual with a respiratory or cardiovascular disorder?
14. Describe the nursing care for an individual receiving oxygen therapy.
15. Explain the difference between hypoxia and hypoxaemia.
16. Identify the key areas a person with a chronic or recurrent respiratory condition should be educated on when being discharged from hospital.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

American Association for Respiratory Care: www.aarc.org

American Journal of Respiratory and Critical Care Medicine: http://ajrccm.atsjournals.org

Australian Red Cross Blood Service: http://www.donateblood.com.au/

Australian Resuscitation Council: www.resus.org.au

Bloodsafe eLearning Australia: https://bloodsafelearning.org.au/

eMedicine (altitude illness—pulmonary syndromes): www.emedicine.com/emerg/topic795.htm

Joanna Briggs Institute www.joannabriggs.org (use the search function to find a variety of research evidence)

National Asthma Council Australia http://www.nationalasthma.org.au/health-professionals

NPS Medicinewise http://www.nps.org.au/health-professionals/cpd/online-courses

Pleur-evac setup: www.medtrng.com/blackboard/chest_tube_care_and_monitoring.htm

The four most important equations in clinical practice: www.globalrph.com/martin_4_most.htm

Respiratory Nurses' Interest Group (NSW) Inc http://www.rnig.org.au/resources.html

# Nursing care of an individual: fluid and electrolyte homeostasis

*Kalpana Raghunathan*

CHAPTER 26

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define key terms
- Discuss the fundamental differences in fluid volume content throughout the lifespan
- Describe body fluid compartments and their significance in maintaining mechanisms of homeostasis
- Explain cations, anions and their associated movement
- Explain electrolytes and the common themes associated with their imbalances
- Identify interventions utilised in the correction of electrolyte imbalances in the clinical environment
- Describe the key physiological processes involved in fluid movement
- Explain the concept of tonicity and its relevance to the administration of intravenous fluids
- Describe the key systems essential in regulating body fluid balance and composition
- Discuss common health problems associated with fluid and electrolyte disturbances
- Describe the homeostatic mechanisms involved in maintaining acid–base balance
- Discuss the implications of acid–base imbalance throughout the lifespan
- Describe the components of a comprehensive person-centred nursing assessment for individuals throughout the lifespan
- Apply principles of person-centred care in planning, implementing and evaluating nursing care for individuals throughout the lifespan

## KEY TERMS

acid
acidosis
active transport
albumin
aldosterone
alkaline
alkalosis
anions
antidiuretic hormone
balance
base
body fluid
buffer
cation
dehydration
diffusion
diuretics
electrolytes
extracellular fluid
filtration
fluid
fluid balance
fluid volume deficit
fluid volume excess
homeostasis
hydrostatic pressure
ions
insensible losses
interstitial
intracellular fluid
intravascular
isotonic
oedema
osmolality
osmosis
osmotic pressure
pH
sensible losses
solutes
specific gravity
tonicity
transcellular
urine

## CHAPTER FOCUS

The purpose of this chapter is to outline the theoretical foundations in the science of fluid and electrolyte homeostasis and acid–base balance. Key physiological processes that regulate the delicate fluid, electrolyte and acid–base balance and pathophysiology of altered homeostasis are discussed. This knowledge acquisition informs nursing practice, advancing skills in providing comprehensive person-centred care throughout the lifespan. Specific evidence-based interventions and management of nursing care related to common disturbances of fluid, electrolyte and acid–base balance are explored to assist in developing best nursing practice.

As this chapter provides a brief overview of the subject material, it is recommended that you access the additional reading and resources at the end of the chapter to enhance your knowledge base.

## LIVED EXPERIENCE

As a nursing student, up until now I had been very unaware of just how important it is to meet and maintain fluid and electrolyte needs for the individual person. Only now as I near the end of my course am I beginning to grasp the dramatic impact that even a slight imbalance could potentially have on a person. Although it seems complicated at first it is essential that as nurses we have an understanding not only of the fluids we give, but also why we are giving them and how they will affect the person.

**Kristy, Enrolled Nurse Student**

# HOMEOSTASIS

There is a delicate balance of fluids, electrolytes, acids and bases which play a vital role in the maintenance of a healthy internal environment of the body. **Homeostasis** can be referred to as 'the state of equilibrium in the internal environment of the body, which is naturally maintained by adaptive responses that promote health survival' (Brown et al 2015). Alterations in fluid and electrolyte balances can lead to serious health conditions (McLafferty et al 2014; McMillan & Pitcher 2011; McGloin 2015). In the healthcare environment it is usually the responsibility of the nurse to monitor and maintain fluid balance; therefore, it is critical for nurses to develop a sound understanding of the mechanisms involved in maintaining homeostasis. This knowledge will inform their ability to anticipate fluid, electrolyte and acid–base disturbances and initiate appropriate person-centred nursing assessment and management.

The significance of the nursing role in maintaining and restoring homeostasis can be demonstrated by the multitude of conditions a person presents with that may result in fluid and electrolyte or acid–base disturbances. The person might consume a variety of common medications that can also impact on maintenance of homeostasis. Nursing care includes the early identification of individuals in this group, their assessment and monitoring, and the development of a collaborative plan of care (LeMone et al 2014). Table 26.1 lists the common conditions that can affect fluid and electrolyte homeostasis.

**TABLE 26.1 | Common conditions affecting fluid and electrolyte homeostasis**

| | |
|---|---|
| Skin losses | Excessive sweating, burns, fever |
| GIT losses | Diarrhoea, vomiting, nasogastric suctioning |
| Renal losses | Diuretics |
| Osmotic diuresis | Diabetic ketoacidosis (DKA) |
| Volume loss | Haemorrhage, diabetes insipidus (DI) |
| Third spacing | Burns, sepsis, bowel obstruction, pancreatitis |
| Others | IV fluid administration, chronic heart failure, chronic renal failure, crush injuries |

## Fluid volume content of the body

A large proportion of the human body is made up of **body fluid** or water and its **solutes**, which are small particles of dissolved substances. In a healthy adult total body water accounts for 55% of total body mass in women and 60% in men (McGloin 2015). This value changes quite significantly with age: in a newborn total body fluid can be up to 80% and gradually decrease in a person as they age (McLafferty et al 2014). The proportion of body water is dependent on the amount of lean body mass. As men generally tend to have more lean body mass than women, men naturally have greater body water content than women. Older people also have less lean mass and therefore a lower body water volume, rendering them to be more intolerant to fluid loss. Older people and infants require a particularly astute nursing assessment of their fluid volume status.

Fluids and electrolytes are usually discussed simultaneously because body fluid is the mode of transport for electrolytes and other substances. Figure 26.1 illustrates the percentage of water content in the body.

## Fluid volume distribution

Body water is distributed between two major compartments, approximately two-thirds in the intracellular space and one-third in the extracellular space (Friedman 2010) (see Figures 26.2 and 26.3). **Intracellular fluid** (ICF) is the fluid contained inside the cells which accounts for approximately 40% of total body weight (LeMone et al 2014). Electrolytes contained within the ICF include potassium, phosphorus and magnesium. **Extracellular fluid** (ECF) is located outside the cells and can be further divided into:

- **Intravascular**: contained within the blood vessels (plasma) accounting for 5% of body weight
- **Interstitial**: the fluid that surrounds cells accounting for approximately 15% of body weight
- **Transcellular**: includes fluid in spaces between joints (synovial) and other compartments such as pericardial, pleural, intraocular, cerebrospinal and secretions
- Sodium and chloride are the electrolytes found in the extracellular compartment (LeMone et al 2014).

The ICF and ECF are separated by two specific membranes: a semi-permeable cell membrane and the blood vessel wall including the capillary membrane. Under normal healthy conditions the volume of fluid within each compartment remains relatively unchanged, although fluids and electrolytes move between compartments to maintain their relative compositions (McGloin 2015). The fluids and electrolytes are able to move between compartments via the semi-permeable membrane, meaning only selected substances can cross it. Water and solutes, depending on their size, solubility, electrical properties and concentration, can pass through the cell membrane (Craft & Gordon 2015). This membrane is an example of a homeostatic mechanism (Caon 2008). It plays an integral role in maintaining fluid, electrolytes and other substances at their optimal levels and in the correct spaces for a healthily functioning body. The pathophysiology of diseases affecting the function of the semi-permeable membrane is explored later in this chapter.

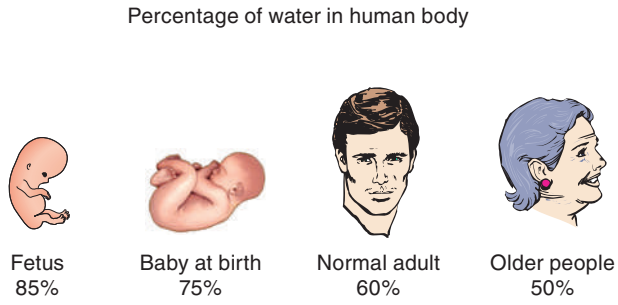



**Figure 26.1** Percentage of water in the human body

## Mechanisms of fluid and electrolyte movement to maintain homeostasis

Fluid and electrolyte movement are critical in maintaining homeostasis of the internal environment. Movement across the semi-permeable membrane is facilitated to maintain the appropriate concentrations of fluids and electrolytes in their respective compartments; this is particularly essential for optimal nerve and muscle function. Generally there are two types of fluid movement: passive transport (no cellular energy is used) and active transport (requires expenditure of cellular energy) (McLafferty et al 2014). The most common methods by which electrolytes and other solutes move are diffusion, osmosis, active transport and filtration.

### Diffusion

**Diffusion** is the movement of a substance, or solute, such as sodium (an electrolyte) or oxygen from an area of greater concentration to an area of lower concentration, resulting in an even distribution of the substance. This could be described as moving from a particularly crowded space to a less crowded space, termed as moving 'down a concentration gradient' (Craft & Gordon 2015). Many substances in the body move

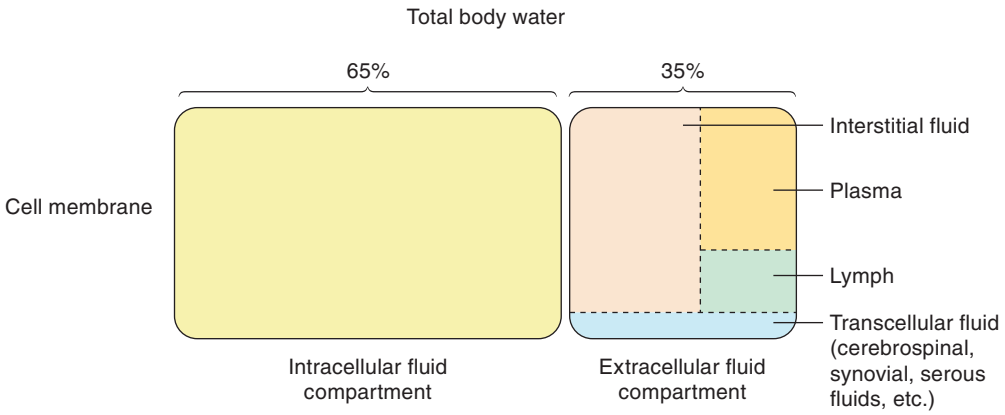



**Figure 26.2** Body water distribution and compartments

*(Saladin 2001)*

**FLUID COMPARTMENTS**

The three major fluid compartments:

- **Intracellular fluid (ICF)** is the fluid within cells, also known as cytosol
- **Extracellular fluid (ECF)** is the fluid found outside of cells.

There are two major kinds of extracellular fluid:

- **Interstitial fluid** is the fluid surrounding the cells
- **Plasma** is the fluid component of blood.

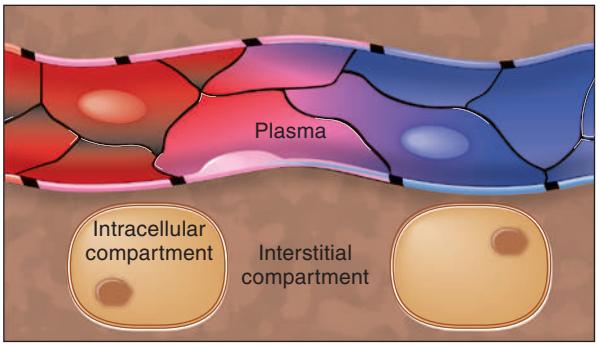



**Figure 26.3** Body fluid compartments

*(Humboldt State University, CC BY SA)*

by diffusion, such as electrolytes, amino acids and glucose. Sometimes diffusion of fluids occurs through a membrane, as in the movement of oxygen from alveoli in the lungs through the capillary membrane into the bloodstream.

Facilitated diffusion occurs when substances need to move but they need a little help to get to their destination. This assistance comes in the form of proteins, which transport substances through specific channels in the cell membrane. As a result of these substances moving down a concentration gradient (to the less crowded area) this process does not require energy (Craft & Gordon 2015). In diffusion through ion channels the membrane proteins allow the movement of specific electrolytes through the cell membrane. The channels are selective and some channels are gated opening only when stimulated to do so, playing an important part in the electrical activity of body cells (McLafferty et al 2014).

## Osmosis

**Osmosis** is the movement of water through a semi-permeable membrane from an area of high water concentration to an area of low water concentration (Caon 2008). This simply means water will move to where there is a stronger concentration of electrolytes—like adding more water to a strong cup of tea or coffee. This ultimately has a dilutional effect on the solution. This movement continues until the concentration reaches equilibrium on either side of the membrane. The rate at which osmosis occurs depends upon several factors, including:

- The concentration of electrolytes
- The temperature of the solution
- The electrical charge of the electrolytes
- The difference between the osmotic pressures exerted by the solutions.

See Table 26.2 for a summary of movement mechanisms for water and substances.

## Active transport

**Active transport** is the movement of substances from an area of lower concentration to an area of higher concentration. Unlike diffusion, this process requires substances to move up the concentration gradient (Craft & Gordon 2015). This process could be described as being similar to swimming against a strong current, therefore requiring more energy. Energy for this process comes in the form of adenosine triphosphate (ATP) (LeMone et al 2014). The sodium–potassium ATP pump is a familiar example of this type of movement. The concentrations of sodium and potassium are maintained within a tight range in the ECF and ICF; this is essential for optimal nerve conduction. As electrolytes have a tendency to want to reach equilibrium on either side of the membrane, they have to be pumped 'against the current' to maintain their concentrations. The sodium–potassium ATP pump is responsible for maintaining their concentrations and the cell 'charge', providing there is enough ATP available for this process (LeMone et al 2014). If ATP is depleted through disease processes, the consequences of homeostasis breakdown would potentially have a significant impact on the health of the person.

## Filtration

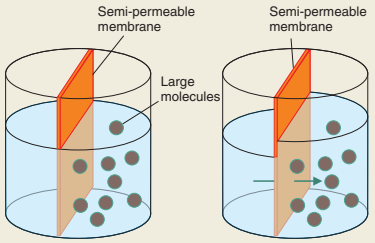
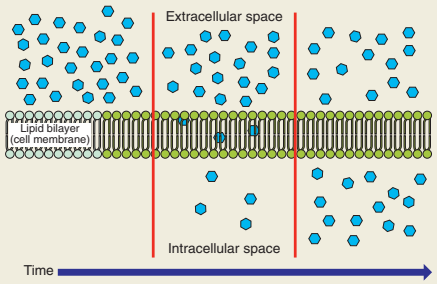
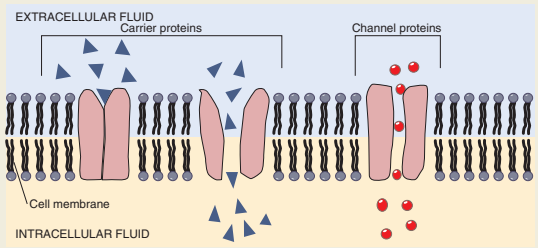
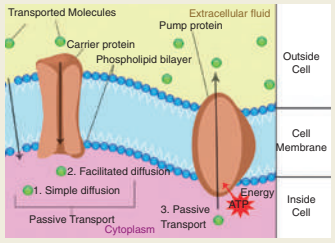
**Filtration** is the movement of water and solutes through a permeable membrane as a result of pressure from within the capillaries into the interstitial space (Craft & Gordon 2015). The pressure in the fluid compartments as a result of the movement of fluid and solutes out of the compartment is known as filtration pressure. Hydrostatic and oncotic pressures are involved in this process (McGloin 2015). In the cardiovascular system hydrostatic pressure is the blood pressure generated in the vessels when the heart contracts. In the renal system the proper excretory functioning of the kidneys is dependent on glomeruli filtration and it is particularly relevant to nurses providing care for individuals with compromised renal function. *Creatinine* clearance in the urine is especially important to know before giving some medications which are excreted by kidneys in order to prevent kidney damage (Berman et al 2015). See Clinical Interest Box 26.1 for examples of medications effecting urine production and elimination.

## Osmotic pressure and hydrostatic pressure

**Osmotic pressure** (also called oncotic pressure) refers to the concentration of a solution expressed as a pressure unit, usually mmHg (Caon 2008). Movement of water can be affected by the differences in osmotic pressure on opposite sides of the membrane. Plasma has a higher concentration of proteins compared to interstitial fluid; these proteins (especially albumin) exert osmotic pressure causing water to remain in the intravascular space (LeMone et al 2014).

Additionally, movement of water through a membrane can be affected by differences in **hydrostatic pressure** on either side of the membrane (Caon 2008). The process of water moving from an area of high hydrostatic pressure to low hydrostatic pressure is called filtration (LeMone et al 2014).

**TABLE 26.2 | Summary: mechanisms of movement—fluid and electrolytes**

| Transport mode | Image | Movement of | Movement summary | Is ATP required? |
|---|---|---|---|---|
| Osmosis |  | Water | Movement of water from high to low concentration | No |
| Simple diffusion |  | Substances | Movement of substances from a high to low concentration (crowded to less crowded) | No |
| Facilitated diffusion |  | Substances | Proteins assist in movement from a high to low concentration (crowded to less crowded) | No |
| Active transport |  | Substances | Movement from low to high concentration (to a crowded space) | Yes |

*Adapted from Craft & Gordon 2015; Active transport image © Balint Radu/Fotolia.com*

Hydrostatic and osmotic pressures greatly influence the movement of water between the interstitial and intravascular compartments. For example, hydrostatic pressure at the arterial end of the capillary pushes water into the interstitial space, until the hydrostatic pressure is finally reduced due to the movement of water. The osmotic pressure at the venous end of the capillary is then greater than hydrostatic pressure and so encourages water to move back into the capillary (LeMone et al 2014). Conditions affecting the integrity of the membrane or the amount of protein in the intravascular space will have a profound impact on health. See Figure 26.4 for visual representation of capillary hydrostatic and oncotic pressure.

## Tonicity

Tonicity can be thought of as the 'concentration' or 'osmolality' of a solution (Craft & Gordon 2015). The terms **osmolality** and osmolarity are often used interchangeably. Osmolality refers to the solute concentration in osmoles per litre (per volume of solution), while osmolarity refers to the solute concentration in osmoles per kilogram. According to Caon (2008), the difference between the two terms with relevance to intravenous solutions encountered in nursing practice is so small it is acceptable to use either term.

The **tonicity** or concentration of a solution refers to the concentration of one fluid compared to another (Caon 2008).

It is measured against the normal osmolality fluid within, which is between 275 and 295 mOsm/kg (LeMone et al 2014). An **isotonic** solution has the same tonicity or concentration as body fluid, meaning this solution will not cause water movement into or out of cells if they were placed in this solution. A hypotonic solution is less concentrated than body fluid; therefore it will encourage water to move into the cell, causing it to swell and perhaps burst (haemolyse) if there is a significant influx of water. Hypertonic solution is more concentrated than body fluid and encourages water movement out of the cell, causing the cells to shrink (Caon 2008). The concept of tonicity is particularly relevant to nurses providing care and ongoing management for individuals receiving treatment with intravenous fluids to monitor the effects of them on the person's health. Intravenous fluids will be discussed further at a later point in this chapter. See Figure 26.5 for a visual representation of fluid tonicity.

### CLINICAL INTEREST BOX 26.1 Examples of medications affecting urine production and elimination

- Some antibiotics such as gentamicin can be nephrotoxic
- Abuse of analgesics such as Act-3, Actiprofen, Brufen and Nurofen can be nephrotoxic
- Diuretics cause moderate to severe increase in production and excretion of urine
- Cholinergic medications such as pilocarpine stimulate urine production
- Some analgesics and tranquillisers suppress the CNS system and interfere with urination and neural reflex
- Certain drugs change the colour of the urine (e.g. anticoagulants—red, diuretics—pale yellow, B-complex vitamins—green or blue-green, levodopa—black or brown)

*(Dempsey et al 2014)*

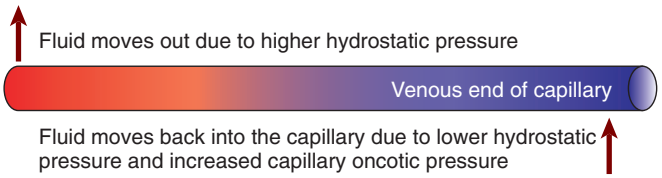



**Figure 26.4** Capillary hydrostatic and oncotic pressure

## FLUID BALANCE

**Fluid balance** relates to the correct balance of fluid input and output required in the body and it is crucial to the health of an individual (McMillan & Pitcher 2011). Fluid regulation in the body is managed by the action of the kidneys, and fluid loss and gain are carefully regulated processes in the body (McLafferty et al 2014). In the healthcare environment nurses are involved in the assessment of individuals in their care and play a vital role in monitoring and managing fluid balance. It is therefore important that nurses have a knowledge of the mechanisms involved in fluid regulation and the impact on health. When caring for young children, older people and acutely ill it is particularly important to carefully monitor fluid balance. Children have relatively higher fluid requirements compared with adults because of greater body water content (Coe & Williams 2011). Older people are less likely to respond to the thirst mechanism with age-related changes and are at risk of inadequate fluid balance (Bernoth et al 2014; Shepard 2013). Acute illness is associated with poor appetite and reliance on others for assistance with hydration and nutrition, and physiological effects that may result in fluid loss (McGloin 2015). Some of the causes for reduced or inadequate intake of fluids are:

- Refusal to drink fluid for fear of incontinence
- Cognitive impairment, dementia, Alzheimer's disease
- Reliance on others for assistance with fluid intake
- Physically weak and frail
- Fasting for medical/surgical procedures
- Diuretics and laxatives
- Being ill
- Nausea

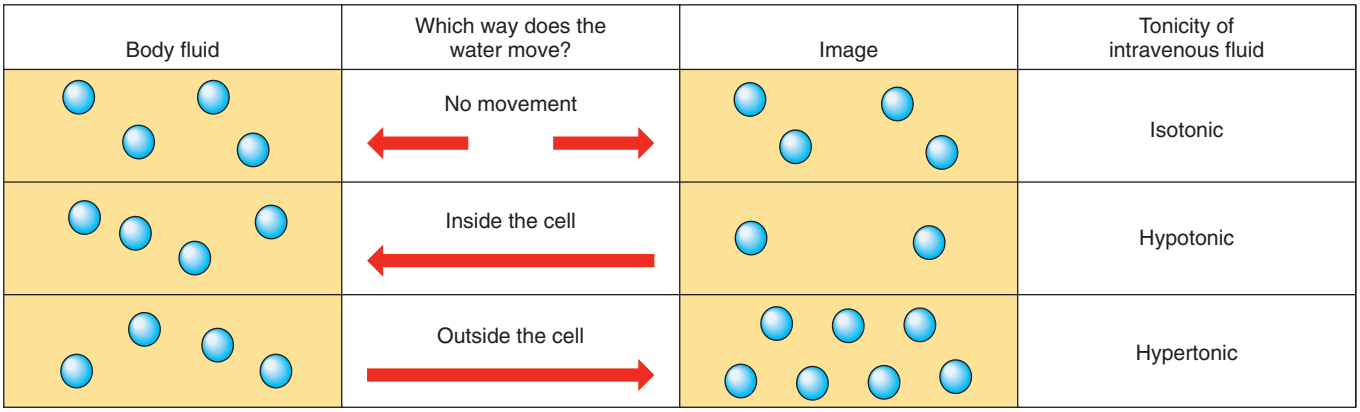



**Figure 26.5** Fluid tonicity

**TABLE 26.3 | Average adult fluid balance as millilitres of water**

| Input | Amount (mL) |
|---|---|
| Drinks | 1500 |
| Food | 800 |
| Metabolism (breakdown of food) | 200 |
| Total | 2500 |
| **Output** | |
| Urine | 1500 |
| Breathing and sweating | 800 |
| Stools | 200 |
| Total | 2500 |

*Adapted from Welch 2010*

- Reduced thirst sensation with ageing
- Fluid restrictions for medical conditions such as heart failure and renal disorders (Shepard 2011).

## Fluid intake

Fluid gain in the body is a homeostatic mechanism triggered by dehydration (McLafferty et al 2014). Fluid intake is mainly regulated by the sensation of thirst and liquid intake, and hydration requirements are highly individual depending on the person's age, gender, body mass, environment and activity levels (Coe & Williams 2011). The normal daily turnover of water in the body is equivalent to approximately 2500 mL (Welch 2010). See Table 26.3 to view the average adult fluid balance.

## Fluid output

Fluid loss from the body and the volume of body water is mainly regulated by the kidneys, determined by the levels of sodium chloride excreted in the urine through hormonal control (McLafferty et al 2014). **Sensible losses** are those which can be measured. These losses are comprised of urine and faeces and amount to approximately 1700 mL daily (Welch 2010). **Insensible fluid losses** occur in the form of invisible vaporisation and are difficult to measure. Insensible losses occur through the skin and lungs, amounting to approximately 800 mL daily.

Increased water loss is associated with an accelerated metabolism. Factors that potentially increase fluid loss in the body can include:

- High temperature
- High altitude
- High-fibre diet
- High sodium intake
- Caffeine and alcohol consumption
- Exercise.

### CRITICAL THINKING EXERCISE 26.1

**Fluid excess**

Joan, 80 years old, was admitted to hospital after seeing her GP. She presented with swollen ankles, pitting oedema and shortness of breath. She has a medical history of renal impairment and hypertension. Recently her medication dosages had been changed to manage her condition. She was confused as to what tablets she was to take and thinks she may have missed some of her regular doses. Her symptoms developed progressively over the past week. Considering Joan's symptoms, based on her medical history what specific medication do you think she may have missed which may have led to her situation?

## The antidiuretic hormone (ADH)

Several mechanisms are integral in the maintenance of fluid balance and homeostasis. They are briefly discussed in Table 26.4. The **antidiuretic hormone** (ADH) is the primary regulator of water balance. ADH is secreted when plasma concentration is elevated or when blood volume or blood pressure is decreased. When plasma concentration is increased, the osmoreceptors in the hypothalamus respond by stimulating the sensation of thirst to encourage fluid intake. The osmoreceptors also signal the posterior pituitary to release ADH, increasing the reabsorption of water by the kidneys (Figure 26.6). This reduces the amount of water lost in the urine and the reabsorbed water reduces plasma concentration (Craft & Gordon 2015). Clinical Interest Box 26.2 lists other factors that may trigger thirst when fluid volume is normal.

## Electrolytes

Electrolytes are also commonly referred to as 'solutes'; the two terms are used interchangeably and carry the same meaning. During this chapter the term electrolytes will be used to avoid any confusion for the reader.

**Electrolytes** are substances that dissociate into electrically charged particles called 'ions'. These can be negatively or positively charged—known as **anions** and **cations** respectively. Electrolytes have an 'osmotic potential'—their ability to pull water into a compartment. Sodium and dextrose are examples of electrolytes with high osmotic potentials. Movement of these electrolytes can result in major fluid shifts between the ICF and ECF (Craft & Gordon 2015). Table 26.5 lists some familiar anions and cations.

Electrolytes vary in number depending on whether they belong inside or outside the cell (in the ICF or ECF). For example, sodium ($Na^+$) is the most abundant cation outside the cells (in the ECF), whereas potassium ($K^+$) is the most predominant cation inside the cell (in the ICF). It is critical for nerve function that electrolytes retain their numbers in their relative compartments to maintain a 'charge'. If this charge is lost, it will ultimately impact on the transmission of electrical impulses across the cell membranes of nerve and

**TABLE 26.4 | A systems approach to fluid balance**

| | |
|---|---|
| Hypothalamus and pituitary | The primary regulator of fluid intake is the thirst mechanism. Thirst can result from fluid loss or an increase in plasma osmolality (an increase in plasma concentration). The thirst centre, located in the hypothalamus, is highly sensitive to changes in the concentration or osmolality of the blood. A change in the blood osmolality or a decrease in blood volume stimulates osmoreceptors in the hypothalamus to trigger the sensation of thirst and the release of the antidiuretic hormone (ADH). ADH is released from the posterior pituitary and acts in the renal tubules, causing water reabsorption. Through these mechanisms, there is an increase in water in the body and a decreased plasma osmolality (Craft & Gordon 2015). |
| Renal control<br>Aldosterone<br>Renin–angiotensin system (RAS) (see Figure 26.6) | In an average adult, total blood volume is filtered through the kidneys numerous times daily (Brown et al 2015). Most of this filtrate (99%) is reabsorbed, resulting in the production of approximately 1500 mL of urine daily. Fluid and electrolytes are selectively reabsorbed in the renal tubules according to the plasma concentration. The renal tubules are where the ADH and aldosterone perform their actions.<br>Aldosterone secretion can be stimulated by decreased renal perfusion: a person presenting with a low blood pressure, for instance. Aldosterone has the ability to retain sodium and excrete potassium. It forms part of the renin–angiotensin system.<br>In response to reduced renal perfusion, renin is released by the kidneys. Angiotensinogen is produced by the liver and is also found in the blood. Renin is an enzyme; it reacts with angiotensinogen to produce angiotensin I which is converted to angiotensin II by angiotensin-converting enzyme (ACE). Angiotensin II activates the secretion of ADH and aldosterone. Aldosterone works to reabsorb both sodium and water in the renal tubules. The end result is the restoration of plasma volume and concentration. |
| Adrenal cortical control | Glucocorticoids and mineralocorticoids are secreted by the adrenal cortex and both play a role in fluid and electrolyte imbalance. Glucocorticoids have an anti-inflammatory effect and increase glucose levels in the plasma. Cortisol is an example of a glucocorticoid. Mineralocorticoids, such as aldosterone, work by increasing sodium retention and thus water reabsorption, and excretion of potassium. An increase in the secretion of these steroid hormones is associated with physical and psychological stress. |
| Cardiac control | An elevation in blood volume or blood pressure causes atrial natriuretic peptide hormone (ANP) to be released from cells located in the atria of the heart. ANP inhibits activation of the renin–angiotensin system (RAS), promoting excretion of sodium and water. |
| Gastrointestinal control | The gastrointestinal tract secretes approximately 800 mL of fluid a day and in a healthy adult most of this is reabsorbed (Brown et al 2015). A small amount of fluid is eliminated in faeces. From this information, it is easy to imagine the impact diarrhoea and vomiting would have on the secretion and absorption of water. |

muscle cells (Craft & Gordon 2015). The detrimental impact electrolyte imbalances might have on maintaining health can be imagined.

Discussion of all the electrolytes is beyond the scope of this chapter. Electrolyte imbalances commonly encountered in the clinical environment will be discussed and a summary of common themes associated with electrolyte imbalances in general will be presented. See Table 26.6 for the blood values of electrolytes. It is important to note that normal laboratory values for tests may vary and be specific to the health setting.

## Fluid and electrolyte imbalance

Several factors can disturb the body's **fluid** and electrolyte **balance**, resulting in **fluid volume deficit** or **fluid volume excess**. Water volume imbalances are usually accompanied by electrolyte imbalances, particularly sodium. It is important to note that the term 'fluid volume deficit' does not carry the same meaning as 'dehydration' (Brown et al 2015). Dehydration refers to the loss of pure water alone without the associated loss of sodium.

### Dehydration

**Dehydration** can be defined as a sudden loss of 3% or more of the individual's body weight (Welch 2010). Inadequate intake of fluid and an excessive output or combination of the two are the two main issues associated with the problem of dehydration (McMillan & Pitcher 2011). People considered to be at a higher risk for dehydration include: young children, elderly, people with increased insensible fluid loss, confused and immobile individuals, someone with trauma or surgical wounds and individuals being treated with medications that alter electrolyte balance (Rathnayake 2013). Dehydration can lead to hyperkalaemia, cardiac arrhythmia, renal failure and death in some cases. Dehydration is a common clinical presentation among older people and children. People over the age of 85 years are six times more likely to be admitted to

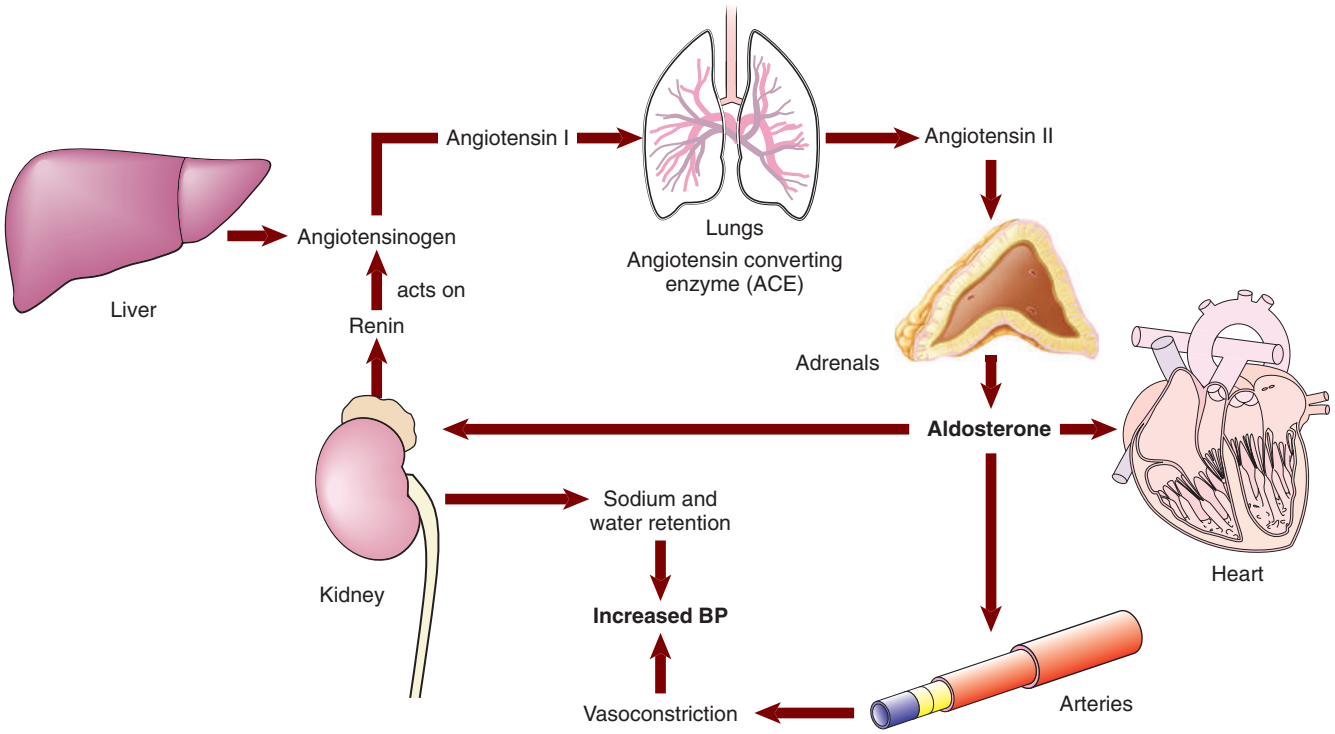



**Figure 26.6** Renin–angiotensin system (RAS)
*(Adapted from Hellman 2016)*

**TABLE 26.5 | Cations and anions**

| Cations | Anions | Major intracellular | Major extracellular |
|---|---|---|---|
| Sodium ($Na^+$) | Bicarbonate ($HCO_3^-$) | $K^+$ | $Na^+$ |
| Magnesium ($Mg^+$) | Chloride ($Cl^-$) | $PO_4^-$ | $Cl^-$ |
| Potassium ($K^+$) | Phosphate ($PO_4^-$) | $Mg^+$ | $Ca^+$<br>$HCO_3^-$ |

## CLINICAL INTEREST BOX 26.2 Other factors that can trigger thirst when fluid volume is normal

Actions such as mouth breathing or eating dry or salty foods can be misinterpreted by the body as thirst. Situations such as these can cause additional fluid intake even though the osmolality of the blood or the blood volume is within normal range.

**TABLE 26.6 | Electrolyte values**

| | |
|---|---|
| $Na^+$ | 135–145 mmol/L |
| $Cl^-$ | 98–110 mmol/L |
| $K^+$ | 3.5–5.0 mmol/L |
| $Ca^+$ | 2.2–2.6 mmol/L |
| $Mg^+$ | 0.7–1.1 mmol/L |
| $PO_4^-$ | 0.7–1.3 mmol/L |
| $HCO_3^-$ | 22–26 mmol/L |

hospital for dehydration, while dehydration in children is a leading cause of morbidity and mortality worldwide (Welch 2010).

Special considerations for older people include:

- Loss of appetite and thirst sensation
- Physical changes resulting in loss of independence
- Biochemical effects of ageing
- Cognitive impairment.

Comorbidities can also have a profound effect on hydration. For example, individuals experiencing incontinence will frequently reduce their fluid intake; this can cause other problems and predispose the person to urinary tract infections (Welch 2010). Dehydration in acutely ill individuals

causes decreased blood circulation volume, seriously affecting cardiovascular and renal functions (McGloin 2015). Some of the effects of dehydration in an acutely ill person include:

- Poor cognition and confusion
- Reduced activity levels
- Headache and fatigue
- Reduced skin turgor
- Sunken and dry eyes
- Dry lips and oral mucosa (McGloin 2015).

The opposite of dehydration is over-hydration. Over-hydration can have a serious effect on people with underlying pathological conditions such as renal failure and heart failure (McMillan & Pitcher 2011). This occurs when the body is unable to deal with the excess water simply by increasing urine output resulting in fluid retention. Excess fluid leaks into the surrounding tissue and is drawn into the cells causing them to swell (oedema). In the lungs fluid leaks through the capillaries, resulting in fluid accumulation and breathing difficulty (dyspnoea) (McMillan & Pitcher 2011).

## Fluid volume deficit

**Fluid volume deficit** is also called hypovolaemia and refers to the abnormal loss of both body fluid and electrolytes in similar proportions from the ECF (Berman et al 2015). Causes for fluid volume deficit can include:

- Decreased fluid intake as a result of unavailability of fluids, or secondary to other conditions (e.g. unconsciousness)
- Increased fluid output secondary to other conditions (e.g. diarrhoea, vomiting, excessive urine output, hyperventilation, excessive perspiration, diabetes insipidus, prolonged fever, haemorrhage or inadequate replacement of aspirated or drained fluids)
- Increased electrolyte load secondary to other conditions; (e.g. hyperglycaemia associated with uncontrolled diabetes mellitus, excessive intravenous infusion of hyperosmotic or concentrated solutions of glucose or sodium bicarbonate).

Fluid volume deficit can also occur when fluid shifts abnormally from the plasma to the interstitial space. This is commonly referred to as 'third-space fluid shifts' in the clinical environment. There is not an absolute loss of fluid: it has simply moved to another compartment. Either disease process causing this shift creates an imbalance in hydrostatic and oncotic pressure and/or there is destruction of the semi-permeable membrane that usually contains fluids within their compartments. Examples of these disease processes include:

- Burns
- Intestinal obstruction
- Ascites
- Sepsis.

The signs and symptoms of fluid deficit include:

- Thirst
- Reduced urine output and increased urine concentration
- Drier mucous membranes and sunken eyes
- Headache and confusion
- Weak and thready pulse, and increased capillary refill time
- Reduced blood pressure and rapid shallow breathing (McMillan & Pitcher 2011).

## Fluid volume excess

**Fluid volume excess**, also referred to as hypervolaemia, is a condition whereby the body retains both water and sodium in similar proportions to the normal ECF (Berman et al 2015). This could be as a result of excess intake or due to disease processes that result in an imbalance in hydrostatic and oncotic pressures causing fluid to shift into the vascular compartment or shift into the interstitial space. The latter exhibits signs such as oedema. Although the overall volume of the ECF does not change, it does affect the volume of fluid in the intravascular space. Examples of these disease processes include:

- Excessive administration of intravenous fluids or hypotonic solutions
- Disturbance of homeostatic mechanisms (e.g. water retention resulting from kidney, cardiac or liver failure)
- Insufficient sodium (e.g. from use of diuretic medications)
- Inappropriate ADH secretion due to cerebral infections, head injury or increased intracranial pressure (Brown et al 2015).

Symptoms of fluid retention vary depending on the severity of fluid overload. In the case of acute fluid overload there may be sudden onset of acute dyspnoea as a result of fluid in the lungs. A person with chronic history of fluid overload may show signs of fatigue, dyspnoea and pitting oedema (Shepard 2011).

### CRITICAL THINKING EXERCISE 26.2

**Fluid balance**

A 78-year-old man was having multiple IV antibiotics throughout the day. Each dose was given with 100 mL normal saline six times a day. Nursing care included 6/24 hourly vital signs observations to be recorded, daily weight, fluid balance chart, total fluid restriction of 1200 mL daily and a low-salt diet. The person has renal impairment. After 24 hours he is exhibiting signs of swollen ankles and shortness of breath. The oral intake column on the fluid balance chart shows 1200 mL and output is 800 mL over 24 hours. What has caused the person's symptoms and fluid retention in this case? What is the critical issue with the fluid balance charting for this person?

## Oedema

**Oedema** (swelling) occurs due to the accumulation of fluid in the interstitial spaces (Craft & Gordon 2015). Causes of oedema include increased capillary hydrostatic pressure, where fluid from the vascular space is forced into the interstitial spaces. This can occur in individuals with heart failure.

A lowered plasma oncotic pressure also causes fluid to shift into the interstitial spaces; this can occur in a person with a low albumin level. Increased capillary permeability affects the ability of the capillary membranes to maintain fluid within the vascular compartment, resulting in fluid shift to the interstitial space. Examples of conditions with increased capillary permeability include burns and systemic inflammatory response syndrome (SIRS). Figure 26.4 shows capillary hydrostatic and oncotic pressure.

## ELECTROLYTE IMBALANCES

Electrolyte imbalance involves either a deficit or an excess of electrolytes such as sodium, potassium, calcium, magnesium or phosphate. Sodium and potassium imbalance are two most common presentations associated with fluid and electrolyte imbalances (McLafferty et al 2014).

### Sodium ($Na^+$)

Normal plasma value: 135–145 mmol/L. Sodium imbalance is one of the most prevalent electrolyte imbalances encountered in the clinical environment. Sodium plays an integral role in the maintenance of irritability and conduction of nerve and muscle tissue. It impacts on volume and concentration of ECF, maintains acid–base balance and influences levels of other electrolytes such as potassium and chloride.

#### Sodium homeostasis

The kidneys are the primary organs responsible for maintaining the plasma concentration (ECF) of sodium within the tightly controlled limits of 135–145 mmol/L. Sodium balance is regulated by the hormone **aldosterone** which is secreted by the adrenal cortex (Craft & Gordon 2015). If plasma sodium levels are decreased, aldosterone is secreted to increase sodium reabsorption in the kidney tubules, and as a result the plasma sodium level will rise.

Sodium imbalances are referred to as being either hyponatraemia or hypernatraemia. Hyponatraemia refers to sodium deficit—a low concentration of sodium in the ECF caused either by the loss of sodium or by gaining more water. Hyponatraemia can be caused by impaired renal function, fluid loss related to burns, impaired ADH secretion, sodium loss associated with diuretics or hyperglycaemia (McLafferty et al 2014). Decreased sodium causes fluid to move by osmosis from the less concentrated ECF compartment to the ICF space, resulting in a fluid shift. This fluid shift can lead to swelling of the cells and cerebral oedema. Severe hyponatraemia can cause seizures and neurological damage (Dempsey et al 2014). Hypernatraemia is the opposite—it refers to an excess of sodium in the ECF as a result of water loss or an overall surplus of sodium. Hypernatraemia can occur as a result of excessive consumption of salt in the diet, prolonged diarrhoea and vomiting or dehydration. Symptoms of hypernatraemia include an intense thirst, hypertension, oedema, agitation and convulsions (McLafferty et al 2014). See Table 26.7 for a list of conditions and signs and symptoms associated with hypernatraemia and hyponatraemia. These will be dependent on whether there is an associated hypervolaemic or hypovolaemic state. Refer to the online resource Nutrient Reference Values from NHMRC for information about specific electrolyte values.

**TABLE 26.7 | Causes, signs and symptoms associated with hypo/hypernatraemia**

| Causes of hyponatraemia | Associated signs and symptoms |
|---|---|
| • Water retention (dilutional): chronic heart failure, renal failure, liver failure<br>• $Na^+$ in excess of water: diuretics, diarrhoea, vomiting, hyperglycaemia, NG suctioning, third space losses | Cramps<br>Muscle weakness<br>Headache<br>Anorexia<br>Nausea<br>Confusion<br>Seizures<br>Ataxia<br>Respiratory depression<br>Coma |
| **Causes of hypernatraemia** | **Associated signs and symptoms** |
| • Dehydration: pure water loss caused by insensible losses: sweat, burns, hyperventilation, GIT losses, diabetes insipidus (DI), hyperglycaemia, excessive $Na^+$ intake, IV fluids | Hypovolaemic signs: tachycardia, thready pulse, hypotension<br>Thirst<br>Dry mucous membranes<br>Cool extremities<br>Muscle weakness<br>Lethargy<br>Confusion<br>Seizures<br>Coma |

**CRITICAL THINKING EXERCISE 26.3**

**Electrolyte imbalance**

Nathan is a participant in a local marathon. He is brought in to ED by ambulance after collapsing at the event. He had been drinking water only during the run. His results show BP 95/55, HR 60, BGL 3 mmol/L, sodium 126 mmol/L, potassium 3.5 mmol/L and he is unable to pass urine. Consider his results. What has happened to Nathan?

### Potassium ($K^+$)

Normal plasma value: 3.5–5.0 mmol/L. Potassium is the chief intracellular cation and has a major role in the concentration of intracellular fluid and neural function. It is particularly essential for the neuronal function of cardiac, musculoskeletal and smooth muscle. Because of this, imbalances in the potassium levels in the intracellular or extracellular environment can be potentially life threatening and

## CLINICAL INTEREST BOX 26.3 Nursing considerations for potassium

- Foods rich in potassium may need to be restricted in individuals with chronic renal failure. Such foods include dates and bananas
- IV $K^+$ administration can be painful
- Consider oral route of administration if appropriate to the clinical situation
- Preparations such as Resonium exchange $K^+$ for calcium ($Ca^+$) in the gut and have a long-lasting effect
- Administration of blood products can cause hyperkalaemia and hypocalcaemia
- $K^+$ levels are usually kept in the high/normal range for individuals with cardiac complaints (i.e. >4.0)
- Digoxin is a medication commonly encountered in the clinical environment. Therapeutic levels of this drug are influenced by serum $K^+$ levels.

often present as a medical emergency (Craft & Gordon 2015). Clinical Interest Box 26.3 outlines the nursing considerations for an individual taking potassium.

### Potassium homeostasis

Potassium is regulated by the kidneys. It is filtered by the nephrons, reabsorbed back into the blood and secreted according to bodily requirements and functioning. An alteration in the flow of urine also influences the secretion of potassium. For a person taking **diuretics** (substances that increase excretion of water) the urine flow will be increased, resulting in increased levels of potassium in the urine. Aldosterone also increases the secretion of potassium when levels are high. Potassium balance is also affected by acid–base disturbances. For example, an increase in hydrogen ions ($H^+$) will cause potassium to shift outside the cell in exchange for $H^+$ ions to maintain a balance of cations on either side of the cell.

Potassium imbalances are referred to as being either hypokalaemia or hyperkalaemia. Hypokalaemia refers to potassium deficit in the ECF. It can be caused by excess fluid loss, dehydration, decreased levels of potassium intake, renal impairment, overuse of laxatives, prolonged diarrhoea and vomiting and some diuretics. Symptoms include thirst, muscle weakness, cramps, increased urine output and confusion. Low potassium can have an effect on cardiac cell activity and cause arrhythmias in severe cases (McLafferty et al 2014). Hyperkalaemia is the excess of potassium in the ECF. It can be caused by high potassium intake, tissue trauma caused by burns or accidents and renal failure inhibiting potassium excretion. Symptoms include skeletal muscle weakness, paralysis, irritability, nausea and vomiting. High potassium levels can have a serious effect on the cardiac muscle function and cause arrhythmias and even cardiac arrest if untreated (McLafferty et al 2014). Table 26.8 outlines conditions and signs and symptoms associated with hyper/hypokalaemia.

**TABLE 26.8 | Causes, signs and symptoms associated with hypo/hyperkalaemia**

| Causes of hyperkalaemia | Associated signs and symptoms |
|---|---|
| • Renal failure<br>• Acidosis<br>• IV $K^+$ administration<br>• Blood products<br>• $K^+$ sparing diuretics<br>• Trauma<br>• Burns | Lethargy<br>Confusion<br>Muscle weakness<br>Calf pain<br>ECG changes<br>Arrhythmias |
| **Causes of hypokalaemia** | **Associated signs and symptoms** |
| • Diuretics<br>• NG suction<br>• Diarrhoea and vomiting<br>• Starvation<br>• Alkalosis | Fatigue<br>Muscle weakness/cramps<br>Nausea/vomiting<br>Arrhythmias<br>Digoxin toxicity |

## NURSING ASSESSMENT OF INDIVIDUALS WITH FLUID AND/OR ELECTROLYTE NEEDS

In the healthcare environment nurses are usually responsible for accurate assessment and adequate fluid management for individuals in their care. Poor fluid management and record keeping can contribute to the worsening of a person's health condition. The nursing process is integral to the provision of person-centred care for individuals in healthcare settings. The process encompasses the following:

- Assessment
- Nursing diagnosis
- Planning
- Implementation
- Evaluation.

The process is not merely a series of steps; a critical thinking approach is adopted by analysing at each stage and updating or changing plans according to the individual's needs (Crisp et al 2013). (Read Chapter 17 for further information on the nursing process.)

The assessment phase refers to the collection, validation, organisation and documentation of data retrieved from the individual (Berman et al 2015). During this phase the nurse will gather information about the person's health status. The use of a model to promote systematic data collection to prevent the omission of important relevant data is recommended. This data will include subjective and objective information, both of which are essential. This will provide the nurse with a holistic overview of the individual's health status to inform the provision of person-centred care. Also see the sample Progress Note Example 26.1 for a person admitted with fluid and electrolyte needs and monitoring.

## PROGRESS NOTE EXAMPLE 26.1

| | |
|---|---|
| 21/03/2015<br>1600 hrs | Nursing: Mrs Kay was admitted for management of congestive heart failure after seeing her GP, complaining of swollen ankles and shortness of breath. Following her admission to hospital the RMO has ordered blood tests FBE and U & E, random blood glucose and a urine test. She is also referred for chest x-ray and ECG. Nursing orders included 2/24 hourly vital signs observations to be recorded, daily weight, fluid balance chart, fluid restriction of 1200 mL daily and a low-salt diet.<br>***M. E. Reynolds*** **(Reynolds) EN** |

With specific reference to fluid and electrolyte needs, obtaining an initial health history would be an appropriate starting point. This could include questioning the person about their present illness/condition/complaint and their past history, including family history where relevant. Subjective data collection should include questioning the person about their lifestyle habits and psychosocial status. For the assessment of fluid and electrolyte needs it is particularly important to gather data on:

- Past medical history: any conditions associated with fluid/electrolyte disturbances
- Medications: any medications associated with fluid/electrolyte disturbances
- Diet: any specific requirements/restrictions, eating habits, supplements, factors limiting access to adequate nutrition/fluid intake
- Exercise: how often, type of exercise and the conditions; whether there are specific nutritional/fluid requirements associated with it
- Other personal habits: alcohol consumption, sports drinks
- Social data: cultural affiliation (some religious practices include fasting during certain periods)
- Psychological: mental health history (e.g. eating disorders; anxiety, stress) (Berman et al 2015).

Table 26.9 outlines assessment findings associated with fluid volume deficit or excess.

Gathering of objective data will include a thorough physical assessment of the person, frequently performed using a systems approach to facilitate comprehensive systematic data collection. These physical findings will be dependent on the associated disease process the person is experiencing. For example, a person with acute pulmonary oedema may be agitated and confused due to hypoxaemia caused by reduced ability of oxygen to diffuse into the pulmonary capillaries.

## Urine

**Urine** volume and concentration is a helpful clinical assessment about a person's fluid, electrolyte and acid balance status (Dempsey et al 2014). It is important to also be aware that when assessing urine there are no absolutes. Urine tests may not be reliable especially in individuals with medical conditions such as renal or heart failure or people taking diuretics. Diuretics are prescribed to manage conditions associated with excessive fluid retention and therefore need to be taken into consideration when assessing urine and urinary output (Kaufman 2014).

Urine **specific gravity** (SG) refers to the density of urine compared with water. Osmolality refers to the concentration of the urine. Urine SG can be measured with a dipstick using a fresh urine sample or through laboratory tests. Normal urine specific gravity is between 1.005 and 1.030 and osmolality between 500 and 1200 mOsm/kg. In states of volume deficit, urine SG can be elevated and the osmolality high, usually accompanied by a decrease in urine output (except in diabetic ketoacidosis). In volume excess, urine tends to be dilute with a low SG and osmolality. See Clinical Interest Boxes 26.4 and 26.5 for more tips on undertaking a physical assessment and additional information to consider when assessing fluid needs of individuals.

## Paediatric assessment

There are some important issues to consider in paediatric assessments. These issues will obviously depend on the age of the child and a detailed account is beyond the scope of this chapter. However, an overview of questions to consider includes:

- Feeding regimen—are there problems with feeding (e.g. lethargy, poor sucking, regurgitation, colic, irritability)?
- What is the typical intake over 24 hours?
- Type of formula?
- Type of fluids?
- Number of wet nappies?
- Bowel movement—any vomiting/diarrhoea?
- Any weight gain/loss?
- Allergies?

Important aspects of physical assessment include:

- Obtaining age-appropriate vital signs
- Assessment of state of alertness—how interactive is the child?
- Sunken eyes, pallor, reduced tears, dry arm creases, dry mucous membranes or depressed fontanelle (age appropriate) may suggest dehydration
- Weight.

If the child's current weight and pre-morbid weight are available, this information can be the most reliable indicator of the fluid volume deficit (refer to the online resource The Royal Children's Hospital Melbourne, *Clinical Practice Guideline: Intravenous Fluids*). In addition there are also physical signs frequently encountered with varying degrees of fluid volume deficit. Volume loss in children is commonly expressed as a percentage of body weight. For example, a 10 kg child who is 5% dehydrated would have a fluid deficit of approximately 500 mL. See Table 26.10 for clinical signs of

## TABLE 26.9 | Assessment findings associated with fluid volume deficit or excess

| Body system | Physical assessment findings—fluid volume excess | Physical assessment findings—fluid volume deficit |
|---|---|---|
| Central nervous system | Agitation<br>Confusion<br>Numbness, tingling, seizures with associated electrolyte losses | Headache<br>Irritability/agitation<br>Confusion/delirium<br>Dizziness<br>Lethargy<br>Numbness, tingling, seizures with associated electrolyte losses |
| Respiratory | Increased work of breathing: use of accessory muscles<br>Dyspnoea<br>Orthopnoea<br>Adventitious breath sounds: crackles, wheezes<br>Hypoxaemia | Non-specific findings<br>Increased work of breathing related to disease process |
| Cardiovascular | Bounding pulse<br>Distended neck veins<br>Third heart sound<br>Oedema<br>Hypertension | Tachycardia<br>Thready pulse<br>Orthostatic blood pressure changes<br>Hypotension<br>Decreased capillary refill<br>Flat neck veins<br>Arrhythmias associated with electrolyte imbalances |
| Renal | Oliguria or anuria | Oliguria or anuria |
| | Diuresis | Increased urine specific gravity |
| Gastrointestinal | Distended abdomen | Abdominal cramps<br>Diarrhoea/vomiting<br>Sunken or distended abdomen<br>Hyperactive bowel sounds |
| Skin | Non-specific | Cracked lips<br>Tongue furrows<br>Dry mucous membranes<br>Decreased skin turgor (not reliable in older adults)<br>Decreased sweat<br>Reduced or increased body temperature<br>Flushed or pale skin |

### CLINICAL INTEREST BOX 26.4 Physical assessment tips for nurses

- Physical examination is a critical element for assessing and treating disorders of fluid balance
- It is often more reliable than data obtained by invasive monitoring
- Weight gain is the most consistent sign of volume excess
- Gravity-dependent oedema is an important finding; not usually apparent until 2–4 kg of fluid have been retained

### CLINICAL INTEREST BOX 26.5 Important nursing considerations when assessing fluid needs

- **F**luid/dietary restrictions
- **L**oss of fluid: what is the source, what is the fluid and electrolyte imbalance associated with this?
- **U**nderlying disease processes
- **I**V fluids: what treatment is the person receiving and why?
- **D**rugs, digoxin, diuretics
- **S**ystems assessment

**TABLE 26.10 | Characteristics of dehydration according to severity for children <12 years**

| | Mild | Moderate | Severe |
|---|---|---|---|
| Infants | 1–5% | 6–9% | >10% |
| Older children | 1–3% | 3–6% | >6% |
| Pulse | Full, normal | Rapid | Rapid, weak |
| Systolic BP | Normal | Normal, low | Very low |
| Urine output | Decreased | Decreased | Oliguria |
| Buccal mucosa | Slightly dry | Dry | Parched |
| Anterior fontanelle | Normal | Sunken | Markedly sunken |
| Eyes | Normal | Sunken | Markedly sunken |
| Skin turgor/ capillary refill time | Normal | Decreased | Markedly decreased |
| Skin | Normal | Cool | Cool, mottling |

dehydration that might be observed in children less than 12 years old, depending on the severity of fluid loss. See Clinical Interest Box 26.6 for further details on estimating volume loss in children.

## Care planning and intervention

The data gathered from the comprehensive person-centred assessment will inform nursing diagnoses, subsequent planning of care and nursing interventions. The formulation of nursing diagnoses requires critical thinking skills to be utilised by the nurse (Crisp et al 2013). Diagnostic statements should be specific, including a 'qualifier' in the statement. These qualifiers include:

- Deficient
- Impaired
- Decreased
- Ineffective
- Compromised.

The statement should also include the causative factors.

Most healthcare organisations utilise pre-printed standardised care plans to some degree. Whether the plan is prewritten or not, an integral component of person-centred care is that the plan must be individually relevant to the particular individual's needs. The majority of plans frequently incorporate the key components of:

- Nursing diagnosis/individual's problem
- Desired outcomes/goals
- Nursing interventions
- Rationales
- Evaluation.

(See Nursing Care Plan 26.1 for a sample of how a plan might be provided for a person with fluid and electrolyte needs.)

Some important general aspects of care to assist an individual who requires encouragement with their usual fluid intake, or requires assistance in meeting a higher than usual intake, include:

- Providing assistance to individuals who experience difficulty in pouring fluid or holding a cup or glass
- Explaining the importance of consuming the normal or increased fluid volume
- Providing the individual's preferred types of fluid if not contraindicated
- Ensuring that all fluids are presented attractively and at the correct temperature
- Encouraging smaller amounts of fluid at more frequent intervals
- Ensuring that about 75% of the total volume of fluid is taken by early evening so that sleep is undisturbed
- Ensuring that toilet facilities are easily accessible
- Documenting input and output to assess and maintain the person's fluid and electrolyte balance.

Some people may have restrictions on their fluid intake for medical reasons: those with renal failure, for example. Basic nursing actions to assist individuals in this group might include:

- Explaining to the person and significant others the importance of consuming only the volume ordered
- Planning to distribute fluid evenly throughout the day, including fluid to swallow medications
- Encouraging small amounts at regular intervals to avoid thirst

### CLINICAL INTEREST BOX 26.6 Assessment of dehydration in children

An evaluation of dehydration is based on clinical signs and the degree of dehydration. The degree of dehydration is based on recent loss of body weight.

- Mild dehydration: less than 3% in older children or less than 5% in infants, generally no clinical signs
- Moderate dehydration: 5% to 10% in infants and 3% to 6% in older children, with some clinical signs
- Severe dehydration: more than 10% in infants and more than 6% in older children, with multiple pronounced clinical signs.

*(Perry et al 2014)*

## NURSING CARE PLAN 26.1

**Assessment**: Fluid balance and hydration
**Issue/s to be addressed**: At risk of dehydration due to impaired swallow mechanism
**Goal/s**: Prevent dehydration through:
Maintaining fluid balance—input and output
Maintain urine output at 30 mL/hr
Maintain urine specific gravity 1.005–1.025
Maintain current weight
Maintain serum Na levels within the normal range
Maintain moist mucous membranes

| Care/Actions | Rationale |
|---|---|
| Monitor fluid intake and output on a fluid balance chart and communicate imbalances with medical staff | To identify fluid volume deficit/excess early and prevent complications |
| Administer and monitor intravenous therapy as prescribed and record on the fluid balance chart | IV therapy is an important adjunct in maintaining hydration in a person unable to tolerate oral fluids |
| Perform urinalysis to assess SG | Urine specific gravity is an indicator of increased or decreased serum osmolality |
| Daily weights | Weight loss or gain is a reliable indicator of fluid loss/gain |
| Monitor serum Na levels | Serum Na levels are strongly associated with fluid loss/gain |
| Observe all mucous membranes and provide necessary care to maintain integrity | Mucous membranes are a reliable indicator of hydration status and they may be at risk of breakdown |
| Document findings and liaise with interdisciplinary team accordingly | Alterations may require prompt medical management |

**Evaluation**: Assessment and monitoring of individual to include:
Fluid intake and output on a fluid balance chart
Status of IV site, IV cannula and dressing
Check IVT flow rate
Mobility and comfort level with IVT
Urinalysis
Daily weight
Serum Na levels
Observation of skin integrity and mucous membranes
Vital signs (Temp, BP, P, R)

- Providing thirst-quenching fluids (e.g. water) and avoiding sweetened drinks that increase thirst
- Notifying ancillary staff (e.g. dietitians and kitchen staff) of changes
- Ensuring that the person's mouth does not become dry by regular attention to oral hygiene
- If not contraindicated, the person may be permitted sweets or sugar-free gum to stimulate production of saliva to keep the mouth moist.

## Weighing and fluid balance charts

Clinical assessment of individuals, reviewing fluid balance charts and blood chemistry are key elements for assessing fluid balance and hydration (Shepard 2011). Fluid balance charts (Table 26.11) are commonly utilised in clinical practice and are considered to be an important aspect of nursing documentation. The fluid balance chart is a record of fluid input and output, documented over a 24-hour period, indicating if the person is in fluid balance, deficit or overload (McGloin 2015). The charts are used concurrently with the person's daily weights to assess hydration status. However, an evidence summary presented by the Joanna Briggs Institute (Le 2014) summarises some of the concerns with the use of fluid balance charts, which include inaccurate cumulative fluid balance, inconsistency with standardised body weight measurements, omission or duplication of information, inappropriate chart design and arithmetical errors. Tang and Lee (2010) also report inconsistency and poor documentation with the use of fluid balance charts. The evidence currently recommends the use of daily weights without the use of fluid balance charts (JBI 2014); however, fluid balance charts continue to be used in many healthcare facilities. If the decision is made to use a fluid balance chart, evidence strongly supports the individual's involvement in completing the chart to achieve more accurate charting (Le 2014).

The person should be weighed daily at the same time, wearing the same type of clothing and using the same set of scales. Weight can be measured with a standing scale or chair or bed scale and the measurement should be recorded on the appropriate form. The measurement can be affected by bowel and urine elimination pattern and this should be taken into account. Table 26.12 outlines the key aspects of care for a person with fluid imbalance. See Clinical Skill 26.1 for the correct steps in completing a fluid a balance chart.

## TABLE 26.11 | Sample fluid balance chart

| FLUID BALANCE CHART | | | | | | | | | | IDENTIFICATION LABEL | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Input** | | | | | | **Output** | | | | | | |
| | | | | | | | | | | OTHER | | | |
| **Time** | **Oral** | **Enteral** | **IV** | **IV** | **IV** | **Total Input** | **Time** | **Urine** | **Faeces** | **Gas asp** | **Wound** | **Total Output** | |
| 0700 | Water 150 mL | | N/S 0.9% 1 L/10 hours | | | 150 mL | | 400 mL | | | | 400 mL | |
| 0800 | | | 100 mL | | | 250 mL | | | | | | | |
| 0900 | | | | | | | | | | | | | |
| 1000 | Tea 150 mL | | 100 mL | | | 500 mL | | | 150 mL (loose) | | | 550 mL | |
| 1100 | Water 150 mL | | 100 mL | | | 750 mL | | 350 mL | | | | 900 mL | |
| 1200 | | | 100 mL | | | 850 mL | | | | | | | |
| 1300 | Water 150 mL | | 100 mL | | | 1100 mL | | 150 mL | | | | 1050 mL | |
| 1400 | Tea 150 mL | | 100 mL | | | 1350 mL | | | | | | | |
| 1500 | | | 100 mL | | | 1450 mL | | | 100 mL (loose) | | | 1150 mL | |

**TABLE 26.12 | Key aspects of care for individuals with fluid imbalance**

| Fluid volume deficit | Fluid volume overload |
|---|---|
| Administer pharmacological interventions (within scope of practice) as prescribed:<br>• Anti-emetics<br>• Medications for the treatment of diarrhoea<br>• Paracetamol for fever if appropriate<br>• IV fluids<br>• Electrolyte replacement as ordered, monitor for effects and consider a 12-lead ECG and continuous cardiac monitoring<br>• Rehydration via nasogastric or gastrostomy tube (if this is the person's usual method of fluid intake). A nasogastric tube may need to be inserted for rehydration—more commonly used in the paediatric setting as a non-invasive method of fluid administration<br>• Continuous nursing assessment and evaluation of response to management<br>• Monitor vital signs—frequency according to the acuity of the person's condition<br>• Infection control measures for individuals with suspected gastroenteritis<br>• Comfort measures—fans, blankets as appropriate<br>• Monitor serum electrolytes and urine SG<br>• Monitor input/output on a chart<br>• Maintain skin integrity and attend to hygiene needs | Administer pharmacological interventions (within scope of practice) as prescribed:<br>• Treatment of the underlying condition may require management with diuretics<br>• Monitor associated electrolyte imbalances and replace as required/prescribed. Consider a 12-lead ECG and continuous cardiac monitoring<br>• Continuous nursing assessment and evaluation of response to management<br>• Monitor vital signs—frequency according to the acuity of the person's condition<br>• Recording fluid balance<br>• Daily or twice-daily weighing<br>• Care of oedematous limbs: increased risk of skin breakdown. Also, reduced healing capabilities due to reduced blood supply<br>• Elevation where appropriate and comfortable<br>• Adhere to dietary/fluid restrictions |

## INTRAVENOUS THERAPY

Management of individuals receiving intravenous therapy incorporates:

- Monitoring of the IV site
- Maintenance of equipment
- The prevention of complications occurring during and after completion of the intravenous (IV) infusion
- Educating the individual
- Assistance with mobility needs
- Continuous assessment.

Insertion of an intravenous cannula is performed by a registered medical officer or a Registered Nurse (RN) who within their scope of practice is certified to insert IV cannulas. Prior to the insertion of a cannula, the most appropriate site is selected, which depends on several factors, including the condition of the person's veins—avoiding areas that are oedematous, infected or otherwise impaired—and general comfort considerations (Figure 26.7).

Other site determinants include:

- A vein in the non-dominant arm is preferably used
- The initial site should be in the most distal part of the vein to allow more proximal replacement in the same vein in the event of cannula blockage, infiltration or phlebitis. A commonly selected site is one of the superficial veins on the dorsum of the hand
- If the site chosen is near a joint, extension and splinting of the limb may be necessary; for example, by back slab (Figure 26.8).

Healthcare facilities will have individual policies and guidelines pertaining to the management and insertion of IV cannulas. An example of a guideline document in relation to management of IV cannulas in the health setting is the NSW guideline for PIVC insertion and post-insertion care in adult patients (NSW Health 2013). As an overview, IV cannulas should be inserted by competent accredited healthcare professionals. They should be inserted utilising a sterile technique and the insertion site labelled with the corresponding date/time to allow for timely removal (usually replaced every 72 hours). Documentation in the person's chart should be completed. An extremely important aspect of care is monitoring the site for complications such as swelling and oedema. A site that is suspicious for infection should be reported and managed immediately. Infections from IV sites can have potentially lethal complications for individuals, and preventing them is integral to hospital quality and risk programs.

The nurse caring for individuals receiving IV therapy has the responsibility of ensuring that the person's care is within their scope of practice. IV fluid is prescribed depending on the desired treatment outcome for the individual. We have previously discussed fluid tonicity in this chapter; it is an extremely important concept relevant to the administration of IV fluid. For example:

- Isotonic solution has the same tonicity as the internal environment of the body—it has approximately the same amount of $Na^+$ concentration. Therefore the administration of this type of fluid is used to increase the circulating fluid volume or simply used for fluid/hydration maintenance. Normal saline (0.9%) is an example
- Hypotonic solution has a lower tonicity or solute concentration than the internal environment. This type of solution will attract water into the cell—causing cells

## CLINICAL SKILL 26.1 Fluid balance charting

**Review and carry out the standard steps for all nursing procedures/interventions**

An accurate fluid balance chart (FBC) should be completed using the correct equipment listed below.

It should be completed immediately post meals (input) and with intravenous fluid hourly. All insensible losses (vomit, NG aspirates/drainage and drain tubes) should be recorded including accurate measurements of urine and faeces.

Six-hourly totals should be recorded which will enable an individual's accurate fluid status.

Healthcare organisations' policy and procedure regarding recording of FBCs should be adhered to.

**NMBA Decision-Making Framework considerations:**

1. Am I educated?
2. Am I authorised?
2. Am I competent?

If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator.

**Equipment:**

Fluid balance chart
Weigh scale (calibrated)
Calculator
Biro (blue/black)
List of correct amounts of fluid containers (oral)
Bed pan and/or urinal
Measuring jug
Appropriate PPE

| Skill activity | Rationale |
|---|---|
| Explain procedure to the individual | Reduces anxiety/apprehension and gains individual's trust and cooperation<br>Reinforces consent of individual |
| Establish the reason for the commencement of a fluid balance chart (FBC):<br>• Fluid restriction<br>• IV fluid administration<br>• Critically ill/haemodynamically unstable individual<br>• Prevention of fluid overload<br>• Dehydration<br>• Electrolyte replacement<br>• Multiple infusions<br>• Blood product administration<br>• Indwelling catheter (IDC)/urinary retention<br>• IV antibiotic administration<br>Check medical orders and review healthcare organisation's policies and procedures regarding FBCs | Ensures correct use of FBC<br>Abides by legal and healthcare organisation's guidelines |
| Ensure a list of the correct amount of millilitres per container of fluid (intake) is available<br>Ensure all IV fluid administration is via an IV pump | Ensures accuracy of individual's intake |
| Ensure urinal, bedpan or plastic urinal female toilet available for the individual to urinate into, or that an IDC is in situ if haemodynamically unstable<br>Ensure all wound drainage, vomitus, loose bowel actions and gastric fluid also recorded on the individual's output | Ensures accuracy of individual's output |
| Maintain hourly 24-hourly fluid balance totals (depending on the medical officer's orders and/or the healthcare organisation's guidelines)<br>Observe for any signs of under- or over-hydration | Establishes an accurate positive or negative balance to determine the individual's fluid status so that intervention may be prompt<br>Prevents circulatory overload and complications |
| Document in the progress notes and report any changes to the relevant registered nurse and/or medical officer. | |

*(Shepherd 2011; Berman et al 2015)*

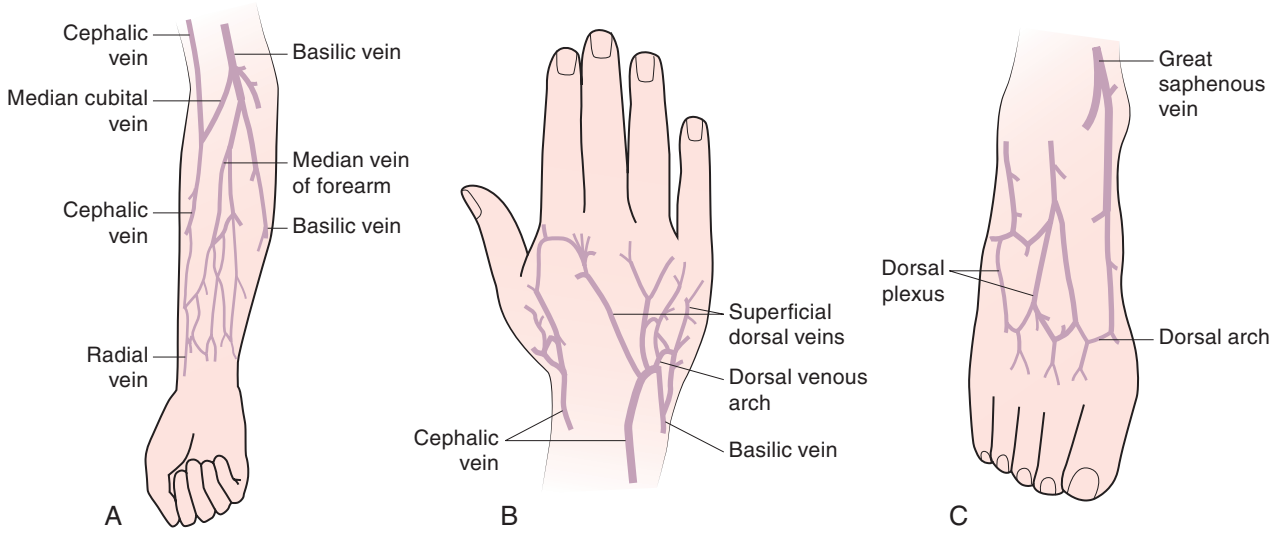



**Figure 26.7** Common IV sites

*(Redrawn from Potter & Perry 2008)*

**Figure 26.8** Back slab

*(Potter & Perry 2008)*

to swell. It is used for individuals who are very dehydrated, individuals with an elevated $Na^+$ (depending on the cause) or increased serum osmolality. 5% dextrose is an example of a hypotonic solution. The dextrose is metabolised (used by the body for energy) so it leaves behind water.

Hypertonic solution has an increased tonicity compared to the internal environment. Therefore it draws water out of the cells and into the vascular space. Twenty per cent albumin is an example. **Albumin** is an important protein in the maintenance of plasma oncotic pressure and so assists with attracting fluid into the vascular compartment.

## Care of individuals with an intravenous infusion

As previously stated within this chapter, nurses have a professional accountability and responsibility to be aware of the scope of their role in relation to the management of IV infusions. The scope of practice and responsibilities for care and management of IV infusions varies in nursing practice in different settings. Enrolled Nurses must ensure that they practise within their scope and educational level in relation to intravenous infusions. See NMBA (2015) Enrolled Nurse and Medicine Administration for specific information about IV administration.

Of prime importance is careful observation of the individual and the IV equipment used during the infusion, and accurate reporting of the person's assessment and vital signs. Complications that may occur when a person has an IV infusion, and which must be recognised and reported immediately, are:

- A flow rate that is too slow or too fast, or cessation of flow
- Infection, pain or infiltration at the insertion site
- Phlebitis of the vein being used for the infusion
- Circulatory overload
- Air embolism.

The nurse also has a responsibility to promote the general comfort of the individual, to ensure that the infusion is administered as prescribed and to observe for and prevent complications. Key aspects related to the care of a person with an IV infusion are described as follows:

- Ensure that the flow rate is set as prescribed and adjusted when necessary to deliver the correct amount of fluid within the prescribed time. Various methods of determining the number of millilitres per minute are used to distribute the total amount of solution equally over the time period prescribed for the infusion
- A calibrated burette (e.g. macrodrip or microdrip volume control set) can be incorporated into the infusion system. Such devices enable very small or precise amounts of fluid to be administered and can also be used when medications are to be given IV. A formula is used to determine the number of drops per minute at which the solution should flow.

To calculate the flow rate, the following formula is used:

$$\frac{\text{Volume (mL)} \times \text{Drop factor (drops/mL)}}{\text{Time (hours) 60 min}} = \text{Drops per minute (dpm)}$$

- When calculating the rate it is essential to know the calibration of the drip rate for each manufacturer's product, as these vary from 10 drops/mL to 60 drops/mL
- The flow rate should be checked every 15 minutes to ensure that the drip rate is stable, then every hour or at the time intervals specified in the institution's policy on IV infusions
- Check the level of solution to determine the volume of fluid remaining in the flask. It is important to ensure that a flask does not empty completely, as this can interfere with the flow rate and permit air to enter the tubing, which could lead to an air embolism. Air emboli can result in sudden decrease in blood pressure, rapid weak pulse, cyanosis and loss of consciousness
- Check the insertion site every 24 hours for signs of infection, inflammation or infiltration. Infection at the insertion site is indicated by redness, warmth, swelling and tenderness. The vein may become injured or irritated and phlebitis may occur. Signs and symptoms that indicate phlebitis are pain, swelling and inflammation along the course of the vein; the vein may also feel hard and warm to touch. Infiltration occurs if the needle becomes displaced, causing IV solution to flow into the surrounding tissues. Signs and symptoms of infiltration are cool skin in the site area, swelling and discomfort at the site, oedema of the limb, sluggish flow rate and absence of blood in the tubing when it is lowered
- Observe the person for signs of over-hydration or circulatory overload, caused by excessive or too rapid fluid administration. Signs and symptoms of circulatory overload include elevated blood pressure, venous dilation (especially of the neck veins), coughing, tachypnoea and shortness of breath
- Check the information on the label of the flask when each new flask is started and at the start of each shift. It is essential that the person receives the prescribed solution; the nurse should therefore follow the nursing protocol regarding checking of IV solutions
- The type, volume and expiry date of the solution is checked. Glass containers are inspected for chips and cracks and the seal over the opening is observed to ascertain if it is intact. Plastic containers should be squeezed gently to detect leaks. The solution is examined for particles, abnormal discolouration and cloudiness. The container is not to be used if any doubt exists, and the intact container is retained for further investigation
- Throughout the course of the infusion, document details of the flow rate, the type and amount of fluid and additives being administered and the person's fluid input from other sources and fluid output. The vital signs (temperature, pulse, respirations and blood pressure) are also measured regularly and documented. See Case Study 26.1.

### CASE STUDY 26.1 ADMINISTERING INTRAVENOUS FLUIDS

Mary, an 84-year-old female, was brought into the emergency department from her nursing home. The staff at the nursing home reported that Mary has become increasingly confused and has developed a fever of 38.2°C. Mary has a background of a previous stroke, affecting her ability to self-care, and Alzheimer's disease. Mary has been commenced on IV fluids and antibiotics and she has been admitted to your ward for ongoing care.

1. What risk factors could have contributed to Mary's dehydration?
2. What risk factors could have contributed to Mary developing a urinary tract infection?
3. What are some possible nursing diagnoses for Mary?
4. How will you manage Mary's infusion of IV fluid? What are some important considerations?
5. What will your ongoing assessment of Mary consist of and what complications will you be monitoring Mary for?

There are also a number of equally important safety and quality initiatives around IV therapy that must be adhered to in order to prevent risk of infections. Prior to using the IV line, it is important that the intravenous access port is cleaned with a single-use alcohol swab before each use. Sterile single-use devices must be used for intermittent medication administration through the IV access ports. Where possible it is also recommended that continuous IV fluids should be administered to promote patency of the line and maintain asepsis. Disconnecting and reconnecting lines for intermittent infusions increases risk of infections. Health facilities will have specific guidelines with details for care of IV lines. As an example refer to *Guideline for Peripheral Intravenous Catheters (PIVC)* (Centre for Healthcare Related Infection Surveillance and Prevention & Tuberculosis Control 2013).

## Electrolyte replacement

Nurses should be especially cautious when administering IV solutions containing electrolytes or fluids that have had electrolytes added to them. Potassium ($K^+$) is a classified high-risk medication in IV replacement and may require the person to be cardiac monitored. It is important for the nurse to be aware of and to monitor serum $K^+$ levels. A common side effect associated with administration of intravenous potassium is significant pain at the IV site and sometimes to the whole limb. This is usually associated with larger doses and shorter administration times. Cold packs can be applied, but it might be necessary to liaise with the medical team for

further problem resolution. For more information about medication safety and alerts for potassium and electrolytes refer to the Australian Commission on Safety and Quality in Health Care (ACSQHC) online resource at the end of this chapter.

### Intravenous fluid administration in paediatrics

Intravenous fluid therapy is less commonly used in children and is indicated only in emergency situations. Wherever possible, the enteral route (usually via a nasogastric tube) should be used in paediatric settings. If the enteral route is not suitable, then intravenous fluid administration can be utilised. Nurses need to exercise caution prior to and during the administration of IV fluids in children and should ensure that it is within their scope of practice. Accurate prescribing of the fluid and careful monitoring is very important for IV fluid administration in children. If a nurse is uncertain of the fluid order for any reason, liaising with the prescribing medical officer is critical and safe practice. Healthcare facilities will have specific guidelines pertaining to managing IV fluid administration in paediatric settings. As an example see the *Intravenous Fluid Management—CHW Practice Guideline* (SCHN 2015) from the Children's Hospital at Westmead, Sydney.

In a child with normal fluid volume status not consuming oral fluids, maintenance fluid will usually be administered. It is termed maintenance because it replaces insensible losses usually expected. A child's maintenance fluid requirement decreases proportionately with increasing age (and weight). The calculations in Table 26.13 approximate the maintenance fluid requirements of well children according to weight in kilograms.

Choice of IV fluid will depend on the clinical situation. A commonly used maintenance fluid is 0.45% NaCl with 5% glucose, although it may not be appropriate in all situations.

If a child presents with dehydration then initial replacement of the loss is essential. The formula for this is 10–20 mL/kg administered as boluses until the desired clinical outcome is achieved. The fluid of choice in this situation is usually 0.9% saline.

**TABLE 26.13 | Fluid requirements in paediatric settings**

| Child's weight | mL/day | mL/hour |
|---|---|---|
| 3–10 kg | 100 × wt | 4 × wt |
| 10–20 kg | 1000 plus 50 × (wt – 10) | 40 plus 2 × (wt – 10) |
| >20 kg | 1500 plus 20 × (wt – 20) | 60 plus 1 × (wt – 20) |

wt = weight in kg
*Adapted from Sydney Children's Hospital Network (SCHN) (2015)*

The Royal Children's Hospital Melbourne outlines the following recommendations in its guidelines (refer to the online resource The Royal Children's Hospital Melbourne, *Clinical Practice Guideline: Intravenous Fluids*).

Monitoring of children receiving treatment with IV fluids should include:

- Obtaining a weight from the child prior to commencement and then 6–8 hourly after fluid has been commenced. Daily weights should then continue
- Electrolytes and glucose should be checked prior to fluid administration and within 24 hours.

Clinical Interest Box 26.7 outlines the treatment of gastroenteritis in children.

## UNDERSTANDING ACID–BASE BALANCE

### Acids and bases

An **acid** is any substance that releases hydrogen **ions** ($H^+$) when dissolved in water. Acids have chemical properties essentially opposite to those of bases. Examples of acids found in the body include hydrochloric, lactic, pyruvic, carbonic, citric, folic and fatty acids. A **base** is any substance that accepts hydrogen ions in chemical reactions. Alkalis are bases that are soluble in water. Examples of bases found in the body include hydrogen bicarbonate and sodium hydroxide (Craft & Gordon 2015).

### The meaning of pH

The **pH** scale is used to express the concentration of hydrogen ions ($H^+$) in acids or bases. The 'p' stands for potential or power, and the 'H' stands for hydrogen. Therefore, pH represents the potential, or power, of hydrogen ions present. The

**CLINICAL INTEREST BOX 26.7**
**Paediatric gastroenteritis**

Treatment of gastroenteritis in the young requires special attention to fluid and electrolyte balance. Fluids such as flat lemonade and mineral water are often used for rehydration. This treatment has potential life-threatening consequences. Lemonade has a high sugar content, and sugar acts as an osmotic agent, drawing water into the gastrointestinal tract (GIT) from the body's fluid compartments. This fluid loss results in increased diarrhoea and dehydration. Sugar is also utilised by bacteria in the gastrointestinal tract as a form of nutrition, resulting in increased gas production by the bacteria, causing gaseous distension and abdominal pain.

Hydration in the young needs to be assessed by a medical officer. The person often requires rehydration with products such as Gastrolyte, by oral or nasogastric administration and, in more severe cases, intravenous therapy may be required.

pH of a solution is determined by measuring the amount of $H^+$ present. The scale is numbered from 0–14; the lower the number on the scale, the more $H^+$ is present, therefore the more acidic the solution is. A pH of 7 indicates a neutral solution, while a pH above 7 is termed basic, or alkaline, and a solution below 7 is acidic. Each integral step in the pH scale (i.e. 14, 13, 12 … to zero pH) represents a tenfold increase in $H^+$ ion concentration; thus, the pH scale is an inverse logarithmic scale of the amount of hydrogen ions present.

## Acid–base balance

In order to maintain optimal cellular function the hydrogen ion ($H^+$) concentration of body fluid is maintained within a close range (LeMone et al 2014). The pH of body fluid is maintained between 7.35 and 7.45; this means it is slightly basic (**alkaline**) as neutral is a pH of 7. A number of buffering systems are required to maintain a normal pH; this is because the normal cellular metabolism of nutrients in the human body continuously produces acids (LeMone et al 2014).

The body's capacity to form, excrete and 'buffer' acids and bases is known as the acid–base balance. Acid–base imbalances are classified as either respiratory or metabolic depending on the underlying cause (Berman et al 2015). The acid–base balance is critical to the survival of the human body. Variations outside the normal arterial range of a pH of 7.35–7.45 indicate serious dysfunction in the body. The normal metabolism of nutrients by cells produces large amounts of hydrogen ions ($H^+$) that form acids. The concentration of hydrogen ions in the cells and tissues must, however, be kept low to prevent cellular damage. To maintain pH within normal limits, the body excretes acids at the same rate that they are produced and buffers any excess hydrogen ion (Craft & Gordon 2015).

## Buffer systems

A **buffer** is a chemical substance that resists changes in the pH of solutions by either removing or releasing hydrogen ions (LeMone et al 2014). When bodily fluid is too acidic buffers bind with hydrogen ions to keep the pH within the homeostatic range. When body fluid is alkaline buffers release hydrogen ions, again returning the pH to normal (LeMone et al 2014).

For example, $CO_2$ is an end product of cellular metabolism and when combined with water, forms carbonic acid ($CO_2 + H_2O = H_2CO_3$), which drains back into the circulation. Excess carbonic acid in the blood is rapidly decomposed into carbon dioxide and water ($H_2CO_3 = CO_2 + H_2O$) and the $CO_2$ is excreted by the lungs to maintain the pH at normal physiological levels. Conversely, if water is lost from the blood, it is replaced by the ionisation of carbonic acid, and a rise in pH is prevented. Thus, carbonic acid acts as a buffer in the blood. An example of the buffering action of bicarbonate ion is its reaction with lactic acid. Lactic acid is produced from glucose during muscle contraction, and the dissociation of lactic acid tends to lower the pH. As lactic acid is a stronger acid than carbonic acid, its conjugate base (lactic ion) is weaker. The stronger base (bicarbonate ion) combines with the hydrogen from lactic acid forming dissociated carbonic acid (Craft & Gordon 2015).

## Acidosis and alkalosis

**Acidosis** is a condition in which the blood becomes acidic (pH <7.35) due to an increase in hydrogen ion concentration as a result of an accumulation of an acid, or the loss of a base. **Alkalosis** is a condition characterised by an increased pH, above 7.45, due to a decrease in hydrogen ion concentration as a result of a loss of acids or the accumulation of a base.

An acid–base imbalance occurs when there is a deficit or excess of carbonic acid or base bicarbonate. In some situations in which a person cannot efficiently excrete enough $CO_2$—for example, in an individual with pneumonia—the buffer system may be unable to keep the pH within the normal range. In this situation the excess $CO_2$ will make the blood more acidic, reducing the pH. If the pH falls below 7.35 the condition is termed acidosis; if the pH rises above 7.45 the condition is termed alkalosis. Normally the body can soak up or neutralise acids as they are formed (buffering). This is done by:

- Blood: initial buffering of acids occurs in tissue, blood cells and the plasma
- Lungs: rapidly alter blood pH by increasing or decreasing the respiratory rate, increasing the removal of carbon dioxide
- Kidneys: excrete additional acids that cannot be excreted by any other method; they also reabsorb bicarbonate back into the bloodstream after acids have been excreted.

A pH above or below the normal pH of arterial blood (7.35–7.45) may result in severe dysfunction and potential death.

### CRITICAL THINKING EXERCISE 26.4

**Acid–base imbalance**

Sara is 17 years old. She has been complaining of excessive thirst and passing a lot of urine. Her breath smells, and she is deep breathing. Her results show BGL 21 mmol/L and pH 7.1. What could be the issue in this case?

## Causes of pH disturbances

### Respiratory causes

Respiratory acidosis occurs with hypoventilation, when the body is unable to ventilate enough $CO_2$ out of the lungs, as may occur in airway obstruction, emphysema, asthma or opiate overdose. (The kidneys compensate, e.g. by retaining bicarbonate.) Respiratory alkalosis occurs with hyperventilation, when rapid respirations blow off too much carbon dioxide, resulting in alkalosis of a respiratory nature, as may occur in panic attacks. (The kidneys compensate, e.g. by excreting more bicarbonate.)

### Metabolic causes

Metabolic acidosis occurs when the body is unable to excrete enough acids because of a problem with malabsorption, such

## CLINICAL INTEREST BOX 26.8 Diabetic ketoacidosis

Individuals with diabetes who have not been administered enough insulin or are unwell, or those with undiagnosed diabetes, are at risk of developing diabetic ketoacidosis. Without adequate insulin the body uses its muscle and fat for metabolism, producing ketone acids. To rid the body of acids, emesis and later hyperemesis occurs, resulting in a loss not only of acid but also of fluid and other electrolytes. The ketone acids can severely affect the pH of the blood, causing a metabolic acidosis. The body tries to compensate by excreting acid by the lungs (compensatory respiratory alkalosis), kidneys and skin.

Hyperglycaemia causes an osmotic-induced polyuria and a subsequent fluid and electrolyte imbalance and may result in severe dehydration. If insulin is not administered and the correct rehydration therapy instigated, in severe cases the condition can result in cerebral oedema, coma and death.

as diarrhoea; metabolism, for example, diabetic ketoacidosis (see Clinical Interest Box 26.8); or organ failure, such as kidney failure. (The lungs compensate, e.g. by increasing ventilation and increasing excretion of acidifying $CO_2$.)

Metabolic alkalosis occurs when too much acid is lost, for example by vomiting, nasogastric drainage or use of some diuretics. (The lungs compensate, e.g. by decreasing ventilation and decreasing excretion of acidifying $CO_2$.)

### Compensation

A change in pH by one system of the body will tend to cause an opposite compensatory change in pH, known as respiratory or metabolic compensation. If respiratory acidosis exists, the body will compensate by producing a metabolic alkalosis. If metabolic alkalosis exists, the body will compensate by producing a respiratory acidosis.

Implementing nursing care for individuals with acid–base imbalances involves monitoring, prevention and correction of the particular imbalance. Treatment and care of individuals in these situations is directed towards reversal or correction of the acid–base disorder and may include modification of dietary and fluid intake, administration of medications, intravenous therapy and the administration of blood, blood products or total parenteral nutrition (TPN) (Dempsey et al 2014).

## Summary

This chapter provides an overview of the key physiological concepts implicated in fluid, electrolyte and acid–base homeostasis. Developing an understanding of these theoretical underpinnings is critical for nurses as this knowledge will inform the basis of evidence-based person-centred care. Knowledge acquisition will particularly assist nurses to utilise their critical thinking skills and strengthen their position as advocates. To consolidate learning, further reading and completion of the review and critical thinking exercises is highly recommended.

Several essential homeostatic processes are integral in the maintenance of fluid, electrolyte and acid–base balance within the body. Water is distributed within both intracellular and extracellular compartments. This fluid provides a transport medium for electrolytes and other substances. Movement of fluids and electrolytes is dynamic and constant and is essential for a healthily functioning body. Osmosis is the mechanism of movement for water; diffusion and active transport are mechanisms facilitating the movement of other substances. The semi-permeable membrane is a critical structure in the regulation of intracellular and extracellular fluid composition and in the maintenance of electrolytes within optimal levels in their respective compartments. Damage to the semi-permeable membrane through disease processes, such as burns and infections/sepsis, can result in fluid and electrolyte shifts detrimental to healthy function.

It is natural for the body to lose water through both sensible and insensible mechanisms. Sensible losses include those that are able to be measured, that is, urine and faeces. Insensible losses are not easily measurable, for example, perspiration. Under certain conditions fluid losses may increase; but in the healthily functioning body homeostatic mechanisms will act to restore body water volume and composition. Key systems for these mechanisms of action are the neural (hypothalamus and pituitary) system, the renal system (RAS—aldosterone) and the GIT. Disease processes resulting in fluid volume excess have also been discussed in this chapter. Bodily mechanisms that compensate for this also include the neural, renal and cardiovascular mechanisms.

Major cations and anions have been discussed with reference to their significance in maintaining nerve and muscle function. Electrolyte imbalance rarely occurs in isolation; there is usually more than one imbalance involved. Sodium is associated with water imbalance and it is important for the clinician to establish whether there has been a loss of sodium, for example, or an increase in water volume. Potassium is an extremely important electrolyte in the maintenance of an optimally functioning cardiac conduction system. It should be monitored closely and administered with caution as it is associated with potentially lethal complications.

The maintenance of the pH of blood within a closely regulated range is critical to survival. Maintenance is achieved through both renal and respiratory buffering capabilities. These buffering mechanisms can be overwhelmed by disease processes.

Person-centred care is aimed at treating the underlying clinical condition and providing supportive therapies

## Summary—cont'd

during this process. An integral element of the nurse's role is the completion of a comprehensive person-centred assessment, which includes considering additional risk factors associated with older adults and the paediatric population. The nurse is required to execute astute physical assessment skills; these accompanied by theoretical underpinnings will form the basis of planning, implementing and evaluating care and of timely reassessment of the individual.

Maintaining a person's safety is paramount. The nurse is required to consider their individual scope of practice prior to the administration of intravenous fluids. Individuals undergoing treatment with IV fluids must be monitored appropriately and continuously reassessed. It is vital for the nurse to understand the clinical reason for the particular IV fluid administration so the effects of the treatment can be evaluated accordingly.

Physiological concepts in fluid, electrolyte and acid–base homeostasis are likely to be frequently encountered in a multitude of clinical settings. The application of this knowledge in clinical practice not only promotes high quality, safe person-centred care but also renders satisfying and rewarding care delivery for the nurse.

### DECISION-MAKING FRAMEWORK EXERCISE 26.1

Sophia is an 83-year-old lady with heart failure. She has a past history of ischaemic heart disease including a myocardial infarction 3 years ago. Sophia is admitted to your ward with swollen ankles and shortness of breath suggesting fluid overload. She is on a small dose of frusemide (20 mg daily), weighs 76 kg and is 155 cm tall. Her urea and electrolyte blood tests come back showing a sodium low of 133 mmol/L and a reduced potassium of 3.1 mmol/L. Blood glucose is elevated (12 mmol/L). Sophia has been ordered IV frusemide and insulin (S/C) by the admitting medical officer.

How should you (as her nurse) respond to this situation in accordance with clinical practice standards and the decision-making framework for nurses?

## Review Questions

1. Draw a table with three columns. Title the first column 'Fluids' and list the following fluids in that column:
   - 0.9% saline
   - 5% dextrose
   - 4% dextrose and 1/5 normal saline
   - Hartmann's/lactated Ringer's solution
   - 0.45% sodium chloride

   Title the second column 'Indications for use' and the third 'Tonicity of the fluid'. Complete the table.
2. An 18-month-old infant is admitted for gastroenteritis and is 7% dehydrated. The infant has been refusing all oral rehydration fluids. What clinical signs would you expect to find in your assessment of the infant and what are the reasons for your findings?
3. John presents with a 5-day history of severe vomiting and diarrhoea on returning from an overseas trip.
   a. What are some electrolyte disturbances you might expect to see in John and why?
   b. What clinical symptoms are associated with these electrolyte disturbances?
   c. What type of IV fluids might be initiated for John and why?
   d. What would you expect John's urine SG and osmolality to be and why?
4. While observing Table 26.1 think about individuals (in the health setting) you may have come into contact with. Reflect on what you would need to know to provide safe person-centred care. Make a note of your answers.
5. Fluid balance will be achieved if there is:
   a. Free access to water
   b. Normal thirst mechanism
   c. Normal ADH mechanism
   d. Normally functioning kidneys

   Consider this list and individuals that may be affected by one or more of these factors. Make a note of your response.
6. What symptoms do you think might be present in a person with dehydration?
7. What are the symptoms associated with chronic history of fluid overload?
8. Refer to the fluid balance chart provided as a sample in this chapter and as a practice exercise complete a fluid balance chart for an 8-hour shift based on the following information:
   - Shift AM. Volume of cup is 100 mL
   - John has had 2 glasses of water since 0700 hrs (0800, 1300)
   - He has also had a cup of tea at 1030 hrs
   - Urine output 0830 hrs is 200 mL, 1100 hrs is 150 mL, 1330 hrs is 150 mL
   - IV therapy normal saline 1 L bag running at a 24-hourly rate. Commenced at 0700 hrs.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

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CHAPTER 27

# Promotion of health and wellbeing: rest and sleep

*Heather Redmond*

## KEY TERMS

central sleep apnoea
circadian rhythm
insomnia
non-rapid eye movement (NREM)
obstructive sleep apnoea
parasomnias
polysomnography (PSG)
rapid eye movement (REM)
rest
restorative sleep
sleep
sleep disorder
sleep disturbance
sleep hygiene
sleep–wake cycle
snoring

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define the key terms
- Describe the importance of rest and sleep to the wellbeing of the individual
- Explain the functions of sleep
- Outline and describe the phases of the sleep cycle
- State the factors that may interfere with the process of rest and sleep
- Describe the supportive nursing measures that may be implemented to promote the individual's need for rest and sleep
- Demonstrate an awareness to identify a range of sleep disorders and the impact of these disorders on wellbeing

## CHAPTER FOCUS

Rest and sleep are important factors to enable individuals to achieve and maintain a state of wellbeing. Rest is a state of feeling mentally and physically relaxed, calm and free from worry (Rebeiro 2013). Sleep is a basic physiological need and relates to a decreased level of consciousness that occurs on a cyclical basis. The state of sleeping enables a period of rest, which is essential for restoration of physiological and psychological processes of the body (Rebeiro 2013). The amount of sleep an individual requires depends on age, lifestyle, personality, environment and state of health. The need for a required amount of sleep generally becomes less as a person ages.

An important nursing responsibility is implementing measures that will promote physical and emotional comfort, thereby assisting the individual to experience sufficient rest and sleep. Factors affecting rest and sleep can result from a variety of physical or psychosocial reasons. Without adequate rest and sleep, the ability to perform the normal activities of daily living may be affected (Rebeiro 2013). Most people report 'difficulty with sleeping' at some stage in their lives, and for most this is usually a temporary problem. Nurses need to assess the individual's sleep problems and use critical thinking skills to implement measures to promote effective sleep (Rebeiro 2013).

This chapter explores the promotion of optimal rest and sleep and strategies the nurse can provide to enhance the individual's physical and psychological comfort and wellbeing. The ability to achieve adequate rest and sleep is closely associated with comfort; therefore, the nurse should be aware of the measures necessary to ensure that comfort needs are met. Rest and relaxation can occur only when there is freedom from physical discomfort and emotional tension, and individuals are more likely to sleep well if normal sleep hygiene habits are maintained.

## LIVED EXPERIENCE

How are people expected to sleep at all in hospital? I don't know how anyone is supposed to get better. During my recent stay for hip surgery, I was woken frequently for observations, medications and by noise—the person snoring in the next bed, buzzers going off, nurses talking loudly and footsteps down the hall, the pump dinging, lights being turned on and, not only that, I was in pain! Everything was different … I felt like I was out of my normal routine and the bed wasn't all that comfortable, the meals came too early to what I was used to at home, and it was so hot in the room I was in, I felt stifled … I was glad to be finally discharged and go home, so I could get some rest and sleep in my own bed!

**Norman, 68, recent surgical inpatient**

# REST

**Rest** is a state where the individual assumes a comfortable position and is relaxed for a period of time, allowing the individual to feel refreshed and rejuvenated, ready to continue on with daily activities (Rebeiro 2013). Individuals at rest are considered free from any physical or mental exertion (Christensen & Kockrow 2011). Individuals who are confined to bed for physical reasons may not always feel rested, as psychological issues may impact on the ability to completely rest (Rebeiro 2013). Individuals have different methods of achieving adequate rest and this may be disrupted when admitted to a healthcare facility (Christensen & Kockrow 2011).

# PHYSIOLOGY OF SLEEP

**Sleep** can be defined as a period of reduced conscious awareness of the environmental surroundings from which individuals can be easily woken (Lewis et al 2014). Certain stimuli, for example a sudden loud noise, will usually rouse the individual, although not necessarily to full alertness. The **sleep–wake cycle** is a process that promotes sleep and maintains wakefulness (Christensen & Kockrow 2011).

## Sleep regulation

The control and regulation of the sleep–wake cycle depends on the interrelationship between structures in the brainstem, hypothalamus and thalamus (Lewis et al 2014). The sleep–wake cycle is controlled by the brain's higher centres where one mechanism causes wakefulness, while the other causes sleep (Rebeiro 2013). The reticular activating system (RAS) is located in the upper brainstem and is believed to contain special cells that maintain alertness and wakefulness (Rebeiro 2013). The RAS is activated when it receives visual, auditory, pain and tactile sensory stimuli as well as thoughts and emotions. When a person tries to sleep in a darkened room they become relaxed, and stimuli to RAS is decreased (Rebeiro 2013). In addition the hypothalamus releases neurotransmitters and peptides which promote sleep by inhibiting the RAS (Lewis et al 2014). The pineal gland also plays a part in the sleep–wake cycle by releasing melatonin as the environment gets darker, inducing sleep. With light exposure from natural or artificial light melatonin release is suppressed, and the individual awakens (Lewis et al 2014).

## Circadian rhythm

The concept of circadian rhythm (derived from the Latin: *circa*—about, and *dies*—day) refers to the cyclical measures that are part of our everyday life (Rebeiro 2013). **Circadian rhythms** are physical, mental and behavioural changes that follow roughly a 24-hour cycle, responding primarily to light in the environment (Lewis et al 2014). Circadian rhythms are produced by natural factors within the body, but they are

also affected by environmental signals such as a person's daily activities, as well as internal physiological signals such as hormones, temperature, pulse and blood pressure, the individual's mood and their sensory awareness (Bernhofer et al 2013; Rebeiro 2013). It appears that the 24-hour cycle to which the human body synchronises is highly individualised, allowing variation as some people are distinctly described as 'morning people', while others fit well into the 'night-owl' category. Any disruption to a person's circadian rhythm can cause discomfort and manifest in a disturbed sleep pattern (Rebeiro 2013).

An example of the consequences of a disrupted circadian rhythm is the state known as 'jet lag'. This condition occurs when a person's circadian rhythm is disrupted by travel across several time zones in a relatively short time, and is characterised by fatigue, insomnia and sluggish physical and mental function. Individuals who are ill in hospital may also experience sleep disruptions where quantity and quality of sleep are affected (Thomas et al 2012). Some wards may be brightly lit during the night as well as during the day; therefore, the regular pattern of light and dark, together with perhaps increased noise levels, poor control of pain and the activities of others disrupt the normal 24-hour rhythm (Thomas et al 2012). A person who engages in varied shift work may experience symptoms similar to jet lag, as the body attempts to adapt to changes in the 24-hour biological clock. Working on night shift removes sleeping from the normal night-time routine and renders it out of order with the body's normal circadian rhythm (Christensen & Kockrow 2011).

## Stages of sleep

Sleep is a diverse and complex process that includes **non-rapid eye movement (NREM)** or quiet sleep, and **rapid eye movement (REM)** or active sleep (Rebeiro 2013). It is generally recognised that each **sleep cycle** consists of five stages. NREM sleep consists of the first four stages where light sleep occurs in stages 1 and 2 and progresses through to a deeper sleep in stages 3 and 4 (Christensen & Kockrow 2011). The reverse then occurs where the person will progress from stage 4 back to stage 2, ending with the fifth stage of sleep, REM. This process takes about 90 minutes and continues with the person going through 4–6 of these cycles of sleep per night, with the REM stage increasing in length and the NREM stages shortening with each cycle (Rebeiro 2013). If the person wakes fully on occasions during sleep, the sleep cycle needs to restart at stage 1; if this occurs the total time spent in deep sleep may be lessened. Infants spend a greater proportion of time in REM sleep than adults, with about 40% of total sleep time being REM sleep. With adults, about 20% of total sleep time is REM sleep. (See Clinical Interest Box 27.1 for details of the five stages of sleep and Clinical Interest Box 27.2 for physiological changes during NREM and REM sleep.)

## Dreams

Dreams occur during both the NREM and the REM sleep stages. Dreams are more vivid and elaborate in the REM sleep period, which is also believed to contribute to the consolidation of long-term memory (Rebeiro 2013). Through each REM period dreams may progress in content, including current events to emotional dreams from childhood, or events and experiences that have occurred in the past. Dreams often relate to experiences that may have occurred over the day, or incidents that have caused stress such as with relationships and work (Rebeiro 2013). Many dreams are forgotten and not recalled; therefore, people do not believe they have dreamt at all. Remembering a dream requires a person to consciously think about their dream upon waking. Recall of vivid dreams usually occurs if the person has woken just after a period of REM sleep (Rebeiro 2013).

## Quality of sleep

The quality of sleep is a subjective experience where the amount of restfulness, depth of sleep, number of times woken and amount of sleep impact on the individual's perception of quality of sleep. The quality of sleep is equally as important as the quantity of sleep achieved. The amount of sleep a person reports that they need to feel refreshed is both subjective and individualised (McCance et al 2015). It is also reported that quality of sleep decreases with age, although many middle-aged individuals will report a change in sleep quality, and sleep disorders may be diagnosed during this period of the lifespan (Rebeiro 2013). The length of lighter stages of sleep (especially stage 1) is often increased in older people and stages 3 and 4 often decrease. This may explain why many older adults often report the quality of their sleep as poor and feeling less rested even after being observed to have slept soundly.

## Sleep patterns across the lifespan

There are many variations in the optimal amount of sleep each individual requires. The range of 7–9 hours per night is the average required for an adult, meaning that about one-third of the day and, consequently, one-third of an individual's life is spent sleeping (Rebeiro 2013). Sleep patterns change throughout the lifespan and as a person ages, the amount of time spent sleeping at night is usually less than earlier in life. The quantity of sleep diminishes from about 20 hours a day in infancy to about 8–12 hours a day in adolescence, to perhaps as little as 6–8 hours of sleep at night in adulthood. In older adulthood, the amount of sleep achieved at night will often decrease; however, older adults often report 'napping' during the day. Daytime napping may occur due to poor night-time sleep, early wakening and/or changes in the central nervous system (CNS) regulation of sleep and circadian rhythm. In addition many older adults will wake more often during the night and report an inability to return to sleep after rousing (Rebeiro 2013). Clinical Interest Box 27.3 outlines the sleep requirements across the lifespan.

There are several theories about the purpose of sleep, with the most frequently accepted concept being that sleep contributes to physiological and psychological restoration, influencing and regulating body functions, and behavioural

## CLINICAL INTEREST BOX 27.1 Sleep cycle stages

### Stage 1: NREM

Stage 1 sleep is light sleep. It can be considered a transition from awake to sleeping, an experience of drifting in and out of sleep. It lasts only a few minutes (1–7 minutes).

- Easily woken
- Eye movement and body movements slow down
- May experience sudden jerky movement of legs or other muscles
- Easily awoken and, if awoken, may not feel like having been asleep.

### Stage 2: NREM

Stage 2 lasts for approximately 10–25 minutes. Relaxation progresses.

- More difficult to rouse
- Body temperature starts to decrease
- Heart rate begins to slow.

### Stage 3: NREM

Stage 3 is the first stage or transitional phase to deep sleep. Muscles are completely relaxed. It lasts a few minutes.

- Very difficult to wake
- If woken during this stage, may feel groggy and disoriented for several minutes
- Vital signs decrease but remain regular.

### Stage 4: NREM

Stage 4 sleep is the second stage of deep sleep. It lasts 20–40 minutes.

- Very difficult to wake up
- Both stages of deep sleep are important for feeling refreshed in the morning
- If these stages are too short, sleep will not feel satisfying
- Sleepwalking and enuresis may occur.

### Stage 5: REM sleep

Lasts 5–30 minutes, begins about 90 minutes after falling asleep.

- The sleep stage in which dreaming occurs, but will usually not be remembered unless person briefly rouses
- Breathing becomes fast, irregular and shallow
- Brain becomes highly active
- Difficult to rouse
- Distinctive eye movement occurs; voluntary loss of muscle tone and reflexes; men may develop an erection
- The REM period of first sleep cycle is usually shorter than subsequent REM periods
- REM sleep is not fully understood. What is known is that REM sleep is important in the creation of long-term memory.

  The full sleep cycle usually lasts 90–110 minutes.

*(Adapted from Berman et al 2015; Rebeiro 2013; Christensen & Kockrow 2011)*

## CLINICAL INTEREST BOX 27.2 Physiological changes during NREM sleep

- Arterial blood pressure falls
- Pulse rate decreases
- Peripheral blood vessels dilate
- Cardiac output decreases
- Skeletal muscles relax
- Basal metabolic rate decreases
- Growth hormone levels peak
- Intracranial pressure decreases

*(Adapted from Christensen & Kockrow 2011; Rebeiro 2013)*

## CLINICAL INTEREST BOX 27.3 Sleep requirements across the lifespan

Newborns: 16–18 hours/day
Infants: 14–15 hours/day
Toddlers: 12–14 hours/day
Preschoolers: 11–13 hours/day
School-age children: 10–11 hours/day
Adolescents: 9–10 hours/day
Adults: 7–9 hours/day
Older adults: 7–9 hours (with more difficulty)

*(Adapted from Berman et al 2015)*

responses (McCance et al 2015). It appears that the level of circulating hormones, such as human growth hormone and those secreted by the adrenal glands, vary during sleep. The levels of these hormones circulating during sleep is thought to facilitate cell growth and repair (Berman et al 2015). Sleep is also a time that allows for conservation of energy, prevention of fatigue and provision of organ respite, with the relaxation of skeletal muscles and the lowering of basal metabolic rate (McCance et al 2015). Alternatively, cerebral function during periods of sleep is increased, with important cognitive restoration and the filtering and storage of the day's activities (Rebeiro 2013). It is therefore of particular importance that the person who is ill or hospitalised has the opportunity to benefit from the restorative nature of sleep (Thomas et al 2012). A person who suffers from chronic illness or chronic pain syndrome that disturbs effective sleep may not wake feeling rested or restored, no matter how long they spend resting in bed.

### Sleep disturbances

Any interruptions to sleep may have an impact on a person's ability to carry out their usual daily activities. A person who experiences a **sleep disturbance** may exhibit changes in behaviour response and performance, and also may show signs of irritability, lack of energy and fatigue, which can occur within 24 hours (Lewis et al 2014). Sleep-pattern disturbances include difficulty in falling asleep, periods of wakefulness during the night, waking earlier than usual and not feeling rested after sleep (see Clinical Interest Box 27.4 for conditions of proper rest and Clinical Interest Box 27.5 for cultural aspects of sleeping).

Some people experience nightmares or sleepwalking. A nightmare is a dream that arouses feelings of intense fear or extreme anxiety and usually wakes the sleeper. Sleepwalking is a state that culminates in the individual walking about, but will have no recollection of the episode. Other disorders that affect sleeping patterns include insomnia, snoring, sleep apnoea, narcolepsy and parasomnias. A person who develops a sleep disorder may require referral to a sleep disorders centre for investigation.

## SLEEP DISORDERS

Individuals may at some stage in their lives experience a **sleep disorder**. The most severe types of sleep disorders include 'obstructive sleep apnoea (OSA), narcolepsy, restless legs syndrome (RLS), periodic limb movement disorder, insomnia, parasomnias, circadian rhythm disorders including jet lag and shift work, and sudden infant death syndrome' (Deloitte Access Economics 2011:8). Sleep disorders impose a burden on the Australian healthcare system and in 2010 cost approximately $818 million for medical services and pharmaceutical supplies. Much of these costs are attributed to sleep apnoeas, insomnia and restless leg syndrome (Deloitte Access Economics 2011). Sleep disorders decrease quality of life causing increased morbidity and mortality (Lewis et al 2014) and contribute to workplace incidents and motor vehicle accidents (Deloitte Access Economics 2011).

If a sleep disturbance persists despite the implementation of sound sleep hygiene measures and lifestyle changes, medical advice may be sought. A referral then may be made to a sleep physician so that **polysomnography** (PSG) sleep studies can be conducted at sleep clinics or in the individual's home. Night-time PSG involves attaching monitoring leads to multiple areas of the body and, while the person sleeps, data regarding the stages of sleep are recorded, as well as night-time wakefulness, to detect any sleep abnormalities (Rebeiro 2013). This process usually involves an overnight admission in a sleep disorders unit or an in-home PSG, where sleeping patterns are monitored. The annual rates of

### CLINICAL INTEREST BOX 27.4 Conditions for proper rest

- Physical comfort
- Eliminate sources of physical irritation and pain
- Control room temperature and provide adequate ventilation
- Maintain proper alignment and anatomical position
- Remove environmental distractions
- Freedom from worry
- Have knowledge of health problems and their implications
- Make own decisions
- Participate in personal healthcare
- Practise restful and relaxing activities frequently
- Know that environment is safe
- Sufficient sleep
- Know and obtain the hours of sleep that are needed to feel refreshed
- Follow good sleep hygiene habits

*(Christensen & Kockrow 2011; Rebeiro 2013)*

### CLINICAL INTEREST BOX 27.5 Cultural aspects of sleep

- Practices and patterns of sleep and rest differ between cultures
- Many cultures favour daytime rest and shorter night-time sleep periods
- Western cultures reinforce autonomy in children sleeping independently, whereas Asian and African cultures favour infants and children co-sleeping for much of their childhood. Even within these cultures, differences now being seen may be due to industrialisation
- Co-sleeping in which infants sleep with their parents may result in alterations to both parents' and child's sleeping patterns
- Research continues on the value of touch in inducing rest and sleep, especially in neonatal intensive care situations, and parental bonding and attachment

*(Adapted from Rebeiro 2013)*

PSG in Australia have increased from 339 in 2005 to 608 in 2008 per 100 000 people. This is largely attributed to the use of in-home PSG (Woods et al 2014). Prior to the PSG occurring, a specialised nurse or technician obtains a thorough sleep history from the individual, which includes information of both past and current sleep problems. Specific information collected in relation to sleep include the time of settling and waking, the number of times sleep is disturbed, physical illnesses, medications, diet, any aids or techniques that the person is currently using to achieve sleep and an environmental assessment.

## Sleep deprivation

Many individuals experience disturbed sleep and sleep deprivation as a result of hospitalisation (Missildine et al 2010). This results in decreased amount, quality and consistency of sleep due to sleep being interrupted or fragmented. This causes changes in the normal sequence of sleep stages, and the normal cycles cannot be completed (Rebeiro 2013). Gradually a cumulative sleep deprivation occurs (see Clinical Interest Box 27.6). Chronic sleep deprivation is linked to several common health problems, many related to metabolic syndrome, such as cardiovascular diseases, weight gain, type 2 diabetes, poor memory, depression, digestive problems and even links to cancer (Lewis et al 2014). The severity of symptoms is often related to the duration of sleep deprivation. The most effective treatment for sleep deprivation in any environment is eliminating or correcting the factors that lead to disruption of sleep (Rebeiro 2013).

## Insomnia

**Insomnia** is the most common sleep disorder and is characterised by difficulty falling asleep or staying asleep, more than three times a week (Lewis et al 2014). The individual may complain of trouble falling asleep or staying asleep, early awakening and feeling un-refreshed upon awakening (Lewis et al 2014). This results in insufficient quantity and quality of sleep, which may lead to excessive daytime sleepiness (EDS). Acute insomnia is the most common of the insomnias, and is often in relation to one or a number of the factors that are associated with sleep disorders (illness, stress or change in sleeping environment) (Rebeiro 2013). This type of insomnia will usually subside once the acute event or causative factor has passed or been eliminated. In the short term, having less sleep than normal usually causes no harmful effects. Often lifestyle and environmental conditions are able to be easily modified, such as reducing alcohol and caffeine intake before bed, not napping through the day and use of stress-modifying techniques. Teaching individuals about the factors influencing sleep and sleep routine (sleep hygiene) may help in improving sleep quality in the individual suffering insomnia.

Chronic insomnia consists of the same symptoms as acute insomnia; however, it lasts for more than a month or longer (Lewis et al 2014). It may be the result of an underlying medical, behavioural or psychiatric problem. Depression can often cause insomnia. Chronic insomnia usually requires investigation as to its cause, and treatment usually requires more than simple lifestyle and environmental assessment and modifications (Rebeiro 2013). The fear of not being able to sleep can be enough to cause wakefulness, thus potentiating the underlying feelings of sleep deprivation, and daytime sleepiness, fatigue, depression and anxiety (McCance et al 2015).

### CLINICAL INTEREST BOX 27.6 Signs and symptoms of sleep deprivation

**Physiological symptoms**

- Ptosis, blurred vision
- Fine motor clumsiness
- Decreased reflexes
- Slowed response time
- Decreased reasoning and judgment
- Decreased auditory and visual alertness
- Cardiac arrhythmias

**Psychological symptoms**

- Stress and anxiety
- Confusion and disorientation
- Increased sensitivity to pain
- Irritable, withdrawn, apathetic
- Agitation
- Hyperactivity
- Decreased motivation
- Excessive sleepiness

*(Rebeiro 2013; Pilkington & Lorenz 2013)*

## Snoring

**Snoring** is defined as breathing during sleep accompanied by harsh sounds and is caused by any obstruction of the air passages at the back of the mouth and nose. Poor muscle tone, excessive tissue or deformities such as a deviated septum may cause snoring. Obstructed airways due to colds or allergies can also cause snoring. Snoring can also be a symptom of sleep apnoea. The mild snorer should exercise to develop good muscle tone and lose weight if needed (deWit & Williams 2014).

## Sleep apnoea

**Sleep apnoea** is a disorder characterised by the lack of airflow through the nose and mouth for periods of 10 seconds or more. There are three types of sleep apnoea: obstructive sleep apnoea (OSA), central sleep apnoea (CSA) and mixed sleep apnoea, with OSA being the most common (Rebeiro 2013).

### Obstructive sleep apnoea

**Obstructive sleep apnoea** (OSA) is characterised by repetitive upper airway closure during sleep causing a partial or full obstruction, resulting in blood oxygen desaturation and fragmented sleep (Australasian Sleep Association 2015). Structures in the upper airway collapse during sleep, which may involve the tongue and soft palate falling backwards, causing

air entry to cease from anywhere between 15 and 90 seconds (Lewis et al 2014). The individual may be seen to be attempting to breathe with the rise and fall of the chest or abdominal wall, but as the airway is obstructed there is no air entry (McCance et al 2015). The decrease in oxygen to the brain causes the person to rouse slightly, often snorting and gasping, causing the soft palate and tongue to move forwards, allowing the airways to open (Lewis et al 2014). Often the person will not become consciously aware that they are rousing and will continue to sleep, with further apnoeic cycles occurring. The individual fails to maintain the deep sleep period required for a restful sleep (Rebeiro 2013). Nurses monitoring hospitalised individuals during sleep may observe apnoeic episodes and will need to document the findings and report to the medical officer for further assessment. (See Progress Notes Example 27.1.)

A number of studies have shown that approximately 24% of middle-aged males and 9% of middle-aged females suffer with OSA, which may repeat itself many times during the night, leaving the person sleep-deprived and fatigued (Australasian Sleep Association 2015). Given that the major modifiable risk factor for OSA is obesity the prevalence of OSA is increasing (McCance et al 2015). OSA is a serious and potentially life-threatening condition. The episodes of apnoea during sleep may cause various organ systems to function abnormally and possibly contribute to many disorders such as hypertension, heart attack and stroke (Rebeiro 2013). It also commonly leads to EDS, which is the most common presenting complaint of individuals suffering sleep apnoea, leading to poor concentration, and is potentially one of the causes of workplace and road accidents (McCance et al 2015).

Treatment options may begin with lifestyle changes, if these are indicated, such as weight loss and a decrease in alcohol intake (Rebeiro 2013). Referral may be made to an ear, nose and throat (ENT) surgeon to assess whether airway obstruction could be caused by mechanical factors. A dental splint may be utilised in mild cases of OSA to hold the jaw in a forced-forward position, keeping the airway open. Moderate to severe sleep apnoea usually requires the long-term use of a continuous positive airway pressure (CPAP) device—a nasal mask worn while sleeping (Lewis et al 2014). The CPAP device keeps the back of the throat open by creating a backward pressure through the airways, preventing the upper airway structures from collapsing and thereby preventing apnoeic periods (Rebeiro 2013). Individuals require education and support to adapt to the use of a CPAP device, as non-compliance is high, but in the long term, OSA can be managed, and effective restorative sleep achieved (Lewis et al 2014).

### Central sleep apnoea

**Central sleep apnoea** (CSA) is similar to OSA, where breathing periodically ceases. However, there is no obstruction in the upper airways. CSA occurs due to signals failing to reach the respiratory muscles, and therefore no effort is made to breathe (Snore Australia 2015). When breathing slows during sleep the respiratory control centres in the brain do not respond fast enough to the changes in oxygen and carbon dioxide levels in the blood (Sleep Disorders Australia 2015). When the signal eventually does come through, breathing is quietly resumed, without the snorts and jerks associated with obstructive apnoea. This condition is commonly seen in people with congestive heart failure (Snore Australia 2015). Other disorders like stroke or a weakened diaphragm can also contribute to CSA (Sleep Disorders Australia 2015). CSA is managed with CPAP therapy, at low pressure, providing a positive impact on the quality of sleep achieved.

## Narcolepsy

Narcolepsy is a chronic sleep disorder characterised by an abnormality in the sleep–wake area of the brain resulting in persistent and excessive daytime sleepiness (Lewis et al 2014). An overwhelming urge to sleep overcomes the individual during hours of wakefulness and brief periods of sleep occur, lasting from seconds to several minutes (Lewis et al 2014). Individuals with narcolepsy may experience symptoms of EDS, loss of muscle tone, hallucinations, disrupted sleep at night and be unaware of their actions (Giacomini et al 2012). The individual will often fall straight into the REM period

### PROGRESS NOTES EXAMPLE 27.1

| | |
|---|---|
| 15/02/15<br>06:30 hrs | Nursing: Mr Adams was admitted to the medical ward at 22:30 hrs for overnight observation and review by the cardiac physician in the morning. He was brought in by the ambulance to the emergency department with chest pain 9/10 at 14:00 hrs. His chest pain was relieved with 600 mcg of Anginine × 3 and 2.5 mg of IV morphine given by the ambulance officers. He has a past history of angina and a stent to his left main coronary artery. On arrival to the ward he was pain free, and admission ECG and vital signs were within normal parameters. Refer to medication chart for medications commenced. At 02:00 hrs it was observed that Mr Adams appeared to be having an apnoeic period. He struggled for breath, awoke slightly snorting and then resumed a normal breathing pattern. Vitals signs were performed and no alterations from previous observations were noted. The oxygen saturation probe was left in situ. The oxygen saturation machine alarmed approximately every 15–30 min with varied desaturations down to $SpO_2$ of 75%. Mr Adams was reviewed overnight by the night resident medical officer as per the medical emergency team (MET) call criteria. Appointment to be made upon discharge for the sleep study clinic.<br>***J. McArdle* (McArdle) EN** |

of sleep (Lewis et al 2014). Narcolepsy often occurs in individuals in their teens or early 20s and research suggests the prevalence is increased if family members have narcolepsy (Giacomini et al 2012). There is no cure, but narcolepsy may be managed with medication (i.e. amphetamines), changes in lifestyle, counselling and support (Rebeiro 2013). Narcolepsy is usually diagnosed by conducting a daytime sleep study measuring the individual's tendency to fall asleep.

### Parasomnias

**Parasomnias** are sleep disorders that include a range of physical and behavioural occurrences such as sleep walking, nightmares, enuresis (bed wetting) and bruxism (tooth grinding), which occur more commonly in children than in adults (Rebeiro 2013). These can occur during REM or NREM periods of sleep. Sudden infant death syndrome (SIDS) is also considered a parasomnia and is thought to be an autonomic nervous system abnormality causing apnoea, hypoxia and cardiac arrhythmias during sleep (McCance et al 2015). It is recommended that infants be placed in the supine position during sleep. There are specific treatments recommended for parasomnia disorders which vary according to the sleep disturbance. Safety is paramount when providing education and treatment to support the individual with their disorder (Rebeiro 2013).

## FACTORS AFFECTING SLEEP

Frequently a number of factors affect the quantity and quality of sleep, rather than one individual factor (Rebeiro 2013). Clinical Interest Box 27.7 outlines the factors that affect sleep. Some of these factors are often transient; however, the individual may seek advice about a sleeping problem. Many stressors associated with daily living, and particularly with illness, may have a detrimental effect on a person's ability to rest and sleep, and this will further impact on their general wellbeing. It is vital that the nurse is aware of the factors that affect a person's ability to sleep in order to assist in alleviating or minimising these factors.

### Shift work

Shift work is a necessary and inherent part of the nursing profession. Nurses rotate through day, afternoon and night shifts, all of which may occur over a working week. Shift work causes disruption to the body's circadian rhythm, affecting physical and psychological wellbeing, which can lead to an increased risk of workplace and personal accidents (Gkrizioti et al 2010). Shift work can affect a nurse's normal sleeping pattern and quality of sleep. Fatigue and the ability to catch up on sleep when not rostered on are the main complaints from nurses who work night shift (Powell 2013). Just as nurses care for individuals' rest and sleep needs, nurses need

### CLINICAL INTEREST BOX 27.7 Factors affecting sleep

**Physical illness**: pain and discomfort may interfere with falling asleep, or disrupt the sleep pattern. The impact of a plaster cast, traction, a brace or splint will physically limit movement and position when sleeping.

**Pain**: chronic pain can increase feelings of fatigue, and intensity may be increased at night.

**Nocturia**: getting up at night to urinate will disrupt sleep pattern, and difficulty in falling back to sleep may be experienced.

**Dyspnoea**: the position that must be assumed to sleep and to ease difficulty breathing may be different or difficult for the individual to adjust to without disruption to sleep cycle. Fear of increasing difficulty in breathing is often experienced at night, particularly in cardiac disease when individuals may awaken with dyspnoea.

**Hypertension**: individuals may experience increased fatigue and early morning awakening.

**Drugs and substances**: see Clinical Interest Box 27.9.

**Lifestyle**: work shifts (especially rotating shifts) disrupt sleep patterns. It may take several weeks for the body to adjust to shifts such as night duty with the change in exposure to light and activity levels (see 'circadian rhythm').

**Exercise and fatigue**: physical activity that results in individuals feeling tired may actually increase quality of sleep. Fatigue, however, and feelings of exhaustion often result in difficulty falling asleep.

**Nutrition**: changes in body weight can influence sleep patterns, with weight gain causing longer sleep periods, and weight loss sometimes causing a reduction in sleep continuity. The timing and type of meals (e.g. a heavy or spicy meal close to the time of sleeping) may interfere with falling asleep and the ability to achieve restorative sleep, as the digestive system will be engaged in activity during sleep periods.

**Stress and emotional state**: worry over personal problems, health or work issues can disrupt sleep. Emotional problems cause tension, both physically and psychologically, and can interfere with the relaxation and calm required to fall asleep. Individuals may become frustrated at not being able to fall asleep, may wake frequently because of their emotional state or may oversleep as a result of sleep pattern disturbances.

**Grief**: also a realistic cause of sleep disturbance, not just in relation to death of a loved one, but also in relation to loss of position in society (such as retirement) or in relocation such as moving homes.

**Environment**: simple factors such as heating/cooling, lighting, comfort and familiarity of bed and bedding, noise (such as that experienced in hospitals or residential care facilities) may all impact on the ability to fall asleep and/or remain asleep.

*(Christensen & Kockrow 2011; Rebeiro 2013)*

to be aware of their level of fatigue and care should be taken to ensure adequate rest and sleep is obtained between shifts and on non-rostered shifts. It is also important to consider a good diet and exercise regimen as they can have a positive impact on circadian rhythms, leading to improved sleeping patterns (Pakieser-Reed 2013).

### CRITICAL THINKING EXERCISE 27.1
### Care of the nurse and night duty

You work on the medical ward and are rostered to work on two night shifts after working a late/early. You already feel tired from working the late and then an early, after only 5 hours' sleep in between. On the early shift at the morning handover the night shift RN reported that it had been quite busy on the night shift. There are a few palliative individuals requiring specialised care to manage their pain and comfort levels. There are also several individuals who have had dense CVAs (cerebrovascular accidents) who are long term, requiring extra care. What strategies could you put in place to ensure that you are not too fatigued to commence and work the two night shifts as rostered? What strategies can you put in place to care for self, working shift work?

## ASSESSING REST AND SLEEP PATTERNS

Assessment of rest and sleep patterns plays an important role in assisting individuals and their caregivers to identify habits and factors that contribute to poor sleep (Lewis et al 2014). The information gathered can allow the nurse to identify strategies and incorporate them into the nursing care provided (Rebeiro 2013).

### Sleep pattern

When assessing an individual's status in relation to comfort, rest and sleep, the nurse should obtain information of the individual's usual periods of rest and sleep behaviour, such as periods of rest during the day and the time normally gone to sleep, the quality of sleep and the time of waking (Rebeiro 2013) (see Clinical Interest Box 27.8). It is helpful to know the individual's sleep hygiene routine; for example, if they normally have a hot drink before bedtime, or if they require medication to help them sleep (Clinical Interest Box 27.9).

### CLINICAL INTEREST BOX 27.8
### Questions to assess sleep patterns

- What time do you usually go to sleep?
- How quickly do you fall asleep?
- What is the average number of hours you sleep during the night?
- How many times do you wake at night
- Do you know what wakes you at night?
- When do you usually wake in the morning?
- Do you rise once you wake or do you stay in bed?
- How do you feel physically after awakening in the morning?

*(Christensen & Kockrow 2011; Rebeiro 2013)*

### Physiological factors

The nurse should also assess whether there is any discomfort that may disturb rest and sleep, such as nausea, difficulty

### CLINICAL INTEREST BOX 27.9
### Effects of medications on sleep

**Hypnotics**
- Interfere with reaching deeper sleep stages
- Provide only temporary (1 week) increase in quantity of sleep
- Eventually cause 'hangover' during day; excess drowsiness, confusion, decreased energy
- Sometimes worsens sleep apnoea in older adults

**Antidepressants and stimulants**
- Suppress REM sleep
- Decrease total sleep time

**Alcohol**
- Speeds onset of sleep
- Reduces REM sleep
- Awakens person during night and causes difficulty returning to sleep

**Caffeine**
- Prevents person from falling asleep
- Causes person to awaken during night
- Interferes with REM sleep

**Diuretics**
- Night-time awakenings caused by nocturia

**Beta-adrenergic blockers**
- Cause nightmares
- Cause insomnia
- Cause awakening from sleep

**Benzodiazepines**
- Alter REM sleep
- Increase sleep time
- Increase daytime sleepiness

**Narcotics**
- Suppress REM sleep
- Cause increased daytime drowsiness

**Anticonvulsants**
- Decrease REM sleep time
- Cause daytime drowsiness

*(Christensen & Kockrow 2011; Rebeiro 2013)*

breathing or any acute or chronic pain related to the illness. Pain is associated with chronic poor sleep (Dzierzewski et al 2015). Pain causes the person to have fragmented sleep as it stimulates the cortical areas of the brain, leading to arousal, and lack of sleep intensifies the experience of pain (Fillary et al 2015).

Nursing assessment of individuals with chronic illnesses is important so that the sleeping environment can be modified or referral for further assessment can be initiated to assist in achieving adequate rest and sleep. Individuals with chronic lung disease or congestive heart failure are often short of breath when lying flat and will require two or more pillows to sleep on. They may be woken during the night due to congestion or shortness of breath (Rebeiro 2013). Nocturnal chest pain is common in the early hours of the morning in people with coronary artery disease related to the REM period of sleep where dreams occur (McCance et al 2015). Hypertension also causes early morning waking and fatigue (Rebeiro 2013).

Nocturia disturbs sleep due to the frequent waking to void or when incontinence occurs. Nocturia may be caused by diabetes where high blood sugars cause polyuria; loss of bladder tone causing incontinence or frequent urination; congestive heart failure where elevating legs in bed results in increased venous return and the filtering of increased blood volume creates more urine; or prostatic enlargement resulting in frequent urination overnight (Rebeiro 2013).

Musculoskeletal issues affecting sleep include inability to reposition self when uncomfortable or in pain; restless leg syndrome where deep muscles become itchy and the only relief is by moving them; muscle cramps due to poor circulation in the legs causing pain and waking a person suddenly (Rebeiro 2013).

## Emotional factors

It is important also to assess for psychological and emotional factors (that may not be visible) that may be impacting on the individual's ability to relax and achieve a state of calm to facilitate rest and sleep. Worry or stress about an illness state or the impact of the illness on an individual's lifestyle can result in poor sleep habits (Rebeiro 2013).

## Environmental factors

Hospitalised individuals' sleep pattern may be affected by illness or the hospital environment and routines (Rebeiro 2013). The normal pattern and quality of sleep deteriorates greatly when a person is in a hospital environment (Thomas et al 2012). There is a correlation between disruptions to sleep and noise levels. Electronic sounds are more likely to wake individuals than other noises at the same volume (Fillary et al 2015). Assessment of environmental factors affecting a person's ability to maintain sleep is important in being able to modify the environment to promote sleep and rest. This may be as simple as turning down the volume of the volumetric pump or dimming lights. Review Case Study 27.1 in relation to changes in sleep patterns due to hospitalisation.

### CASE STUDY 27.1

Mrs Walsh is a 75-year-old woman diagnosed with bowel cancer, who has been admitted to the surgical ward preoperatively for an anterior bowel resection with the possibility of the formation of a colostomy. She has been admitted for preop bowel preparation. On admission, Mrs Walsh tells you that she dreads coming into hospital because she finds it very difficult to sleep, and when she gets home it takes her ages to catch up on all the sleep she has lost.

1. What steps will you undertake to develop a sleep plan to assist Mrs Walsh to improve her expected sleep pattern in hospital? What strategies might she use to regain her previous sleep quality once home?
2. Identify factors that may impact on Mrs Walsh's ability to sleep post surgery. Develop a brief care plan to meet postop rest and sleep needs.
3. What do you believe individuals should expect to achieve in terms of quality sleep while in hospital and how would you implement nursing strategies that could improve quality of sleep?

## Medication factors

Assessment of the individual's medication regimen is important to determine if the side effects of particular prescribed medications are contributing to daytime sleepiness or drowsiness (Rebeiro 2013) or night-time wakefulness (e.g. prednisolone taken at night causes insomnia and nightmares, which is why it is prescribed as a dose). If so, the ability to achieve an adequate night's sleep may be affected. An individual may need the assistance of medications to fall asleep and maintain sleep but these are indicated for short-term management only (Bryant & Knights 2014).

The information obtained, together with observation of the individual, provides the nurse with a foundation on which to plan and implement nursing actions to promote comfort, rest and sleep. When possible the person's usual sleep hygiene routine should be maintained, and the immediate environment arranged so that it is conducive to comfort, rest and sleep.

## Hospitalisation/residential care

Sleep and rest disruption is prevalent in hospitalised individuals. Thomas et al (2012) highlighted that inadequate pain control, frequent disturbances from staff and presence of other persons in the room are major disturbances to sleep reported by hospitalised individuals. Sleep problems in individuals in residential aged care facilities include difficulty getting to sleep, night-time waking, night-time wandering and over- or under-sleeping (Swann 2013). Both short- or long-stay hospitalisation can cause sleep deprivation, leading to negative health outcomes (Pilkington & Lorenz 2013). Adequate rest and **restorative sleep** is crucial for optimal

recovery from illness (Ye & Keane 2013). The need to promote adequate rest is an important aspect of nursing care as without it individuals may experience fatigue and irritability as well as having a decreased ability to deal with stressors (Christensen & Kockrow 2011). Nursing interventions should therefore be aimed at improving the quality of rest and sleep to promote health (Rebeiro 2013).

Many of the causes of sleep deprivation in hospitalised individuals are environmental, and the nurse needs to focus on reducing these effects by modifying the environment (Pilkington & Lorenz 2013). An individual may find it difficult to rest in a hospital environment because of constant activity levels and attention by nursing staff, or disturbing sights and smells that may occur. In addition an individual may be subjected to sensory stimulation not normally experienced in the home environment (see Clinical Interest Box 27.10). During the night, nurses continue to observe individuals and perform certain procedures or treatments as required. Nurses can control the ward environment to optimise sleep by avoiding waking individuals for non-essential activities, and timing them so they are completed when the individuals are awake (Rebeiro 2013). However, as part of the nurse's responsibility and accountability in delivering care it is at times unavoidable to disturb individuals from their sleep to perform nursing observations and activities required to ensure an individual's safety and wellbeing. For example, an individual on hourly neurological observations may appear to be having a restful sleep but has deteriorated neurologically. A critical error can be made if the individual is not woken up for the hourly assessment and the changes in neurological status are not detected.

## CLINICAL INTEREST BOX 27.10 Controlling noise in the hospital setting

- Close doors to individual's room when possible
- Keep doors to work areas of unit closed when in use
- Reduce volume of nearby telephone and paging equipment
- Wear rubber-soled shoes. Avoid clogs
- Turn off bedside oxygen and other equipment that is not in use
- Turn down alarms and beeps on bedside monitoring equipment
- Turn off room TV and radio unless individual prefers soft music
- Avoid abrupt loud noise such as flushing a toilet or moving a bed
- Keep necessary conversations at low levels, particularly at night
- Conduct conversations and reports in a private area away from individuals' rooms

*(Rebeiro 2013)*

It is optimal to achieve at least 90 minutes of continuous sleep as this gives the individual at least one full REM cycle, which can have a positive influence on the effectiveness of sleep (Missildine et al 2010). If woken, and the individual experiences difficulty resettling, measures such as a change of position, adjustment to the bedding or a warm drink may help with resuming sleep. It should be noted if an individual does not resettle after these supportive measures have been implemented, the nurse on night duty must ensure that the individual's comfort and safety are promoted.

## CRITICAL THINKING EXERCISE 27.2

Mrs Pratt is a young mother of three children, aged 2, 4 and 6 years. She has just been discharged from hospital after a 3-day admission for the treatment of exacerbation of asthma. She has been prescribed an anti-inflammatory prednisolone 25 mg on a reducing dose, as well as her preventer and reliever. Identify factors that may affect her ability to sleep, and briefly describe nursing interventions that may assist her to rest to facilitate her recovery.

Continuity of care is essential, and as there are usually fewer staff working at night, the nurse's observational skills are vital in detecting any change in an individual's condition or comfort levels. The nurse is also in a position to observe any specific physiological problems related to sleep including pain, discomfort, excessive restlessness, snoring or airway obstruction. Referrals may also need to be made to a sleep study centre, pain management team, social worker, counsellor or psychologist to address the sleep disturbance issue.

Stressors or psychological issues associated with illness or hospitalisation may cause difficulty in maintaining the usual sleep pattern (Rebeiro 2013). Being in hospital involves a variety of potential stressors; the nurse should therefore implement measures to provide as stress free an environment as possible. Anxiety related to illness, and its consequences, may prevent relaxation and interrupt sleep. Emotional tension may be reduced by providing individuals with adequate information before any treatment or procedure starts. See Nursing Care Plan 27.1 on sleep alteration. To provide opportunities for questions to be asked and answered, the nurse should promote a climate that is conducive to communication by spending time with the individual and their significant others.

Some healthcare facilities have regulations and specified visiting hours, which are designed to provide rest periods and avoid overtiring hospitalised individuals. Throughout the rest periods, visitors to, and activities in, the ward are kept to a minimum to provide a quiet relaxed environment where individuals should be encouraged to try to sleep or to engage in some relaxing non-stressful activity. To facilitate rest and relaxation, an individual's physical comfort should be promoted, as it is difficult to rest in the presence of discomfort such as pain, a full bladder or an uncomfortable position. (See Clinical Interest Box 27.11.)

### CRITICAL THINKING EXERCISE 27.3

Ms Barbara White, a 49-year-old woman on the surgical ward, has recently undergone knee reconstruction surgery. You are on night shift, and find her awake at 0100 hrs. She tells you that she has been having trouble sleeping since her surgery 4 days ago. What strategies could you implement to assist Ms White to have optimal sleep?

## SLEEP-PROMOTION MEASURES

Sleep is influenced by a variety of factors that may be described as physical, psychological or environmental. Effective sleep may be facilitated by a range of natural/non-pharmacological measures, which include:

- Sleep in a room that is quiet, darkened and at a comfortable temperature (coolness or warmth), which has sufficient fresh air or ventilation
- Engage in physical exercise/activity during the day to promote rest at night, and go to bed when feeling tired

### CLINICAL INTEREST BOX 27.11 Promoting rest and sleep in hospitalised adults

- Follow regular sleep hygiene routines
- Encourage individuals to wear loose-fitting nightwear
- Remove any irritants against the individual's skin, such as moist or wrinkled sheets or drainage tubing
- Position and support body parts to protect pressure areas and aid muscle relaxation
- Administer necessary personal hygiene measures
- Keep linen clean and dry
- Encourage the individual to void before going to sleep
- Administer any analgesics or sedatives about 30 minutes before bedtime
- Provide a quiet environment

*(Rebeiro 2013)*

### NURSING CARE PLAN 27.1 SLEEP ALTERATION

**Assessment:** Mr Brown is an 85-year-old farmer who has recently entered a nursing home after a failed rehabilitation, post repair to a compound fracture to his right neck of femur. Prior to this Mr Brown was living independently at home with his wife. Mr Brown was an inpatient in an orthopaedic ward for 20 days and then in a rehabilitation unit for 3 weeks. Mr Brown has not been able to regain the ability to walk and requires assistance to mobilise in on-bed and off-bed tasks. As a result he requires repositioning several times overnight due to pain in his right leg. Mr Brown has mentioned prior to coming into hospital that he normally slept soundly until morning. He is feeling stressed about the pain and not getting enough quality sleep due to the noises in the night within the nursing home. He also feels depressed at having to be cared for in a nursing home, and wishes to be home with his wife as he worries about her being alone on the farm.
**Issue/s to be addressed:** Disturbed sleep pattern related to pain in right hip and stress
**Goal/s:** Mr Brown will be able to have improved quality of sleep within 2 weeks
Mr Brown will achieve a normal sleep pattern within 2 weeks

| Care/Actions | Rationale |
|---|---|
| Assess pain levels prior to sleep | To prevent pain waking Mr Brown |
| Refer Mr Brown to pain management team | To provide adequate treatment to optimise pain relief measures allowing optimal sleep |
| Adjust the environment to minimise the noise levels; close door, darken room or soft music | A quiet, darkened environment promotes sleep and soft music masks environmental noises that may keep a person awake |
| Encourage Mr Brown to verbalise concerns to decrease stress prior to sleep | Excess worry or stress prior to sleep may stimulate wakefulness |
| Refer family situation to a social worker to enable Mr Brown to discuss concerns about the farm and his wife | To decrease worry and concern, which may relax Mr Brown, enabling him to sleep |
| Promote relaxation techniques to promote sleep | Relaxation techniques may promote sleep by decreasing thought processes and reducing stress |
| Provide aids to promote comfort; air mattress to cushion body against pressure. Correct body alignment supported with pillows to promote comfort | Falling asleep only occurs if a person feels relaxed and comfortable |

**Evaluation**

Ask Mr Brown regarding his perception of quality of sleep.
Ask Mr Brown if pain is waking him in the night.
Observe amount of night-time wakefulness and daytime sleepiness.

- Spend some time relaxing and unwinding before going to bed. Sleep may also be more easily achieved if the person is calm and has been able to resolve any problems prior to going to bed
- Resist stimulants such as tea, coffee or cocoa immediately before going to bed. Individuals may find it easier to sleep if they avoid going to bed feeling hungry or overfull
- Adopt a sleep hygiene routine (e.g. similar time each night, warm bath or shower, warm drink and some peaceful music or relaxing reading). For children, this may include quiet time and perhaps story reading, as well as settling with a familiar object, such as a doll or soft toy. Clinical Interest Box 27.12 outlines how to promote safe sleeping for infants.

The need for comfort is closely related to the need for sufficient rest and sleep. Rest depends on relaxation and to be relaxed a person must be physically comfortable and free from emotional tension. Rest and relaxation do not necessarily mean inactivity; for example, a person who has a sedentary occupation may find the physical exercise of a brisk walk relaxing. People confined to bed may find it more relaxing if they are reading or watching television rather than lying in bed unoccupied (Christensen & Kockrow 2011).

### CRITICAL THINKING EXERCISE 27.4

Mr Herron is a middle-aged factory worker who works permanent evening shift, finishing work each weeknight at 2300 hrs. After work he eats his main meal of the day and drinks at least six cans of beer. He normally goes to bed at 0200 hrs and sleeps in short periods, for about 5 hours. He gets up at least once to urinate. He relaxes by watching television in bed. You perform a sleep assessment on Mr Herron's sleep habits and history. How could you assist Mr Herron to develop effective sleep hygiene habits that will improve his sleep patterns?

### CLINICAL INTEREST BOX 27.12 Promoting safe sleeping for infants

The SIDS and Kids Safe Sleeping program teaches parents how to create a safe sleeping environment for babies and young children:

1. Sleep baby on the back from birth, not on the tummy or side
2. Sleep baby with head and face uncovered
3. Keep baby smoke free before birth and after
4. Provide a safe sleeping environment night and day
5. Sleep baby in their own safe sleeping place in the same room as an adult caregiver for the first 6 to 12 months
6. Breastfeed baby.

*(SIDS and Kids 2014)*

## Meeting sleep needs/sleep hygiene

Good sleep hygiene promotes sleep and minimises factors that impact on individuals' ability to achieve adequate sleep (Hellstrom et al 2011). Hospitalised individuals should be encouraged to maintain their usual pre-sleep routine (Rebeiro 2013). (See Clinical Interest Box 27.13.) **Sleep hygiene** is the routines and habits an individual performs prior to sleep to maximise the effectiveness of sleep. In hospital, the nurse should assist a person in preparation for sleep by ensuring that the following key physiological and psychological needs are met.

### Hygiene needs

When required the individual should be assisted to meet all hygiene needs, such as washing face and hands and cleaning teeth. An ambulant individual may like to have a warm shower or bath before settling to sleep. A non-ambulant individual may require repositioning and turning.

### Nutritional and fluid needs

Large spicy meals, caffeine and alcohol must be reduced or avoided prior to retiring to bed as they can disturb sleep (Rebeiro 2013). A warm drink and snack could be offered to the individual, unless this is contraindicated. An individual may prefer a non-stimulating milk-based drink rather than tea or coffee, which can have a stimulating effect. In addition oral fluids that can be consumed during the night if desired should also be provided.

### Elimination needs

Individuals should be provided with toilet facilities before settling for sleep. The nurse may need to provide assistance with the appropriate toileting aids and facilities. Urinary drainage equipment should be checked, and the collection bag emptied if necessary.

### Comfort needs

Preparing the individual's room includes ensuring that there is adequate ventilation and warmth and that lighting is reduced to a minimum (Rebeiro 2013). The individual's nurse call bell and any other items that may be required

### CLINICAL INTEREST BOX 27.13 Sleep hygiene

- Bedtime routines and sleeping environment
- Use of sleep and other prescription medications, and over-the-counter drugs
- Pattern of dietary intake and amount of substances that influence sleep
- Symptoms experienced during waking hours
- Physical illness
- Recent life events
- Current emotional and mental status

*(Adapted from Rebeiro 2013)*

during the night need to be placed within easy reach. Nursing measures include ensuring that the individual is positioned comfortably and that the bedclothes and pillows are arranged to meet the individual's needs. The bottom sheets should be free of wrinkles or creases, and supplementary items such as a sheepskin or bed cradle may be used to enhance comfort and to prevent the risk of pressure on skin and bony prominences. Whenever possible, treatments and procedures are completed before individuals settle for sleep. For example, any splints or dressings should be checked and, if necessary, adjusted or changed (Rebeiro 2013). (See Chapter 23.)

## Protection and safety needs

The National Safety and Quality Health Service (NSQHS) standards (ACSQHC 2012) on preventing and managing pressure injuries, and preventing falls and harm from falls, need to be considered in the protection and safety needs of hospitalised individuals (see Chapter 19). Extended bed rest from illness and immobility can lead to pressure injuries and can occur in individuals with risk factors including poor nutrition, skin integrity and pressure points, or be age related (ACSQHC 2012). The intention of the NSQHS standard regarding pressure injuries is to prevent the occurrence of pressure injuries. The nurse needs to perform a risk assessment on admission to provide the appropriate interventions when assisting the individual with rest and sleep needs.

The NSQHS standard regarding falls prevention aims to prevent falls or minimise the harm from falls. Measures need to be taken to promote the individual's safety during sleep. If a person is restless (but not confused or disoriented), the use of bed rails (one or both) may be indicated, but a comprehensive falls risk assessment must be completed with appropriate consent and documentation undertaken. Then an individualised falls prevention plan must be implemented (ACSQHC 2012). For a confused individual, it is usually more appropriate to adjust the height of the bed to its lowest level. As an alternative safety measure, 'hi-lo' beds, which can be situated at floor level, may be appropriate for an individual who is disoriented and inclined to get out of bed and wander. The risks to a confused or disoriented individual are greatly increased in raising bed rails as the feeling of being enclosed or limited in activity may result in them climbing over the rails, thus causing an unnecessary injury. Confused or disoriented individuals need frequent monitoring and measures that limit the risk of injury. Adequate lighting should be provided, perhaps via a night light, particularly if the individual needs to mobilise during the night.

Other safety measures include regular monitoring throughout the night to assess an individual's health status and ensure that any equipment such as intravenous infusion apparatus, monitoring leads, indwelling catheters, drain tubes or any assistive devices are in place and functioning appropriately.

## Physiological needs

It is the role of the nurse to assess an individual for any physiological disturbances that may impact on adequate sleep and to promote comfort conducive for rest and sleep (Rebeiro 2013). This includes interventions such as alleviating pain, attending to hygiene or any distressing symptoms, such as difficulty breathing, which may affect adequate rest and sleep (Rebeiro 2013). In collaboration with a Registered Nurse, measures (either non-pharmacological or pharmacological) should be undertaken to alleviate these factors (as much as possible).

## Psychological needs

Anxiety and an active mind can interfere with effective sleep (White et al 2011). If an individual is anxious or worried, the nurse should try to ascertain the reason and provide appropriate support. For example, a person may be concerned about some aspect of treatment, such as forthcoming surgery, and providing them with more information (as appropriate within scope of practice) may help to alleviate some of their anxiety (Rebeiro 2013). Reassurance that a nurse will be available to respond to needs may also be helpful.

## Pharmacological measures

In the short term, and particularly while hospitalised, an individual may be prescribed medication by a medical officer to promote sleep; for example, a sedative. Long-term use of sedatives can be detrimental to sleep routines. Therefore, alternative measures to assist a person to improve sleep patterns are important (Rebeiro 2013). Natural sleep hygiene measures to promote settling should be undertaken first but, if difficulty getting to sleep persists, mild sedation may be considered by the medical team to be appropriate (White et al 2011). After a sedative medication has been administered, the individual should be encouraged to relax and allow it to take effect. In most cases, light sedatives assist individuals to fall asleep, but do not have an impact on keeping the individual asleep; therefore, once the individual has settled, activity, noise and light should be reduced to a minimum. The response to, and effects of, such medication must be noted and recorded (Rebeiro 2013).

## Stress reduction

A range of techniques are available for reducing stress and promoting relaxation, all of which aim to help the individual control reactions to stress. A calm relaxed person is likely to fall asleep quickly and sleep soundly through the night (White et al 2011). Relaxation techniques should initially be learned in a quiet restful environment and, with practice, may then be used in most situations to reduce stress. Physical and psychological relaxation is the aim of relaxation techniques, reducing the body's physical tension as well as interrupting constant thoughts that prevent sleep. Some individuals benefit from utilising relaxation techniques and do sleep longer; however, not all people respond to relaxation techniques (White et al 2011). Individuals should be encouraged to pursue activities that reduce stress.

## Management of weight

Individuals who are overweight tend to sleep longer and have fewer interruptions than an individual who is underweight,

who will have more interruptions and wake earlier (Christensen & Kockrow 2011). Discussion with a dietitian should be made to assist in formulating a dietary plan to manage weight issues to promote health and wellbeing and reduce the risk of diet-related conditions and chronic diseases (Australian Dietary Guidelines 2015).

## Complementary and alternative therapies

Individuals are increasingly turning to complementary therapies to use alongside traditional medical treatments to enhance health and wellbeing (Christensen & Kockrow 2011). A range of complementary therapies can assist with promoting rest and sleep. Some of these may include meditation techniques, relaxation, exercise, creative therapies, religious activities, acupuncture, biofeedback, massage, reflexology, aromatherapy and herbal treatments (Christensen & Kockrow 2011). They are known as alternative therapies when the complementary therapy becomes the main form of treatment, replacing medical treatment.

***Yoga, mindfulness, meditation and tai chi*** Yoga, meditation and tai chi are forms of relaxation and exercise that are helpful to many people and, while they have degrees of difficulty, can be practised by many age groups and people of varying degrees of wellness. Mindfulness is a form of self-awareness meditation which is used as an adjunct to both medical and psychological therapies. It is a process that allows an individual to become aware of physical and psychological events affecting sleep and to develop strategies to manage the reactions to sleep disturbances (Ong & Sholtes 2010). It is important that techniques for alternative therapies are taught by people with expertise in these methods (Halpern et al 2014).

***Relaxation breathing*** This technique consists of controlled breathing, performed while the individual assumes a comfortable position. The person is encouraged to concentrate on their breathing, and may find it helpful to visualise each breath as providing muscles with energy-giving oxygen. The person is encouraged to take a deep breath, hold it briefly and then exhale slowly. With each exhalation the person is encouraged to say 'relax' and, as the technique is repeated, should feel progressively more relaxed (Beyond Blue 2015).

***Progressive muscular relaxation*** The theory behind this technique is that a relaxed body leads to a relaxed mind. The technique consists of consciously tensing and relaxing the major muscles of the body in sequence. The individual is encouraged to tense one or a group of muscles for approximately 10 seconds, feel the tension and then slowly ease the tension by relaxing the muscles (Beyond Blue 2015). As the technique is repeated there should be an awareness of the sensation of relaxation in the muscles.

***Massage*** Massage is a method of communication without words, and can induce a feeling of physical and mental relaxation and calm. Massage therapy releases chemical neurotransmitters (endorphins) that contribute to a feeling of wellbeing, and decreases the levels of stress hormones, adrenaline, cortisol and noradrenaline (Hellstrom et al 2011). Muscles contract and become tense in stressful situations, and massage can be an effective method of promoting muscle relaxation (Salvo 2016). There are many types of massage and, while most are relatively easy to learn, instructors with experience can teach caregivers simple relaxation massage techniques to assist others to relax.

Although a massage can be beneficial, some people may not feel comfortable about being massaged. Also, an individual's physical condition may contraindicate the use of massage. In older individuals, with age-related skin changes, extreme care must be taken to ensure that massage is gentle and light to avoid disruption of the epidermal–dermal junction, which becomes weaker with age (Salvo 2016). In older individuals, the risk of skin tears is greatly increased because of this junction weakness, and massage should be limited to small areas of the hands, feet or shoulders as tolerated. In the right situation, however, massage, particularly of the neck and back, can be very relaxing and promote rest (Salvo 2016).

## Exercise

Exercise can be useful in sleep promotion; however, it is recommended that it be performed at least 2 hours prior to bedtime to allow the body to relax (Rebeiro 2013). In relation to older adults who may have age-related changes or chronic ill health, or those who are experiencing episodes of illness or changes to health status (such as surgery or treatment), the degree of physical activity that may be undertaken may be limited, but simple activity such as sitting out of bed or gentle ambulation several times a day may meet the same activity level for an individual with health limitations that regular exercise has for a person in a state of wellbeing (Christensen & Kockrow 2011). Exercise is not always practical, especially if the person is unwell; therefore, relaxation techniques may be used instead (Christensen & Kockrow 2011).

Clinical Interest Box 27.14 outlines some ways in which sleep and rest can be promoted at home.

### DECISION-MAKING FRAMEWORK EXERCISE 27.1

You are looking after Mr Adams on night shift. You go to do his vital signs at 02:00 hrs and notice that he does not appear to be breathing normally. When you touch his arm and speak to him he rouses and starts to snort. You ask him if he has had any sleep issue at home. He tells you that he is not aware of any, although his wife reports he stops breathing sometimes. You apply the $SpO_2$ saturation probe to his finger and leave it in situ. Not long after that Mr Adams falls back to sleep and the $SpO_2$ machine alarms. You enter the room and his $SpO_2$ is at 79%.

1. What is your responsibility in regards to the nursing care for Mr Adams?
2. Using the decision-making framework, what is your role in the need for a MET call?

## CLINICAL INTEREST BOX 27.14 Promoting rest and sleep at home

### Sleep pattern

- Establish a regular bedtime and waking time for all days of the week. Eliminate lengthy naps during the day. Limit naps to only 30 minutes a day
- Exercise adequately during the day. Avoid physical exertion 2 hours before bedtime
- Avoid dealing with work or family problems before bedtime
- Establish a regular sleep hygiene routine before sleep (e.g. reading, listening to music)
- When unable to sleep, pursue a relaxing activity until you feel drowsy
- If having trouble falling asleep, get up until you feel sleepy
- Use the bed mainly for sleep; avoid activities like watching TV

### Environment

- Ensure appropriate lighting, temperature and environment
- Keep noise to a minimum

### Diet

- Avoid heavy meals in the 3 hours before bedtime
- Avoid alcohol- and caffeine-containing foods and beverages at least 4 hours before bedtime
- Decrease fluid intake 2–4 hours before sleep
- If a bedtime snack is necessary consume only a light snack or a warm milk drink

### Medications

- Use sleeping medications only as a last resort
- Take analgesics 30 minutes before bedtime to relieve aches and pains
- Consult with a healthcare provider about adjusting other medications that may cause insomnia

*(Adapted from Berman et al 2015)*

## Summary

Comfort is necessary for relaxation, rest and sleep. A person's ability to achieve comfort and relax, and therefore to receive sufficient rest and sleep, may be disrupted during illness or hospitalisation. Measures that can be implemented to promote rest may include certain techniques that facilitate relaxation. Sleep can also be promoted by allowing the hospitalised individual to maintain their normal pre-sleep routine, and by ensuring that the person's safety and comfort are promoted during the night, as at any other time. Sleep behaviours and patterns can be assessed by the nurse, and simple measures to promote effective sleep may be taught and implemented. Assisting individuals and self to meet comfort, rest and sleep needs is essential in the promotion of individual physical and psychological wellbeing.

## Review Questions

1. Describe the importance of rest and sleep to a person's wellbeing.
2. Briefly describe the five stages of the sleep cycle.
3. List the factors that may interfere with the process of rest and sleep.
4. What is the circadian rhythm?
5. Describe the supportive nursing measures that may be implemented to promote the individual's need for rest and sleep.
6. Briefly describe why individuals have difficulty achieving restful sleep while hospitalised.
7. Identify factors across the lifespan that may impact on an individual's perception of their quality of sleep.
8. What measures can be implemented by nurses to assist an older individual to re-establish their sleep pattern when they have changed their living environment (such as moving to a new home or residential facility)?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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CHAPTER
28

# Promotion of health and wellbeing: movement and exercise

*Heather Wakefield*

## KEY TERMS

active
ankylosis
arthrography
benign tumours
body mechanics
contractures
dangling
deep vein thrombosis
elevation
haematopoiesis
health and wellbeing
hypostatic pneumonia
isokinetic exercise
isometric exercise
isotonic exercise
metastatic bone tumours
muscle atrophy
obesity
orthostatic or postural hypotension
osteoblasts
osteoclasts
osteogenic sarcoma
osteomyelitis
osteoporosis
overweight
passive
plantar flexion (footdrop)
PRICE: prevention, rest, ice, compression and elevation
pursed-lip breathing
range of movement (ROM)

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define the key terms
- Describe and implement the principles of good posture and body mechanics
- Describe the role of the musculoskeletal system in the regulation of movement
- Describe how joints are involved in movement
- State differences between isotonic, isometric and isokinetic exercise
- Describe and define range of movement (ROM)
- Identify and demonstrate joint movements involved in ROM exercises
- Define obesity and describe how variables such as family values and diet influence adult obesity
- Describe how older adults may benefit from exercise
- Identify and describe the complications associated with immobility and implement appropriate preventative measures
- State the influences and effects associated with disorders of the musculoskeletal system
- Identify the major musculoskeletal system disorders that impact movement and exercise
- Describe the major manifestations of musculoskeletal system disorders
- Briefly describe the specific disorders of the musculoskeletal system outlined in this chapter
- Define the diagnostic tests that may be used to assess musculoskeletal function
- Assess individuals for impaired mobility and activity intolerance
- Assist in planning and implementing nursing care plans for individuals with a musculoskeletal disorder
- According to specified role and function, perform the nursing activities described in this chapter safely and accurately in the clinical environment

## CHAPTER FOCUS

Movement and exercise are essential components for restoring, maintaining and enhancing physical and psychosocial health. As society becomes increasingly sedentary in both work and home environments, government and health agencies are researching and evaluating the effects of inactivity on health, disease processes, ageing and morbidity. Research suggests that despite the rising trend in health conditions related to obesity and immobility, the commencement of an exercise program can retard and even reverse the progression of conditions such as osteoporosis, heart disease, diabetes mellitus and the effects of ageing.

The human body is ideally suited to movement. Regular exercise promotes health, feelings of wellbeing and prevents illness throughout the lifespan. Exercise is made possible by the muscular, skeletal and nervous systems. These interconnected systems work together to make movement possible and for most human movement they must function effectively for optimal physical performance. Disease processes that disable one or more of these systems may inhibit or restrict mobility. To ensure mobility and exercise are maximised and maintained, allied health teams should devise care plans to meet individual needs and abilities based on the specific strengths and disabilities of each individual in their care.

Healthcare workers are in a unique position to educate and support people to make lifestyle changes for improvement in health and prevention of disease. Effective and timely health promotion can significantly contribute to the long-term health of a person and potentially reduce disease progression and hospital re-admission. For those with recurring mobility issues, nurses and allied health professionals can support the transition to mobility aids and promote independence and quality of life on discharge to home or an assisted facility. Nurses who promote and encourage mobility and movement play a significant role in the individual's healthcare experience. This important contribution can have a lasting impact on a person's recovery and rehabilitation and benefit society with its positive outcomes.

## LIVED EXPERIENCE

When I turned 50 I began to worry more about my bone and muscle health. I regularly attend Pilates and yoga and now that I am 60 I am noticing how much more agile and active I am in comparison to some of my friends who stayed more sedentary. I have also started swimming and cycling which keeps my joints moving. I feel better now than when I was 30.

**Vanessa, 65 years**

# THE PHYSIOLOGY OF MOVEMENT

## The skeletal system

The skeletal system is the internal framework that supports, shapes, protects and moves the human body. The bones that form the skeleton serve many functions. These functions include support of body shape, protection of organs, movement, storage of fat and minerals and **haematopoiesis** or blood cell formation in bone marrow. To understand the importance of the skeletal system, imagine performing a task such as running or throwing. If the bones required in this movement are disabled due to damage or pain, this activity becomes more challenging, if not impossible, to perform (Patton & Thibodeau 2010).

## The muscular system

The muscular system enables body movement, joint stabilisation and maintenance of posture. The function of muscle is to contract or shorten (see Clinical Interest Box 28.1). Skeletal muscle attaches to bone and can rapidly contract to exert great power or fine movement under voluntary control. Muscles are supported by a network of connective tissue and tendons that anchor muscle to bone for strength and support. Skeletal muscle is classified by the kind of movement it makes; for example, flexors allow joints to bend or flex, while abductors allow shortening so that joints are straightened or abducted (moved away from the body). When muscle contracts it pulls on a bone or bones and produces movement at a joint, where two bones meet. As joints are weak points in the skeleton, synovial fluid, cartilage, ligaments and tendons add protection and support (Patton & Thibodeau 2010).

### CLINICAL INTEREST BOX 28.1 Muscle coordination

The muscular system plays a vital role in maintaining correct body posture by means of good muscle tone and coordinated activity. Most skeletal muscles work in pairs or groups, with one pair or group antagonising the action of another pair or group to achieve controlled movement. For example, during elbow flexion, the triceps muscle relaxes to allow the forearm to be pulled up when the biceps muscle contracts. Extension of the arm is made possible by the relaxation of the biceps, as the triceps contracts and pulls on the arm. The erect position of the trunk is maintained as a result of coordination of groups of muscles (Marieb 2013; Patton & Thibodeau 2010).

## The nervous system

Muscle movements occur as a result of stimulation by a motor or efferent nerve. These nerves activate muscles to respond to voluntary signals, such as grasping an object or towel drying hair. Muscle can respond to voluntary control, those movements controlled by human thought, or to involuntary control through the autonomic nervous system (Marieb 2013). Transmission of the impulse from the nervous system to the musculoskeletal system requires a chemical transmitter to cross the myoneural junction. Acetylcholine transfers the electric impulse from the nerve to the muscle to stimulate muscle and initiate movement (Crisp & Taylor 2012). An imbalance in this chemical neurotransmitter can result in impeded nerve transfer which delays the potential for coordinated or rapid musculoskeletal response.

The co-dependent relationship between the skeletal, muscle and nervous system in body movement can be demonstrated in a person with a spinal cord injury. A lesion in the spinal cord inhibits nerve transmission beyond the point of injury. With no nerve impulse to contract or react, muscle lays dormant. While still providing shape and connection with the underlying bones, the posture cannot be supported and the bones are unable to mobilise due to absence of muscle contraction and voluntary stimulation (Marieb 2013).

# BODY MECHANICS

Fatigue, muscle strain and injury can result from improper use or positioning of the body during activity or rest. Good posture is achieved when all parts of the body are in correct alignment when sitting, lying, standing or moving. Normal spinal curves should be maintained and the joints should be supported in their normal positions. Good posture and alignment reduces strain on all muscles and enables internal organs to function without interference (Figure 28.1). **Body mechanics** is the term used to describe the physical coordination of all parts of the body to promote correct posture and balanced effective movement. The practice of correct body mechanics results in less fatigue and reduces the risk of muscle and joint injury (Marieb 2013).

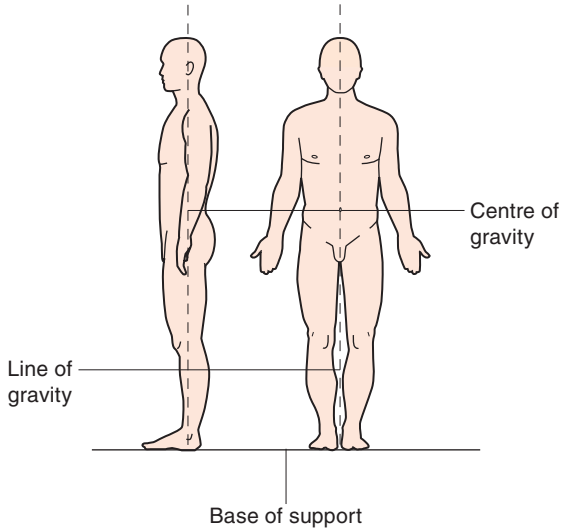


**Figure 28.1** Body mechanics: correct standing posture

Protection of the musculoskeletal system is essential to ensure continuing ability to undertake activities of daily living (ADLs). Everyday activities including walking, showering, cooking and employment are dependent on a functioning and healthy body support system. Nurses in their own activities and during instruction of an individual must familiarise themselves with the mechanics of movement to protect themselves and assist the individual in movement and recovery.

A national health survey of Australians (ABS 2009) revealed that 14% of adult respondents reported long-term medical conditions of back pain and disc disorders. Backache may be a symptom of various health conditions, yet up to 80% of cases result from weak muscles in the abdominal, back and hip regions. These muscles reinforce spinal posture and weakened or damaged muscles through inactivity or poor lifting techniques can result in pain, discomfort and even disability. To maintain a healthy back for optimal posture and mobility, weight control, daily exercise and correct alignment should be practised (Marieb 2013). (See Clinical Interest Box 28.2.)

# DISEASE PROCESSES THAT INFLUENCE BODY MECHANICS

## Diseases of the bones and skeletal system

### Osteoporosis

**Osteoporosis** is a condition in which the amount of bone tissue is reduced because the rate of bone deposition lags

### CLINICAL INTEREST BOX 28.2 Protecting the back through correct body alignment

- Pull abdominal muscles inwards to support your back and counterbalance weight
- Avoid high-heeled shoes as they change spinal alignment and increase stress on abdominal and back muscles
- Stand straight with head and back aligned
- Practise safe lifting techniques—wide stance with bent knees
- Face the direction of movement, avoid twisting
- Use other methods to move things such as rolling, turning or pivoting
- Include periods of rest into activities
- Avoid sitting for long periods of time
- Stretch for 10 minutes a day to strengthen abdominal muscles and stretch and loosen skeletal muscles.

*(Adapted from Marieb 2013)*

behind the rate of resorption. It may be progressive, temporary or permanent. Cancellous bone is usually affected before compact bone. Osteoporosis may be localised or occur throughout the skeleton. Bones become brittle and are susceptible to fractures. The factors that contribute to excessive bone loss include diminished oestrogen levels, immobility and lack of exercise, nutritional deficiencies and certain endocrine disorders. Manifestations include low back pain, kyphosis (rounded back) and spontaneous or pathological fractures from minor injuries (Christensen & Kockrow 2010).

### Osteomalacia

Osteomalacia (also known as Paget's disease) is a metabolic disease of inadequate or delayed bone mineralisation. This results in bones becoming soft, bowed and prone to fractures. Paget's disease is found in people over 40 years of age. The disease is of unknown origin and characterised by hyperactivity of **osteoblasts** and **osteoclasts** with rapid turnover of bone tissue. Bones are soft, thick and enlarged and may 'bow'. Usually the pelvis, long bones, lumbar vertebrae and skull are affected.

### Tumours

Tumours of the bone may be benign, primary malignant or metastatic. **Benign tumours** may be single or multiple, or of several types. The most common benign form is giant-cell tumour, which is composed of multinucleate giant cells or osteoclasts. Individuals complain of pain and tenderness, with localised swelling. **Osteogenic sarcoma** is the most common primary malignant bone tumour. The areas most often affected are the ends of long bones, especially the distal femur or proximal tibia, and metastases may occur most commonly in the lungs. Bone tumours are characterised by the gradual onset of pain in a limb, or the sudden onset of pain after a minor injury to the limb, with a localised mass, swelling and limp in weight-bearing limbs. Fatigue is a common symptom. **Metastatic bone tumours** occur when cells of a malignant primary tumour in another part of the body enter the blood or lymph and are spread to the bone (Christensen & Kockrow 2010).

### Osteomyelitis

**Osteomyelitis** is an acute or chronic infection involving bone, bone marrow and surrounding soft tissues. Acute osteomyelitis is characterised by rapid onset of severe pain in the involved bone, with local heat, swelling and inflammation as well as pyrexia, tachycardia, nausea and malaise. Chronic osteomyelitis is characterised by slight pyrexia, pain and persistent drainage of purulent material from a sinus tract injury (Christensen & Kockrow 2010; Marieb 2013).

## Disorders of the joints and tendons

### Rheumatoid arthritis

Rheumatoid arthritis is a systemic disease characterised by chronic inflammation of the synovial joint linings, with periods of remission and exacerbation. Joints most commonly affected are those of the wrists, hands and feet. Rheumatoid arthritis results in muscle atrophy and osteoporosis. Signs and symptoms include swelling and stiffness of the joints, followed by marked deformities resulting from soft tissue weakness and joint destruction (Farrell & Dempsey 2011).

### Osteoarthritis

Osteoarthritis is a degenerative non-infectious disease that causes pain and restricted movement of affected joints (Figure 28.2). Cartilage in the joints becomes thinner and eventually the two bones come into contact and begin to degenerate, followed by inflammation and effusion. Thought to be caused by excessive use, it usually develops in late middle age and affects large weight-bearing joints (hips, knees and cervical and lower lumbar spine) (Farrell & Dempsey 2011).

### Gout

Gout is a condition characterised by joint inflammation due to deposits of sodium urate crystals in joints and tendons. Causes include a metabolic defect responsible for increased serum uric acid production and impaired excretion of uric acid by kidneys. Use of alcohol and diuretics may precipitate attacks. The large toe is commonly affected and becomes tender, inflamed and very painful. It occurs in males more often than females (Farrell & Dempsey 2011).

## Diseases of the muscles

### Myasthenia gravis

Myasthenia gravis is an autoimmune disease of unknown origin. Defective muscle stimulation is caused by the development of antibodies that damage receptors in the neuromuscular junction, blocking impulses to muscle fibres. Progressive and extensive muscle weakness occurs, with the eyelids affected first, followed by the neck and limb muscles. Remissions and relapses are precipitated by exercise, infections, emotional disturbances and pregnancy (Crisp & Taylor 2012; Farrell & Dempsey 2011).

### Muscular dystrophies

Progressive muscular dystrophies are an inherited group of diseases in which there is progressive degeneration of groups of muscles. The major differences between these types of conditions are age of onset, rate of progression and groups of muscles involved. For example, the Duchenne type is gender-linked and presents at about 5 years of age, while myotonic dystrophy usually begins in adulthood. Both progress without remission, and death occurs from respiratory failure or cardiac disease (Crisp & Taylor 2012; Farrell & Dempsey 2011).

### Diseases of the nervous system

Multiple sclerosis, Parkinson's disease and Huntington's disease are progressive neurological disorders that affect neurotransmission along motor pathways. With varying aetiology and signs and symptoms, these diseases affect voluntary and involuntary muscle groups and have long-term effects on gait, mobility and ability to independently undertake and complete activities of daily living (Christensen & Kockrow 2010; Crisp & Taylor 2012; Marieb 2013).

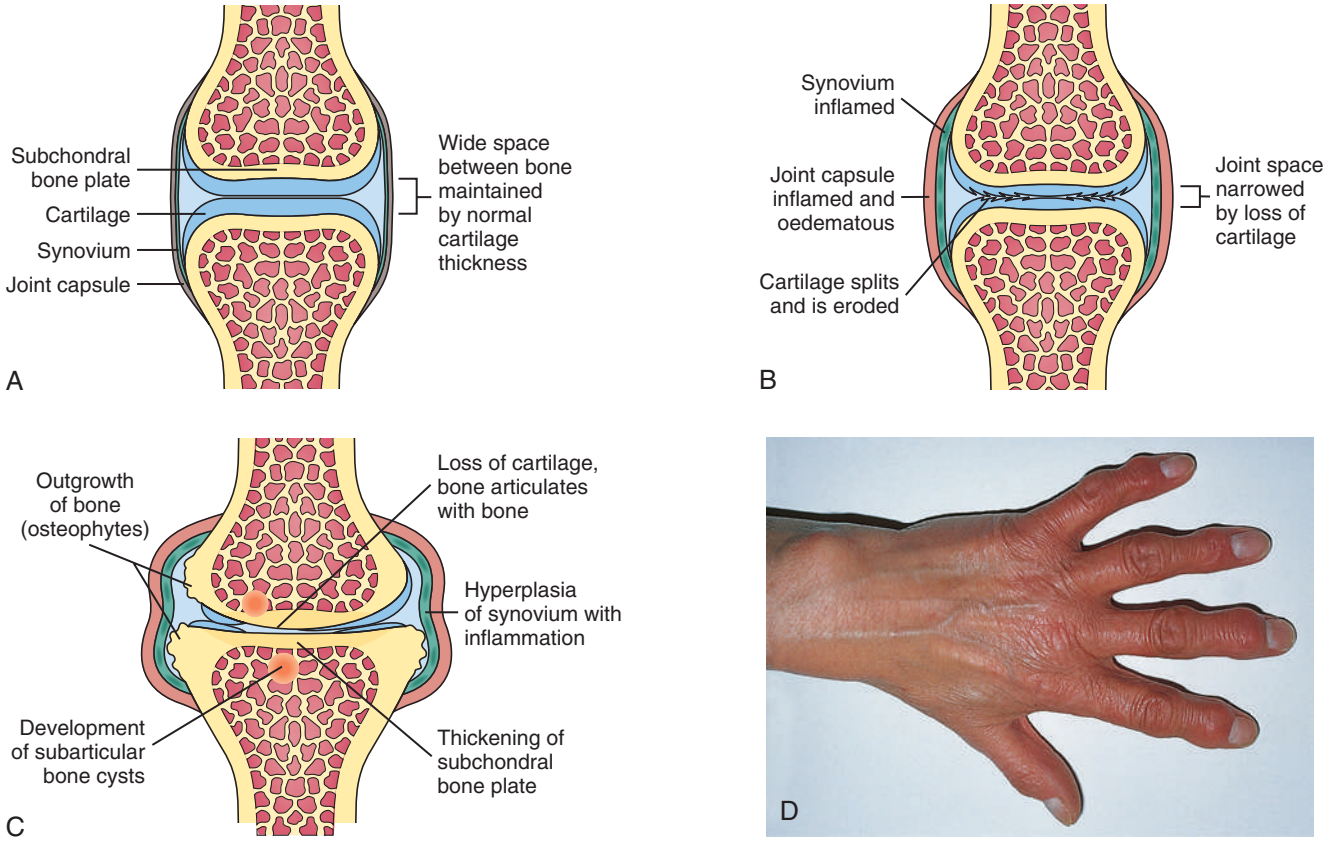


**Figure 28.2** Pathological changes in osteoarthritis

A: Normal synovial joint B: An early change in osteoarthritis is destruction of articular cartilage and narrowing of the joint space. There is inflammation and thickening of the joint capsule and synovium. C: With time, there is thickening of subarticular bone caused by constant friction of the two bone surfaces. Osteophytes form around the periphery of the joint by irregular overgrowths of bone D: In osteoarthritis of the hands, osteophytes on the distal interphalangeal joints of the fingers are termed Heberden's nodes and appear as small nodules

*(Stevens et al 2008)*

## DEVELOPMENT OF MOVEMENT AND EXERCISE THROUGH THE LIFESPAN

The provision of holistic care must consider individuals within the context of their life and development. A well-structured nursing care plan will incorporate growth and developmental changes, family and social support and cultural, spiritual and ethnic influences that give a person life, meaning and purpose (Crisp & Taylor 2012). To achieve this goal, nurses gather subjective and objective data. Care is planned and implemented based on identified nursing diagnoses and development of goals that can be measured, achievable and relevant to human stages of development.

The body changes throughout the lifespan (see Table 28.1). Nurses encounter people in all stages and are in a perfect position to promote **health and wellbeing** to assist optimal performance, regardless of an individual's age, ability or co-existing medical conditions. The role of exercise in health and wellbeing has been found to have benefits for both people and society and should be practised by all. Yet resistance to movement and physical exertion is a well-documented phenomenon and has been proven to contribute to the

**TABLE 28.1 | Stages of development**

| | |
|---|---|
| Infant | Flexible musculoskeletal system that matures to allow for movement from rolling to crawling and standing when lumbar spine matures |
| Toddler | Swayback and protruding abdomen gives awkward appearance as legs and feet are splayed apart for balance when walking |
| Preschool to adolescent | Greater coordination, skeletal growth and improved balance continue to adolescence when periods of rapid growth, sexual organ maturation and muscle development predominate |
| Adult | Period of greatest strength, coordination and muscle/posture changes related to pregnancy |
| Older adult | Bone density reduction related to inactivity, hormonal changes and bone tissue absorption result in weakening skeletal system with risk of fracture, injury and falls |

development of diseases such as hypertension, diabetes and osteoporosis.

A child's behaviour is modelled on that of their caregiver. Children learn the value of regular exercise if they are raised in an environment in which exercise is seen as a positive experience for the family to enjoy. Children with two active parents are themselves more active than those with one or no active parents. Parents can promote physical activity at home by encouraging the child to play outside and providing active play spaces and equipment (Ostbye et al 2013) (Figure 28.3).

The role of schools in keeping children active is important as indoor activities at home lead to increased rates of childhood inactivity and obesity. Families, schools and communities can work together to promote healthy eating and physical activity by providing water to drink, healthy breakfasts and school foods, active transport to and from school, participation in organised sport in and around school time and positive body image (Millar et al 2011) (Figure 28.4).

### CRITICAL THINKING EXERCISE 28.1

A friend of yours is a primary school teacher. He is worried about the number of overweight children in his Year 4 class. He seeks your advice on how to promote healthy diet and exercise with his students. As an Enrolled Nurse what strategies might you recommend?

The challenge to keep children active into adulthood may be lost post secondary school as a downward trend towards inactivity occurs (Crisp & Taylor 2012). While community and government initiatives support increased activity, the stresses of work, family, money and time constraints can sometimes make participation a challenge. The World Health Organization (WHO 2011) suggests that between 60% and 85% of adults lead partial or complete sedentary lifestyles and this inactivity can be attributed to death in 10% of the global population.

The findings of the National Health Survey published by the ABS (2009) indicated that as age progressed, exercise level regressed. Sedentary or low levels of exercise were more common in women and were above 70% for age groups of 15 years and above. The highest was in the 75 years and over who reported 83% were sedentary or had low levels of exercise. These findings demonstrate Australians need to increase their activity and movement levels. Not only because of the immediate benefits, but because of the associated health issues that sedentary behaviour intensifies. Healthy eating is more common in those who exercise. Half of those with low exercise levels ate less than the recommended fruit and vegetable intake per day. More were found to smoke and drink alcohol than their exercising counterparts. Inactivity is estimated to increase death rate and the chance of weight-related diseases including breast cancer, colon cancer, diabetes and heart disease (ABS 2009).

## OVERWEIGHT AND OBESITY IN AUSTRALIA

The National Health Survey (NHS) released disturbing statistics on Australia's expanding waistline. Up to 61% of Australian residents are either overweight or obese, posing a challenging problem about how to tackle this rising statistic.

**Figure 28.3** Toddler development and activity
*(© Christine Ingram)*

**Figure 28.4** Child playing team sport

**Overweight** and **obesity** are defined as abnormal or excessive fat accumulation that may impair health (WHO 2011). Comparison with data from the 1995 National Nutrition Survey (ABS 1997) shows that the percentage of persons 18 years and over who are classified as overweight or obese has increased. The male population increased from 64% in 1995 to 68% in 2008. The increase for women was from 49% to 55%. The highest rate of obesity was in the 65–74-year-old age group. Of this category, 75% of those surveyed were classed as overweight or obese (ABS 2009).

Childhood obesity is of particular concern because the evidence shows that one in three obese children will become obese adults, increasing their vulnerability to weight-related diseases. Overweight and obesity in children and adolescents is generally caused by lack of physical activity, unhealthy eating patterns, or a combination of the two, with genetics and lifestyle both important determinants of a child's weight. Nurses need to be aware that inactivity is a health risk and that obesity is a serious health risk, not just a cosmetic issue (Kozier et al 2010). Clinical Interest Box 28.3 provides an outline of some self-care behaviours and exercises.

### Fit versus fat

Obesity and fitness may be considered polar opposites, but can an individual be fit and 'fat'? Studies by Joshua Bell (University College London) show that people with a BMI greater than 30 (obese) may have normal cholesterol, blood pressure and blood sugar levels. However, over a period of 20 years, at least half of the studies' participants had progressed to unhealthy metabolic levels, even without any changes in weight. The studies sum up that being overweight and 'fit' is only a short-term phase (Brenza 2015).

## THE BENEFITS OF PHYSICAL ACTIVITY

Participation in regular exercise can enhance the life of individuals, families, community groups and society (Figure 28.5). At least 30 minutes of moderate exercise (or 150–300

### CLINICAL INTEREST BOX 28.3 Self-care behaviours and exercise

- Make the most of opportunities for exercise—use stairs, park a kilometre away from work or walk to work once or twice a week, walk faster and use lunchtimes for exercise
- Choose an enjoyable physical activity
- Plan 3–4 exercise activities per week
- Before starting exercise sessions, ensure medical clearance if in a high-risk group
- Alternate different types of exercise to keep interest up; for example, Pilates followed by weight-training sessions then walking or bike riding
- Invite a friend to walk or join a health club or gym
- Build up exercise sessions to avoid over-exertion
- Keep it simple—gradually increase your exercise time and activity.

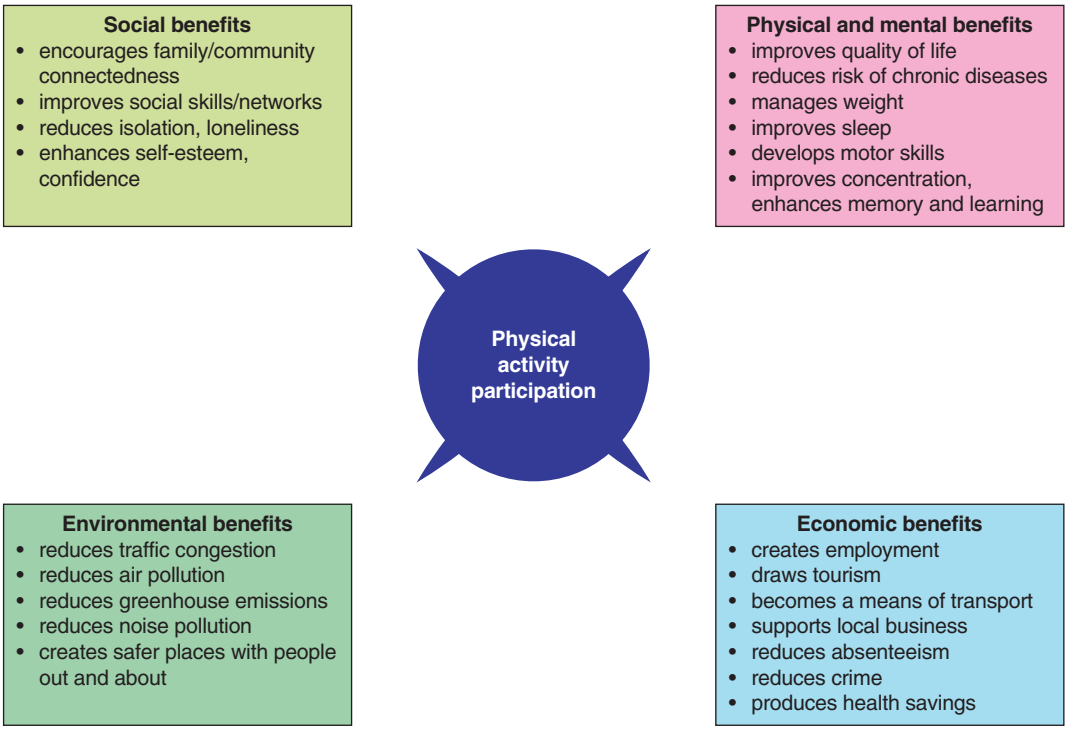


**Figure 28.5** Benefits of physical activity

*(© The State of Queensland (Queensland Health) 1996–2016)*

minutes per week) is recommended and provides considerable health benefits. Exercise has been shown to reduce blood pressure and risk of stroke and cardiovascular disease, prevent **deep vein thrombosis** and enhance joint mobility. Other studies have shown that exercise reduces the risk of developing some cancers, especially colon and breast cancer, and has psychosocial benefits including protection against depression (Brown et al 2012).

Exercise can boost concentration, alertness, mood and optimism through promoting better sleep, coping abilities, self-esteem and a sense of control (Johnson 2014).

## Exercise and the older adult

As humans age, body systems deteriorate. Research suggests that up to half of the functional decline associated with ageing is the result of disuse and can be reversed with exercise. Exercise improves cardiopulmonary fitness, strength, coordination, mental health, motor control and cognitive function. Improved flexibility, balance and muscle tone can help prevent falls.

The benefits of physical activity can be enjoyed even if regular practice starts late in life (Figure 28.6). Physical activity improves self-confidence and self-sufficiency to enhance psychological wellbeing. Active lifestyles provide occasions to establish new friendships, maintain social networks and interact with people of all ages. Walking, swimming, stretching, dancing, gardening, hiking and cycling are excellent activities for older persons. With the number of people over 60 years of age projected to double in the next 20 years, reducing and postponing age-related disability is an essential public health measure that must be initiated now (WHO 2011).

**Figure 28.6** Regular activity creates a sense of health and wellbeing

*(© Dorothy Lanyon)*

A study by Allen and Morelli (2011) demonstrated that in older adults regular exercise reduced the occurrence of health changes associated with ageing and helped prevent diseases associated with a sedentary lifestyle. The exercise recommended included a combination of aerobic exercise, strength training (i.e. using resistance bands), flexibility (stretching) and balance (use of exercise ball). Health changes documented included improvement in blood pressure, diabetes, lipid profile, OA, osteoporosis, mood, neurocognitive function and overall morbidity and mortality.

### Falls risk

The older adult is more prone to falls related to reduced exercise tolerance, reduced joint mobility and comorbidities such as neurological conditions (Parkinson's disease), depression, acute infections and lower limb arthritis. Other factors such as a cluttered environment, inappropriate footwear, medications, incontinence, leg muscle weakness and postural hypotension also contribute to the likelihood of a fall. A person-centred approach is needed to screen for falls risk, and then assess comprehensively the likelihood of falls in an individual.

Individuals should be assessed for falls risk upon admission to a healthcare facility, daily as part of a care plan and after a fall or change in health status. Healthcare professionals then must implement strategies to minimise this falls risk (The Victorian Quality Council 2004).

## Exercise attitudes within Indigenous communities

Identified health issues within the Indigenous communities of Australia include hypertension, stroke, diabetes, smoking, obesity and alcohol abuse. In an ABS report, high levels of sedentary behaviour were reported in the 15 years and above age group, which accounts for 75% of the Indigenous population in non-remote areas of Australia (ABS 2010). Of those who exercised, the prevalence of arthritis, diabetes, heart and vascular diseases was significantly reduced. Similarly, those who regularly exercised at moderate levels reported good self-assessment of their general health and smoked less than their sedentary counterparts (ABS 2010).

## Finding exercise to suit the individual

Like any activity that humans undertake, exercise must be enjoyable or rewarding if commitment is to be assured. While some are motivated by weight loss or muscle definition, others may be encouraged by improvement in mood, freedom of movement or cardiovascular fitness.

New Australian physical activity guidelines recommend that doing any physical activity is better than doing none. Guidelines recommend 150–300 minutes per week of moderate physical activity (e.g. brisk walking or swimming) or 75–150 minutes per week of vigorous physical activity (e.g. jogging or aerobics), or an equivalent combination of both. Guidelines also suggest an individual be active most days, do muscle strengthening activities at least 2 days per week and minimise prolonged sitting time (Brown et al 2012).

Movement and exercise should form part of any treatment program for individuals with neurological disorders. While the exact mechanism of effectiveness is unclear, the benefits can be demonstrated in those suffering symptoms of stroke or Parkinson's disease. New studies are showing that when individuals move and exercise, dopamine is released within the brain, reducing the motor symptoms of Parkinson's disease. Benefits of exercise such as dance therapy include improved balance and gait function (Nogrady 2013). Barriers to exercise in the older person include medical conditions and frailty, depression, lack of confidence and fears associated with injury (Well for Life 2012). Many Australian aged-care facilities offer in-house exercise programs based on the Easy Moves for Active Ageing program. This chair-based program aims to maintain function and prevent physical decline in older adults by working through a low-impact series of ROM movements (see Case Study 28.1). While the benefits of exercise have been discussed, the Well for Life study revealed factors that can cause resistance in older adults. Many residents find these sessions enjoyable, social and empowering; others may experience barriers that inhibit their participation (see Clinical Interest Box 28.4).

### CRITICAL THINKING EXERCISE 28.2

You are working in a low-level aged care facility. The resident you are caring for is complaining of joint stiffness. An exercise class is being run that morning and you believe they would benefit from the chair-based movements. The resident is resistant to attending the session. What steps could you take to encourage them to attend?

### CASE STUDY 28.1

Clara Black is a 92-year-old resident of an aged care facility. Up until a year ago, Clara was ambulant and quite active. As Clara's nurse, you would like her to start participating in the facility's exercise program.

1. In educating Clara, outline five (5) benefits of exercise in the older individual.
2. Outline how you would plan for Clara to attend the exercise classes, including overcoming obstacles to participating in exercise.
3. Describe exercise appropriate for a 92-year-old woman with limited mobility.

## PRINCIPLES OF MUSCLE MOVEMENT IN EXERCISE

### Isotonic exercise

**Isotonic exercise** involves muscle shortening and active contraction and relaxation of muscles. Isotonic activity occurs with movement, such as carrying out activities of daily living, independent **range-of-movement (ROM)** flexing exercises, swimming, walking, running, cycling or jogging.

### Isometric exercise

**Isometric exercise** involves muscle contraction without shortening of the muscle length. These exercises build muscle bulk and are a popular muscle activity for body builders; for example, lifting weights.

### Isokinetic exercise

**Isokinetic exercise** causes muscle contraction, shortening and relaxation at an even speed. Isokinetic movement occurs during swimming as arms move evenly through water resistance (Marieb 2013).

### CRITICAL THINKING EXERCISE 28.3

Vivienne is 67 and is learning how important an active lifestyle is to slow the ageing process. Vivienne has asked you to design a simple exercise plan to help maintain her health and wellbeing. Using the above principles of exercise, create a simple program for Vivienne to follow.

### Encouraging maintenance and restoration of muscle strength

As communities become increasingly sedentary, the cost is reflected in the calibre of individuals in the healthcare system.

### CLINICAL INTEREST BOX 28.4
### To facilitate chair-based exercises

- Ensure person goes to the toilet before the exercise session
- Administer analgesia prior to or after an exercise session
- Plan exercise into daily activities
- Educate the person about the benefits of the exercise and what is to be expected
- Dress the individual appropriately for exercise
- Ensure the individual is positioned safely to exercise and that there is no risk of falling
- Use a variety of techniques to teach the exercise such as repetition, demonstration and one-on-one assistance
- Ensure the individual can see and/or hear the exercise instructor.

With increasing numbers of cases of osteoporosis and arthritis requiring in-hospital care, nurses may frequently find themselves caring for immobilised or physically disabled people. To aid return to mobility after the acute care phase, provision of movement activities is essential to prevent long-term complications sustained during immobility. Until this stage, nurses should undertake muscle and joint movement. Using the principles of muscle movement, a range of exercises can be incorporated into everyday situations to enhance the individual's health and recovery (Crisp & Taylor 2012):

- Isotonic bed exercises: pushing or pulling against a stationary object, using a trapeze to lift the body off the bed, lifting the buttocks off the bed by pushing with the hands against the mattress and pushing the body to a sitting position (Crisp & Taylor 2012)
- Isometric bed exercises: Benefits of isotonic and isometric exercise include increase in muscle tone, mass and strength, improved joint mobility, increased circulation and osteoblastic activity. Examples may include lifting of hand weights and gripping of tennis ball to aid arm strength and mobility. Quadriceps extension: push knee into mattress while attempting to lift heel off bed to strengthen thigh muscles (Crisp & Taylor 2012)
- Isokinetic bed exercises: for example, rehabilitative exercises for knee and elbow injuries. In this case, isokinetic devices are used to take muscles and joints through a complete ROM without stopping, with resistance at each point. Mechanical devices are available for specific joints, which place these joints through continuous passive ROM (Crisp & Taylor 2012).

## Encouraging maintenance of joint mobility

Joints are capable of a wide range of movement or motion (Figure 28.7). ROM or motion exercises are either **active**, when the individual is able to move the joints themselves, or **passive**, when the nurse moves the individual's joints within the normal ROM, noting joint flexibility and/or limitations of movement. Joints that are not moved regularly can develop contractures (shortening of a muscle and eventually ligaments and tendons and eventual loss of function). It must be remembered that when a nurse performs passive ROM exercises in which a person's muscles do not exert effort, some of the potential benefits are reduced in favour of improved joint mobility and circulation (Christensen & Kockrow 2010; Farrell & Dempsey 2011).

The frequency with which ROM exercises are performed depends on the individual's condition and medical and nursing management, but they are commonly performed at least

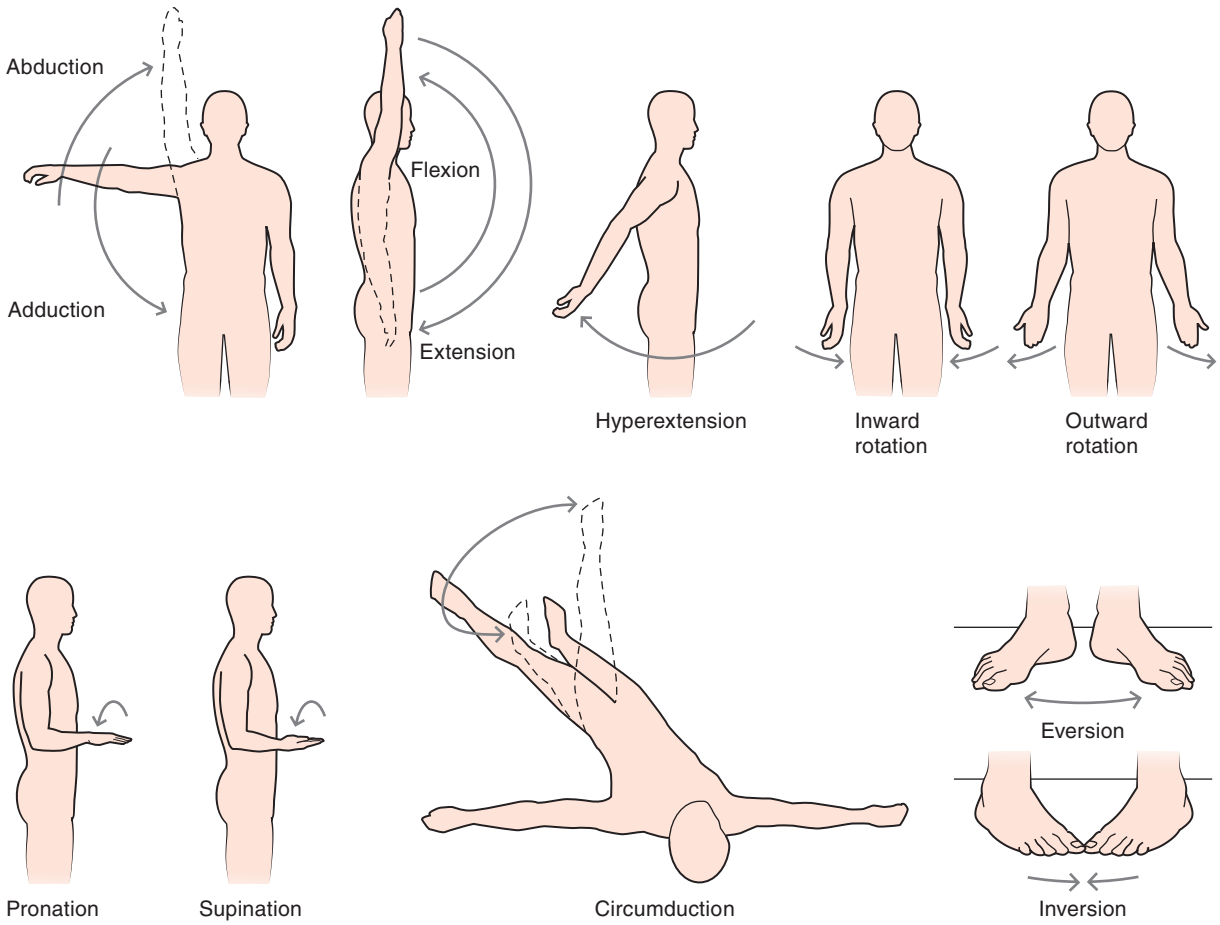


**Figure 28.7** Range-of-movement joint movements

twice daily. However, it is important not to overtire the person partaking in the exercises. ROM exercises may be performed independently or with assistance. Using appropriate movements, all joints are exercised in a logical sequence. Exercise routines are normally individually designed and the intensity and frequency depend upon a person's general condition, level of fitness and capabilities (Crisp & Taylor 2012).

## ASSESSMENT OF MOVEMENT, MOBILITY AND THE MUSCULOSKELETAL SYSTEM

Undertaking a systematic assessment of an individual will identify issues of movement and mobility. After prioritising care by applying first aid and pain management measures prior to examination, the nurse should obtain a musculoskeletal medical history that includes:

- Activity and exercise level prior to hospital presentation
- Past history of muscle and joint pain or injury
- Current treatment for existing muscle and joint pain or injury, including medications, physiotherapy, osteopathy, chiropractic or other complementary therapies
- Presenting problem including details of injury, cause of injury, symptoms, duration and treatment received (if hospital presentation is due to a musculoskeletal condition)
- Recent changes in mobility or movement unrelated to current hospital presentation
- Use of aids for mobility.

On completion of verbal data collection, a physical examination should be undertaken to provide a baseline for ongoing assessment and completion of a management or care plan. Identifying current and potential movement and mobility issues will tailor treatment needs and identify potential discharge issues. A physical assessment will incorporate observation of gait and posture, pain and nerve changes, limb deformities, neurovascular assessment and spinal conditions including congenital and acquired pain or abnormalities (Crisp & Taylor 2012).

See Clinical Skill 28.1 for information and guidelines on assisting with transfer.

### Gait

Gait describes the manner of walking and, while varying from one person to another, there is normally a certain rhythm to a person's walk. Gait abnormalities may occur when there is a disorder of the musculoskeletal or nervous system; for example, unilateral hip dislocation produces a distinct 'waddle' with each step. A staggering, or ataxic, gait may be caused by a lesion in the brain or spinal cord, and a 'scissors' gait is one in which the legs cross each other in progression. An abnormal gait may also result from pain or discomfort due to a lesion on the foot, such as a corn, or from ill-fitting and uncomfortable shoes (Crisp & Taylor 2012).

### Pain and nerve (sensory) changes

Pain is a common symptom of musculoskeletal disorders, as a result of trauma, inflammation or degeneration. People may describe the pain as mild, aching, severe or throbbing, and it may be localised or generalised, depending on the specific disorder. Pain may increase with movement, be exacerbated by changes in external temperature and relieved by rest. It may be worse at certain times; for example, joint discomfort from degenerative disease is often worse in the evenings. Numbness, tingling and lack of sensation are other sensory changes. Swelling from injury or tumours may cause pressure on nerves, resulting in loss of sensation (Farrell & Dempsey 2011).

### Swelling, deformity and impaired mobility

Swelling of an affected area may be the result of the formation of inflammatory exudate in response to injury from physical trauma, chemicals or infection. Swelling will also occur when blood is lost from the circulation into surrounding tissues (haematoma); for example, after a fracture. A joint may become swollen if there is an increase in the amount of synovial fluid or if blood or purulent discharge is present in the joint capsule. Deformity may be the result of growths, fractures, dislocations, abnormal curvature of the spine or contractures. The effects of a deformity include changes in range of joint motion, posture and gait. Mobility may be impaired to such an extent that the individual is unable to move without pain or unable to carry out activities of daily living, or it may only restrict mobility at certain times, such as after activity or be related to certain positions (Figure 28.8).

**Figure 28.8** Knee joint deformity caused by osteoarthritis
*(© Dorothy Lanyon)*

## CLINICAL SKILL 28.1 Assisting with transfer

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Transfer belt<br>Sling<br>Lap board<br>Slide sheet<br>Mechanical/hydraulic lift |

| **Skill activity** | **Rationale** |
|---|---|
| Assess the individual for:<br>• Joint mobility<br>• Presence of paralysis or paresis<br>• Activity tolerance<br>• Orthostatic blood pressure<br>• Level of consciousness<br>• Pain level<br>• Ability to follow instructions | Provides information regarding individual's ability to transfer and the number of people required to assist |
| Adjust height of the bed and ensure the brakes are locked in place | Safety of the individual and nurse<br>Prevents strain on nurse's back |
| **Assisting individual into sitting position on side of bed** | |
| With the individual in a supine position, raise the head of bed to 30 degrees | Decreases amount of work required by the individual and nurse to raise person to a sitting position |
| Where possible, the individual should be encouraged to move into the position themselves | Decreases amount of work needed by individual and nurse to raise person to a sitting position |
| Turn the individual to side, facing nurse on side of bed on which the individual will be sitting | Prepares the individual to move to side of bed and protects the individual from falling |
| Stand opposite to the individual's hips and turn diagonally to face the individual and the far corner of foot of bed | Places nurse's centre of gravity near to individual<br>Reduces twisting |
| Place feet apart with foot closer to head of bed in front of other foot | Increases balance and allows nurse to transfer weight as individual is brought to sitting position on side of bed |
| Place arm nearer head of bed under individual's shoulder, supporting head and neck | Maintains alignment of head and neck as nurse brings individual to sitting position |
| Place other arm over individual's thighs | Supports hip and prevents individual from falling backwards during procedure |
| Move individual's lower legs and feet over side of bed. Pivot towards rear leg, allowing the individual's upper legs to swing downwards | Decreases friction and resistance. Weight of individual's legs when off bed provides gravity to lower legs, and weight of leg helps pull upper body into a sitting position |
| At same time, shift weight to rear leg and elevate individual | Allows nurse to transfer weight in direction of motion |
| Remain in front of the individual until they regain balance | Reduces risk of falling |
| **Transfer individual from bed to chair** | |
| Adjust the bed so that it is slightly higher than the chair. Assist the individual to a sitting position on side of the bed. Have chair in position at 45-degree angle to the bed and ensure the brakes are on | Positions chair within easy access for transfer |
| Apply transfer belt or other transfer aids if required | Reduces risk of falling |

*Continued*

| CLINICAL SKILL 28.1 Assisting with transfer—cont'd | |
|---|---|
| Ensure individual has stable, non-skid shoes. Weight-bearing or stronger leg is placed forwards with weaker foot back | Decrease risk of slipping. Bare feet increases risk of falls |
| Spread feet apart | Ensures balance with wide base of support |
| Flex hips and knees, aligning feet and knees with individual's feet | Flexion of knees and hips lowers nurse's centre of gravity to object to be raised; aligning knees with individual allows for stabilisation of knees when individual stands |
| Grasp transfer belt from underneath, if used, or reach through individual's axillae and place hands on individual's scapulae | Transferring individual with hands on scapulae reduces pressure on axillae and maintains the individual's stability. Transfer belt is grasped at each side to provide movement of individual at centre of gravity |
| Rock individual up to standing position on count of three while straightening hips and legs and keeping knees slightly flexed. Individual is instructed to use hands to push up if possible | Rocking motion gives individual body momentum and requires less muscular effort to transfer individual |
| Maintain stability of individual's weak or paralysed leg with knee | Ability to stand can often be maintained in paralysed or weak limb with support of knee to stabilise |
| Pivot on foot further from chair | Maintains support of individual while allowing adequate space for individual to move |
| Instruct the individual to use armrests on chair for support and ease themselves into chair | Increases individual's stability |
| Flex hips and knees while lowering individual into chair | Prevents injury to nurse from poor body mechanics |
| Assess the individual for proper alignment for sitting position. Provide support for paralysed extremities. Lap board or sling will support flaccid arm. Stabilise leg with bath blanket or pillow | Prevents injury to individual from poor body alignment |
| Praise individual's progress, effort and performance | Continued support and encouragement provides incentive for individuals |
| **Use mechanical/hydraulic lift to transfer individual from bed to chair (two nurses)** | |
| Bring lift to bedside. Before using lift, be familiar with its operation | Prepares environment for safe use of lift and subsequent transfer |
| Position chair near bed and allow adequate space to manoeuvre hoist | Prepares environment for safe use of lift and subsequent transfer |
| Raise bed to safe working height with mattress flat. Lower side rails | Allows nurse to use proper body mechanics |
| Roll the individual towards one nurse | Positions individual for use of lift sling |
| Place sling evenly under individual's back (follow manufacturer's guidelines) and roll individual to opposite side to position sling | Places sling under individual's centre of gravity and greatest portion of body weight |
| Roll individual supine on sling and position hoist over individual. Lower boom and attach sling to frame with the head end attached first. Raise individual's knees and feed the leg sections of the sling under the thighs and attach to frame | Sling should extend from shoulders to knees to support individual's body weight equally |

| CLINICAL SKILL 28.1 Assisting with transfer—cont'd | |
|---|---|
| Elevate head of bed | Positions individual in sitting position |
| Ask or assist the individual to fold arms over the chest | To prevent injury during transfer |
| Pump hydraulic handle using long, slow, even strokes, or activate electronic hoist until individual is raised off bed ensuring the head is supported | |
| Using steering handle to move lift from bed and manoeuvre to the chair | Moves individual from bed to chair |
| Slowly lower the individual onto chair | |
| Detach sling from frame and remove hoist. Pull leg straps to the side, tilt the individual forwards to slide out the sling | Safely guides individual into back of chair as seat descends |
| Reposition the individual to a comfortable and safe position | |
| Perform hand hygiene | Prevents cross-infection |
| Report and document the procedure, including level of assistance required and individual's responses and tolerance. Report and record any sign of pressure injury | Enables appropriate care to be implemented |
| *(Tollefson 2010; Rebeiro et al 2013; Varnam 2011)* | |

## Sprains

A sprain is an injury to a ligament, caused when a joint is forced beyond its normal ROM. A ligament may be stretched or torn and local bleeding and bruising present with restricted movement. Sprains commonly occur in the wrist and ankle. Treatment is aimed at resting and supporting the area and reducing pain and inflammation with anti-inflammatory medications (Farrell & Dempsey 2011).

## Strains

A strain is an injury to a muscle and/or a tendon, resulting from excessive physical effort. Both sprains and strains cause pain and swelling, but strains may cause muscle spasm as well. Nurses can suffer strain injuries from incorrect manual handling techniques (Crisp & Taylor 2012; Christensen & Kockrow 2010).

## Fractures

A fracture is a broken bone, often with nearby soft tissue, blood vessel and nerve damage. A stress fracture occurs when a bone is subjected to repeated or prolonged stress such as jogging. A pathological fracture may occur in weakened bone as a result of osteoporosis. Fractures are classified as open or closed, simple or complicated. Open (or compound) fractures are those in which the bone breaks through the skin, while closed fractures are those where the skin is intact. In a simple fracture only the bone is involved, while in complicated fractures nearby blood vessels, nerves or organs are affected. Table 28.2 and Figure 28.9 demonstrate and describe the various types of fractures. Signs and symptoms vary but usually encompass pain, swelling, muscle spasm, bruising, deformity, abnormal mobility and loss of function. Crepitus (grating caused by bone fragments rubbing together) may be heard on examination or experienced and described by the person. Shock may occur as a result of haemorrhage or extensive damage (Farrell & Dempsey 2011; Patton & Thibodeau 2010).

## Neurovascular assessment

A neurovascular assessment is performed on people who have experienced a fracture, have been fitted with a cast, have undertaken vascular surgery or have had spinal surgery. Neurovascular protocols vary depending on the individual's diagnosis and treatment undertaken. Nurses should familiarise themselves with neurovascular guidelines within their place of work and employment facility. For example, a person with a fracture should have neurovascular observations undertaken every hour for 24 hours, then every 4–8 hours if fitted with a cast (Berman et al 2015; Farrell & Dempsey 2011).

Assessment must be undertaken by the primary care nurse at the commencement and throughout the shift to identify early changes that can indicate a pathological deterioration. Inability to recognise significant changes in a timely manner may influence an individual's potential for recovery

**TABLE 28.2 | Types of fractures**

| Type | Description |
|---|---|
| Greenstick | The fracture is incomplete and does not extend through the bone. The bone bends, and splits or cracks on one side |
| Transverse | The fracture line is straight across the bone |
| Oblique | The fracture line is at an angle across the bone |
| Spiral | The fracture line coils around the bone. This type of fracture generally results from twisting of the limb |
| Impacted | The fragments of broken bone are pushed (telescoped) into each other |
| Comminuted | The bone is broken into a number of fragments |
| Depressed | The broken edges are pushed below the level of the rest of the bone. This type of injury may occur when the skull is fractured |
| Avulsion | A fragment of bone, connected to a ligament, breaks off from the rest of the bone |
| Intracapsular | The fracture is within the joint capsule |
| Extracapsular | The fracture is close to a joint, but is outside the joint capsule |

*Adapted from Crisp & Taylor 2009; Marieb 2009; Patton & Thibodeau 2010*

and rehabilitation. A neurovascular assessment might include inspection of:

- *Skin:* inspect area distal to the injury; inspect for skin discolouration and palpate skin temperature with the back of the hand and compare with the opposite extremity or site
- *Movement:* have the person move the area distal to the injury, or move it passively; there should be no discomfort
- *Sensation:* enquire about feelings of numbness or tingling; check sensation with a paper clip and compare bilaterally—sensation should be the same
- *Pulses:* palpate pulses distal to the injury; compare bilaterally
- *Capillary refill*: check this in the nail beds distal to the injury. Capillary refill should occur within 3 seconds and within 5 seconds in the older adult
- *Pain:* enquire about the degree, location, nature and frequency of pain, noting any increase in intensity or change in the type of pain (deWit & Williams 2013).

## Dislocation

Dislocation is complete displacement and subluxation is partial displacement of a joint's articulating surfaces; both processes damage surrounding soft tissue structures. Joint effusion is the accumulation of synovial fluid in a joint and occurs if blood vessels in the synovium are damaged. Joint effusions may result from severe sprains, dislocations or fractures. Signs and symptoms of dislocation and effusion include severe pain, limited movement, joint deformity and swelling. Dislocations may affect fingers, elbows, shoulders, hips, knees and ankles and are often caused by sporting injuries or pressure on the affected area after a fall (Marieb 2013).

## Lower back pain

Lower back pain is a common symptom that has a variety of causes, including poor posture, injury, inflammatory conditions, obesity, metabolic bone disorders, degenerative processes and intervertebral disc disease. Discomfort or pain may be mild, severe, continuous or intermittent and be aggravated by certain movements or posture; it may radiate into the buttocks or down the back of the legs. People with lower back pain should not sit for more than 30 minutes at any one time, and frequent stretching (thrusting the hips forwards while the upper body leans back) is recommended. Most lower back pain can be safely and effectively treated after an examination by an orthopaedic surgeon and a prescribed period of activity modification and medication to relieve the pain and diminish the inflammation. Although a brief period of rest may be helpful, most studies show that light activity speeds healing and recovery. It may not be necessary to discontinue all activities, including work. Instead, people may adjust their activity under the guidance of medical officers or physiotherapists (Marieb 2013).

When the initial pain has eased, a rehabilitation program may be suggested to increase muscle strength in the lower back and abdominal muscles, as well as stretching exercises to increase flexibility. If overweight, weight loss is recommended, as this may decrease the chance of recurrence of lower back pain. The best long-term treatment is an active program of maintaining optimal physical condition. This can be achieved by regular exercise and using the principles of body mechanics including practising correct lifting techniques, and assuming good posture (Crisp & Taylor 2012; Radomski & Latham 2013).

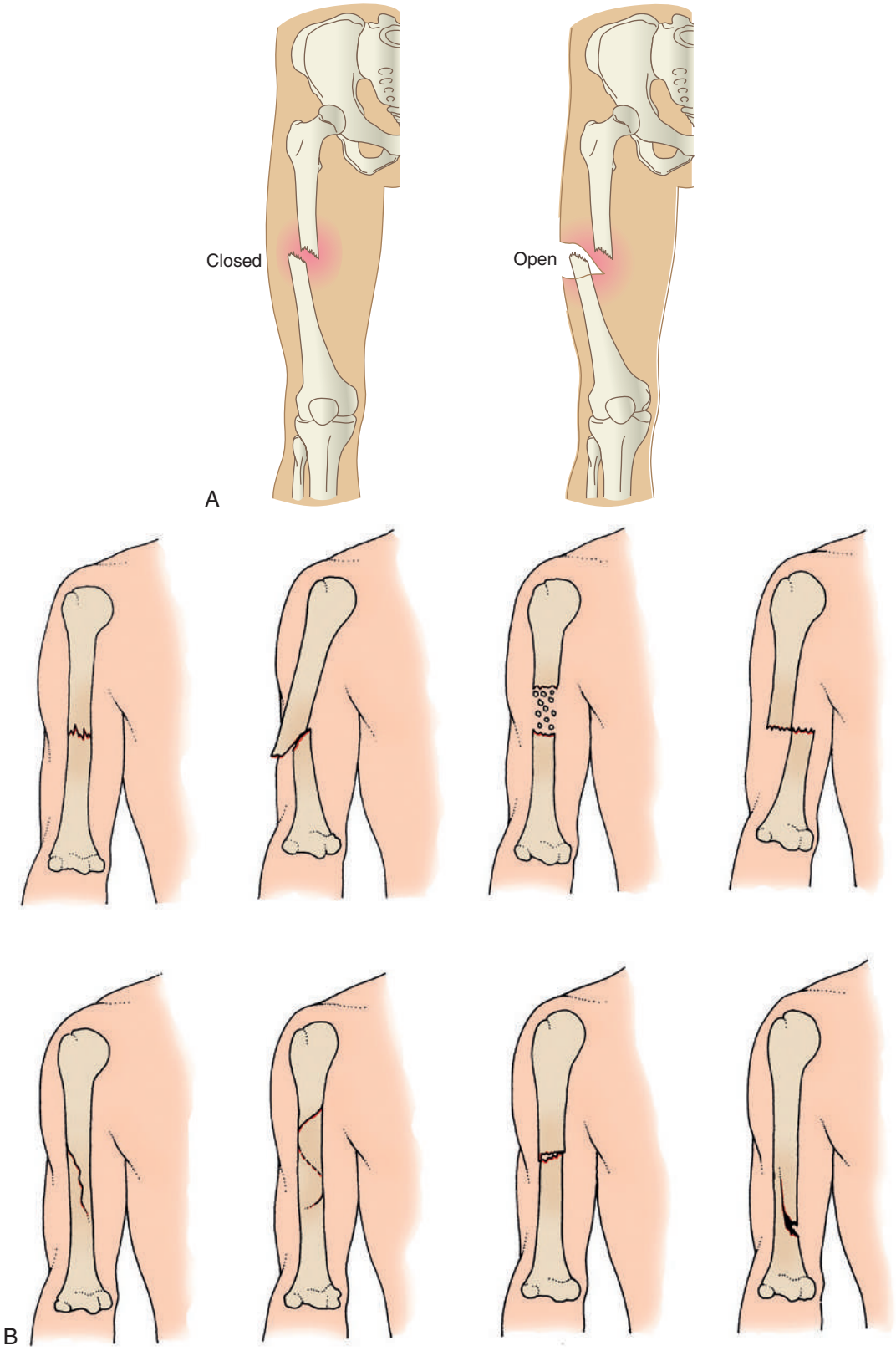


**Figure 28.9** A: Closed and open fracture B: Common types of fractures
*(A Figure 4.22 from Christensen & Kockrow 2010; B Figure 4.23 from Christensen & Kockrow 2010)*

## DIAGNOSIS OF A MUSCULOSKELETAL DISORDER

Diagnosis of musculoskeletal disorder will be confirmed by:

- Presenting history of injury, disorder or change in range of movement
- Physical examination including observation, palpation and assessment of joint movement
- Radiological examinations including plain x-ray, arthrogram, **arthrography**, bone scan, arthroscopy, biopsy, ultrasound, MRI and CT scan (Marieb 2013) (see Figure 28.10 and Table 28.3).

## NURSING CARE OF THE INDIVIDUAL WITH A MUSCULOSKELETAL DISORDER

While medical management and nursing care will depend on the specific disorder, the general aims of care of an individual with a musculoskeletal disorder are to:

- Promote rest and relieve pain
- Prevent complications of inactivity and promote movement when possible
- Maintain skin integrity
- Maintain or improve nutritional status
- Prevent and recognise potential psychosocial problems
- Promote rehabilitation (Berman et al 2015; Crisp & Taylor 2012).

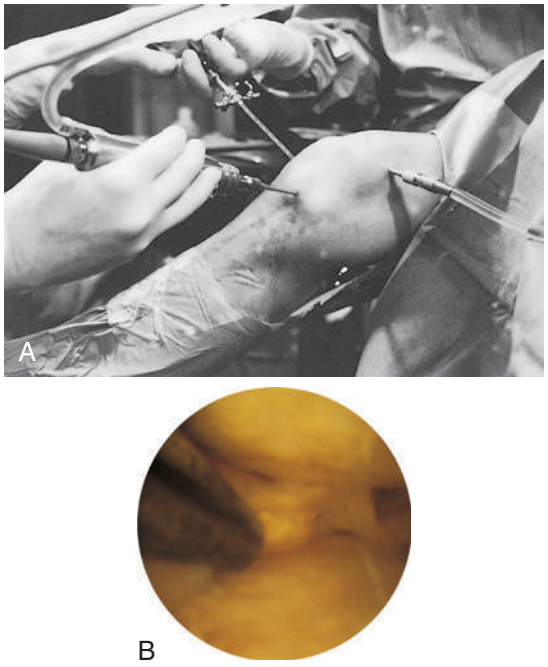


**Figure 28.10** Arthroscopy of knee

A: Insertion of a fibreoptic light source into joint B: Internal view of joint

*(Courtesy of Lanny L. Johnson, MD, East Lansing, MI. Used with permission)*

**TABLE 28.3 | Musculoskeletal diagnostic tests**

| Type | Description |
|---|---|
| Plain x-ray | Standard x-ray of bones and joints that detects abnormalities in shape and alignment |
| Arthrogram | Outlines soft tissue (e.g. meniscus) which is not usually visualised on x-ray |
| Arthroscopy | Visual examination of a joint with a fibreoptic endoscope. Commonly performed on the knee to remove loose fragments, view suspected damage or obtain a biopsy |
| Biopsy | May be performed on bone, muscle or synovial membrane. Takes blood and tissue samples to test for tumours, enzymes, antibodies and antigens, erythrocyte sedimentation rate (ESR) and calcium, phosphorus and uric acid levels |
| Arthrocentesis | Aspiration of synovial fluid for analysis of infection and inflammation |
| Bone scan | Provide imaging of the skeleton after intravenous injection of a radioactive isotope that collects in bone tissue at sites where there is increased activity (i.e. at the site of a tumour) and lesions can be detected earlier. |
| Ultrasound | 2D examination of soft tissue for signs of bleeding, haematoma and fluid collection |
| Magnetic resonance imaging (MRI) | Magnetism and radiowaves form cross-sections and images to detect pathological abnormalities in soft tissue and blood vessels |
| Computerised axial tomography (CT or cat scan) | 3D cross-sections that provide detail about injuries to ligaments, tendons, tumours and fractures difficult to determine on plain x-ray. May use iodine contrast medium for greater clarity of affected area to be examined |

*(Adapted from Crisp & Taylor 2012; Marieb 2013; Patton & Thibodeau 2010)*

## Individuals with a bone injury

Bone fractures can take weeks or months to heal, and healing occurs in stages:

- Stage 1: The formation of a haematoma between the two ends of the bones
- Stage 2: Inflammation and accumulation of white cells to break down (phagocytose) the haematoma (this takes approximately 5 days)
- Stage 3: The development of granulation tissue and new blood vessels is followed by the development of a callus (calcified osteoblasts) and shaping of new bone by osteoclasts, which remove excess callus (Figure 28.11).

Bone healing is individualised. For most, healing takes place within a standardised time frame; however, some healing is delayed and can be influenced by the following factors:

- Infection
- Fat emboli (from the medullary canal) that lodge in the lungs
- Splinters of dead bone not removed by phagocytosis
- Ischaemia (the neck of the femur is vulnerable, as it has a poor blood supply)
- Continued mobility and the person's age
- The individual's nutritional status (Farrell & Dempsey 2011; Marieb 2013).

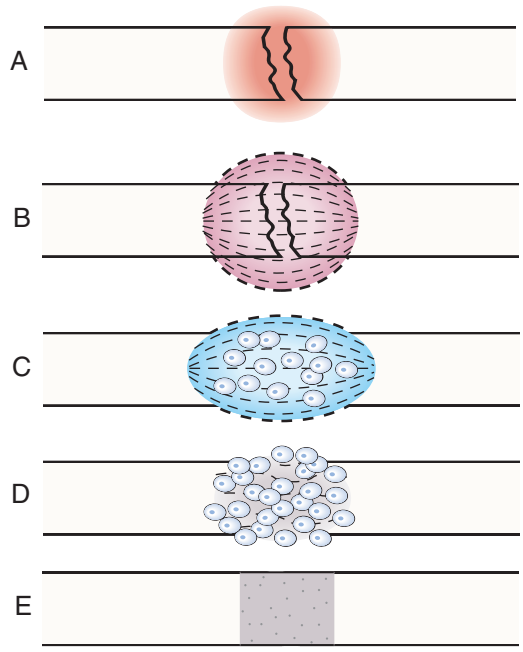


**Figure 28.11** Stages in bone healing

A: Bleeding at fractured ends of the bone with subsequent haematoma formation B: Organisation of haematoma into fibrous network C: Invasion of osteoblasts, lengthening of collagen strands and deposition of calcium D: Callus formation: new bone is built up as osteoclasts destroy dead bone E: Remodelling is accomplished as excess callus is reabsorbed and trabecular bone is laid down

*(Fig 62-9 from Brown & Edwards 2012)*

# TREATMENT OF BONE INJURIES AND MUSCULOSKELETAL DISORDERS

## Surgical repair

For some bone and joint disorders, surgical repair of the affected area is essential to restore alignment, control pain and enhance rehabilitation for full joint mobility. Simple fractures require return of bone fragments to their original position and may be achieved by surgical review and realignment with an internal or external fixture. Compound fractures require surgical debridement to remove dirt, foreign material and necrotic bone fragments (Christensen & Kockrow 2010; Patton & Thibodeau 2010).

A closed fracture may be reduced using closed reduction manipulation, where bony fragments are repositioned into normal alignment by applying pressure and traction distal to the fracture.

Skeletal fixation devices such as casts, metal pins, braces, skeletal and skin traction are used to hold bone and bone fragments in a normal position. Internal fixation is a surgical procedure in which pins, screws, plates and rods fix bony fragments into normal alignment. This procedure is called an open reduction with internal fixation (ORIF) (Christensen & Kockrow 2010).

External devices such as wires or pins which are inserted into the bone allow easy access to wounds, adjustment of the device throughout the course of healing and more functional use of the limb. External fixation is commonly used to treat complex limb deformities and fractures, and the surgery is considered less invasive than internal fixation surgery (Timms et al 2011).

Skeletal traction may be applied to the bone via the skeletal fixation device. Traction aids reduction and immobilisation of fractures, as well as being used to treat muscle spasms, correct or prevent deformities and relieve pressure on a nerve. A steady pull in opposite directions keeps the bone in place. Weights, ropes and pulleys are used to create the pull required to stabilise the limb. Traction can be applied to the neck, arms, legs or pelvis. Skin traction is applied directly to adhesive materials attached to the skin below the site of the fracture. Weights are attached to the pulley system and to a boot, splint or elastic bandage (Christensen & Kockrow 2010) (Figure 28.12).

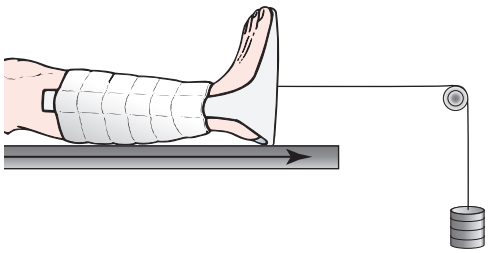

**Figure 28.12** Common type of traction

*(Fig 63-10 from Lewis et al 2011)*

### Casts

Casts are immobilisation devices made of plaster or fibreglass. They are applied after bone alignment by internal or external fixation. Applying the cast can be painful during manipulation for alignment and the person should be advised of the warmth they will experience as the plaster undertakes its setting process. Casts may be complete (encase the affected limb) or partial; that is, backslabs only. Backslabs are applied longitudinally to the affected limb and bandaged into place while still soft. Once firm, the cast provides support with less risk of limb constriction. Indications for backslabs include:

- Minor injuries of the wrist
- Elbow fractures
- Temporary support for foot or hand injuries
- Tibial fractures with significant swelling or oedema
- Crush injuries
- Open fractures
- Support for injuries prior to surgical intervention (Royal Children's Hospital 2015).

A person with a fracture should have neurovascular observations undertaken every hour for 24 hours, then every 4–8 hours if fitted with a cast (or per hospital protocol) (Berman et al 2015; Farrell & Dempsey 2011). As stated previously, the neurovascular assessment should include:

- *Skin:* inspect area distal to the injury; inspect for skin discolouration and palpate skin temperature with the back of the hand and compare with the opposite extremity or site
- *Movement:* have the person move the area distal to the injury, or move it passively; there should be no discomfort
- *Sensation:* enquire about feelings of numbness or tingling; check sensation with a paper clip and compare bilaterally—sensation should be the same
- *Pulses:* palpate pulses distal to the injury; compare bilaterally
- *Capillary refill*: check this in the nail beds distal to the injury. Capillary refill should occur within 3 seconds and within 5 seconds in the older adult
- *Pain:* enquire about the degree, location, nature and frequency of pain, noting any increase in intensity or change in the type of pain (deWit & Williams 2013).

People discharged home wearing a cast should have their cast inspected for rough edges and signs of bleeding or drainage, and be educated to seek medical advice if they notice their cast is cracked, moist or emitting an offensive odour. Other education re cast care includes resting for the first couple of days post application, to let the cast set and keeping the cast dry (plastic bag to cover if bathing or if raining). No foreign objects should be put down the inside of the cast as there is potential for skin damage, and the cast should not be cut or altered by the person wearing it (Better Health 2015).

The limb should be kept elevated to reduce swelling and advice sought if the limb becomes cool, swollen, increasingly painful or changes colour. Casts may remain in place for several weeks to some months, depending on the bone or joint requiring immobilisation (Berman et al 2015; deWit & Williams 2013; Farrell & Dempsey 2011).

Compartment syndrome is a condition of progressive arterial vessel compression and decreased blood supply to an extremity. Factors predisposing to development of compartment syndrome are fractures of the tibia or forearm resulting in muscle oedema, and too-tight casts or dressings (Christensen & Kockrow 2010). If a developing compartment syndrome is suspected, the affected limb should be placed at heart level (not elevated). Elevation of the affected limb decreases arterial blood flow and narrows the arterial/venous pressure gradient (Rasul 2015).

## GENERAL TREATMENT OF MUSCULOSKELETAL DISORDERS

### Promoting rest

Rest helps minimise pain and swelling, promotes healing of injured tissues, relieves muscle spasms and prevents further tissue destruction in inflammatory conditions. Rest may be classified as general, when the individual is confined to bed (e.g. if several joints are inflamed), or local, when a specific body part is immobilised, such as a limb in a splint or cast. General care during the rest phase involves:

- Providing a suitable bed with a firm mattress, pillows and sheepskins to promote comfort
- Meeting basic needs; that is, helping those who are immobilised with activities of daily living
- Preventing complications associated with immobility
- Maintaining correct posture and body alignment (deWit & Williams 2013; Farrell & Dempsey 2011).

### Maintaining joint movement

Some joints require movement, not immobilisation post repair. The continuous passive movement (CPM) device provides gentle forward and backward joint movement after total knee replacement surgery (arthroplasty). Used on people who are resting in bed, the joint is strapped into the device and moved continuously while the person is immobilised. This movement ensures the joint remains mobile, resulting in reduced pain, swelling and eventual immobility (Crisp & Taylor 2012). Because the patella is not disrupted in partial knee replacement surgery, the individual usually may resume walking 3–4 hours after surgery.

Mobilisation of the affected joint after hip replacement surgery (arthroplasty) is dependent on the prostheses used and treating medical officer. Physiotherapists may start mobilisation (weight bearing or non-weight bearing) day 1 post surgery per the medical officer's orders. Exercises may be passive or active involving straight leg raising, flexion and extension to all joints, including the replaced joint (Christensen & Kockrow 2010).

## Maintaining skin integrity

Individuals who are immobilised for prolonged periods are at high risk of developing pressure injuries. Skin must be maintained in good condition and protected from irritation, friction and prolonged pressure (Crisp & Taylor 2012). General care of the skin and prevention of pressure injuries are described in Chapter 29.

## Positioning techniques

People with musculoskeletal disorders who are immobilised require help from nurses to ensure proper body alignment and comfort. Aids to comfort in bed, such as pillows, foot boards, trochanter rolls, trapeze bars, sandbags and slippery-type sheets for ease of movement in bed, are all useful to ensure that an immobilised person is comfortable (Crisp & Taylor 2012). See Clinical Skill 28.2 for more information and guidelines on positioning individuals in bed.

Various positions and proper positioning are discussed in Chapter 23.

## Maintaining or improving nutritional status

Nutrition for individuals with a musculoskeletal disorder includes a well-balanced diet and maintenance of recommended body weight. The diet should contain adequate amounts of protein, calcium and vitamin D to promote healing and maintenance of the musculoskeletal system. Adequate fibre and fluids aid elimination. If a person is overweight, a weight-reduction diet is recommended to prevent stress on inflamed or diseased joints (Berman et al 2015; Crisp & Taylor 2012).

### CRITICAL THINKING EXERCISE 28.4

Why might children from developing countries be more prone to developing bone deformities and delayed healing than children from developed countries? How can nutrition in these communities be enhanced to ensure strong bones and non-delayed healing?

## Relieving pain

While the general approaches to pain management described in Chapter 33 are relevant to people with musculoskeletal disorders, specific measures may also be indicated. A person may experience acute or chronic pain, depending on the specific disorder, and general measures to promote comfort and minimise pain should be implemented; that is, changing position, massage, handling a painful limb gently and rest. If not contraindicated, elevating the limb may relieve discomfort and pain. Specific measures include checking to ensure that splints, casts or dressings are not too tight or rubbing against the skin. Hot or cold packs or treatments may be used to provide relief and increase ROM. Heat is sometimes used in chronic joint disorders, as it relaxes muscles, relieves stiffness and provides analgesia, and is often applied before exercise and massage. Applying a cold pack to a limb or area is useful for acute pain or acutely inflamed joints. When these treatments are used, caution is necessary to prevent tissue damage. Analgesia may be prescribed and administered in accordance with nursing regulations and the institution's policy (Crisp & Taylor 2012).

## Prevention of psychological problems

Management of a musculoskeletal disorder may require a person to be confined to bed, and possibly hospital, for an extended time, and often leads to boredom, frustration or depression. To prevent such problems, the individual should be encouraged to express their feelings and be allowed to participate in making decisions about their care. Active involvement in all aspects of care and self-care techniques are taught, as this allows the individual to take responsibility for some of their care and can help to reduce problems associated with dependence and immobilisation. Regular programs of activity developed with the individual and other allied health professionals need to be incorporated into the nursing care plan. Participation in group physiotherapy or rehabilitation sessions promotes social interaction with others in similar situations (Crisp & Taylor 2012; Farrell & Dempsey 2011).

## Promoting remobilisation and rehabilitation

As the musculoskeletal system is crucial to activity, a routine of exercise and rehabilitation is developed and implemented. A planned exercise program is generally developed by the physiotherapist, but the nurse is required to encourage and supervise regular exercise. The goals of musculoskeletal rehabilitation and exercise are to relieve symptoms, improve musculoskeletal function, control inflammation, restore range of movement, restore and improve muscular strength and power and train to return to daily and recreational activities (Lennard et al 2011).

The overall aim of rehabilitation is to limit the effects of a disability and increase independence in activities of living. This requires a multidisciplinary team approach consisting of nurses, medical officers, physiotherapists, occupational therapists and even members of the individual's own family. Depending on specific needs, a social worker and splint-maker may be involved. Preparation for discharge includes informing the individual of the need to continue any exercise program, on the use of splints or braces, about limits of physical activity and the importance of attending any future appointments or ongoing rehabilitation programs. Information on rehabilitation is provided in Chapter 40.

## Nursing care of a person requiring prolonged bed rest

Older people are more prone to problems associated with prolonged bed rest. These individuals need careful planning and enactment of care to minimise these potential problems (see Nursing Care Plan 28.1 and Case Study 28.2).

## CLINICAL SKILL 28.2 Positioning individuals in bed

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Slide sheet/slip sheet<br>Pillows<br>Lifting device if required |

| **Skill activity** | **Rationale** |
|---|---|
| Assess the individual's body alignment and correct positioning<br>Assess the individual's comfort level | Baseline data<br>Maintains and helps restore body functioning and helps to prevent the complications with bed rest and immobility |
| Assess the individual's physical ability to help with moving and positioning | Ensures individual's independence is maintained<br>Determines needs for additional assistance<br>Ensures safety |
| Explain the procedure to the individual | Ensures consent and cooperation<br>Assists to decrease anxiety and increase cooperation |
| Adjust the height of the bed to between mid-thigh and hip height | Raises level of work towards the nurse's centre of gravity |
| Place the individual in supine position with head of the bed flat and remove the pillows, place pillow at the head of the bed | Enables nurse to assess body alignment<br>Reduces gravity's pull on individual's upper body<br>Prevents striking the individual's head against head of the bed |
| Assess the need for extra help | Ensures the individual's and nurse's safety |
| Determine the most appropriate position for the individual | Various conditions and diseases preclude moving individuals into some positions |
| Perform hand hygiene | Reduces risk of transmission of infection |
| Utilise principles of efficient body mechanics | To protect the nurse's back |
| Perform pressure area care<br>Wash and dry area<br>Apply moisturiser if appropriate<br>Change linen | Prevents skin breakdown<br>Maintains skin integrity |
| Move and position individual appropriately<br>Ensure pressure is relieved by positioning in a different position<br>Pressure-relieving devices may be utilised | Promotes individual's comfort |
| The body must be supported to maintain its natural contours, symmetry and alignment | Maintains and help restore body functioning and helps to prevent the complications with bed rest and immobility |
| Assess the skin | Ongoing assessment of the skin is necessary to detect early signs of pressure damage |
| Clean, replace and dispose of equipment appropriately | Time management strategy<br>Courtesy to fellow nurses<br>Prevents cross-infection |
| Document relevant information | Provides relevant information about the individual and the skin integrity |

*(Australian Commission on Safety and Quality in Healthcare 2012; Rebeiro et al 2013; Tollefson 2010)*

## NURSING CARE PLAN 28.1

**Assessment:** Immobile, urine and faecally incontinent, mature-aged person.
**Issue/s to be addressed:** Potential for sacral pressure area injury related to immobility and prolonged bed rest.
**Goal/s:** The person's sacral area will remain intact and healthy, with no signs of redness, excoriation or pain, during the period of immobility.

| Care/Actions | Rationale |
|---|---|
| Reposition the individual every 2 hours while sitting or resting in bed | Repositioning relieves pressure on dependent tissues and enables the nurse to visualise and assess sacral areas for changes in skin condition |
| Clean, dry and moisturise sacral skin 3 times a day or as indicated by incontinence | To reduce friction caused by moisture of body fluids and to enable the nurse to visualise and assess the sacral area |
| Use slide sheets and lifting devices to change the person's position | To reduce friction and shearing caused by dragging the person across surfaces |
| Apply pressure-relieving devices such as an air mattress, pressure-reducing foam mattress or pressure-reducing mattress overlay under the individual | To reduce pressure points on dependent tissues and promote rest and sleep |

**Evaluation**

During the period of immobilisation, the individual's sacral area remained intact with no signs or symptoms of redness, excoriation or pain.

*(Adapted from Crisp & Taylor 2012; Gulanick & Myers 2010)*

### CASE STUDY 28.2

Judy Blackwater is 78 and admitted to a surgical ward postoperatively a L knee replacement. She is required to be immobilised for 4 days. Judy has a past history of atrial fibrillation and currently has a BMI of 30 (obese).

1. Identify and give reasons for the potential problems of immobility that Judy may experience.
2. Because of Judy's history of AF and obesity, outline some strategies to prevent formation of an embolus/DVT.
3. List the assessments you would perform on an individual with a musculoskeletal disorder.

## General treatment for exercise-related injuries

Exercise can be the cause of injuries that are mostly orthopaedic in nature and caused by irritation of bones, tendons and ligaments and/or muscle tissue. Injury may be as a result of weight-bearing stress or collision. Nurses can teach individuals the acronym **PRICE: prevention, rest, ice, compression** and **elevation**, and advise of the need for a medical officer to diagnose the injury. Generally, further injury can be avoided by resting the affected limb (Christensen & Kockrow 2010; Stroppler 2014).

## Meeting movement and exercise needs

To determine what the individual can and cannot do without assistance, the clinician must assess the individual in how cognitive and physical deficits cause disabilities. The nurse assists the health professional team by providing subjective and objective data about the individual, and facilitating rehabilitation activities and exercises (Daroff et al 2012).

It is important to identify potential problems that may affect a person's ability to exercise. Impaired mobility may result from:

- A decrease in the individual's strength
- Presence of pain or discomfort
- Impaired cognition or perception, such as dementia, severe anxiety or depression
- Impaired neuromuscular or skeletal function
- Imposed restrictions such as bed rest.

Being in hospital is likely to alter a person's normal movement and exercise routine and, although there is often a degree of restriction in activities and ability to ambulate, they should be encouraged to do so, while those who are immobilised may require assistance to move. Nurses promote safety and comfort while encouraging, when possible, a return to independent function (Crisp & Taylor 2012; Farrell & Dempsey 2011).

When planning care to meet an individual's need for movement and exercise the nurse must consider factors such as:

- Maintaining and promoting normal mobility
- Assisting those with restricted mobility
- Providing and assisting with use of equipment to aid mobility
- Preventing and alleviating discomfort associated with reduced mobility.

A sample nursing care plan is shown in Nursing Care Plan 28.2.

### CRITICAL THINKING EXERCISE 28.5

Individuals with spinal injuries have varying degrees of mobility. Select one form of paralysis resulting from a spinal cord injury. Using the internet, devise a set of exercises (active or passive depending on the severity of injury) for the person you have chosen.

## NURSING CARE PLAN 28.2

**Assessment:** Individual with newly applied leg cast following surgery, non-weight bearing, resting in bed only, with pain score of 5/10 at rest.
**Issue/s to be addressed:** Discomfort related to prolonged bed rest, newly applied leg cast and surgical wound.
**Goal/s:** To reduce and maintain pain score to less than 2/10 (0–10 pain scale) by the end of the shift.

| Care/Actions | Rationale |
|---|---|
| Assess pain characteristics (quality, severity, location, onset, duration, causing and relieving factors) every 4 hours | To map and evaluate the pain in the individual |
| Administer analgesics as prescribed, at regular intervals when pain present and/or prior to pain-inducing activities (i.e. exercise) | To maintain therapeutic analgesic serum levels within the person |
| Apply non-pharmacological therapies to reduce pain, such as heat/cold packs, relaxation exercises, position change, massage | To provide adjunct therapy to reduce pain experience and promote rest and sleep |
| Eliminate other stressors that may cause discomfort (i.e. noise, thirst, hunger) | Rest and relaxation promote better pain management and recovery |

**Evaluation**

By the end of the shift, the individual reports a pain score of 3/10 on movement.

## PROGRESS NOTE EXAMPLE 28.1

| | |
|---|---|
| 18/02/2015<br>1100 hrs | Nursing: CNS: Individual alert and orientated, complaining of aching pain in left leg, 6/10 pain score. Paracetamol 1 g PO given with pain score decreasing to 2/10 after 30 minutes. Equal movement and strength all limbs.<br>CVS: Peripherally perfused but cool to touch. Pedal pulses present. BP dropped from 130/80 lying to 90/60 standing when getting out of bed. Individual stated 'I feel dizzy'. Reported to doctor. To continue lying and standing blood pressures QID.<br>Respiratory: Equal air entry to right and left lungs auscultated. Occasional dry cough. Short of breath on exertion.<br>GIT: Tolerated LWD. Bowels not open for 4 days, and abdomen firm when palpated. Faint bowel sounds heard. Aperient administered as ordered and fluids encouraged.<br>Renal: Incontinent of urine. Urinalysis = leucocytes ++ and S.G 1.030. Reported to doctor.<br>Musculoskeletal: Ambulant with supervision.<br>Integument: Skin intact—reddened areas observed to both heels. Air mattress applied to bed and individual encouraged to change position every hour when awake.<br>***K. Adams*** **(Adams) RN** |

# AMBULATION AFTER PROLONGED IMMOBILISATION

## 'Dangling' before ambulating

Ambulating, or walking, is encouraged and facilitated to prevent the complications associated with even short-term but especially with long periods of immobility. Certain individuals may need to relearn how to walk; for example, after a cerebrovascular accident or leg surgery, an individual may need the assistance of aids such as a walking stick, crutches or walking frame. After an extended period of immobility, nurses need to instruct the individual to mobilise progressively. A bedridden person who is able to raise each leg 4–6 cm straight up from the bed usually possesses enough strength to walk, provided that they are mentally alert.

Nurses begin re-educating muscle groups by first allowing the person to sit on the edge of the bed for 1–2 minutes with their feet on the floor, a technique called **dangling**. The person then progresses to standing, then walks a few steps, gradually increasing the distance. Blood pressure can drop dramatically and the person could faint if they were to stand up suddenly. Application of anti-embolic stockings (to facilitate venous return), dangling and assisting the individual to move slowly and in stages, allow the blood pressure to adjust, and reduce the risk of falls (Radomski & Latham 2013) (see Progress Note Example 28.1).

When the nurse assists an individual who has a one-sided weakness, or hemiplegia, it is important to decide which walking aid or technique has been recommended. Although the method used to assist is individualised, most people require assistance and support on the affected side. When

assisting a person to walk it is helpful if they remain close to a railed wall and are able to rest on a chair before beginning the return walk. If an ambulant person has an intravenous infusion or urinary or wound-drainage bag, the nurse ensures that therapy or drainage is not affected, by checking tubing or drainage bags in case they have become dislodged after exercise.

Well-fitting, supportive, non-slip footwear should always be worn, the floor should be clean and dry and the environment cleared of obstacles. The individual should not be allowed to walk barefoot or with just socks or slippery footwear (e.g. women with nylon hose) on the feet. Each individual is encouraged to walk at their own pace and resting points established along the way should the individual become tired, dizzy or unsteady. If the individual begins to fall, the nurse should assume a wide stance and guide the person to the floor, protecting their head as they do (Crisp & Taylor 2012).

## WALKING AIDS

Walking aids broaden the base of support and increase stability. The type of aid used depends on the person's condition, disability and amount of support required. An individual is commonly instructed in the use of walking aids by a physiotherapist; however, it is important for nurses to know the principles involved in the use of walking aids. Walking aids that may be required on a temporary or permanent basis include crutches, walking sticks and walking frames. Callipers, leg braces or splints may be used to provide extra support for a weak leg, to prevent or correct deformities or prevent joint movement.

### Crutches

Crutches enable a person to ambulate by taking the weight of the body off one or both legs. Successful use of crutches requires balance and upper body strength. Selection of crutches and particular type of gait depends on individual needs, but must be appropriate to be safe and effective. The two types commonly used are the underarm and forearm crutches.

Underarm crutches are often used by people with a sprain or leg cast, while forearm crutches are more commonly used by those with a through gait (which is a type of swinging gait), as in paraplegia (Walk Easy Inc 2015). Underarm crutches must be measured so that the person's weight is carried on their wrists and palms and not on the axillae. The axilla bar should be 4–5 cm below the axilla, and the hand bar positioned to permit 15–30-degree flexion of the elbow at rest. Forearm crutches must also allow 15–30-degree flexion of the elbow at rest. Before crutches are used they should be assessed for safety, ensuring that all screws and bolts are tightened and rubber tips are in good repair. It is important to ascertain the amount of weight bearing allowed on the affected leg(s); that is, partial or none (Berman et al 2015; Crisp & Taylor 2012; Farrell & Dempsey 2011) (Figures 28.13 to 28.15).

**Figure 28.13** Using the goniometer to verify correct degree of elbow flexion for crutch use
*(Potter & Perry 2013)*

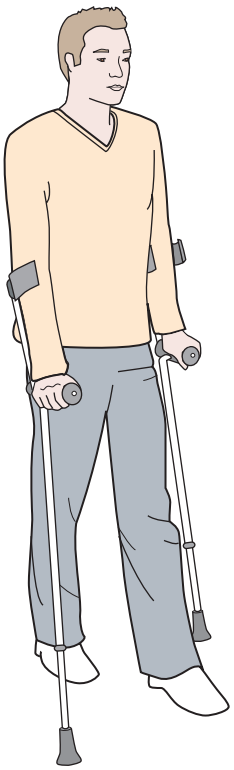

**Figure 28.14** Double adjustable forearm crutch
*(Potter & Perry 2013)*

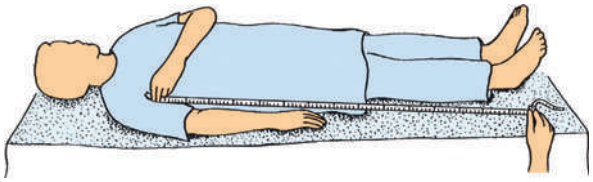

**Figure 28.15** Measuring crutch length
*(Potter & Perry 2013)*

## Crutch-walking gaits

Individuals are instructed in one of several **crutch-walking gaits**, according to need. The most common is the three-point gait, in which weight is borne on the unaffected leg, and the crutches moved forwards first, followed by the unaffected leg, then the affected leg follows in a swinging movement because it is raised from the ground. This gait is used when a person is unable to bear weight on one leg. The two-point and four-point gaits are used when both feet can bear some weight; that is, partial weight bearing. The two-point gait requires the individual to advance one crutch and the opposite leg together, followed by the other crutch and leg. The four-point gait requires greater coordination but provides more stability, as there are always three points on the floor as each leg is moved alternately with the opposite crutch.

The swing-through gait is used when a person has no use of the lower body (i.e. in paraplegia), and both crutches are advanced simultaneously. The person swings both legs either parallel with or beyond the crutches, the pelvis moving first, followed by the shoulders and head in order to maintain balance.

When rising from a chair the individual is taught to hold both crutches in one hand, tips resting firmly on the floor, and to push up with their free hand, using the crutches for support. To sit down, the process is reversed, the person supports themselves with the crutches in one hand, holds the arm of the chair with a free hand and lowers into the chair. To use stairs, the three-point gait is easiest, so that when going up stairs a person leads with the unaffected leg, follows with both crutches then the affected leg. When going down stairs a person leads with the crutches and affected leg, followed by the unaffected leg (Mercy Health Services 2014).

## Walking sticks

A walking stick may be used for people with one-sided weakness or injury, occasional loss of balance or to reduce weight bearing on a hip or knee, as well as to provide balance and support for walking, reducing fatigue and strain on weight-bearing joints. Walking sticks should extend from the individual's greater trochanter to the floor, and be fitted with a rubber tip to prevent slippage. Sticks are available as single-tipped, tripod or four-point, and should permit 15–30-degree flexion of the elbow. Three and four point sticks provide a broad base and greater stability and may be used by a person with poor balance or one-sided weakness.

To use a stick the individual holds it close to the body on the unaffected side; taking the weight off the affected leg, the person then moves the stick and the affected leg simultaneously, followed by the unaffected leg. Sometimes the three or four-pronged stick is held on the affected side. Individuals are encouraged to keep the stride of each leg, and the timing of each step, equal. While a person is learning to use the stick, the nurse stands behind them to support them if they become unsteady. When going up stairs the stick should be held in one hand and the person encouraged to hold the stair rail, leading with the unaffected leg; when going down stairs the affected leg leads (Farrell & Dempsey 2011).

**Figure 28.16** Walking frame
*(© Norman Lanyon)*

## Walking frames

Walking frames consist of a metal frame with hand grips, four legs and one open side (Figure 28.16). A frame may be used by an older adult, as it provides greater support and sense of security than a stick and is useful for those with an unsteady gait, or when partial weight bearing is recommended. The height is selected to allow 15–30-degree flexion of the elbows when the hand grips are held. Attachments such as baskets and trays are available to meet specific needs and to promote greater independence. To safely rise from a chair, the frame is placed in front of the person, who then inches forwards in the seat of the chair and, with both feet firmly on the ground and both hands on the arms of the chair, pushes with their arms to stand and, when standing, grasps the frame. Commonly, the individual picks the frame up and moves it 15–20 cm forward, then moves one foot, followed by the other, up to the frame. If an individual has a one-sided weakness, the affected leg is moved first (Crisp & Taylor 2012; Mercy Health Services 2014; Walk Easy Inc 2015).

When an individual is learning to use a frame, the nurse stands behind them to support the hips and encourages the person to stand upright and look straight ahead. To sit down, the person stands with the back of their knees against the front of the chair, then reaches behind to securely grip the armrests, bending their arms to lower themselves into the chair. When a walking aid is used, the person is assisted until they are confident in the use of the aid and when unassisted use is decided by their medical officer, physiotherapist or nurse, in consultation with other health professionals (Mercy Health Services 2014).

## COMPLICATIONS ASSOCIATED WITH REDUCED MOBILITY

The body works more efficiently when people are active, so when a person is confined to bed or immobilised, each system is affected in a negative way. Depending on age, health status and length and degree of immobility, inactivity can cause both short- and long-term complications. Disuse of muscles leads to degeneration and subsequent loss of function and it is important that individuals receive some form of exercise to prevent **muscle atrophy**. Atrophy begins almost as soon as muscles are immobilised. Individuals also experience a limitation in their endurance, which makes activities of daily living difficult. Restoring muscle strength and tone in people who have been immobilised for any length of time is a slow process.

Systemic effects of immobility include:

- Pressure injuries
- Contractures
- Cardiovascular and pulmonary stasis
- Urinary stasis
- Constipation
- Depression, anxiety or boredom.

### Pressure injuries

Pressure injuries result from localised damage to the skin and underlying tissue caused by pressure, shear or friction (for a bedridden person, shear or amount of friction increases as their head is elevated). Pressure, especially on bony prominences, results in poor circulation, so that the area is deprived of essential nutrients and oxygen, and cellular death may occur. Any person with a mobility or activity deficit should undergo a pressure-sore risk assessment. Pressure injuries remain a significant problem in hospitals and residential care settings despite being largely preventable (Crisp & Taylor 2012; Farrell & Dempsey 2011). See Chapter 29 for factors that affect skin integrity.

### Effects of immobility upon the musculoskeletal system

Effects of immobility are evident after even short periods of inactivity. People who attempt to walk after several days of bed rest are surprised at how weak their leg muscles have become. Immobilisation and the resultant disuse of muscles lead to decreased joint mobility, bone demineralisation and atrophy of muscles with decreased size, strength and tone.

#### Contractures and ankylosis

Contractures are abnormal conditions of a joint. **Contractures** are characterised by flexion and fixation and caused by atrophy and shortening of muscle fibres. **Ankylosis** is joint consolidation and immobilisation. Contractures may result from improper support or positioning of a joint, or as a result of inadequate joint movement. For example, if a joint is allowed to remain in one position for an extended length of time, the muscle fibres that normally provide movement shorten to accommodate that position, and lose the ability to contract and relax. Weight-bearing activity stimulates bone formation and balance; however, during immobilisation, bone formation slows, while breakdown of bone increases. With the subsequent loss of bone calcium, phosphorus and matrix, disuse osteoporosis results, and the brittle demineralised bones fracture easily.

For prevention, encourage physical activity and isometric or isotonic active ROM exercises while the person is in correct body alignment. An immobilised person may need direction as well as assistance when they perform ROM exercises. Pressure-relieving devices, such as a bed cradle, may prevent the bedclothes pressing down and forcing joints into abnormal positions. Supportive devices such as splints, slings and wheelchair attachments help prevent or realign joints (Berman et al 2015; Crisp & Taylor 2012; Wagner & Clevenger 2010).

#### Footdrop

**Footdrop** is another term for **plantar flexion**, which is caused by damage to the nerve supply of the muscle responsible for dorsiflexion of the foot (Figure 28.17). If an individual's feet are allowed to assume plantar flexion for long periods they become fixed in that position so that, when that individual attempts to stand or walk, they will be unable to place their heels on the floor and walk normally.

Prevention includes using a foot board or firm pillow in the bed to maintain the feet in proper alignment, or dorsiflexion, as if in a standing position (if not contraindicated); that is, at a 90-degree angle. Devices and techniques to keep pressure off the feet should be used, such as a bed cradle or foot pleat in the upper bedclothes. The person's feet should be exercised through their ROM, either actively or passively. If footdrop occurs, management includes use of an orthopaedic brace, intensive physiotherapy or surgical intervention (Crisp & Taylor 2012).

### Effects on the cardiovascular and pulmonary systems

The primary negative effects of immobility on the cardiovascular system are increased cardiac workload, postural hypotension and venous thrombosis. An increase in the workload on the heart may be due to less resistance by blood vessels and changes in blood distribution. Heart rate increases and cardiac output falls after prolonged rest. A significant drop in

blood pressure on standing (25 mmHg systolic and 10 mmHg diastolic) is termed **orthostatic or postural hypotension**, and is due to a decrease in neurovascular reflexes and muscle tone. In addition, stasis of blood may precipitate clot formation. A lack of muscular activity that would normally help move blood towards the heart results in calcium exiting the bones to enter the systemic circulation. This action influences clot formation. If a clot or thrombus detaches from the vessel wall and is transported in the bloodstream, it is called an embolus. Emboli that lodge in the pulmonary artery tree are referred to as pulmonary emboli. Depending on the size of the embolus, consequences may be serious (Berman et al 2015; Marieb 2013).

## Prevention of venous thromboembolism

Prevention of venous thromboembolism (VTE) includes exercises to stimulate venous blood circulation in the legs.

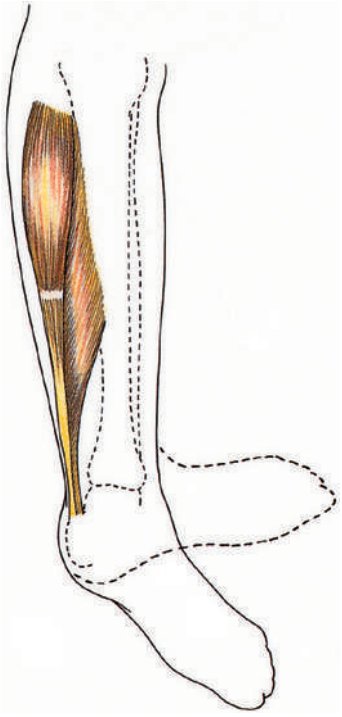

**Figure 28.17** Footdrop
*(Potter & Perry 2013)*

Active or passive 2-hourly exercises should be performed and consist of rotating the ankles, dorsiflexion and plantar flexion of the feet, flexing and extending the knees and raising and lowering each leg. Individuals are advised not to cross their legs while lying in bed or sitting. Prolonged pressure on the backs of the legs should be avoided by careful positioning and repositioning. Upper bedclothes should remain loose to allow movement of the legs.

Anti-embolic elastic stockings may be prescribed to facilitate venous return from the lower extremities, prevent venous stasis and venous thrombosis and reduce peripheral oedema. The stockings expose the toes but cover the foot and extend up the leg to the knee or groin. They give firm support to superficial veins in the leg, maintaining adequate venous pressure and reducing the incidence of thrombi. The individual's leg(s) are measured to ensure correct fit, then the stockings applied by rolling them slowly from the foot up the leg. Firm, even pressure is essential, and the toes are exposed to check that they remain warm and pink and blood supply is not impeded by the stockings.

An alternative or adjunct therapy to prevent VTE is sequential compression device therapy (SCD). SCDs are considered first choice for VTE prevention. These devices sequentially inflate and deflate air-filled sleeves applied to the lower limbs. This inflation/deflation mimics the muscle activity of ambulation, pushing blood up towards the heart. SCD may be used in conjunction with anti-embolic elastic stockings. SCD is contraindicated in individuals with deep vein thrombosis, compartment syndrome, extremity deformities and open wounds of the extremities (Moore et al 2013).

For people requiring surgery, additional preventative measures may include antithrombotic agents pre- and postoperatively (Berman et al 2015; Crisp & Taylor 2012; Farrell & Dempsey 2011).

See Clinical Skill 28.3 for more information and guidelines on the application of anti-embolic stockings.

## Prevention of postural hypotension

Prevention involves the gradual reintroduction of ambulation and allowing time to adjust to changes such as moving from a lying to a sitting or standing position (see 'dangling technique' earlier in this chapter).

### CLINICAL SKILL 28.3 Application of anti-embolic stockings

**Review and carry out the standard steps for all clinical skills/interventions**

**NMBA Decision-making Framework considerations:**

1. Am I educated?
2. Am I authorised?
3. Am I competent?

If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator.

**Equipment:**

Tape measure
Correct size of anti-embolic elastic stockings
Talcum powder

## CLINICAL SKILL 28.3 Application of anti-embolic stockings—cont'd

| Skill activity | Rationale |
|---|---|
| Observe for signs and symptoms and conditions that might contraindicate the use of anti-embolic elastic stockings:<br>• Skin grafts<br>• Size of thighs | Anti-embolic elastic stockings may aggravate skin conditions<br>Continuous pressure is necessary to keep graft adherent to recipient bed, but pressure should not be firm as to cause death of the graft<br>Anti-embolic elastic stockings that do not fit correctly due to larger thighs may cause excessive pressure and constriction around the thighs, which could then lead to reduce venous return |
| Obtain medical prescription | May be required for legalities or associated costs |
| Ensure understanding by individual and/or carer<br>Explain procedure to individual | Ensures informed consent<br>Identifies possible education needs<br>Reduces anxiety |
| Assess individual's skin, colouration and circulation of legs | Identifies a baseline |
| Use tape measure to measure individual's legs to determine correct stocking size | Stockings must be measured as per the instructions on the packaging. The length of the stockings will be determined by the medical orders and the individual's condition<br>If stockings are too large, they will not support the extremities adequately<br>If stockings are too small, stocking may impede circulation |
| Position individual in supine position | Ensures good body mechanics for the nurse and enables ease of application<br>Stockings should be applied before standing to prevent stagnation of blood in lower extremities |
| Ensure the individual's legs are clean and dry and apply a small amount of talcum powder | Allows for easier application and reduces friction |
| Stockings are applied by rolling them slowly from the foot up the leg<br>Ensure the foot fits into toe and heel position of the stocking<br>Ensure the stocking is completely extended up the leg<br>Ensure it is smooth and no creases are present<br>Ensure toes are able to be exposed to check they remain warm and pink and blood supply is not impeded by the stockings | Creases in stockings can impede circulation to lower region of extremities |
| Inspect stockings to make sure there are no creases or binding at the top | Can lead to increased pressure and alter circulation |
| Ensure individual is aware not to adjust stockings or roll them down<br>Note individual's reaction to stockings | Rolling down of stockings can have a constricting effect and impede venous return<br>Ensure the individual is adapting to stockings and is not experiencing discomfort |
| Remove stocking once per shift | Ensure they remain in the correct position<br>Ensures skin intact<br>Ensures adequate circulation<br>Identifies any complications |
| Document size and length of stockings that were applied<br>Record skin condition and circulatory assessment | Informs healthcare professionals and assists with planning and implementing care |

*(NSW Health Prevention of Venous Thromboembolism Policy Directive 2014; Rebeiro et al 2013)*

### Development and management of pulmonary embolus

Management of emboli in the pulmonary system includes administration of oxygen, analgesia and anticoagulant therapy. When immobilised, a person's pulmonary system declines in function and effects are related to a decrease in the rate and depth of breathing and effort, as well as an increase in bronchial secretions. Lung expansion decreases and breathing deeply is inhibited. In addition, secretions pool in the bronchial tract, which predisposes a person to respiratory tract congestion and infection. **Hypostatic pneumonia** may result and the risk increases when a person is dehydrated or is given medication that causes respiratory depression, such as morphine.

Atelectasis, or collapse of the lung, may occur and inhibits gaseous exchange at the alveoli. This results in hypoxaemia. Signs and symptoms of lung congestion include a cough and production of sputum, rattling, distressed or painful breathing and increased body temperature (Berman et al 2015; Crisp & Taylor 2012; Farrell & Dempsey 2011).

### Prevention of pulmonary stasis

Preventing pulmonary stasis includes nursing an individual sitting up when possible and encouraging coughing and deep breathing. Deep breathing exercises are performed with the person in a sitting position. The nurse places one hand on the chest and the other on the abdomen just below the ribs. The person is instructed to inhale slowly and deeply, pushing the abdomen out to promote optimal distribution of air to the alveoli, then breathe out through pursed lips while contracting their abdomen, which forces air out of the lungs. **Pursed-lip breathing** improves oxygen diffusion, encourages a slow deep-breathing pattern and puts positive back-pressure on the airways so that they stay open longer and expel greater amounts of stale air. Abdominal contraction pushes the diaphragm upwards, exerts pressure on the lungs and helps to empty them. Deep breathing and coughing (DB&C) involves incorporating deep breathing exercises with voluntary coughing. Deep breathing before coughing stimulates the cough reflex. The nurse instructs the individual to take a deep slow breath and exhale slowly (repeated several times). The individual then takes a short breath and coughs from deep inside the lungs. Analgesia may need to be administered prior to DB&C to facilitate effective results (Smeltzer et al 2010).

Additional chest physiotherapy such as postural drainage and chest percussion and vibration may be added. Fluids should be increased (provided there are no contraindications) to help liquefy secretions and facilitate coughing up secretions or phlegm. Oxygen therapy may be necessary, and medications such as antibiotics may be prescribed if infection is present. Analgesia is offered before chest physiotherapy begins. Nebulisation using normal saline can loosen secretions for ease of expectoration (Berman et al 2015; Crisp & Taylor 2012; Farrell & Dempsey 2011).

## Urinary stasis

Immobility can lead to retention of urine, urinary tract infection or renal calculi. Difficulty in using the pan or bottle in bed can result in incomplete bladder emptying and stasis of urine. Immobility reduces the amount of circulating lactic acid, which leads to alkaline urine (i.e. high urinary pH values) and, together with excess blood calcium (which is excreted by the kidneys), may result in kidney stones.

### Prevention and management of urinary stasis

To prevent stasis of urine, nurses promote an adequate intake of fluids (unless contraindicated), and ensure that the person understands the importance of not postponing urination and of the need to empty the bladder completely. Management depends on the cause and includes increasing fluids and treating any infection (Berman et al 2015; Crisp & Taylor 2012; Farrell & Dempsey 2011). Information on elimination of urine and disorders affecting the urinary system is provided in Chapter 31.

## Constipation

Constipation may occur as a result of decreased intestinal peristalsis due to reduced mobility or as a result of difficulty in using the bedpan in bed. Preventing and managing constipation includes promoting adequate fluids, exercise and fibre, as well as the appropriate aperient or suppository when required. Individuals are encouraged to maintain as normal a routine as possible to promote normal bowel function. Information on bowel elimination is provided in Chapter 32.

## Psychological effects of reduced mobility

Psychological stress, anxiety, depression or boredom can occur when a person is immobilised. Loss of independence occurs when people have to rely on other people or aids to carry out activities of daily living. It interferes with all aspects of living, and people become bored by the lack of stimulation or variety. A change in the level of independence and physical impairment or isolation from family and friends result in feelings of depression, and people may also be anxious and feel worthless, irritable, apathetic and restless. Nurses need to try to improve the person's self-esteem.

Individuals are encouraged to participate in decisions regarding care, which allows some control over their life. Changes of environment may be beneficial; for example, some time spent in the day room or outside, reading, exploring the internet, using the radio, TV or telephones may prevent boredom. Encourage the individual to pursue hobbies or studies, or the occupational therapy department may be able to provide alternative activities. A social worker may assist with any problems about finance or the home situation. Flexible visiting hours are important, as well as communication with the person showing concern, respect and empathy, active listening and providing information about care and treatment. It is important that people are allowed to express their emotions (Berman et al 2015; Crisp & Taylor 2012; Farrell & Dempsey 2011).

### DECISION-MAKING FRAMEWORK EXERCISE 28.1

You are a newly registered Enrolled Nurse on a busy surgical orthopaedic ward. One of your tasks is to shower a person on a commode chair as he is faecally incontinent. The only safe way to move this person is by electric hoist; however, you have never used one before. The person waiting to be showered is becoming extremely uncomfortable and extremely impatient.

Using the decision-making framework:

1. What strategies could you use in this situation?
2. Is it appropriate to attempt to shift this individual by yourself? Give reasons for your answer.
3. What strategies could you use to plan care for this individual in the future?

## Summary

Movement and exercise are necessary to maintain cardiopulmonary efficiency, muscle strength and tone and joint mobility. Some form of movement and exercise is advisable for health and wellbeing, as it stimulates the mind, enhances awareness and improves the psychological state. The practice of good body posture and body mechanics reduces muscle fatigue and prevents injury and is important whether lying, sitting, standing or moving. During exercise the joints should move through their full ROM.

An individual's ability to exercise should be assessed in order to plan and implement nursing measures to meet their needs. Some people will be able to move and ambulate independently, while others will require assistance. Any technique or aid used to assist a person to move should be one that promotes safety and comfort. Immobility presents challenges for nurses, who can often prevent serious complications by implementing simple measures for movement and exercise. Nurses have a duty of care to identify individuals at risk of developing complications while immobilised, and to promote movement and exercise in those who are capable, encouraging independence.

Knowledge of the musculoskeletal system gives the nurse insight into how the body functions during exercise and movement and the way in which exercise can improve health and wellbeing. Pathological changes in the musculoskeletal system can result from inflammation, infection, degeneration, nutritional influences, neoplasms or trauma. Major manifestations include pain, sensory changes, swelling, deformity and impaired mobility. Disorders of the musculoskeletal system may be classified as congenital, degenerative, infectious or inflammatory, immunological, metabolic, neoplastic, traumatic or from multiple causes.

Care of individuals with musculoskeletal disorders includes promoting rest, preventing complications of immobility, maintaining skin integrity and nutritional status, relieving pain, preventing psychosocial problems, remobilisation, regaining independence and rehabilitation. Nurses need to be aware of correct positioning of person who is immobilised, as comfort and correct body alignment are important aspects of care. The general objectives of fracture management are reduction, immobilisation and restoration of function. Exercise has many physical and psychological benefits that greatly enhance wellbeing. Healthy attitudes towards regular exercise can mean a population that ages well and values exercise to prevent disease and illness.

## Review Questions

1. What are the principles of good posture and body mechanics?
2. Describe the effects of exercise on the human body.
3. What is the difference between isotonic, isometric and isokinetic exercise?
4. Describe the range of movement exercises used to maintain joint mobility in the immobilised person.
5. Describe the benefits of exercise on health, fitness and the older person.
6. What are the complications associated with bed rest and immobility?
7. Discuss the importance of initiating an exercise program in an aged care facility with a centre manager who is resistant to change.
8. Outline the components of a neurovascular assessment.
9. List factors that may contribute to delayed healing of a person with a neuromuscular disorder.
10. Outline the subjective and objective data that should be collected from the individual with a neuromuscular disorder.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Recommended Reading

Easy moves for active ageing: <http://www.activeageingaustralia.com.au/resources/useful-links#stats>.

Health insite (Exercise): <www.healthinsite.gov.au/topics/Exercise>.

Walking and health: <www.healthinsite.gov.au/topics/walking>.

## Online Resources

ABC Health & Wellbeing: www.abc.net.au/health/

Australian Bureau of Statistics: www.abs.gov.au

Walk Easy Inc: http://www.walkeasy.com/interact/crutch_gait2.asp

Well for Life: www.health.vic.gov.au/agedcare/downloads/wellforlife/helpsheet11.pdf

CHAPTER
29

# Maintaining and promoting skin integrity and wound care

*Kerrie Coleman*

## KEY TERMS

burn injuries
delayed primary intention
first intention
leg ulcers
pressure injuries
primary intention
risk factors
secondary intention
skin disorders
skin tears
third intention
wound assessment

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define the key terms
- Describe the structure of the skin
- Describe the functions of the skin
- Identify the risk factors for loss of skin integrity
- Discuss the wound healing process
- Describe the different wound healing intentions
- Describe the classifications of wound types
- Identify the principles of wound management
- Identify nutritional needs to promote wound healing
- Describe the differences between acute and chronic wounds
- Describe the procedures related to care of surgical wounds
- Describe the care required to prevent and manage pressure injuries
- Discuss the differences between arterial and venous leg ulcers
- Describe the care required to prevent and manage skin tears
- Describe the management of loss of skin integrity related to burns
- Describe the major manifestations of skin disorders
- Complete an assessment for an individual with impaired skin integrity
- Assist in planning and implementing nursing care for the individual with a loss of skin integrity
- Identify the purpose of commonly used wound dressings
- List appropriate nursing interventions for the individual with impaired skin integrity

## CHAPTER FOCUS

The skin has several functions, which are largely concerned with protection of the body against infection, physical trauma and ultraviolet radiation. Any disorder that disrupts normal skin function will affect the efficiency with which it carries out its functions, and may place the physiological integrity of the individual at risk. The effects that disorders of the skin have on the individual range from minor and temporary to major and life threatening. Some serious skin disorders such as burns affect the individual to the extent that self-concept and body image are severely impaired. Wound management is a major role of the nurse. It is important that all nurses understand normal wound healing and the variances that can occur with ageing and disease processes. There is an abundance of literature on wound management and a vast array of wound-care products. The aim of this chapter is to assist the nurse to increase their knowledge in this rapidly changing area.

## LIVED EXPERIENCE

I had a leg ulcer that would not heal. I had it for over a year. A new nurse came one day to do my dressing at home and she suggested a new type of dressing. I started using the new dressing and the ulcer started to look much better. After a few months it was almost healed. I am so thankful to the nurse for being able to help my ulcer heal.

**Dulcie, 65**

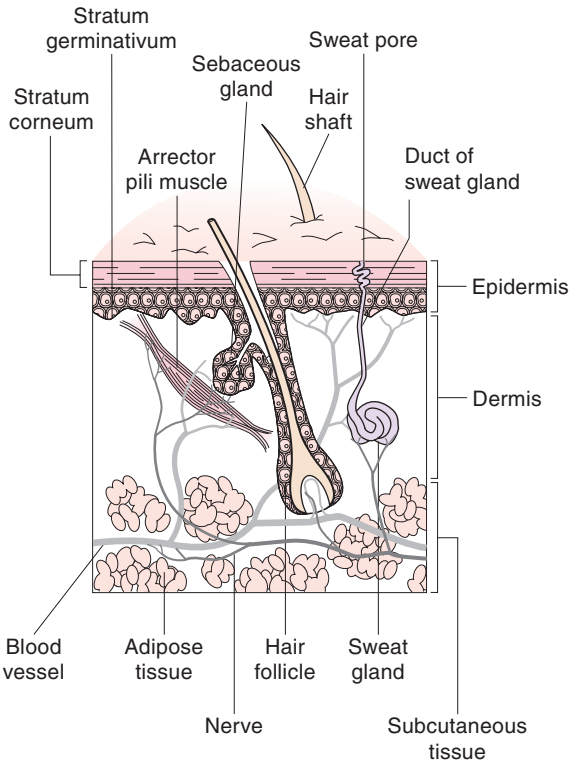



**Figure 29.1** Structure of the skin

# THE INTEGUMENTARY SYSTEM

The integumentary system consists of the skin and its appendages; the hair, nails, sweat and sebaceous glands. The skin (or integument) is the largest organ of the body, covering about 7500 $cm^2$ of surface area in an average adult (Figure 29.1). It is a protective barrier to the outside world, plays a vital role in homeostasis and also provides a major means of communication through touch and sensation. The appendages of the skin, hair, nails and glands, arise from the epidermis but are present in the dermis.

## Structure of the skin

The skin is comprised of two basic layers: the epidermis and dermis. Under the dermis is a layer of adipose tissue called subcutaneous tissue. While this layer is not considered to be part of the skin, subcutaneous tissue does protect and insulate the deeper tissues and is composed primarily of fat and loose connective tissue.

### The epidermis

The epidermis is the thin outermost layer and is composed of epithelial cells arranged in layers of stratified epithelium. The number of layers varies according to the amount of wear and tear experienced; for example, there are many more layers on the soles of the feet and the palms of the hands than there are between the toes and the fingers.

The epidermis is divided into two layers. The horny layer (stratum corneum) is the uppermost layer, and consists of about 30 layers of dead, flattened keratinised cells. These keratinocytes contain a waterproof hard protein substance called keratin. Keratin's waterproofing properties protect the body and prevent escape of fluid from the deeper tissues. Keratin is also responsible for the formation of hair and nails. The germinative layer (stratum germinativum) is the deeper layer of the epidermis. It is here that new cells are constantly being formed and pushed upwards to replace cells that die and are rubbed off. Millions of new cells are produced daily and are pushed up away from the source of nutrition, to become part of the outermost layer.

Melanocytes are present in the germinative layer. Their function is to produce a brown pigment called melanin. Melanin gives colour to the skin and protects the body against the damaging effects of ultraviolet rays in sunlight. Brown-toned skin results when large amounts of melanin are

produced, whereas light-toned skin results when the body produces less melanin.

The epidermis does not contain any blood vessels, but receives its essential substances from fluid that comes from the blood supply to the dermis. As cells are pushed towards the surface, away from the source of nutrition, they die and are eventually rubbed off. Thousands of dead epithelial cells are flaked off every day, which means that they are deposited on clothing and on every surface touched. They become part of the dust in a room, serve as food for mites and harbour microorganisms. A person sheds about 0.5 kg of dead cells per year, much of which goes down the bathroom drain.

The patterns of lines and ridges in the epidermis are due to projections in the dermis called papillae. On the fingertips these patterns are the fingerprints, which are different in every individual. For this reason, fingerprints are useful for purposes of identification. Nails are formed from the stratum corneum and are composed of modified epithelium.

## The dermis

The dermis consists of white fibrous tissue containing many elastic fibres. Elasticity of the skin is essential to allow for changes in the size of a part of the body without tearing, such as the abdominal area during pregnancy. In old age the fibres become less elastic, causing wrinkles and folds to appear in the skin. The following structures are contained in the dermis.

## Network of blood vessels

The blood vessels transport blood containing oxygen and nutrients to the dermis and transport blood containing wastes such as carbon dioxide away from the dermis. The blood vessels also play a role in regulating body temperature. If the body temperature is elevated the dermal capillaries become engorged with blood, which allows loss of body heat from the skin surface through radiation. If the environmental temperature is low, blood vessels in the skin constrict, conserving body heat by reducing radiation from the body.

## Nerve endings

The dermis has a rich nerve supply consisting of several types of nerve endings. Each type of nerve ending reacts to a different stimulus, such as pain, touch, pressure and temperature. Impulses are transmitted from the nerve endings to the brain for interpretation.

## Hair follicles and hairs

Hairs grow from hair follicles, which are deep pouch-like cavities in the skin. Although hair follicles are present in most areas of the skin, they are not found on the palms of the hands, lips or the soles of the feet. Hair is composed of modified epithelium and grows from roots deep in the follicles. The part of a hair projecting above the epidermis is called the shaft. Hair colour reflects the amount of pigment, generally melanin, in the epidermis. Hair is a protection from the elements and from trauma; for example, the scalp hair and eyebrows are barriers against sunlight, and the nasal hairs filter inhaled air.

Hair growth is influenced by the sex hormones oestrogen and testosterone. An excessive growth of hair is called hirsutism. Like other cells that compose the skin, the hair cells also become keratinised. The hair that we brush, blow dry and curl is a collection of dead keratinised cells. Hair colour is genetically controlled and is determined by the type and amount of melanin. The absence of melanin produces white hair. Grey hair is due to a mixture of pigmented and non-pigmented hairs. Red hair is due to a modified type of melanin that contains iron. Hair is important cosmetically. Hair loss can be very distressing for some people. The most common type of hair loss is male-pattern baldness. It is a hereditary condition characterised by a gradual loss of hair with ageing.

## Arrector pili muscles

The arrector pili muscles are minute involuntary muscles, with one end attached to a hair follicle and the other end to the dermis. When these muscles contract (e.g. during fear or exposure to cold) the follicles and hairs become erect. Contraction of the muscles also causes some elevation of the skin around the hairs, giving rise to the 'goose pimple' appearance. The contraction of the arrector pili muscles increases heat production. This response is called shivering.

## Skin glands

Two major types of glands are associated with the skin: sebaceous glands and sweat glands.

***Sebaceous glands*** Sebaceous glands are small glands, most of which open into hair follicles. The glands produce sebum, which is an oily substance and a lubricant that keeps the skin soft and moist and prevents the hair from becoming brittle. Combined with sweat, sebum forms a moist, oily acidic film that is mildly antibacterial. During periods of increased hormonal activity, such as adolescence, sebaceous glands become very active and the skin becomes oilier. Sebaceous glands are present on all areas of the skin except for the palms of hands and soles of feet, and are most abundant on the face, scalp and upper chest and back.

***Sweat glands*** Sweat glands, which are widely distributed, are either eccrine or apocrine. Eccrine glands are present all over the body and produce a clear perspiration. Apocrine glands are found mainly in the axillary and genital areas, and secrete sweat that has a strong characteristic odour. Sweat glands are coiled in appearance, with a straight duct that releases sweat onto the surface of the skin through an opening called a pore.

Sweat glands play a part in regulating body temperature. They excrete large amounts of sweat when the external, or body, temperature is high. When sweat evaporates off the skin's surface it carries large amounts of body heat with it. Sweat consists of water that contains sodium chloride, phosphates, urea, ammonia and other waste products. Under normal circumstances, the amount of sweat secreted by an individual is about 700 mL/day. Under some conditions, such as strenuous physical exertion or pyrexia, the amount can be increased to as much as 1500 mL/day. Much of the water lost through the skin evaporates immediately, so it is not noticeable and is called insensible perspiration. Sweat that makes the skin damp and is noticeable is called sensible perspiration.

## Functions of the skin

The major functions in which the skin and its appendages play a role are protection, thermoregulation, metabolism and sensory perception.

### Protection

The skin is the first line of defence against the external environment. It provides a barrier to a variety of harmful agents, such as microorganisms, radiant energy and chemical substances. The skin acts as a barrier to harmful agents only as long as it remains intact. The waterproof quality of the outer layer prevents excess water absorption and abnormal loss of body fluids. The skin contains nerve endings that are sensitive to painful stimuli. The nerve endings transmit impulses to the brain that alert the individual that damage is occurring.

### Thermoregulation

The skin plays a major role in the maintenance of constant body temperature. Blood conducts heat from internal structures to the skin for dissipation. The skin dissipates excess body heat by radiation, conduction, convection and evaporative cooling. Body temperature is controlled by the hypothalamus, which is the heat-regulating centre in the brain. This centre is sensitive to the temperature of the blood passing through it and also receives sensory stimuli from nerve endings in the skin that react to heat and cold (thermoreceptors). The hypothalamus in turn relays impulses requiring vasodilation and activation of the sweat glands (for cooling), or vasoconstriction and inhibition of sweat glands (for heat retention). Thus, the hypothalamus acts like a thermostat that initiates heat-losing activities when the body temperature begins to rise and heat-retaining activities when the body temperature starts to fall.

### Metabolism

The skin assists in the regulation of fluid and electrolyte balance by eliminating water and small amounts of sodium chloride through the sweat glands. Sweat consists of 99.4% water, 0.2% salts and 0.4% urea and other wastes. In the presence of sunlight or ultraviolet radiation, the skin begins the process of forming vitamin D (calciferol), a substance required for absorbing calcium and phosphates from food.

### Sensory perception

Through perception of a painful stimulus, the skin causes an avoidance reaction, while other receptors perceive sensations of pressure and touch. The skin is therefore an agent of communication between the outside environment and the body, as the activity of sensory nerve endings informs the individual of what is happening outside the body.

## Factors that affect skin integrity

Many **risk factors** can affect the integrity of the skin, including:

- Immobility and inactivity
- Restlessness
- Sedation
- Neurological factors, such as paraplegia, quadriplegia and multiple sclerosis
- Poor nutrition and hydration status
- Systemic and local circulation and oxygenation
- Presence or absence of excessive moisture
- Vascular conditions such as peripheral vascular disease
- Age-related factors
- Obesity
- Exposure to pressure, friction, shearing forces or burns
- Exposure to chemicals
- Diseases such as diabetes mellitus
- Immunological suppression as a result of systemic conditions or medications
- Trauma from falls, accidents or burns
- Surgical intervention
- Inappropriate or ill-fitting prostheses and footwear
- Infection
- **Skin disorders** (e.g. genetic factors, idiopathic causes, hypersensitivity rashes).

# WOUND HEALING

Wound healing is a dynamic and complex process. Tissue replacement involves two main mechanisms: repair and regeneration. In humans, the mechanism of repair for any wound is determined by the tissue layers involved and their capacity for regeneration (Doughty & Sparks-DeFriese 2012). See Table 29.1 for definitions of repair and regeneration.

The wound healing process consists of four stages: haemostasis, the inflammation stage, the reconstruction phase and the maturation phase. The process of wound healing begins at the moment of injury and can continue for some years.

**TABLE 29.1 | Definition of repair and regeneration**

| Healing properties | Definition | Tissue types |
|---|---|---|
| Repair | Repair is the process of producing connective tissue to fill the defect or knit tissues back together | Deep dermal structures (e.g. hair follicles, sebaceous glands, sweat glands), subcutaneous tissue, muscle, tendons, ligaments and bone lack the capacity to regenerate |
| Regeneration | Regeneration is when damaged cells and tissue are replaced by proliferation of similar cells | Wounds that are confined to the epidermal and superficial dermal layers heal by regeneration because epithelial, endothelial and connective tissue can be reproduced |

*(Doughty & Sparks-DeFriese 2012)*

## Haemostasis

The first stage of wound healing is haemostasis, which has three components: vasoconstriction, platelet response and the biochemical response. Vasoconstriction occurs when the bleeding in the wound is arrested by spasm in the arteries, arterioles and capillaries.

The platelet response is commonly described as the formation of the platelet plug. When platelets come into contact with parts of a damaged blood vessel, such as collagen or endothelium, their characteristics change. They become larger and irregular in shape and stick to the collagen fibres in the wall of the vessels and to each other. The platelets release various chemicals: serotonin, prostaglandins, phospholipids and adenosine diphosphate (ADP) that attract more platelets, which stick to the original platelets and form the plug. This platelet plug is very effective in preventing blood loss in a small vessel.

The biochemical component is the formation of a blood clot through the processes of the intrinsic and extrinsic clotting pathways, clot retraction and fibrinolysis. This is a complex process involving different clotting factors that are released from the damaged tissue. A clot is developed and retraction of the wound takes place.

The next stage of the healing process is termed tissue repair. This stage also has three phases: inflammation, reconstruction and maturation, which overlap each other and have varying time intervals.

## The inflammation phase

This phase begins the moment that injury is incurred. The capillaries contract and thrombose to facilitate haemostasis. Vasodilation of the surrounding tissues occurs in response to the release of histamine and other vasoactive chemicals. This process causes increased blood flow to the surrounding tissue, which produces erythema, swelling, heat and discomfort, such as throbbing. A variety of white blood cells called polymorphonuclear leucocytes arrives at the site of the wound as a defence response and is involved in the immune response to fight infection. Polymorphs, macrophages and their associated growth factors produce various local and systemic effects. This phase continues for about 3 days.

## The reconstruction phase

This is a time of cleaning and temporary replacement of tissue. The polymorphs kill bacteria, and the phagocytic macrophages digest the dead bacteria and debris to clean up the wound. Dermal repair is necessary if the wound is one of full thickness. New blood capillaries are developed (angiogenesis) and granulation tissue, which consists largely of collagen, is laid down. Epithelial cells migrate over the granulation tissue from the surrounding wound edges, hair follicles, sweat or sebaceous glands in the wound. These cells are very fragile. When the wound is covered the epithelium begins to thicken to 4–5 layers, forming the epidermis. Wound contraction then occurs, reducing the overall size of the wound. This phase can continue for 2–24 days.

## The maturation phase

This is commonly known as the remodelling phase. The matrix of collagen cells is reorganised and strengthened. This phase can continue for about 24 days to 1 year. The wound is still at risk during this phase and should be protected.

## Factors that affect wound healing

Factors that affect wound healing include:

- Wound infection
- Allowing the wound to dry out and form a scab (wound hydration)
- Allowing maceration of the wound to occur (exudate management)
- Inappropriate dressings
- Temperature variances
- Not treating the underlying cause
- Keloid formation
- Foreign bodies
- Friction, shearing forces and pressure
- Age
- Underlying disease e.g. diabetes
- Vascularity
- Obesity
- Disorders of sensation and movement
- Drugs
- Psychological state
- Nutritional status
- Radiation therapy.

### Wound healing and nutrition

The role of nutrition in wound healing is vital. Whereas good nutrition facilitates healing, malnutrition delays, inhibits and complicates the process. Carbohydrate, protein and fat provide the energy source for the body (Schols 2014). Adequate energy supports collagen and nitrogen synthesis and promotes anabolism by sparing body protein from being used as an energy source (Schols 2014). It is vital that nutrition is a part of the wound assessment process. Nutritional screening should include assessing body mass index (BMI) and time over which nutrient intake has been unintentionally reduced, and/or the likelihood of future impaired nutrition (Stechmiller 2010). In Australia the common tool used for nutritional screening is the Malnutrition Screening Tool (MST) tool which has a sensitivity and specificity of 70% (Neelemaat et al 2011).

Nutrition for chronic wounds needs to be assessed on an individual basis; some types of wound such as pressure injuries or multiple wounds place high demand for nutrients on the body. See Table 29.2 for a detailed review of nutrition and wound healing.

The use of arginine-enriched oral nutritional supplements may have a positive effect on the healing of chronic wounds; however, at the present time there is limited research to support the use of these products (Schols 2014). Nutrition is a key element in the prevention and treatment of chronic wounds and has to be incorporated into the wound management plan (Schols 2014).

**TABLE 29.2 | Nutrition**

| Nutrient | Function | Key facts | Dietary sources |
|---|---|---|---|
| Fat | Energy source, component of cell membranes, involved in formation of inflammatory mediators and clotting components | Dietary energy should be provided in the form of carbohydrate and fat | Butter, margarine, other spreading fats, oils, cream, full-fat milk, cheese |
| Carbohydrate | Major source of calories for use by the body; its availability is essential to prevent other nutrients (i.e. protein) from being converted into energy | Increased intake provides energy; this is essential for optimal healing | Wholegrain cereals, breads, potatoes, rice, pasta |
| Protein | Necessary for tissue synthesis and repair. Deficiency can inhibit wound remodelling and may increase oedema. This will further impair delivery of oxygen and nutrients to the wound | Excess protein can tax liver and kidney function and cause dehydration | Meat, eggs, cheese, milk, yoghurt, fish, poultry, pulses, nuts |
| Vitamin A | Increases the inflammatory response in wounds, stimulating collagen synthesis. Low levels can result in delayed wound healing and susceptibility to infection | It has been shown that vitamin A can restore wound healing impaired by long-term steroid therapy. Supplementation with vitamin A requires caution as there is a risk of toxicity | Milk, cheese, eggs, fish, dark green vegetables, oranges, red fruits and vegetables |
| Vitamin C | Involved in collagen synthesis and subsequent cross-linking, as well as the formation of new blood vessels. Adequate levels help strengthen the healing wound. Has important antioxidant properties that help the immune system; increases absorption of iron | Deficiency impairs wound healing and is associated with an increased risk of wound infection | Found mostly in fruit and vegetables, especially oranges, grapefruit, tomatoes and leafy vegetables |
| Vitamin B | Helps with production of energy from glucose, amino acids and fats. Vitamin B6 is important for maintaining cellular immunity and forming red blood cells. Thiamine and riboflavin are needed for adequate cross-linking and collagenation | Includes thiamine, riboflavin, niacin, folate, vitamin B12, vitamin B6 | Wholegrains, breakfast cereals, milk and milk products, meat, fish, liver |
| Vitamin E | Can reduce injury to the wound by controlling excessive free radicals | There is limited evidence for the benefits of vitamin E in decreasing scar formation. There is some evidence that suggests oral supplementation of vitamin E over 400 mg/day has an increased health risk | Vitamin E supplementation or topical application is rarely needed for wound healing Vegetable oil, egg yolk, nuts, seeds |
| Vitamin K | Blood clotting | Deficiency very rare | Liver, green vegetables |
| Selenium | Antioxidant | Deficiency relatively common | Brazil nuts, meat, vegetables, fish, cereals |
| Copper | Responsible for collagen cross-linking and erythropoiesis | Deficiency rare | Meat, vegetables, cereals, tea, coffee |
| Manganese | Component of enzymes needed for tissue regeneration | Deficiency rate | Tea, widely distributed in various foods |

*Continued*

**TABLE 29.2 | Nutrition—cont'd**

| Nutrient | Function | Key facts | Dietary sources |
|---|---|---|---|
| Zinc | Plays a role in protein and collagen synthesis and in tissue growth and healing | Zinc deficiency has been associated with delayed wound healing, reduced skin cell production and reduced wound strength | Best sources include red meat, fish and shellfish, milk products, poultry and eggs |
| Iron | Provides oxygen to the site of the wound | Iron deficiency can impair healing, collagen production and strength of wound | Iron absorption from non-meat sources can be enhanced with vitamin C. Best sources are red meat, offal, fish, eggs, wholemeal bread, dark green leafy vegetables, dried fruits, nuts and yeast extracts |

*(Johnston 2007; Schols 2014)*

## CLINICAL INTEREST BOX 29.1 Skin flaps

A flap is a surgical relocation of tissue from one part of the body to another part to reconstruct a primary defect. This creates a secondary defect that will require skin grafting or primary closure.

### Types of flaps

Skin, or cutaneous, flaps are grafts of tissue consisting of skin and superficial fascia. Composite tissue flaps are described according to the type of tissue they are composed of (e.g. fasciocutaneous flap).

Flaps can be classified as free and pedicle. A free flap is the relocation of skin and subcutaneous tissue as a complete segment, with an anastomosis of the segment's blood supply to vessels at the affected site. A pedicle flap is the surgical transfer of skin and subcutaneous tissue to another body site. Blood supply to the flap is maintained via a vascular pedicle attached to the body donor site.

*(Sussman & Bates-Jensen 2011)*

**Figure 29.2** Venous leg ulcer

# TYPES OF WOUND

## Acute and chronic wounds

### Acute wounds

An acute wound is any surgical wound that heals by primary intention, or any traumatic or surgical wound that heals by secondary intention, and which proceeds through an orderly and timely reparative process that results in sustained restoration of anatomical integrity (Carville 2012). Examples of acute wounds are those made by surgical incision or traumatic injury. An example of a surgical wound is a skin flap (see Clinical Interest Box 29.1).

### Chronic wounds

A chronic wound occurs when the reparative process does not proceed through an orderly and timely process as anticipated and healing is complicated and delayed by intrinsic and extrinsic factors that impact on the person, their wound or their environment (Carville 2012). An example of a chronic wound is a venous leg ulcer (see Figure 29.2).

# TYPES OF HEALING

When the wound has minimal tissue loss the edges can be brought together by sutures or clips; as in a surgical wound. The wound is said to heal by **primary intention**, or **first**

## CLINICAL INTEREST BOX 29.2
## Skin grafts

Skin grafts speed up the healing process and reduce the risk of infection. Grafts may be partial or full thickness. Skin grafts are classified as:

- Autograft: a surgical relocation of skin to the wound from another site of the body. A second wound results and is known as the donor site
- Allograft: a donor graft of skin between allogenic individuals, such as from one person to another
- Xenograft: a donor graft of tissue transplanted between different species, such as tissue of porcine origin transplanted to a human being
- Cultured: the cultivation of epidermis from a small amount of epithelial cells taken from the donor or recipient's body and cultivated under laboratory conditions to form epidermis, before being transplanted back to the individual.

*(http://www.wounds-uk.com)*

**intention**. Granulation tissue is not obvious. Healing by **secondary intention** occurs when wound edges cannot be brought together, as with a gaping wound. Granulation tissue fills in the wound until re-epithelialisation takes place and a large scar results. **Third intention**, or **delayed primary intention**, healing occurs when wound closure is delayed for a few days so that an infected or contaminated wound can be debrided (dirt, foreign objects, damaged tissue and cellular debris are removed from a wound or burn to prevent infection and promote wound healing). Closure of contaminated wounds is usually delayed until all layers of wound tissue show no signs of infection, usually within 4–10 days. At other times some wounds need surgical intervention such as the application of skin grafts or flaps to speed the healing process and reduce the risk of infection. Clinical Interest Box 29.2 provides details on skin grafts.

# WOUND MANAGEMENT

Wound management employs the principles of moist wound healing; that is, keeping the wound bed moist enough to facilitate the movement of new epithelials across the granulation tissue.

The benefits of moist wound healing are:

- Thermoregulation
- Less pain
- Less injury and damage to cells on removal of the dressing
- More efficient autolytic debridement of necrotic tissue
- Less risk of transmission of microorganisms
- Fewer dressing changes and therefore less disturbance of the wound, resulting in reduced costs in dressing consumables and reduced workload for care staff
- The individual's lifestyle is interrupted less and, with most dressings, the individual can continue to shower as usual.

## CLINICAL INTEREST BOX 29.3
## Principles of wound management

- Assess and define aetiology
- Control factors affecting healing (e.g. smoking, nutrition)
- Select an appropriate wound dressing
- Plan for maintenance of wound healing
- Evaluate and review

*(http://www.amwa.com.au)*

## Wound assessment

An initial holistic assessment of the individual includes a comprehensive health history, demographics, nutritional status, psychosocial status, medication, mobility and activity, vascularity and current health status. **Assessment of the wound** identifies the wound characteristics, cause of the wound (e.g. traumatic, surgical), appearance of the wound bed, exudate (amount, type), peri-wound skin condition, type of wound (skin tear, pressure injury), location, size of the wound and its chronicity. A wound management history should be obtained to determine previously effective or non-effective treatments. Presence of infection is assessed. Pain management is a vital aspect of care and impacts on the quality of life for the individual with a wound. Clinical Interest Box 29.3 outlines the principles of wound management.

Assessment tools capture essential components of the individual and wound and include medical/surgical history of the individual, clinical history of the wound, relevant investigations to assist diagnosis of aetiology and local wound characteristics. Consistency in the information collected can be obtained in tools such as the mnemonic tool HEIDI: History (H), Examination (E), Investigation (I), Diagnosis (D) and Indicators (I) (Harding et al 2007). Specialised assessment tools are available for pressure injuries: National Pressure Ulcer Advisory Panel (NPUAP)/Agency for Health Care Policy and Research (AHCPR) staging system (see Pressure Injuries) (NPUAP et al 2014); PSST: Pressure Sore Status Tool, automated version known as the Wound Intelligence System (Bates-Jensen 1997); and PUSH: the NPUAP Pressure Ulcer Scale for Healing (NPUAP 2015). Other general tools are the WHS: Wound Healing Scale (Krasner 1997) and the SWHT: Sussman Wound Healing Tool (Sussman & Bates-Jensen 1998).

## Description of wounds

### Colour

Wounds may be described by the colour of the wound bed:

- Black: necrotic tissue can be dry or moist
- Yellow: usually indicates slough, a fibrous material in the wound; can be moist or dry
- Red: healthy granulating wound
- Pink: epithelialising wound usually has a translucent appearance.

### Degree of injury

- Superficial: wounds affecting the epidermis
- Partial thickness: wounds affecting the epidermis and the dermis
- Full thickness: wounds that have affected the epidermis, dermis and the subcutaneous tissue. The muscle, tendon and bone may also be involved.

### Wound location

Anatomical description; for example, lower left leg, upper right arm. This allows consistency in assessment.

### Wound size measurement

- Area
- Depth, at deepest area
- Length, at longest measure in head to toe direction
- Width at widest measure from side to side direction
- Examples of measurement methods available include simple disposable paper rulers and probes, tracing grids and photography.

### Exudate

- Type
  - Serous—clear
  - Haemoserous—slight blood-stained fluid
  - Sanguinous—frank or heavily blood stained
  - Purulent—pus
- Amount
  - Scant, moderate, large, copious
- Colour
  - Clinical indicator for stage of healing or complication; for example, infection or fistulae formation
- Consistency
  - Dependent on type of exudate: fluid, thick, liquid
- Odour
  - Indicates infection or contamination
- Sign of non-viable tissue breakdown
- Drainage of body fluids such as faeces from a fistula.

### Peri-wound skin

- Cellulitis, oedema, maceration, foreign bodies, contact dermatitis
- Colour, warmth, capillary return
- Pulses
- Wound edge for sign of healing.

### Pain

- Identify and manage underlying cause of pain
- Implement appropriate pain management strategies.

### Wound infection

- Monitor for signs and symptoms of infection
- Report and manage
- Infection delays healing.

### Psychosocial

- Individual person-focused outcomes are the foundations of care
- Quality of life/wellbeing

## Wound bed preparation

Schultz and colleagues (2003) defined wound bed preparation as 'the management of the wound to accelerate endogenous healing or to facilitate the effectiveness of other therapeutic measures'. Wound bed preparation uses an algorithm called the TIME principle. These principles identify four key areas of the chronic non-healing wound, though the principles can also be applied to acute wounds (Schultz 2007). All chronic wounds start as acute wounds but fail to progress and get trapped in the inflammatory phase of healing with bacterial and biochemical imbalance. **TIME** provides a systematic approach to wound care. The four elements are **T** (tissue non-viable or deficient), **I** (infection or inflammation), **M** (moisture imbalance) and **E** (edge of wound non-advancing or undermining epidermal margin) (Leaper et al 2012). The wound bed preparation concept has gained international recognition as a framework that provides a structured approach to wound care.

### Tissue non-viable

Non-viable tissue is black (necrotic) dead tissue or thick yellow slough that impairs the growth of new tissue, obscures the true depth of a wound and is a haven for bacterial growth preventing wound healing. Non-viable tissue also increases the risk of wound infection. Serial debridement is required to remove the tissue to, for example, produce a healthy wound bed.

### Infection/inflammation

All wounds contain bacteria at some level often without harmful effects. Wound infection results from an imbalance of the host's (the individual) immune system and its ability to combat bacteria (host resistance), and the virulence of the microorganism: some bacteria have greater disease-producing ability than others. Table 29.3 provides the differences between inflammatory response and infection.

**TABLE 29.3 | Recognising the differences between inflammatory response and infection**

| Inflammation | Infection |
|---|---|
| Localised redness | Erythema (spreading redness) |
| Pain | Increasing local wound pain |
| Heat | Change in the appearance of the wound tissue |
| Swelling | Increase in the amount of wound exudate |
| | Purulent or very foul smelling exudate |
| | Induration (hardness of the surrounding tissue) |

*(Swanson et al 2014)*

## CLINICAL INTEREST BOX 29.4 Identifying wound infection

- Increased discharge
- Delayed healing
- Wound breakdown
- Pocketing at base of wound
- Epithelial bridging
- Unexpected pain or tenderness
- Friable granulation tissue
- Discolouration of wound bed
- Abscess formation
- Malodour

*(WUWHS 2008)*

Failure to control bioburden can lead to infection especially in the immune-compromised individual. Chronic wounds are likely to be colonised with bacterial or fungal microorganisms due to the nature of the open wound and tend to be polymicrobial. The presence of slough and necrotic tissue provides an environment for bacterial growth. It is when these bacteria interfere with wound healing that intervention is required.

Infection in acute or surgical wounds is relatively easy to recognise—spreading redness, local pain and swelling, peri-wound area warm to the touch. Infection in the chronic wound might be less obvious. Delayed healing can be an indicator of infection common to most wounds (Schultz et al 2003). Other signs can be an increase or change in wound exudate, or discolouration of the granulation tissue depending on the cause of the wound (Cutting et al 2005; Swanson et al 2014) (see Clinical Interest Box 29.4). It is recognised with increasing evidence that different wound types exhibit specific characteristics of infection (Swanson et al 2014; WUWHS 2008).

Bacteria can also cause prolonged inflammation by stimulating a continuing influx of neutrophils that release cytotoxic enzymes, free oxygen radicals and inflammatory mediators inducing a cycle of continuing tissue damage (Han et al 2011). Biofilms are also increasingly thought to play a role in prolonging inflammation and delaying healing (Wolcott et al 2010). See below for further information on biofilms.

The risk of infection increases when 'any factor that debilitates the individual, impairs immune resistance or reduces tissue perfusion' (Swanson et al 2014; WUWHS 2008). Comorbidities such as diabetes mellitus, arterial, cardiovascular or respiratory disease, renal impairment, malignancy, malnutrition, obesity, rheumatoid arthritis or an immune-compromised state contribute to an increased risk of infection. Certain medications also affect wound healing and increase the risk of infection, such as corticosteroids, cytotoxic drugs and immuno-suppressants (Swanson et al 2014; WUWHS 2008). In elective surgery the amount of blood loss, the type and length of the procedure and a lack of pre-operative warming can influence the development of postoperative wound infection.

## CLINICAL INTEREST BOX 29.5 Definition of antimicrobial agents: disinfectants, antibiotics and antiseptics

**Disinfectants**

Non-selective agents that kill or remove microorganisms from inert surfaces such as work surfaces, medical instruments. They are not intended for use on the body or human tissue.

**Antibiotics**

Act selectively to inhibit or kill microorganisms. They can be administered either topically (not usually recommended) or systemically (orally or intravenously). Increasing resistance is an international concern among healthcare practitioners.

**Antiseptics**

Non-selective substances that inhibit multiplication of organisms (bacteriostatic) or kill (bactericidal). They can be used on intact skin and some open wounds and do not rely on the bloodstream for access to the wound so are useful for ischaemic wounds. They may have toxic effects on human cells. Low levels of bacterial resistance due to action at multiple sites within the microbial cell.

*(Adapted from WUWHS 2008)*

## Biofilms in wounds

It is theorised that biofilms play a role in the delayed healing of chronic wounds. A biofilm is a community of multiple bacteria that attach to surfaces or each other to form highly complex communities embedded in a matrix that can be difficult to remove as the matrix offers protection from antimicrobials and the host immune system. There is an increasing awareness that microorganisms colonising a wound may be present as a biofilm (Percival & Bowler 2004). Acute bacterial infections are considered to result from growth of planktonic cells (single free floating bacteria) while many chronic bacterial infections involve biofilms. James et al (2008) found 60% of chronic wounds had characteristics of a biofilm compared to only 6% in acute wounds and evidence that biofilms exist in chronic wounds such as pressure injuries, diabetic foot ulcers and venous leg ulcers. Wound swabbing for microscopy and culturing will fail to detect biofilms in wounds and special molecular techniques are necessary.

Difficulties in treating biofilm-related conditions suggest that prevention is a more feasible option and the speed at which biofilms form necessitates rapid therapeutic action. Wolcott et al (2010) demonstrated that sharp debridement followed by the application of topical antimicrobials (e.g. a dressing that contains iodine, polyhexamethylene biguanide (PHMB) or silver) provides a time-dependent window of sensitivity which is effective at targeting bacteria and suppressing their regrowth (Wounds UK 2011). See Table 29.4 and Clinical Interest Box 29.5 for further description of antimicrobial agents.

**TABLE 29.4 | Examples of topical antimicrobial dressings***

| Dressing name (manufacturer) | Content |
|---|---|
| Acticoat™ (Smith & Nephew) | Silver coated rayon and gauze dressing containing nanocrystalline silver |
| Aquacel™ Ag (Convatec) | Silver impregnated dressing with hydrofibre composed of hydrocolloid and 1.2% ionic silver |
| Atrauman Ag (Paul Hartmann) | Polyamide mesh wound contact layer impregnated with neutral triglycerides and coated with metallic silver |
| Biatain™ Ag (Coloplast) | Adhesive polyurethane foam impregnated with silver |
| Contreet™ (Coloplast) | Hydrocolloid foam dressing impregnated with ionic silver |
| Flamazine™ (Smith & Nephew) | Cream containing silver sulfadiazine 1.0% w/w S4 requires doctor's prescription |
| Mepilex™ Ag (Mölnlycke) | Foam dressing containing ionic silver |
| PolyMem™ Silver (Ferris) | Contains nanocrystalline silver particles (nominally 124 micrograms of silver/cm$^2$) distributed throughout a foam pad does not release silver into the wound bed |
| Kerlix™ AMD (Covidien, Kendall) | Gauze dressing impregnated with 0.2% polyhexamethylene biguanide (PHMB) |
| Iodosorb™ (Smith & Nephew) | Cadexomer iodine: slow release polysaccharide lattice formed into spherical microbeads that contain iodine 0.9%. Tissue iodine supply is at a 0.1% concentration |
| Inadine™ (Systagenix Wound Management) | Non-adherent dressing impregnated with 10% povidone–iodine |
| Medihoney™ (Medihoney) | Medical-grade honey incorporated into a variety of presentations |
| Sorbact™ | Non-medicated dressing that has a unique bacterial binding action using the principle of hydrophobicity to remove bacteria and fungi from a wound. |
| Prontosan™ | Contains polyhexamethylene biguanide (PHMB) antimicrobial agent and betaine (surfactant). Comes in a solution and a gel. Used for cleansing, rehydrating and decontaminating acute and chronic wounds. |

*(Adapted from Cowan 2011; Carville 2012; Bradbury & Fletcher 2011; Probst et al 2012)*
*List is not exhaustive. Refer to manufacturer for product information. All trademarks acknowledged.

### Moisture imbalance

Exudate production is a normal part of wound healing. Excessive wound exudate can lead to maceration of the peri-wound skin. Absorbent dressings assist with removal of excessive exudate to re-establish moisture balance. Too little moisture in a wound desiccates the cells and in this situation additional moisture (e.g. a hydrogel dressing) can help maintain a moist wound bed. Chronic wound fluid differs from acute wound fluid. Chronic wound fluid contains high levels of tissue enzymes known as matrix metalloproteinases (MMPs) that are destructive to new tissue growth (Trengove et al 1999).

### Edge of wound non-advancing or undermined

Failure to address the above three elements of TIME will result in the non-migrating keratinocytes and a non-responsive wound.

## Pain

Pain is a significant factor affecting the quality of life for a person with wounds and in one study of people living with a chronic leg ulcer was found to be the most common feature strongly expressed (Douglas 2001).

Causes of pain vary and include procedural, operative, incident and background pain (Briggs et al 2004). Assessment of pain occurs with an initial history taking and is performed before, during and after wound care and documented in the person's medical records. The goal is to minimise pain. Pain scoring can indicate how the wound is progressing; for example, worsening pain can be a sign of infection. Visual or numerical scales can be used to assist in the assessment of pain. Providing adequate and effective analgesia is vital in controlling pain especially at dressing changes and can include oral and topical analgesia.

Dressing selection can affect wound pain. Dressings that provide a moist wound environment and can stay in place for several days, and therefore require less frequent dressing changes, reduce the risk of trauma to the wound and surrounding skin. Soft silicone dressings facilitate non-traumatic removal and can be considered to reduce pain at dressing changes. Avoiding unnecessary handling of the wound at dressing changes can also lessen the pain experienced by the

person. Asking and documenting the types of interventions that worsen or lessen wound pain contribute to the continuing assessment of an individual's pain history.

## Wound debridement

Wound debridement is intended to remove necrotic tissue or fibrous slough from a wound to clean and prepare the wound bed for healing. A variety of debridement modalities are available in clinical practice. Each one listed below will have their own clinical indications, benefits, limitations, precautions, contraindications and requirements for equipment, knowledge and skill. Healthcare professionals are bound by both professional and ethical codes of conduct and regulated by the boundaries of their individual scope of practice. It is imperative that the healthcare professional ensure that they have reviewed local policy regarding debridement, gained appropriate education and training to perform debridement and undertaken risk assessment as part of their clinical decision-making process. As part of the risk assessment important considerations must include the person, their wound, the healthcare practitioner, the health setting and available resources (White & Asimus 2014).

### Autolytic debridement

This method occurs spontaneously in most wounds as macrophages and proteolytic enzymes liquefy and separate non-viable tissue and slough, promoting granulation tissue. Dressings that create or maintain a moist wound environment will assist autolysis. Hydrogels will donate water to necrotic tissue or dry fibrin slough. Hydrocolloids gel on contact with wound exudate and create a moist environment. Film dressings are permeable to water vapour but impermeable to water, bacteria and microorganisms and help to create and maintain a moist wound environment.

### Enzymatic debridement

Enzymatic debridement is a less common method of debridement. Enzymatic agents are applied topically to the wound and work with endogenous enzymes to remove non-viable tissue. They need to be replaced frequently to maintain effectiveness. Several enzyme agents are available but not in all countries. The only enzymatic dressing available in Australia is a hydrogel Flaminal™.

### Mechanical debridement

***Wet-to-dry*** Wet-to-dry dressings are one of the oldest methods of mechanical wound debridement. Wet gauze dressings are applied to the wound and when dry, stripped from the wound, indiscriminately removing necrotic tissue or fibrin slough. They can also remove healthy tissue, causing bleeding. They are not generally recommended as they can cause pain to the individual and can inhibit wound healing (see Clinical Interest Box 29.6).

***Hydro-surgical debridement*** Hydro-surgical debridement is a form of mechanical debridement though under more controlled conditions. Hydro-surgical debridement uses a high-pressure water jet pushed through a suitable hose to the tip of a procedure-specific hand piece. This method is fast and precise in the hands of a skilled operator such as a surgeon for excising unwanted tissue. Its use in practice is mostly in burn injuries and vascular leg ulcers.

***Low-frequency ultrasound debridement*** Low-frequency ultrasound debridement (LFUD) uses lower frequencies than are used in imaging or other forms of therapy. Sound waves produce energy which is transferred to the wound via a hand piece using continuous movement and fluid (normal saline). This causes cavitation and acoustic streaming, which in turn break down devitalised tissue promoting wound debridement. This type of debridement promotes efficient wound bed preparation and offers an alternative to surgical/sharp debridement. Specialised equipment, training and skills are required to undertake LFUD, along with adequate local anaesthetic and pre-emptive analgesia to prevent and minimise discomfort during and post procedure.

### Biological (larval therapy) debridement

In the biological debridement method, sterile maggots are applied to a wound, covered with a sterile semi-permeable dressing and allowed to sit for 1 to 3 days before being removed. The maggots will only 'eat' non-viable tissue and fibrin slough. The procedure is painless though not socially agreeable to all individuals and nurses.

### Surgical and conservative sharp wound debridement

Surgical sharp debridement is the fastest and most effective method of debridement and is performed by a surgeon in an operating theatre under general or local anaesthesia. It is considered when the presence of non-viable tissue is extensive (Joanna Briggs 2014a). With this method all non-viable tissue and slough is removed until a clean, healthy wound bed is exposed. Conservative sharp wound debridement (CSWD) is the removal of loose avascular tissue without (or with very minimal) pain or bleeding. It is appropriate when there is a moderate amount of non-viable tissue (Joanna Briggs 2014a). Sharp scissors, scalpels, forceps and curettes can be used to remove dead tissue. Some pain may be experienced with this method; the use of a topical anaesthetic cream can be applied prior to debridement to help allay the person's concerns. CSWD can be performed by a competent healthcare professional who has undergone relevant education and training and is subject to workplace policies and procedures (Joanna Briggs 2014a).

## CLINICAL INTEREST BOX 29.6
## Clinical note: surgical debridement

It is important to note that in cases where peripheral vasculature is poor, or has not been assessed and investigated, aggressive debridement and moist wound dressings are not indicated as new tissue growth cannot be supported.

*(Adapted from WUWHS 2008; Wounds UK 2011)*

## Managing wound infection

The deleterious effect of infection in wounds is well recognised. Effectively managing wound infection requires optimising the host (person) response, minimising risk factors where possible, reducing bacterial load and managing signs and symptoms such as fever and pain. Regular re-evaluation of the individual and the wound and adjustment in treatment is necessary to assess and optimise the effectiveness of treatment. A systemic antibiotic should be considered for locally infected wounds and spreading infection in a wound.

Managing bioburden (removal of non-viable tissue, preventing and controlling infection and maintaining moisture balance) is essential for wounds to progress to healing. This should be directed by the clinical response of the tissue and individual to the treatment and not dictated by strict times; for example, 2 weeks of antibiotic therapy or the length of time an antimicrobial dressing is used. This means adjusting therapy to the clinical signs and symptoms of infection with the use of topical antimicrobial agents. For example, if the wound is progressing after a week of topical antimicrobial therapy then the therapy may be stopped. See Table 29.4 and Clinical Interest Box 29.5 for definition of antimicrobial agents. If the wound is unchanged after the introduction of therapy, then reassessment and alternative topical therapies need to be used (Swanson et al 2014; WUWHS 2008). Gaining early control requires detection of subtle changes, especially in the chronic wound, such as a reduction in wound odour and reduction in pain. Wound infection requires prompt management to prevent the spread of infection systemically.

Diagnosing wound infection is a combination of clinical signs and symptoms (see Clinical Interest Box 29.4), full systems evaluation, assessment of medications and comorbidities. Microbiological analysis can be used to assist diagnosis. This can be achieved by wound swabbing, wound biopsy or needle aspiration. Wound swabbing might help to detect the causative microorganisms but can also be misleading as it will detect only surface microorganisms, not those in the deeper tissue and there is little supporting evidence of the role of wound swabs in identifying infection (Swanson et al 2014; WUWHS 2008). Results from a wound swab should not be used in isolation to diagnose a wound infection. When a wound swab is to be taken to assist in diagnosing the causative microorganism, clean the wound first with tap water or normal saline and where appropriate debride non-viable tissue. There is no agreed best technique (e.g. Z-technique, Levine, cleansing or no cleansing before swabbing) for wound swabbing. It has been reported that the Levine technique is perhaps the more accurate method for identifying infection (Angel et al 2011; Gardner et al 2006). This technique uses a swab that is rotated over a 1-$cm^2$ area of the wound surface with enough pressure to squeeze fluid from within the wound tissue. See Clinical Skill 29.1 for guidelines on performing a wound swab.

To prevent further wound contamination or cross contamination, infection control procedures should be used to protect the individual and the wound. This includes thorough hand hygiene and the use of suitable protective clothing and gloves at dressing changes. The wound should be cleansed at each dressing change with an appropriate wound cleanser; this can be sterile normal saline or water. Absorbent dressings are used to manage excess exudate. Topical negative pressure therapy can be used for wounds with high volumes of exudate. Serial debridement of non-viable tissue will reduce the medium for bacterial growth and remove biofilms.

### Topical antimicrobial dressings/agents

Topical antimicrobial dressings contain agents that are capable of killing bacteria (bacteriocidal) commonly found in wounds. These agents are impregnated into various wound dressing materials and include silver, iodine, honey, chlorhexidine, polyhexamethylene biguanide (PHMB) and glucose oxidase enzyme systems. Topical antimicrobial dressings can assist in treating local infection in wounds and reduce the risk of infection in immune-compromised people at risk of infection, such as those with diabetes. Systemic antibiotic use should be considered in spreading infection in a wound. Topical antibiotics should be avoided for use on infected wounds to minimise the risk of allergy and the emergence of bacterial resistance (Swanson et al 2014; WUWHS 2008).

Examples of these dressings are listed in Table 29.4 and Clinical Interest Box 29.5 outlines the difference between disinfectants, antibiotics and antiseptics.

## Wound dressings

There are many different types of wound dressings available from numerous manufacturers; therefore, the clinician involved in wound care requires a sound clinical knowledge of how the main groups of dressings perform. Dressings do not heal wounds, but appropriately selected dressings can enhance the body's ability to heal. Maintaining a moist wound bed provides the optimum environment to promote healing (Winter 1962) and forms the foundation for contemporary wound care practice.

The ideal dressing will have many of the attributes listed below:

- Maintains a moist wound environment
- Allows for gaseous exchange
- Provides an effective bacterial barrier
- Protects wound and surrounding tissues
- Promotes comfort and reduces pain
- Maintains an optimal wound temperature and pH
- Controls and prevents odour
- Manages exudate
- Assists to prevent or manage clinical infection
- Covers wound from view of individual and/or significant others
- Does not shed damaging substances into the wound
- Is easy to apply and wear
- Produces minimal pain on application and removal.

Dressings are generally categorised by mode of action or material. Holistic assessment and individual focused outcomes identify the characteristics that determine the specific

## CLINICAL SKILL 29.1 Wound swab

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Gloves<br>Wound swab kit<br>Wound dressing<br>Biohazard specimen bag<br>Laboratory request form<br>Apron<br>Adhesive tape<br>Waste receptacle |

| **Skill activity** | **Rationale** |
|---|---|
| Wound swabs are often taken at the time of wound dressing changes. These are taken when the wound is suspected of containing microorganisms. Identification of the microorganism will enable correct treatment regimens to be implemented. | |
| Assess the individual's record to determine previous appearance of wound and any previous dressings<br>Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for pain<br>Assess for any allergies<br>Visually assess the wound for signs and symptoms of infection | Determines requirements for equipment and dressing requirements<br>Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Pain may be caused during the procedure<br>Determines any adverse reactions to wound irrigation solution, dressing or tape (if required) |
| Assist the individual to assume an appropriate position of comfort, ensuring that only the wound area is exposed<br>Obtain additional assistance if required | Promotes comfort and facilitates performance of the procedure<br>Assistance is available when required |
| Perform hand hygiene | Prevents the spread of infection |
| Place the equipment in a convenient location near the bedside. Open procedure pack using corners. Assemble the required equipment, using aseptic technique. Drop sterile equipment into sterile field | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the dressing is being performed<br>Prevents contamination of sterile items<br>Additional items are available for use |
| Perform hand hygiene and loosen wound dressing | Prevents spread of microorganisms and allows ease of removal of wound dressing |
| Put on apron. Perform hand hygiene, apply gloves if required. If other PPE required put on before gloves | Prevents spread of microorganisms |
| Position dressing towel around the wound, remove old dressing and place in waste bag/container | Protects the wound from environmental contamination |
| Dispose of gloves and perform hand hygiene<br>Put on clean non-sterile gloves | Removes microorganisms and prevents cross-contamination |
| Cleanse the wound with normal saline. Open the swab container, move the swab in a zig-zag motion across the wound surface, rotating during swabbing, and cover at least a 1 cm square area using gentle pressure. Replace swab back into culture medium. Repeat with another swab if required | Removes excessive debris and any dressing residue. Don't swab pus or exudate as these surface organisms may contain contaminants that are different from those causing the wound infection<br>Prevents swab from becoming contaminated. If the wound is fairly dry the swab may be moistened with sterile normal saline; if the wound is moist the swab can be used dry |

*Continued*

| CLINICAL SKILL 29.1 Wound swab—cont'd | |
|---|---|
| Label specimen according to facility/organisation policy. Place in specimen bag. After the wound care is completed, dispatch specimen to the laboratory with the request form. Only store specimen in refrigerator if a delay of more than 24 hours between collection and transport to the laboratory is expected | Decomposition and cell growth occur if specimen is left standing, and may provide a false result<br>On the specimen, ensure the following are clearly labelled: individual's name, DOB and UR number; type of specimen; date and time of specimen |
| Remove gloves and perform hand hygiene | Prevents spread of microorganisms |
| Put on clean gloves. Apply wound dressing as required using aseptic technique | Covers wound and prevents spread of microorganisms |
| Remove and attend to the equipment appropriately. Perform hand hygiene | Prevents spread of microorganisms |
| Assist the individual to reassume a comfortable position | Promotes comfort of individual |
| Report and document all relevant information including type and date of specimen correctly in the healthcare record. Communicate abnormal findings to Registered Nurse/medical officer and any complications | Medico-legal requirement. Allows for the planning and implementation of care |
| *(ACSQHC 2012; 2015; AWMA 2010; Berman et al 2015; Crisp et al 2013; LeMone et al 2014; Lynn & LeBon 2012; NHMRC 2010; NMBA 2013; 2016; Rebeiro et al 2013; Rowley & Clare 2011; Smith et al 2011)* | |

ideal dressing. The criteria listed above will be available in a dressing product which can be selected to meet the needs of the wound—to promote healing and achieve the desired individual-focused outcomes. Table 29.5 gives some examples of dressings and their actions.

Wound dressings can be classified into three main types:

1. Wound hydration products
2. Moisture-retentive dressings
3. Exudate-management products.

See Clinical Skill 29.2 for information and guidelines on dressing a wound.

## Wound hydration products

Wound hydration products provide additional moisture to dry wounds or wounds with dead (necrotic) or sloughy tissue and are usually in the form of a gel. These products are composed of mostly water, bound together by cross-linked polymers. They can be used as cavity fillers in smaller wounds with minimal exudate. These dressings require a secondary dressing to hold the gel in the wound and require daily to third-day changing depending on how quickly the gel is utilised by the wound. These dressings are not suitable for wounds with high amounts of exudate.

## Moisture-retentive dressings

Moisture-retentive dressings keep the wound bed moist, assisting keratinocytes to migrate across the surface of the wound, for example hydrocolloids. These dressings are used on light-to-moderately exuding wounds. They generally have a waterproof outer layer and are composed of hydrophilic particles (cellulose) and come in various thicknesses, shapes and sizes. These dressings aid the process of natural autolysis and stimulate granulation and re-epithelialisation. They retain moisture and are the ideal secondary dressing to support wound hydration. They can be left in position for several days, do not adhere to the wound, allow the passage of oxygen to the wound and are impermeable to microorganisms and water. Some of the dressings allow visual inspection of the wound. These dressings are comfortable for the individual and alleviate pain because they protect exposed cutaneous nerve endings.

## Exudate management dressings

Exudate management products absorb exudate from the wound surface and hold it within the dressing as well as transpiring fluid. These dressings are calcium alginates, which are composed of polysaccharides derived from seaweed; polyurethane or silicone foam dressings; hydrofibre dressings, which are made from sodium carboxymethylcellulose; and the combination dressings, which marry the technologies of hydrocolloids and the absorption capacity of baby nappy technology.

## Negative pressure wound therapy

Negative pressure wound therapy (NPWT) is the application of sub-atmospheric pressure to a wound. This type of therapy has increased in use over the past 10 years and is now a regular aspect of wound care, with several versions available (Henderson et al 2010). It is used to absorb and control large volumes of exudate that are difficult to manage with absorbent dressings. It can be used on a variety of wound types: abdominal dehiscence, diabetic foot ulcers, burns, venous leg ulcers, surgical infections, skin grafts, orthopaedic trauma and soft tissue trauma. It is considered when the wound is

## TABLE 29.5 | Examples and action of wound dressings*

| Dressing | Action |
|---|---|
| Island dressings | Low amounts of exudate<br>Use as primary dressing<br>Waterproof<br>Non-adherent wound contact layer |
| Semi-permeable film dressings | Nil to low amounts of exudate<br>Semi-permeable<br>Use as a primary or secondary dressing |
| Foam dressings | Adherent or non-adherent variants<br>Sheets or cavity-filling shapes<br>Some incorporate a semi-permeable, waterproof, adhesive layer as an outer layer of the dressing<br>Moderate to high absorbency<br>Provides protection and conforms<br>Facilitates a moist wound environment, but may not be sufficient to promote autolysis of sloughy tissue<br>Use as a primary or secondary dressing |
| Silicone dressings | Minimise wound trauma on removal<br>Conform to different anatomical shapes<br>Extended wear time<br>May require a secondary dressing |
| Calcium alginates | Natural polysaccharide from seaweed<br>Reduce pain by protecting nerve endings (moisture)<br>Low allergenic<br>Biodegradable<br>Adaptable to pack sinuses and cavities<br>Absorbent—small amounts<br>Promote haemostasis in bleeding wounds |
| Hydrocolloids<br>Sheets, paste and powder | Absorb small amounts<br>Clean and debride (assist autolysis)<br>The paste and powder variants reduce dead space in cavity wounds and can be easily irrigated out of a wound |
| Hydrogels available in amorphous gels, sheets or hydrogel impregnated dressings | Provide additional moisture to dry wounds<br>Act as debriding agent by softening dead tissue (assist autolysis)<br>Use as primary dressing<br>May need a secondary dressing<br>Gel sheets allow inspection of the wound through the dressing and can remain in situ for several days |
| Gelling fibre (Hydrofibre is a trademark term) | Promotes a moist wound environment<br>Vertical and lateral wicking of exudate<br>Atraumatic removal<br>Use as primary dressing<br>May need a secondary dressing |
| Odour absorbing | Incorporates activated charcoal<br>Absorb bacteria<br>Eliminate odour<br>Absorb exudate<br>May be used as a primary dressing<br>May need a secondary dressing |
| Acrylic dressings | Transparent adhesive allows for wound monitoring without removing dressing<br>Absorbent<br>Waterproof, semi-permeable |

*Continued*

**TABLE 29.5 | Examples and action of wound dressings—cont'd**

| Dressing | Action |
|---|---|
| Hypertonic saline impregnated | Creates an osmotic action to cleanse the wound by wicking away necrotic tissue and purulent debris<br>Inhibits bacterial growth by changing the pH of the wound<br>Reduces odour<br>Maintains a moist wound environment<br>Reduce wound oedema<br>May be effective in reducing hypergranulation tissue<br>Will require a secondary dressing |
| Cadexomer iodine | Iodine is progressively released into the wound<br>Absorbs exudate 6–7 times its weight<br>Converts to a gel and promotes moist wound healing<br>Provides a broad spectrum antimicrobial effect<br>Reduces the pH of the wound enhancing the antimicrobial effect<br>Reduces odour<br>Will require a secondary dressing<br>Contraindicated for people with allergies to iodine, thyroid disease, pregnancy or lactating mothers, or children |
| Silver dressings | Silver is a broad-spectrum antimicrobial agent<br>Silver comes in a range of dressings: foams, calcium alginate, hydrofibre and synthetic fabric<br>Not all dressings release silver into the wound bed |
| Polyhexamethylene biguanide (PHMB) | Has broad-spectrum antibacterial properties<br>Non-cytotoxic or non-irritant<br>May require a secondary dressing |
| Wound honey | Promotes moist wound healing<br>Promotes autolytic and osmotic debridement<br>Has an antimicrobial activity due to a slow release of low levels of hydrogen peroxide<br>Controls malodour<br>May cause some stinging sensations<br>Requires a secondary dressing |
| Negative pressure wound therapy | Provides a moist wound environment<br>Reduces bacterial colonisation<br>Promotes localised blood flow<br>Reduces localised oedema<br>Foam or gauze is used to reduce dead space in wound<br>Promotes granulation and epithelialisation<br>Facilitates collection of wound exudate<br>Reduces the need for frequent dressing change |

*List is not exhaustive. Please refer to manufacturer for product information. All trademarks acknowledged.
*(Adapted from Cowan 2011; Carville 2012; Wounds UK 2011)*

not healing in the expected time frame, the wound is in an awkward location or difficult size to dress or a reduction in wound size is required before surgical closure (Henderson et al 2010).

NPWT is a closed suction and drainage system and consists of a wound filler, an adhesive wound sealer with a drainage tube connected to a vacuum pump that has an attached fluid collection canister. These devices are portable, allowing the individual to mobilise and to be managed in the community. Pressure settings vary from −80 mmHg to −125 mmHg and depend on the wound type. For example, a thin skin graft will require less pressure than an abdominal wound dehiscence. Negative pressure can be applied continuously or intermittently, though continuous suction is more common, especially for wounds with large volumes of exudate.

Two types of wound interface are used: gauze and foam. Both have been shown to be effective (Campbell et al 2008). Foam tends to produce a thicker granulation tissue with gauze producing a less thick but denser granulation tissue (Borgquist et al 2010). A wound contact layer is often placed

## CLINICAL SKILL 29.2 Dressing a wound

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile dressing pack and dressing materials<br>Additional light source (if required)<br>Gloves<br>Disposable apron<br>Normal saline<br>Additional cotton balls or gauze balls<br>Waste receptacle<br>Dressing trolley<br>Mask and eye protection as required |

| **Skill activity** | **Rationale** |
|---|---|
| Wound dressings are undertaken to provide a moist cover for the wound to prevent the introduction of microorganisms and to promote healing. They also absorb exudate. | |
| Assess the individual's record to determine previous appearance of wound and any previous dressings<br>Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for pain<br>Assess for any allergies<br>Visually assess the wound for signs and symptoms of infection and dressings used | Determines requirements for equipment and dressing requirements<br>Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Pain may be caused during the procedure<br>Determines any adverse reactions to wound irrigation solution, dressing or tape (if required) |
| Assist the individual to assume an appropriate position of comfort, ensuring that only the wound area is exposed<br>Obtain additional assistance if required | Promotes comfort and facilitates performance of the procedure<br>Assistance is available when required |
| Place the equipment in a convenient location near the bedside. Open procedure pack using corners. Assemble the required equipment, using aseptic technique. Drop sterile equipment into sterile field | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the dressing is being performed<br>Prevents contamination of sterile items<br>Additional items are available for use |
| Perform hand hygiene and loosen wound dressing | Prevents spread of microorganisms and allows ease of removal of wound dressing |
| Put on apron. Perform hand hygiene, apply gloves if required. If other PPE required put on before gloves | Prevents spread of microorganisms |
| Position dressing towel around the wound, remove old dressing and place in waste bag/container | Protects the wound from environmental contamination |
| Dispose of gloves and perform hand hygiene<br>Put on clean non-sterile gloves | Removes microorganisms and prevents cross-contamination |
| Observe the wound for size, union, signs of infection, exudate, odour, inflammation and healing. Assess for pain | Evaluates condition of the wound and stage of healing |
| Cleanse the wound with sterile normal saline in accordance with the practices of the facility/organisation, medical officer's orders or as directed by the nurse in charge. Clean from top to bottom and from a clean area towards a less clean area, usually an outward direction. | Wound cleansing removes debris from the wound. Avoids transferring wound exudate and normal flora from the surrounding skin into the wound, and thus prevents wound contamination |

*Continued*

| CLINICAL SKILL 29.2 Dressing a wound—cont'd | |
|---|---|
| Apply dressing using a non-touch technique and secure it in position. If ordered, wound may be left exposed to the air | Provides a moist wound environment. Facilitates healing, absorbs exudate, protects the wound from infection and irritation (e.g. from clothing) |
| Remove personal protective equipment and discard with used equipment in an appropriate waste receptacle. Perform hand hygiene | Prevents spread of microorganisms |
| Assist the individual to reassume a comfortable position | Promotes comfort of the individual |
| Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer | Provides relevant information to other members of the healthcare team. Include date and time, appearance of wound and any exudate, cleansing solution, type of primary and any secondary dressing used, and the individual's response to the dressing. Medico-legal requirement. Allows for the planning and implementation of care |
| *(ACSQHC 2012; 2015; AWMA 2010; Berman et al 2015; Crisp et al 2013; LeMone et al 2014; Lynn & LeBon 2012; NHMRC 2010; NMBA 2013; 2016; Rebeiro et al 2013; Rowley & Clare 2011; Smith et al 2011)* | |

under the foam interface when there is concern there may be complications, or there is exposure of vulnerable structures (Dunbar et al 2005). Tissue growth into the foam interface has been reported in the published literature (Borgquist et al 2009), which is why a wound contact layer is placed under the foam. The function of the wound filler is to deliver negative pressure to the wound. Use of either depends on various factors. For example, foam may be used in areas of large tissue loss where contraction of tissue is required before closure. Gauze may be more beneficial when the wound surface is irregular and cosmetic outcome is important.

A newer smaller device is also available that does not rely on a fluid canister for exudate collection, making it extremely portable. This device (PICO™, Smith & Nephew Australia Pty Ltd) has a specialised dressing that absorbs and transpires exudate. The dressing has a tube connection to a small pump that delivers a fixed negative pressure (–80 mmHg).

NPWT offers several benefits:

- Stimulates new tissue growth (granulation)
- Reduces tissue oedema and manages wound exudate
- Increases the rate of wound healing reducing the wound area
- Helps control bacterial burden (removes exudate which contains bacteria)
- Maintains a moist wound environment
- Causes a reduction in pain
- Removes slough
- Reduces the number of dressing changes required.

Certain factors need to be considered before applying NPWT:

- Effective management of the individual's symptoms
- Dimensions of the wound and ease of application
- Placement of tubing
- Care setting (e.g. home, hospital) and who will care for therapy
- Effective debridement of wound bed
- Ability of the individual to give consent to treatment (adapted from Henderson et al 2010).

There are also several contraindications for NPWT:

- Untreated osteomyelitis
- Necrotic tissue in the wound
- Exposed organs or blood vessels
- Malignancy in the wound bed (except in palliative care cases)
- Unexplored fistulas.

Therapy should be stopped when there is uniform granulation tissue in the wound and the wound's depth has decreased.

See Table 29.6 and Clinical Interest Boxes 29.7 and 29.8 for discussion on the right dressings for the right wound, an outline of the basic factors to consider when selecting a dressing and the myth about wound cleansing, respectively.

**CRITICAL THINKING EXERCISE 29.1**

What factors do you take into account in terms of selecting an appropriate dressing product for a given wound type?

# PATHOPHYSIOLOGICAL EFFECTS AND MAJOR MANIFESTATIONS OF SKIN DISORDERS

## Pathophysiological influences and effects

The major factors that affect normal structure and functions of the skin can generally be classified into six categories:

1. Genetic factors
2. Idiopathic causes
3. Hypersensitivity

## TABLE 29.6 | The right dressing for the right wound

Modern wound dressings improve healing time, reduce pain, reduce the time required to dress the wound and require less frequent changes. It is important to use the most appropriate dressing for the wound at the appropriate stage of healing. One dressing will not suit the entire wound healing process. Match the action of the dressing to the aim of the treatment.

| Condition of wound bed | Aim of treatment | Examples of dressings |
|---|---|---|
| Non-viable tissue (black, hard, dehydrated, necrotic) | Rehydrate, debride, promote granulation tissue | Hydrogels |
| Slough (soft, yellow, creamy or fibrous) | Debride slough, promote granulation, absorb excess exudate | Hydrogels (low exudate only), alginates, hydrofibres, hydroactive dressings, cadexomer iodine, hydrocolloids (small to moderate exudate only) |
| Granulating (red, moist) | Retain moisture, promote and protect granulation tissue and epithelialisation, absorb excess exudate | Foams, alginates, hydrofibre, hydroactive dressings, hydrocolloids, hydrogels |
| Epithelialising (pink wound, evidence of epithelial growth on surface) | Retain moisture, promote and protect epithelialisation | Foams, hydrocolloids (thin), non-adherent dressings, polyurethane films |
| Infected (local or spreading) | Treat infection with systemic antibiotics (spreading infection), topical antimicrobial dressings, absorb excess exudate, debride slough | Silver-impregnated dressings, antimicrobial dressings (i.e cadexomer iodine), medical honey, PHMB-impregnated dressings, Prontosan gel, hydrophobic antimicrobial dressing (i.e. Sorbact) |

*(WUWHS 2008)*

## CLINICAL INTEREST BOX 29.7 Factors to consider when selecting a dressing

- Wound type: superficial, full thickness, cavity
- Wound description: granulating, epithelialising, necrotic, sloughy, infected
- Wound characteristics: dry, moist, heavily exuding, malodorous, excessively painful, difficult to dress, bleeds easily
- Bacterial profile: sterile, colonised, infected, infected and potential source of cross-infection

*(http://www.amwa.com.au)*

## CLINICAL INTEREST BOX 29.8 A myth in wound cleansing

**Myth**: Individuals with wounds should not let the wound come into contact with shower water.

**Fact**: Showering an individual with a postoperative wound does not increase the risk of infection or slow the healing process. It does promote a sense of wellbeing and health associated with cleanliness. Showering of chronic wounds and ulcers may be undertaken with caution. Tap water should not be used if declared unsuitable for drinking. Tap should be run for 15 seconds prior to use.

*(Joanna Briggs Institute 2014b)*

4. Trauma
5. Neoplasia
6. Infections and infestations.

### Genetic factors

Genetic factors determine skin colour and the amount and distribution of hair. Congenital skin disorders include birthmarks, hypopigmentation (albinism) and a condition called ichthyosis, which involves excessive scaling or thickening of the outermost skin layer. Heredity also plays a role in predisposition to the development of acne and atopic dermatitis.

### Idiopathic causes

Many skin disorders have no one known cause, for example, vitiligo and psoriasis. Other skin disorders may be associated with emotional or physical stress but there does not seem to be any one identifiable cause.

### Hypersensitivity

Some individuals have a tendency to react adversely to contact with various substances; for example, when a substance is inhaled, ingested or comes in contact with the skin. Some allergic reactions are manifested in alterations in the skin; for

example, reddening and itching of the skin may be side effects of certain medications.

### Trauma

Damage to the skin can result from exposure to extremes of temperature, from prolonged pressure on the skin or from physical injuries resulting in lacerations, punctures or abrasions.

### Neoplasia

Any abnormal growth of new tissue, whether benign or malignant, is called a neoplasm. Examples include calluses, which can develop on the toes from friction and chronic pressure, or keloid scarring, which can result after injury to the skin. Benign or malignant neoplasms may develop from any type of cell in the skin, but the melanocytes and keratinocytes are the cells most frequently involved. A mole (naevus) is a common type of benign skin tumour. Some benign epithelial cell lesions may develop into malignant neoplasms.

### Infections and infestations

If the skin is broken and pathogenic microorganisms gain entry, infection may result.

Primary skin infections are commonly caused by bacteria, fungi and viruses. Secondary skin infections may occur in conditions such as stasis dermatitis, in which impaired circulation damages skin cells of the lower limbs.

Systemic infections, such as measles, chickenpox and some sexually transmitted infections, also result in manifestations on the skin. Skin infestations occur when parasites such as lice or mites invade and subsist on the skin.

## Major manifestations of skin disorders

Various structural and functional changes accompany skin disorders.

### Pruritus

Pruritus (itching) is one of the more common and distressing symptoms of a skin disorder. Pruritus is thought to result from a disruption in the skin nerve endings. Scratching to relieve pruritus can result in tissue damage and infection, thereby causing further discomfort.

### Lesions

Depending on the type of skin disorder, one or a variety of lesions may be present. Observation of the individual includes assessing any lesions to determine their shape, size and distribution. Table 29.7 lists and describes the various types of skin lesions. Some types of lesions may discharge fluid, which is referred to as exudate.

### Alterations in sensation

In addition to pruritus, the individual may experience other abnormal skin sensations such as numbness, tingling, burning or pain.

### Alterations in skin colour

Disorders of the skin may be accompanied by darkened areas of skin (hyperpigmentation), patches of pale skin (hypopigmentation) or inflammation. Burned skin may be reddened, blanched or charred, depending on the extent of the burn. Cold injuries can result in red areas, as in chilblains, or in extreme pallor, as in frostbite.

### Alterations in skin temperature

In certain skin disorders such as bacterial infection the skin may feel hot to touch, whereas in other conditions such as frostbite the skin is cool to touch.

### Alterations in texture

Abnormalities of texture, for example, roughness or hardness, may result from the presence of certain types of lesions such as scabs or papules. Scaling may occur, or the skin may be thick, wrinkled or atrophied. Some skin disorders may result in areas of oedema; for example, injuries from heat or cold.

### Presence of an odour

Certain skin disorders, particularly those that are accompanied by oozing lesions, may give rise to an offensive odour.

### Systemic manifestations

Certain skin disorders, such as acute contact dermatitis or carbuncles, may be accompanied by systemic effects such as fatigue, nausea, headaches and an elevated body temperature.

# SPECIFIC DISORDERS OF THE SKIN

## Genetic disorders

Genetic disorders are those that are present at birth, become evident soon after birth or those that may be passed on to the next generation.

*Acne vulgaris* is a chronic inflammatory condition involving the sebaceous glands and the pilosebaceous follicles, particularly of the face. A blackhead forms and blocks the opening of a sebaceous gland, which becomes infected. Later, a pustule forms. This condition is most often present in adolescents and young adults. Familial tendencies are thought to contribute to the cause or exacerbation of acne. Other causative factors include endocrine imbalances, use of oral contraceptives, hormone therapy, emotional stress and lack of personal hygiene.

*Ichthyosis* is any one of several inherited conditions in which the skin is dry, hyperkeratotic and fissured, resembling fish scales. It usually appears at, or shortly after, birth. Ichthyosis vulgaris is the most common type and the least severe.

## Idiopathic disorders

Idiopathic disorders are those in which no definite cause can be identified.

*Psoriasis* is a chronic skin disorder characterised by red patches covered by thick, dry, silvery scales. The lesions may be present on any part of the body but are more common on the extensor surfaces of the elbows and knees and on the scalp. Psoriasis can be exacerbated by trauma, infection, stress and the use of specific systemic medications.

**TABLE 29.7 | Skin lesions**

| Term | Description | Examples |
|---|---|---|
| Bulla | Elevated, filled with clear fluid. Similar to a vesicle, but larger | Pemphigus vulgaris, drug eruptions, partial thickness burns |
| Comedo | A plug of secretion contained in a follicle | Acne |
| Crust | A superficial mass caused by dried exudate | Impetigo, eczema |
| Cyst | Encapsulated mass in the dermis or subcutaneous layer. May be raised or flat, and contain fluid or solid material | Sebaceous cyst |
| Erosion | Moist, red, depressed break in the epidermis. Follows rupture of a vesicle or bulla | Chickenpox |
| Excoriation | Superficial break in the skin | Scratches, abrasions |
| Fissure | Deep, linear, red crack or break exposing the dermis | Tinea pedis |
| Macule | Small circumscribed discolouration (e.g. red, white, tan or brown) | Freckle, rubella, scarlet fever |
| Nodule | Circumscribed, elevated area—usually 1–2 cm in diameter | Ganglion, acne |
| Papule | Circumscribed, elevated, firm palpable area | Mole, wart, pimple |
| Plaque | Elevated, rough flat-topped areas | Psoriasis, seborrhoeic warts |
| Pustule | A vesicle or bulla containing pus | Acne, furuncle, folliculitis, impetigo |
| Scale | Mass of exfoliated epidermis | Dandruff, psoriasis |
| Scar (cicatrix) | Ranges from a thin line to thick, irregular fibrous tissue. May be white, pink or red | Healed surgical incision or wound |
| Tumour | Elevated, solid formation | Lipoma, melanoma, fibroma |
| Ulcer | Depressed circumscribed area involving loss of the epidermis, exposing the dermis, and may involve subcutaneous tissue | Decubitus ulcer, stasis ulcer |
| Vesicle | Circumscribed, elevated superficial area filled with clear fluid | Blister, herpes simplex infection, contact dermatitis |
| Weal | Transitory, elevated irregularly-shaped swelling of the epidermis | Urticaria, insect bites |

*Pityriasis rosea* is thought to be caused by a virus, and is characterised by a scaling, pink macular rash that spreads over the trunk and other parts of the body. The condition is self-limiting and usually disappears within 4–6 weeks.

*Vitiligo* is a benign disorder consisting of irregular patches of skin totally lacking in pigment.

*Seborrhoeic dermatitis* is a chronic inflammatory condition characterised by dry or moist, red scaly eruptions. Common sites are the scalp, eyelids, face and trunk. The scales have a greasy feel and yellow crusts. Cradle cap is one form of seborrhoeic dermatitis.

## Hypersensitivity disorders

These disorders result from an immediate or delayed reaction after exposure to a certain substance.

*Contact dermatitis* is caused by an irritant substance that comes into direct contact with the skin, such as detergents, hair dye, metals, preservatives, perfumes or specific fabrics. The resultant inflammation and skin rash may be mild or severe, depending on the individual's response. Chronic exposure to an irritant may result in the skin becoming reddened, scaly or cracked.

*Atopic dermatitis* usually occurs when there is a history of asthma and/or hay fever. The condition is characterised by pruritus, redness of the skin, papules and thickening of the skin. Common sites are the face and neck, behind the knees and in the cubital fossae and on the back of the hands.

*Urticaria* is a pruritic skin eruption characterised by transient weals with well-defined red margins and pale centres. Urticaria (hives) is most frequently caused by foods, insect

bites and inhalants. Specific types of urticaria are associated with systemic diseases. Pruritus associated with urticaria is frequently intense and is commonly accompanied by stinging, numbness or prickling sensations. Urticaria may also be a manifestation of an adverse reaction to a drug, and the skin lesions may appear almost immediately or several days after the drug has been absorbed. Drugs responsible for such adverse reaction include acetylsalicylic acid, penicillin and codeine.

*Pemphigus vulgaris* is an uncommon disorder of the skin and mucous membranes, characterised by the formation of large bullae containing clear fluid. The disorder is thought to result from an autoimmune response, and may be fatal if untreated. The bullae erupt, ooze and bleed readily, and death is often due to a secondary bacterial infection or loss of blood protein.

## Trauma

A traumatic injury, which involves damage to the skin, may be due to direct force, penetration or extremes of temperature.

*Erythrocyanosis* (chilblains) is redness and swelling of the skin as a result of excessive exposure to cold. Burning, itching, blistering and ulceration may occur; the areas most commonly affected are the toes, fingers, nose and ears.

*Frostbite* is the traumatic effect of extreme cold on the skin and subcutaneous tissues, characterised by pallor of the exposed areas, such as the nose, ears, fingers and toes. Vasoconstriction and damage to blood vessels impair local circulation, resulting in oedema, anoxia and necrosis.

*Immersion (trench) foot* is a condition of the skin on the feet that develops from continued exposure to wetness and coldness, such as prolonged immersion in cold water. The feet appear pale, cold and swollen, and the individual experiences tingling followed by loss of sensation.

*Burns* are injuries to the body tissues caused by heat, electricity or chemicals. Thermal burns include injuries caused by flame, steam or hot liquids. Electrical burns result from contact with an electrical current, and chemical burns most often result from contact with caustic substances. A burn may be minor or major, and the degree of local effects and systemic consequences depend on many factors, including the severity of the burn and the age of the individual. (More information on burns and the care of individuals with burns is provided later in this chapter.)

## Neoplasia

A *keloid* is a benign overgrowth of fibrous tissue at the site of a wound to the skin. The new tissue is elevated, thickened and reddened. Most keloids flatten and become less noticeable over a period of years. Keloids are more likely to develop if a wound has been infected or if the edges of a wound have been poorly aligned during healing.

*Sebaceous cysts* are one type of epithelial cyst and consist of a capsule containing a soft yellow–white material. These benign cysts are elevated and firm and range in size from about 0.2–5.0 cm.

A *lipoma* is a common benign tumour composed of adipose tissue, which is generally encapsulated in the subcutaneous layer of the skin. Lipomas vary in size and most frequently occur on the neck, back, thighs or forearms.

*Neurofibromatosis* is a congenital condition characterised by:

- Numerous neurofibromas of the skin and nerves
- Café-au-lait spots on the skin
- In some cases by abnormalities of the muscles, bones and internal organs.

Many large, pedunculated soft-tissue tumours may develop.

*Basal cell carcinoma* is a malignant lesion characterised by a shallow ulcer surrounded by a raised well-defined edge. Basal cell carcinomas may also be referred to as rodent ulcers. The most common site is the face, particularly the nose, eyelids and cheeks. Basal cell carcinomas usually occur in people aged over 40 and, as metastasis is rare, the prognosis is favourable.

*Squamous cell carcinoma* is a malignant lesion characterised by a firm, elevated painless nodule. The most common sites are areas of the body most often exposed to ultraviolet rays. Squamous cell carcinoma is most frequently seen in men over age 55 and, as metastasis is probable, this neoplasm has a higher mortality rate than basal cell carcinoma.

A *melanoma* is a malignant tumour that arises from melanocytes. The incidence of melanoma seems to be related to prolonged exposure to the sun, particularly by fair-skinned people. Because metastatic dissemination is relatively common, the mortality rate is high. In its pre-malignant stage, a melanoma appears as a flat, irregularly pigmented macule. Colour changes appear as the melanoma becomes malignant and invasive, with the colour ranging from red, brown and blue to black. Melanoma can occur on any part of the body but most frequently occurs in areas of the skin exposed to sunlight. There are many types of melanoma and, because of its invasive nature, the nodular type is the most serious. Australians have the highest rate of malignant melanoma in the world, and the incidence is particularly high in Queensland and other tropical regions.

## Infections and infestations

Because the surface of the body is constantly exposed to large numbers of pathogenic microorganisms, the skin is a potential area for infection. In addition, dermatological problems are often the result of infestation by parasites. Many factors increase a person's vulnerability to a skin infection, including ill-health, poor standard of hygiene or a break in the continuity of the skin. Bacterial skin infections include carbuncles, erysipelas, folliculitis, furuncles (boils), impetigo and paronychia.

A *carbuncle* is a cluster of staphylococcal abscesses or boils containing purulent matter. Eventually pus discharges to the skin surface through numerous openings.

*Erysipelas* is an acute streptococcal inflammatory infection involving subcutaneous tissue. The skin of the affected

area is bright red and oedematous, with a sharply defined border. The area may develop vesicles and the individual commonly experiences pain and an elevated body temperature.

*Folliculitis* is a common infection of the hair follicles, caused by staphylococci. Superficial or deep pustules are evident, and the most common site is the face.

A *furuncle (boil)* is an infection caused by either staphylococci or streptococci. A furuncle starts as a painful, hard, deep follicular abscess, and the overlying skin is hot to touch. The area becomes soft and opens to discharge a core of tissue and pus.

*Impetigo* is an acute contagious disorder of the superficial layers of the skin, caused by either staphylococci or streptococci. The condition begins as local erythema and progresses to pruritic vesicles which ooze, with the exudate from the lesion forming a yellow-coloured crust. Lesions usually form on the face and spread locally.

*Paronychia* is a painful inflammatory infection of the tissue around the nails.

*Viral skin infections* include herpes simplex and herpes zoster infections, and verrucae.

Herpes simplex virus (HSV) has an affinity for the skin and usually produces small irritating or painful fluid-filled blisters on the skin and mucous membranes. HSV-1 infections tend to occur in the facial area, particularly around the mouth and nose, whereas HSV-2 infections are usually limited to the genital region. The blisters erupt and thin yellow crusts form as the lesions begin to heal.

Acute infection with herpes zoster, or varicella-zoster virus (V-ZV), is characterised by the development of very painful vesicular skin eruptions that follow the underlying route of cranial or spinal nerves inflamed by the virus. After about 1 week the vesicles develop crusts, and the condition may last several weeks. The pain may last for much longer.

A *verruca (wart)* is caused by the human papilloma virus, and presents as a firm skin lesion with a rough surface. Different types of verrucae include those that commonly affect the hands, fingers or knees; and those that affect the genito-anal region.

*Fungal skin infections* include candidiasis and tinea. Candidiasis is any infection caused by a species of *Candida*, usually *Candida albicans*, characterised by pruritus, a white exudate, peeling and easy bleeding. Oral or vaginal thrush are common topical manifestations of candidiasis, as are red eroded patches in the genito-anal region.

Tinea (ringworm) is a group of fungal skin diseases caused by dermatophytes of several kinds. It is characterised by itching, scaling and painful lesions. Types of tinea include tinea capitis, affecting the scalp, tinea pedis, affecting the feet, and tinea corporis, affecting non-hairy smooth skin on the body.

Infestations of the skin by parasites include scabies and pediculosis. *Scabies* is a condition caused by a mite, *Sarcoptes scabiei*, and characterised by a papular rash, intense pruritus and excoriation of the skin from scratching. The sites most commonly affected are the thin-skinned areas between the fingers, flexor surfaces of the wrists and the inner aspect of the thigh. The mite burrows into the outer layers of the skin, where the female lays eggs. Small, thread-like red streaks appear where the mite has burrowed into the skin.

*Pediculosis* is infestation by blood-sucking lice, which causes intense pruritus, often resulting in excoriation from scratching. Different varieties of pediculi affect the hair on the scalp, the body or the pubic area. The lice can be seen with the naked eye, and their eggs (nits) can be seen as small pear-shaped bodies attached to the hairs.

### Diagnostic tests

To diagnose specific disorders of the skin a variety of tests may be performed.

#### Direct examination

A lesion may be examined using a magnifying lens, or a Wood's lamp may be used to determine the presence of fungal infections. Fungal infections such as ringworm show a characteristic fluorescence under black light.

#### Skin biopsy

The medical officer obtains a sample of skin or part of a lesion for pathological examination. Certain lesions may be surgically excised to provide sufficient tissue for histological diagnosis.

#### Microscopic examination

Specimens for microscopic examination may be obtained by gently scraping the scales or crusts of lesions. Exudate from oozing lesions may also be obtained for microscopic examination.

#### Skin testing

Skin testing may be performed to determine which substance or substances cause a hypersensitive reaction. Patch testing provides a means for assessing contact sensitivity. One or more suspected allergens are placed on a hairless part of the body. The test site is later examined for a visible reaction.

## CARE OF THE INDIVIDUAL WITH A SKIN DISORDER

Although nursing care is planned to meet the individual's needs, according to their specific **skin disorder**, the nursing care of a person with any dermatosis generally involves the following aspects.

### Relief of pruritus

Itching, which can be a source of considerable distress, is a feature of many skin disorders. The natural response to pruritus is to scratch, and scratching can cause further discomfort and may lead to tissue damage and infection. While medical therapy is aimed at resolving the problem responsible for the pruritus, certain nursing measures can be employed to provide some relief:

- As heat tends to aggravate itching, the room should be maintained at a moderate and comfortable temperature.

The bedclothes and personal clothing should be light, loose and cool
- Soothing tepid baths may be helpful in alleviating the itching
- Diversions that are of interest to the individual, such as reading or watching television, may be helpful.

### Topical applications

The application of local soothing preparations or topical medications may be prescribed. The most common mediums used to apply medications to the skin are creams, lotions, ointments and pastes, or powders. Medications that are mixed with the appropriate medium for topical application include: anti-inflammatory drugs such as corticosteroids, antipruritic agents such as tar or corticosteroids, antiseptics such as phenol and antibiotics such as neomycin. Specific substances to be added to the bath water may also be prescribed. For example, oatmeal, bath oils or coal-tar preparations may be prescribed when large areas of the body surface are affected. The nurse must ensure that the bath water is at a comfortable temperature and should be aware that many skin disorders result in changes in sensory perception, so it is essential that the water is not too hot.

Whenever topical applications have been prescribed, the nurse must know the level of responsibilities and the regulations regarding administration of medications in the healthcare facility and geographical area in which they work. Each type of topical medication requires proper application, and the nurse must know the amount to use, whether gloves are required during application and the signs of any adverse effects of the medication. The correct administration of medication is required as with any medication; please refer to Chapter 24 for further detail.

In addition to topical applications, systemic medications may be prescribed, such as analgesics to relieve pain, antibiotics to combat infection or mild sedatives to promote adequate rest.

Dressings may be prescribed as part of the local treatment of skin disorders. Moist dressings may be used in the management of acute inflammatory skin disorders. Any solution that is used to soak the dressing should be warmed to body temperature. Occlusive dressings may be applied over a topical medication to promote penetration of the drug into the epidermis.

### Maintenance of fluid and nutritional balance

Fluid and electrolyte balance may be disrupted because of loss of fluid in exudate from skin lesions. It is important to ensure that adequate fluid replacement is provided to compensate for any abnormal fluid loss.

A diet that is rich in protein may be prescribed to replenish losses and to promote healing. It is important to ascertain whether the individual is allergic to any specific foods, as skin disorders can be caused or aggravated by food allergies. Any known allergens must be eliminated from the diet.

### Preventing infection

Any disruption to the integrity of the skin increases the risk of infection, so measures such as the following should be implemented to protect the skin:
- After bathing or showering, the skin should be gently patted dry. Brisk rubbing could cause damage to already tender skin
- The nails should be kept short and clean to prevent damage from scratching, and the person should be encouraged to resist scratching. It is important to explain that scratching increases the risk of skin trauma and infection. For some people, such as a young child or a disoriented person, mittens may be placed over the hands to reduce skin damage by scratching
- All dressings and applications of topical substances must be performed aseptically
- If the skin disorder is contagious, isolation precautions may be implemented to prevent the spread of infection to others.

### Providing psychological support

A severe skin disorder may cause distress and embarrassment to the person who has it. They may be self-conscious about their appearance, and their body image may be severely impaired. If the person feels that other people will avoid contact because of their unsightly appearance, they may experience anxiety or depression, both of which may be exacerbated if the disorder is likely to result in permanent disfigurement. To assist the individual with a skin disorder, the nurse should be careful not to demonstrate any distaste or repugnance. It is important that the individual and their significant others are kept well informed about the disorder and its likely outcome. The individual should be given the opportunity to express their emotions and fears, such as the fear of disfigurement or alienation from their loved ones.

## PRESSURE INJURIES

**Pressure injuries** are defined as 'a localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, shear and/or friction, or a combination of these factors' (Australian Wound Management Association (AWMA) 2012). Pressure injuries have previously been referred to as pressure ulcers/areas, decubitus ulcers, trophic ulcers and bedsores. In 2012 AWMA had adopted the term 'pressure injuries' but in the recent 2014 international update Europe and the US have retained the use of pressure ulcer rather than injury. The prevalence of pressure injuries remains high even with the implementation of guidelines and interventions to reduce their occurrence. Australian prevalence rates have been reported at between 9% and 29.4% with rates declining by 9–16% over a 3-year period (Asimus et al 2011; Mulligan et al 2009; Quality and Safety Branch, Department of Human Services Victoria 2006). In Australia, hospital-acquired pressure injuries are reported at rates between 6% and 68% (Mulligan et al 2009; Quality and Safety Branch,

Department of Human Services Victoria 2006) and have been estimated to independently increase hospital length of stay by over 4 days (Graves et al 2005), deflecting the use of these bed days from other conditions and placing a significant economic and clinical burden on the Australian healthcare system. In the US healthcare system pressure injuries are considered a 'never event', being largely preventable, and have been reported as the most expensive preventable adverse event/medical error, consuming over US$3.8 million annually (Shreve et al 2010). This cost exceeds postoperative infection (US$3.7 million) and mechanical complication of device, implant or graft (US$1.1 million) (Shreve et al 2010). From 2008 the US medical system ceased reimbursement to facilities for hospital-acquired stage III and IV pressure injuries, an indication of the seriousness the system is taking to control the occurrence of pressure injuries (Centre for Medicare and Medicaid Services 2012). In Australia, Queensland Health has imposed financial penalties for both stage 3 and 4 hospital-acquired pressure injuries—$30,000 for stage III and $50,000 for stage IV (Queensland Health 2012).

## Pressure injury aetiology

Pressure injuries result from ischaemic hypoxia of the tissues owing to prolonged pressure on the area when it is over a hard surface such as a mattress or chair. Impaired mobility or activity and impaired sensory perception of the individual affects the ability of the individual to recognise when there is pain and to change position. Clinical Interest Box 29.9 lists conditions in which individuals may be at increased risk to pressure injury.

Pressure impairs blood circulation and the area is deprived of essential nutrients and oxygen, causing cellular death. The major factors contributing to loss of local capillary blood supply are pressure and shearing forces; however, these can be exacerbated by predisposing factors classed as either intrinsic or extrinsic. A combination, of these factors increases the risk of pressure injury.

The greater the pressure on the skin, the more the tissue is compressed. Pressure on the skin over bony prominences can distort the blood vessels to such an extent that the blood flow is interrupted. Pressure can also occlude lymphatic vessels, and the consequent accumulation of toxic substances can contribute to cell damage. Recent research in the laboratory on rats suggests pressure injuries may result from sustained deformation of the tissue, causing an ischaemia-reperfusion injury where there is a cycle of ischaemia and reperfusion of the tissue during prolonged pressure, which contributes to tissue damage (Loerakker et al 2011).

Pressure injuries form in a few hours but may take many months to heal; preventing them is therefore of prime importance. Ensuring adequate blood supply to pressure areas is critical as altered blood supply is the primary cause of pressure injuries. Blood supply to promote tissue healing is dependent on adequate circulation that brings antibodies and leucocytes to combat infection, as well as nutrients and oxygen for regeneration of tissues.

Pressure injuries can develop on body areas when they are subjected to prolonged or excessive pressure (Figure 29.3). The two most frequently reported locations are the sacrum and heels (Quality and Safety Branch, Department of Human Services Victoria 2006).

### CLINICAL INTEREST BOX 29.9 Individuals with increased exposure to pressure

- Spinal cord injury
- Stroke
- Multiple sclerosis
- Trauma (e.g. fracture)
- Obesity
- Diabetes (neuropathy)
- Cognitive impairment
- Medication use (e.g. sedatives, hypnotics, analgesics)
- Surgery

*(Adapted from AWMA & NZWCS 2011)*

## Classification of pressure injuries

Pressure injuries are categorised into four main stages with two sub-categories (NPUAP et al 2014). See Figure 29.4 for images and full descriptions of all the stages.

Stages I and II are generally considered partial thickness wounds (though the skin remains intact in a stage I pressure injury) and stages III and IV are considered full thickness injuries. Tissue destruction can continue through the layers of tissue unless measures are taken early to relieve pressure and increase local tissue perfusion (see Case Study 29.1).

Stage I: non-blanchable erythema. Intact skin with non-blanchable redness of a localised area, usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its colour may differ from the surrounding area.

Stage II: partial thickness skin loss. Partial thickness loss of dermis presenting as a shallow, open ulcer with a red-pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister.

Stage III pressure injury: full thickness skin loss. Pressure injury presenting as full thickness tissue loss in which subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss.

Stage IV pressure injury: full thickness tissue loss. Pressure injury presenting as full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often includes undermining and tunnelling.

### Subcategories

Unstageable: depth unknown: full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, grey, green or brown) and/or eschar (tan, brown or black) in

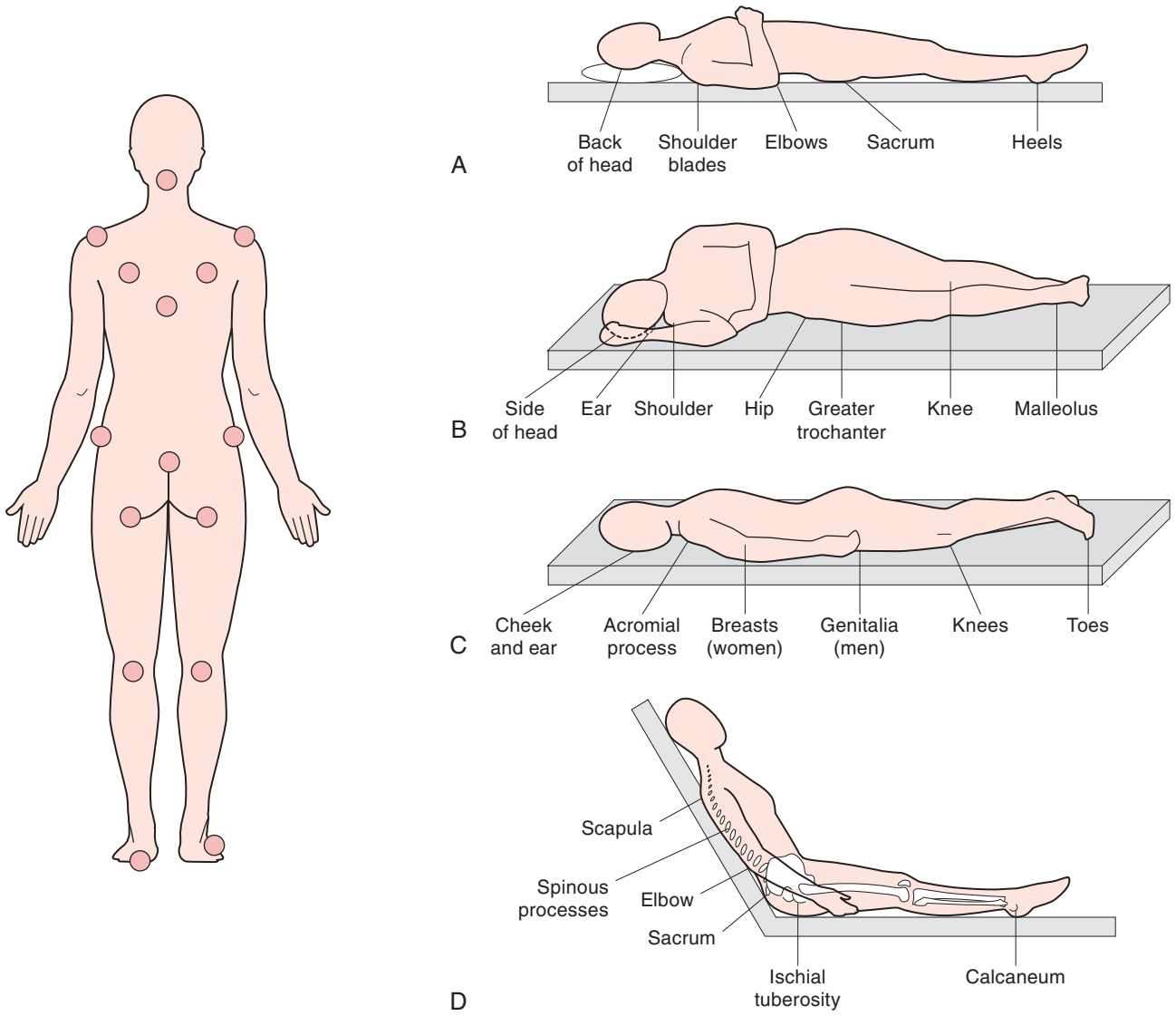



**Figure 29.3** Pressure injury sites

A: In the supine position B: In the lateral position C: In the prone position D: In the sitting position

## CASE STUDY 29.1

**Pressure Injury**

Mr Darcy, an 88-year-old man, was discharged from hospital following admission for a urinary tract infection. As he has no family, Mr Darcy was taken home by hospital transport and was escorted into his home where he lives alone, and placed in a lounge chair. Two days later, a nurse from hospital did a follow-up visit on Mr Darcy. On arrival the nurse found Mr Darcy still sitting in the lounge chair; he had not moved from the chair since his arrival at home, 2 days prior. He had been incontinent of both urine and faeces. Mr Darcy made minimal eye contact and was not able to give coherent answers to questions.

While assisting Mr Darcy, the nurse noted a large lesion on his sacrum. Mr Darcy was transferred to an acute care facility where surgical debridement took place, identifying a stage IV pressure injury on his sacrum.

See Nursing Care Plan 29.1 for the recommended nursing care for Mr Darcy.

1. What other allied health professionals would you include in your care of Mr Darcy?
2. What specialised wound dressing regimen will Mr Darcy require?

wound bed. Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore stage, cannot be determined.

Suspected deep tissue injury: depth unknown: purple or maroon localised area or discoloured, intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue.

Review Case Study 29.1 that explores pressure injuries.

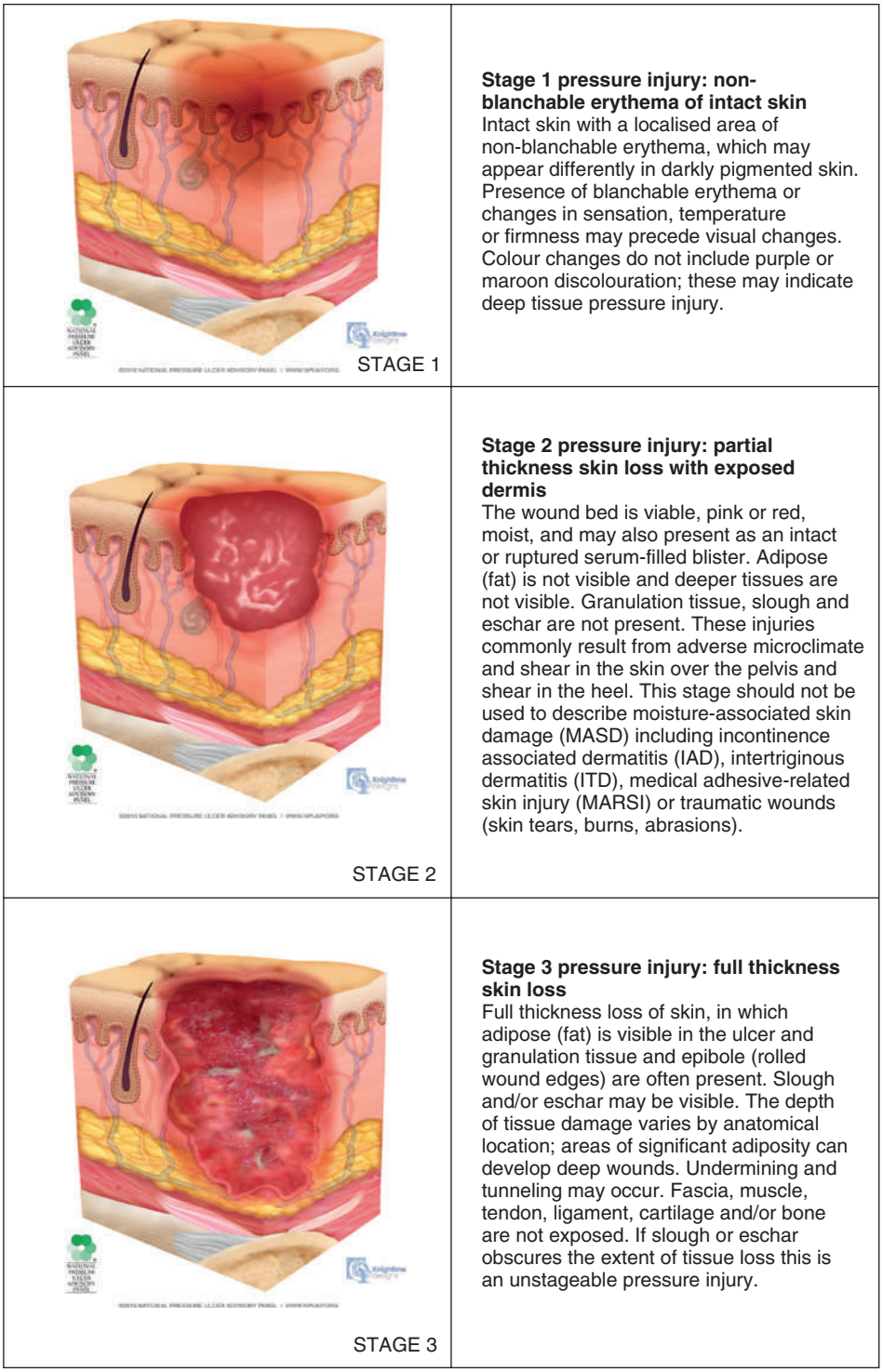



**Figure 29.4** Pressure injury classification system
*(NPUAP et al 2014)*

*Continued*

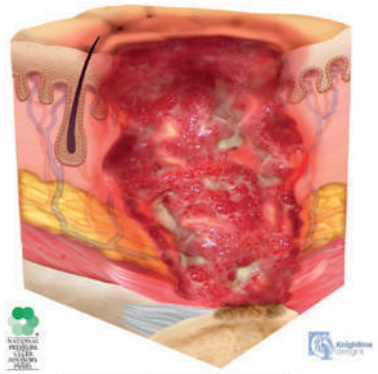
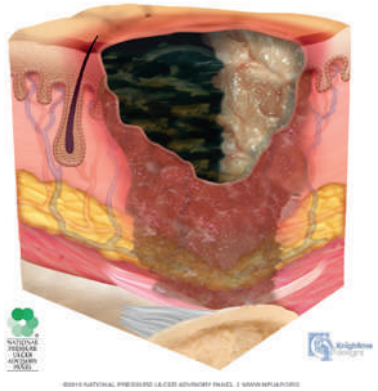
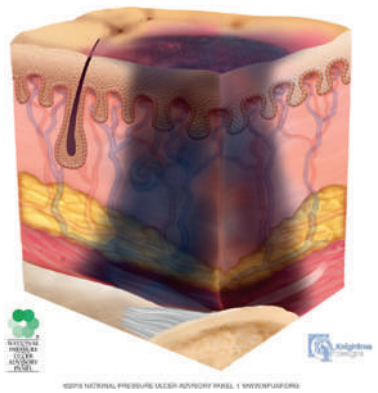
| | |
|---|---|
|  STAGE 4 | **Stage 4 Pressure injury: full thickness skin and tissue loss**<br>Full thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in the ulcer. Slough and/or eschar may be visible. Epibole (rolled edges), undermining and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss this is an unstageable pressure injury. |
|  UNSTAGEABLE | **Unstageable pressure injury: obscured full thickness skin and tissue loss**<br>Full thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a Stage 3 or Stage 4 pressure injury will be revealed. Stable eschar (i.e. dry, adherent, intact without erythema or fluctuance) on an ischaemic limb or the heel(s) should not be removed. |
|  SUSPECTED DEEP TISSUE INJURY | **Deep tissue pressure injury: persistent non-blanchable deep red, maroon or purple discolouration**<br>Intact or non-intact skin with localised area of persistent non-blanchable deep red, maroon, purple discolouration or epidermal separation revealing a dark wound bed or blood-filled blister. Pain and temperature change often precede skin colour changes. Discolouration may appear differently in darkly pigmented skin. This injury results from intense and/or prolonged pressure and shear forces at the bone–muscle interface. The wound may evolve rapidly to reveal the actual extent of tissue injury or may resolve without tissue loss. If necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a full thickness pressure injury (unstageable, Stage 3 or Stage 4). Do not use DTPI to describe vascular, traumatic, neuropathic or dermatological conditions. |

**Figure 29.4, cont'd**

## Intrinsic factors

Intrinsic factors are characteristics specific to an individual. These factors reduce the skin's tolerance to pressure by affecting the vasculature, lymphatic system and supporting structures. Factors include age, mobility, circulation, nutrition, comorbidities and mobility. Chronic illnesses, particularly those affecting tissue perfusion and oxygen delivery (e.g. peripheral vascular disease) and sensation, also contribute to an increased risk of pressure injury development.

### Age

People aged over 65 years are at greatest risk of pressure injuries with the risk increasing over 75 years of age (AWMA 2012).

### Nutritional status

Inadequate nutrition prevents efficient cellular growth and repair, and renders the tissues more vulnerable to damage. A poorly nourished person will usually have less protection over the bony prominences and be more vulnerable to the effects of prolonged pressure.

### Body type

As the sites of maximum skin compression are located over bony prominences, a thin person is more at risk. Conversely, an obese person may be at risk due to shearing forces and added pressure caused by body weight pressing on the skin.

### Mobility

Altered mobility and activity restricts an individual's ability to redistribute pressure on weight-bearing areas.

### Neurological factors

Reduced sensitivity to pressure or pain may occur in certain disease states, such as spinal cord injury, paralysis, multiple sclerosis or diabetes mellitus. Transmission of impulses from receptors in the skin or to the muscles may be impaired, so that the person does not receive the 'message' to change position regularly, a normal body defence mechanism. Other factors can also impact the nervous system such as the use of epidural analgesia, which reduces this protection mechanism (Angel et al 2004).

### Vascular factors

Reduced peripheral tissue perfusion may result from certain disease states, such as atherosclerosis, cardiac failure or diabetes mellitus. As reduced local tissue oxygenation and nutrition are the primary cause of pressure injuries, people with vascular perfusion abnormalities are at increased risk.

## Extrinsic factors

Extrinsic factors are those derived from the individual's environment. The main identified factors are pressure (discussed above), shear, friction and moisture; all of these impact on the ability of the skin to tolerate pressure.

### Shearing forces and friction

When pressure is applied to the skin at an angle, movement of the layers of the skin over one another may cause distortion of the tissue. The mechanical shearing forces involved distort and occlude the dermal capillaries, resulting in thrombosis and capillary occlusion, and tissue necrosis. Friction is also a mechanical force between the skin and another surface, such as bed linen, which creates resistance between the two surfaces. Friction immobilises the epidermis while the deeper layers move, and is an important factor in an individual whose skin is fragile and at risk.

### Moisture

Moisture on the skin can be from incontinence (urinary and faecal), wound exudate, perspiration, mucus or saliva. Prolonged exposure to moisture causes maceration, which weakens the connective fibres of the skin and alters the resilience of the epidermis to external forces (AWMA 2012). Abrasions are more likely to form from friction between the skin and the surface under the individual, making shearing forces more severe. Actions such as excessive washing with soap, unsafe manual handling or rubbing can also damage the skin's integrity. Incontinence of urine or liquid faeces can result in incontinence-associated dermatitis, which can be inaccurately described as a stage I or stage II pressure injury (Black et al 2011) and it is important to be able to clinically distinguish between pressure damage and incontinence-associated skin damage. Incontinence-associated skin damage creates an added risk of exposure to bacterial and faecal enzymes that alter the normal acidic pH of the skin and may lead to an increased risk of skin infection.

## Pressure injury risk assessment

Assessing the potential of an individual for pressure injury development is a combination of the use of a recognised risk assessment tool, skin and nutritional assessment and clinical judgment. Although the use of a risk assessment tool can assist management and provide a structured approach to an individual's care plan it should not be used in isolation. A head-to-toe assessment is made on admission to a facility, including those entering an emergency department, and at regular intervals throughout their stay. Any change in the individual's medical and mental condition also requires reassessment.

### Risk assessment

It is important to identify individuals at risk of pressure injuries and various assessment tools have been designed to assist healthcare professionals. Implementation of a valid and reliable risk assessment tool is considered best practice and is used as a guide to identify an individual at risk of pressure injury development. The tools are intended as a preventative measure to facilitate the implementation of a rational preventative regimen. Several risk assessment tools have been developed with the common ones cited in the published literature being the Braden Scale for Predicting Pressure Sore

**TABLE 29.8 | The Braden Scale for predicting pressure sore risk**

**Patient's name** _____ **Evaluator's name** _____

**Date of assessment** _____

| | | | | |
|---|---|---|---|---|
| Sensory perception<br>Ability to respond meaningfully to pressure-related discomfort | 1. *Completely limited*<br>Unresponsive (does not moan, flinch or grasp) to painful stimuli caused by diminished level of consciousness or sedation<br>OR<br>Limited ability to feel pain over most of body surface | 2. *Very limited*<br>Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness<br>OR<br>Has sensory impairment that limits the ability to feel pain or discomfort over half of body | 3. *Slightly limited*<br>Responds to verbal commands but cannot always communicate discomfort or need to be turned<br>OR<br>Has some sensory impairment that limits ability to feel pain or discomfort in one or two extremities | 4. *No impairment*<br>Responds to verbal commands.<br>Has no sensory deficit that would limit ability to feel or voice pain or discomfort |
| Moisture<br>Degree to which skin is exposed to moisture | 1. *Constantly moist*<br>Skin kept moist almost constantly by perspiration, urine etc. Dampness detected every time patient is moved or turned | 2. *Moist*<br>Skin often, but not always, moist. Necessary to change linen at least once a shift | 3. *Occasionally moist*<br>Skin occasionally moist, requiring an extra linen change approximately once a day | 4. *Rarely moist*<br>Skin usually dry. Require linen changing only at routine intervals |
| Activity<br>Degree of physical activity | 1. *Bedfast*<br>Confined to bed | 2. *Chairfast*<br>Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair | 3. *Walks occasionally*<br>Walks occasionally during day but for very short distances, with or without assistance. Spends majority of each shift in bed or chair | 4. *Walks frequently*<br>Walks outside room at least twice a day and inside room at least once every 2 hours during waking hours |
| Mobility<br>Ability to change and control body position | 1. *Completely immobile*<br>Does not make even slight changes in body or extremity position without assistance | 2. *Very limited*<br>Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently | 3. *Slightly limited*<br>Makes frequent, although slight, changes in body or extremity position independently | 4. *No limitations*<br>Makes major and frequent changes in position without assistance |

Risk© (Braden Scale) (Table 29.8), the Norton Scale and the Waterlow Score. Most encompass a scale or scoring system and include clinical risk factors such as mobility, nutrition, mental condition, activity, incontinence, sensory perception, friction and shear. A cumulative score is reached which is used to determine the type of intervention measures to be utilised for ongoing care. A randomised controlled trial involving 1231 people looked at the effectiveness of risk assessment tools and found no evidence to show that pressure ulcer risk assessment tools are superior to clinical judgment in

**TABLE 29.8 | The Braden Scale for predicting pressure sore risk—cont'd**

| | | | | |
|---|---|---|---|---|
| Nutrition<br>Usual food intake pattern | 1. *Very poor*<br>Never eats a complete meal; rarely eats more than a third of any food offered; eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly; does not take a liquid dietary supplement<br>OR<br>Is NPO and/or maintained on clear liquids or IVs for more than 5 days | 2. *Probably inadequate*<br>Rarely eats a complete meal and generally eats only about half of any food offered. Protein intake includes only 3 servings of meat or dairy products per day; occasionally takes a dietary supplement<br>OR<br>Receives less than optimum amount of liquid diet or tube feeding | 3. *Adequate*<br>Eats over half of most meals; eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally refuses a meal, but usually takes a supplement if offered<br>OR<br>Is on a tube feeding or total parenteral nutrition regimen that probably meets most of nutritional needs | 4. *Excellent*<br>Eats most of every meal; never refuses a meal; usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation |
| Friction and shear | 1. *Problem*<br>Requires moderate-to-maximum assistance in moving; complete lifting without sliding against sheets impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures or agitation leads to almost constant friction | 2. *Potential problem*<br>Moves feebly or requires minimum assistance; during a move skin probably slides to some extent against sheets, chair, restraints or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down | 3. *No apparent problem*<br>Moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times | |
| | | | | TOTAL SCORE |

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preventing pressure injury (Webster et al 2011). It is important for all healthcare workers when assessing individuals utilising any risk assessment tools to use their clinical judgment to ensure that the risk prevention plan is appropriate for the individual person and not based solely on a number.

## Nutritional assessment

Nutritional screening identifies malnutrition, dehydration and comorbidities and allows for appropriate interventions. In the elderly who may already have a poor diet, comorbidities (e.g. diabetes), malabsorption and infection can affect wound healing and nutritional screening can help to identify dietary deficits to guide management. The Mini Nutritional Assessment Short Form (MNA-SF) is an example of a validated nutritional assessment tool that can be used in the elderly population with pressure injuries (AWMA & NZWCS 2011). Assessment includes: weight, height and BMI, food intake, dental and oral health, drugs that can interfere with appetite, swallowing difficulties and biochemical investigations to detect anaemia, haemoglobin and serum albumin levels. Individuals found to be at risk of nutritional deficit must be referred to a dietitian for assessment and other specialist healthcare practitioners (e.g. speech and occupational therapists) where appropriate (EPUAP & NPUAP 2009).

## Skin assessment

Skin and tissue assessment is important in pressure injury prevention, classification, diagnosis and treatment (NPUAP et al 2014). The condition of skin and underlying tissue can serve as an indicator of early signs of pressure damage, therefore routine skin and tissue assessments provide an opportunity for early identification and treatment of skin damage (NPUAP et al 2014). Standard 8.6 of the National Safety & Quality Health Standards (ACSQHC 2012) outlines the

importance of carrying out comprehensive skin inspections of individuals on admission. The current international guidelines state that a comprehensive skin assessment should be undertaken within 8 hours of admission or on the first visit in the community setting (NPUAP et al 2014). Skin is assessed for erythema, blanching response, moisture damage, infection (e.g. fungal infection), oedema, induration (hardness), localised heat and any sign of loss of integrity (e.g. dry skin). It is important to include observation for pressure damage from medical devices such as oxygen tubing and drain tubes.

See Clinical Skill 29.3 for information and guidelines on shortening a drain tube.

## Psychosocial assessment

As part of a risk assessment tool mental or cognitive status is assessed as an impaired status can affect the individual's ability to comply with treatment (e.g. identify when to change position, unplanned removal of devices due to confusion). Also assessed is their social history, previous disease experience, social support, individual preferences for the type of care to be received, culture and ethnicity, financial support, quality of life and goals of care (AWMA 2012).

## Wound assessment

Pressure injuries should be assessed by their size, depth, location and degree of tissue (and bony) necrosis. They are classified on the degree of tissue loss (see Figure 29.4). The classifications are useful for documentation of the degree of injury and when considering treatment options, especially for debridement. Undermining and tunnelling are included as part of the assessment for stages III and IV pressure injuries when there is extension of the wound under the skin such

### CLINICAL SKILL 29.3 Shortening a drain tube

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile dressing pack and dressing materials<br>Additional light source (if required)<br>Gloves<br>Disposable apron<br>Normal saline<br>Additional cotton balls or gauze balls<br>Waterproof sheet (Bluey)<br>Sterile scissors<br>Suture cutter<br>Sterile safety pin<br>Sterile gloves<br>Waste receptacle<br>Dressing trolley<br>Mask and eye protection as required |
| **Skill activity** | **Rationale** |
| Drain tubes are shortened to reduce irritation to the bottom of the wound and promote healing. | |
| Assess the individual's record to determine previous appearance of wound and any previous dressings<br>Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for pain<br>Assess for any allergies<br>Visually assess the wound for signs and symptoms of infection and dressings used | Determines requirements for equipment and dressing requirements<br>Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Pain may be caused during the procedure<br>Determines any adverse reactions to wound irrigation solution, dressing or tape (if required) |
| Assist the individual to assume an appropriate position of comfort, ensuring that only the wound area is exposed. Provide for privacy<br>Obtain additional assistance if required | Promotes comfort and facilitates performance of the procedure<br>Assistance is available when required |

| CLINICAL SKILL 29.3 Shortening a drain tube—cont'd | |
|---|---|
| Place the equipment in a convenient location near the bedside. Open procedure pack using corners. Assemble the required equipment, using aseptic technique. Drop sterile equipment into sterile field | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the dressing is being performed<br>Prevents contamination of sterile items<br>Additional items are available for use |
| Perform hand hygiene and loosen wound dressing | Prevents spread of microorganisms and allows ease of removal of wound dressing |
| Put on apron. Perform hand hygiene, apply gloves if required. If other PPE required put on before gloves | Prevents spread of microorganisms |
| Position waterproof sheet and dressing towel around the wound, remove old dressing and place in waste bag/container | Absorbs moisture and prevents bed from becoming wet<br>Protects the wound from environmental contamination |
| Dispose of gloves and perform hand hygiene<br>Put on clean non-sterile gloves/sterile gloves | Removes microorganisms and prevents cross-contamination |
| Observe the wound for size, union, signs of infection, exudate, odour, inflammation and healing. Assess for pain | Evaluates condition of the wound and stage of healing |
| Cleanse the wound with sterile normal saline in accordance with the practices of the healthcare facility, medical officer's orders or as directed by the nurse in charge. Clean from a clean area towards a less clean area, usually an outward direction | Wound cleansing removes debris from the wound. Avoids transferring wound exudate and normal flora from the surrounding skin into the wound, and thus prevents wound contamination |
| Using the stitch cutter, remove any suture securing the tube in the wound | Enables the tube to be rotated, if necessary, and shortened |
| If the tube is round, gently rotate it | Rotation of the tube frees any adherent granulation tissue |
| Withdraw the tube the prescribed length (e.g. 1.25 cm) | Tube must only be shortened the prescribed length, to allow the wound to heal from within |
| Secure tube with sterile safety pin below level of planned cut | Prevents tube from slipping into the wound |
| Cut off excess tube | Prevents it pressing on the wound |
| A split gauze dressing is generally placed between the pin and the skin, and another dressing or pouch placed over the tube | Protects the skin from irritation and from wound drainage |
| Remove personal protective equipment and discard with used equipment in an appropriate waste receptacle | Prevents spread of microorganisms |
| Assist the individual to reassume a comfortable position | Promotes comfort |
| Remove and attend to the equipment appropriately. Perform hand hygiene | Prevents spread of microorganisms |
| Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer | Provides relevant information to other members of the healthcare team. Include date and time, appearance of wound and any exudate, cleansing solution, type of primary and any secondary dressing used, and the individual's response to the dressing. Medico-legal requirement. Allows for the planning and implementation of care |
| *(ACSQHC 2012; 2015; AWMA 2010; Berman et al 2015; Crisp et al 2013; LeMone et al 2014; Lynn & LeBon 2012; NHMRC 2010; NMBA 2013; 2016; Rebeiro et al 2013; Rowley & Clare 2011; Smith et al 2011)* | |

## PROGRESS NOTE EXAMPLE 29.1

| | |
|---|---|
| 05.06.2015<br>1025 hrs | Nursing: Daily skin assessment performed and all bony prominences checked. Left heel has intact serous fluid filled blister 2 × 2 × 1 cm—stage II pressure injury. Skin is intact but dry and flaky. All other pressure points are intact. Patient is unable to reposition independently or to weight bear on left heel. Patient is incontinent of urine & faeces. Perineum area has 1 cm × 0.5 cm of broken skin in the right groin, no bleeding or exudate, surrounding perineum & groin skin red and excoriated. Pain 4/10. Plan: Heel wedge applied. Patient educated regarding need to keep leg on wedge. Placed on pressure relieving mattress and 1/24 repositioning commenced, on right side at 1000. Heel wedge applied. Cavilon barrier spray applied to broken skin in R groin and 3M wipes used. Incontinence pad in situ and regular toileting offered. Moisturiser cream applied to dry skin of arms, legs and feet. Poor nutritional intake. Referred to dietitian for review as Malnutrition Score Tool 2. PRIME completed (145987) and MO notified (or PI communication sticker may be used).<br>***J. Smith* (Smith) EN** |

## PROGRESS NOTE EXAMPLE 29.2

| | |
|---|---|
| 07.06.2015<br>1930 hrs | Nursing: Tolerating 2/24 repositioning. Heel wedge remains in situ. Patient mobilised with rollator to shower and toilet this shift. Incontinent × 1. Incontinence pad in situ. Sat out of bed for 1 hour with cushion applied to chair. L heel blister remains intact with serous fluid present. Size unchanged. Moisturiser cream continually applied to dry surrounding skin which is improving. Groin/perineum excoriation improving, continuing to use skin barrier wipes. R groin broken skin now 0.5 × 0.5 cm continuing to use skin barrier spray. All other areas and pressure points remain intact. Patient is tolerating diet and nutritional supplements.<br>***K. Jones* (Jones) RN** |

that the wound cavity is larger than the skin opening. Documentation of the assessment findings and stage of pressure injury in the individual's medical records is necessary to provide a comparative review with future assessments and to guide treatment interventions to assess progress of wound healing. A hypothetical case of a pressure injury with additional complications, as well as ongoing documentation following the case, have been outlined in Progress Note Examples 29.1 and 29.2 respectively.

## Prevention and management of pressure injuries

Consideration of psychosocial issues, pain, altered body image and effects on activities of daily living are necessary to provide individual care.

### Skin protection

Protection from pressure, friction and shear forces is identified as the most important measure to reduce the risk of pressure injuries. Appropriate positioning, use of pressure redistribution surfaces, skin hygiene and adequate nutrition all play a role. Local measures include appropriate manual handling techniques when transferring and changing the position of an individual (e.g. using transfer devices) that can lift the individual off the bed to avoid friction and shearing. It is not advisable and cannot be recommended to massage or vigorously rub the individual's skin as part of a pressure injury protocol and is contraindicated where there is 'acute inflammation and where there is the possibility of damaged blood vessels or fragile skin' (EPUAP & NPUAP 2009). Water-based and pH neutral skin cleansers and creams are suggested to maintain skin hydration. Barrier creams help to maintain hydration and prevent maceration.

### Nutrition

Wound healing increases the energy demands on the body. The nutritional requirements of a stage I pressure injury will differ to those of an individual with a stage IV injury and will be affected by the volume of exudate leaking from the wound. As the wound heals nutritional requirements will also change. Australian and New Zealand dietary guidelines suggest increased protein intake (or the inclusion of protein building blocks such as arginine supplements in the diet) and inclusion of vitamin and mineral supplements to the individual's usual diet (TTDWCG 2011). These guidelines also offer recommendations based on the probable risk of healing due to nutritional issues. If a person is unable to tolerate oral food or fluids, an alternative method of meeting nutritional needs, such as gastric tube or total parenteral nutrition (IV) feeding, may be necessary. The 2014 International Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline identifies the importance of nutrition screening using a valid and reliable screening tool, on admission, at each significant change in clinical condition and when the pressure injury is failing to heal (NPUAP et al 2014). A registered dietitian, in consultation with the interprofessional team, should develop an individualised nutrition plan that ensures adequate energy intake. The addition of fortified foods and high-protein oral nutritional supplements between meals can be used to meet increased dietary intake needs.

## Support surfaces

Specialised support surfaces aim to reduce the interface pressure between the skin and the surface on which the individual is placed, such as the mattress on a bed, trolley, operating table or chair. Support surfaces work by increasing the amount of the body's surface area in contact with the surface or alternating the contact with the surface. Using support surfaces does not remove the need for regular skin inspection and care and regular repositioning of the individual. Selection is based on mobility of the individual in the bed, comfort, the microclimate and the care setting. Various types of pressure redistribution devices are available and they fall into two main categories: reactive support surface and active support surfaces. Reactive devices can be powered (e.g. low air loss mattress/beds) or non-powered (e.g. foam/gel/air/combination mattresses). An active support surface is a powered device that produces alternating pressure through mechanical means and has the ability to change its load distribution properties with or without an applied load (NPUAP et al 2014). Mattresses should be checked for 'bottoming out'. This means there must be at least 5 cm between the individual's lowest bony prominence and the mattress when the individual is lying supine. Heel protection should place the heel completely off the bed and distribute weight along the calf avoiding additional pressure on the Achilles tendon. Synthetic sheepskins, fluid filled gloves, donut devices or cut-outs should be avoided as they shift the pressure to another body surface area.

## Repositioning

Repositioning is an essential component of pressure injury prevention and care. Repositioning of the individual is designed to relieve or redistribute pressure points. It provides an opportunity to observe the skin condition and offer basic nursing care such as food or fluids and interaction with the individual. Repositioning regimens such as frequency, position and evaluation of the regimen must be documented in the individual's medical records. When lying in bed, individuals should be placed in a 30 degree tilted side-lying position (right side, back, left side) or 30 degree inclined recumbent position. The reduction of pressure and shear at the heel is important. The posterior prominence of the heel sustains intense pressure, even when a pressure redistribution surface is used (NPUAP et al 2014). Because the heel is covered with a small amount of subcutaneous tissue any pressure is transferred at an angle to the bone, increasing the tissue pressure (NPUAP et al 2014). It is challenging to offload pressure shear and friction for heels—the use of appropriate equipment to elevate and offload the heel completely is recommended. When head-of-bed elevation is required avoid a slouched position, which places extra pressure on the sacrum and coccyx. Use aids such as pillows to support the upper body and prevent the individual slipping towards the foot of the bed. An overhead handgrip may be used to lift and relieve pressure from the buttocks and sacral area. More frequent, smaller shifts in position may be necessary for some individuals intolerant of major changes (e.g. post-surgery pain). The individual sitting in a chair is encouraged to lift up from the seat frequently while sitting, to relieve pressure and facilitate tissue perfusion in the buttocks and sacral area. The person is assisted in this action if unable to lift independently. Avoid positioning the individual on medical devices such as drainage tubes; these can create areas of localised pressure. Splints, plaster casts, braces and bandages should be checked regularly and adjusted to relieve pressure. Individual factors need to be considered to be effective in preventing prolonged pressure on any area. Using correct manual handling techniques can avoid shearing when repositioning an individual. The person must be moved safely avoiding dragging the skin along any surface, and surfaces such as bed linen must be kept smooth and dry. In healthcare, annual mandatory competency in use of aids and positioning is suggested to maintain best practice.

### CRITICAL THINKING EXERCISE 29.2

After changing an individual's position, you observe redness over the bony prominences. What type of assessment must you perform to obtain correct information regarding pressure injury risk?

## Pain assessment and treatment

Pressure injuries are painful. The pain caused by pressure injuries can be constant and severe, and may be the most distressing pressure injury symptom (NPUAP et al 2014). Pain may be related to ongoing pressure, friction and/or shear, damaged nerve endings, inflammation, infection, procedures or treatments, or excoriation from incontinence and muscle spasm (NPUAP et al 2014). Assess all individuals for pain related to a pressure injury or its treatment and ensure an appropriate management plan is put in place.

## Wound care including infection management

Wound bed preparation is used as the tool to guide pressure injury wound care. Debridement of non-viable tissue after vascular assessment maximises the healing ability of the wound. In large pressure injuries therapies such as negative pressure wound therapy (NPWT) may be beneficial to reduce the size of the wound and manage large volumes of exudate. Local wound infection is managed aggressively to avoid spreading infection and speed the healing process. More information on this issue can be found in the wound management section of this chapter.

Specific pressure injury assessment tools such as the Pressure Ulcer Scale for Healing (PUSH) Tool (NPUAP 2015) monitor changes in a pressure injury. The PUSH Tool measures three parameters: size of the wound (length × width), exudate amount and tissue type (e.g. necrotic, slough, granulating, epithelialising). Similar to a risk assessment tool, it gives a score for each parameter with the sum giving a total score. It is designed to provide a quick reference to whether the wound is healing.

### CRITICAL THINKING EXERCISE 29.3

Bruce, 77, is admitted to the acute care hospital for a right total knee replacement. He has been fairly immobile for some time because of deterioration in his right knee. Bruce also has diabetes mellitus and is obese. Bruce's postoperative recovery is marked by pain and subsequent wound infection. He experiences a stage III pressure injury to his right heel. What measures could have been taken to prevent Bruce from developing a pressure injury?

## Skin tears

**Skin tears** are injuries caused by shearing, friction or blunt trauma. The skin injury can present as a laceration or skin flap, with separation of epidermis and/or dermis. At highest risk are the elderly due to skin fragility as ageing takes place. Neonates are also at risk because of the immaturity of their skin. These events cause pain and distress to individuals and their families, and in the elderly can often be difficult to heal.

An international consensus panel defined skin tears as:

*A wound caused by shear, friction and/or blunt force resulting in separation of skin layers. A skin tear can be partial thickness (separation of the epidermis from the dermis) or full thickness (separation of both the epidermis and dermis from underlying structures).*

**(LeBlanc & Baranoski 2011)**

### Prevalence

National figures on incidence and prevalence rates of skin tears are difficult to obtain, as there is no national reporting mechanism. These wounds often go unreported, especially in the community (Carville et al 2007; White 2001). In one Australian state survey skin tears were found to be the most prevalent wound in the aged care setting (16%), followed by pressure injuries (10%) (Mulligan et al 2009). Tears were the third most common wound type in the hospital setting, with over half of these being hospital-acquired (Mulligan et al 2009). This correlates with a 16% incidence rate in a 120-bed aged care facility (White et al 1994). Another survey of forty-four aged care facilities found a prevalence rate of 54% (Edwards 1998). White found 64% of RNs working in high care residential aged care facilities reported more than one skin tear a week, with 29% indicating they became aware of between three and five skin tears a week (White 2001).

Skin elasticity and tensile strength decrease as ageing skin loses subcutaneous and dermal tissue and serum composition, which diminishes skin surface moisture.

### Risk factors

Risk factors for skin tears in elderly are complicated by dehydration, poor nutrition and hydration, cognitive impairment, impaired vision or altered mobility and decreased sensation. Further identified risks include age >85; female; long-term steroid use, which thins the skin; a history of skin tears; stiffness and spasticity; dry, fragile skin; polypharmacy; presence of ecchymosis (bleeding into the subcutaneous tissue); dependence for activities of daily living such as use of assistive devices; applying and removing stockings; removal of tape; having blood drawn; transfers and falls; and cardiac, respiratory or vascular comorbidities. There are currently no validated risk assessment tools for the prevention of skin tears.

### Classification for skin tears

Until recently there was only one recognised skin tear classification system, the Payne Martin Classification for Skin Tears (Payne & Martin 1993). This system was later revised to include sub-classifications of three main categories and five types of skin tears (Payne & Martin 1993).

Recent Australian research has developed a new skin tear classification the system, the STAR skin tear classification system, based on consensus from Australian wound nurse experts (Carville et al 2007). This system uses five categories depending on the degree of skin loss (Figure 29.5).

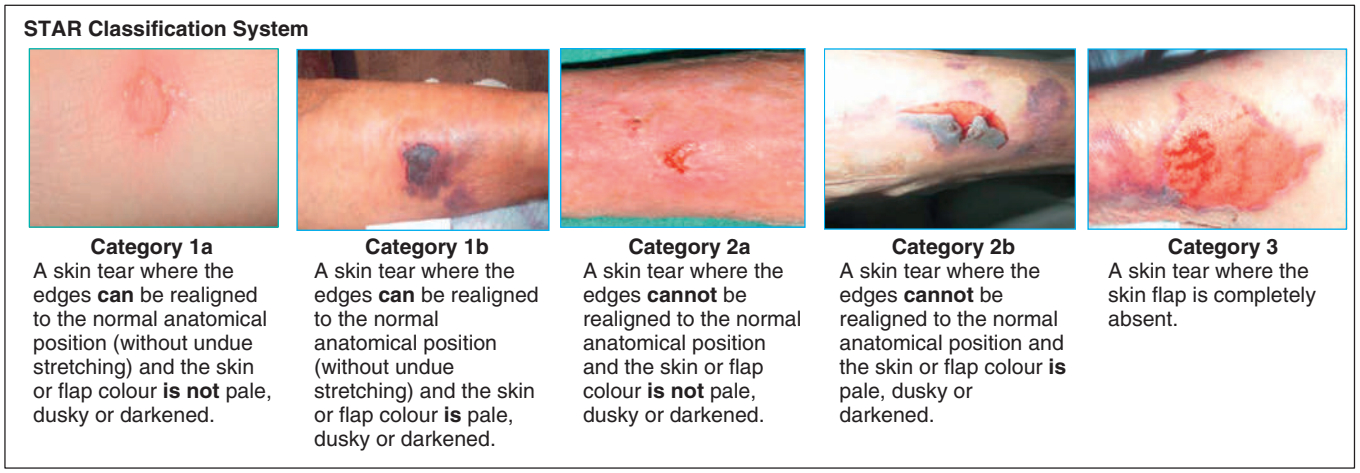


**Figure 29.5** STAR skin tear classification system
*(Carville et al 2007)*

## Skin tear prevention

The majority of skin tears occur during routine care. Any management plans should include strategies that can be adopted by healthcare workers to prevent skin tears from developing and/or prevent further trauma (Stephen-Haynes & Carville 2011). Preventing skin tears should start with early identification of those at risk and should encompass the following identified risk reduction strategies:

- Assess for risk factors
- Practise skin hygiene and responsible bathing: avoid the use of soap; use pH neutral cleansers
- Apply emollients to hydrate the skin and increase suppleness (see Clinical Interest Box 29.10)
- Where adhesive products are used consider the use of silicone-based adhesives or dressings that have a silicone wound contact layer
- Provide appropriate nutrition and hydration
- Use safe clothing that is easy to apply and remove and is protective
- Address environmental risk factors by padding surfaces, removing falls risks and providing uncluttered areas and adequate lighting
- Use correct manual handling techniques for turning, transferring and positioning
- Avoid use of tapes
- Trim individual's finger and toe nails and carer's finger nails (Bianchi 2012).

### CLINICAL INTEREST BOX 29.10 Skin tear research

Recent research by Carville et al (2014) identified that applying moisturising creams twice a day can prevent traumatic wounds from developing by 50%. As we age skin becomes thinner, dryer and more fragile, tears easily and heals more slowly. Skin tears can often lead to chronic wounds such as leg ulcers, which are painful and debilitating. This research demonstrates that by simply applying moisturiser twice a day we can prevent traumatic wounds from developing. With over 430 000 Australians affected by chronic wounds like skin tears, and the cost to the healthcare system approximately $2.6 billion per year, this simple regimen can improve outcomes for individuals.

*(Carville et al 2014)*

## Assessment

Assessment of a skin tear is the same as for other wound types. The cause of the skin tear must be established if possible to implement preventative measures. Full systems assessment, which includes comorbidities, individual's age, medical and surgical history, medications and general health status, will determine the potential for wound healing.

Other factors to consider are:

- Anatomical location
- Wound dimensions (length, width and depth)
- Exudate—type and amount
- Size and depth of skin and skin flap
- Haematoma formation
- Condition of the peri-wound skin (e.g. fragility)
- Pain
- Signs and symptoms of infection where the skin tear is more than a few days old.

The arms and lower leg are reported to be the most common location for skin tears (Payne & Martin 1993).

See Clinical Skill 29.4 for guidelines and information on assessment and management of skin tears.

## Management

Given the lack of available guidelines at this time, best practice wound management principles ensure evidence-based treatment is used in the management of skin tears (Ratliff & Fletcher 2007; Stephen-Haynes & Carville 2011). Essential criteria for creating a management plan are: assessment (as discussed above), documentation, cleansing, moist wound

### CLINICAL SKILL 29.4 Assessment and management of skin tears

**Review and carry out the standard steps for all clinical skills/interventions**

| NMBA Decision-making Framework considerations: | Equipment: |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile dressing pack and dressing materials<br>Additional light source (if required)<br>Gloves<br>Disposable apron<br>Normal saline<br>Waste receptacle<br>Dressing trolley<br>Mask and eye protection as required |
| **Skill activity** | **Rationale** |
| Skin tears can result in partial or full separation of the layers of the skin. They may be caused by friction and/or shearing forces and require treatment to prevent wound contamination and infections. | |

*Continued*

## CLINICAL SKILL 29.4 Assessment and management of skin tears—cont'd

| | |
|---|---|
| Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for pain<br>Assess for any allergies | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Pain may be caused during the procedure<br>Determines any adverse reactions to wound irrigation solution, dressing or tape (if required) |
| Assess the skin tear to determine the severity: assess degree of tissue loss and skin or flap colour using STAR<br>Assess surrounding skin for swelling, discolouration or bruising, fragility<br>Choose appropriate dressing according to skin tear assessment | Severity will depend on the treatment and the type of dressing required<br>Dressing choice will maintain a moist wound healing environment, control or manage exudate and reduce the risk of infection |
| Assist the individual to assume an appropriate position of comfort, ensuring that only the wound area is exposed.<br>Obtain additional assistance if required | Promotes comfort and facilitates performance of the procedure<br>Assistance is available when required |
| Place the equipment in a convenient location near the bedside. Open procedure pack using corners. Assemble the required equipment, using aseptic technique. Drop sterile equipment into sterile field. | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the dressing is being performed<br>Prevents contamination of sterile items<br>Additional items are available for use |
| Perform hand hygiene and loosen wound dressing | Prevents spread of microorganisms and allows ease of removal of wound dressing |
| Put on apron. Perform hand hygiene, apply gloves if required. If other PPE required put on before gloves | Prevents spread of microorganisms |
| Position dressing towel around the wound, remove old dressing and place in waste bag/container | Protects the wound from environmental contamination |
| Dispose of gloves and perform hand hygiene<br>Put on clean non-sterile gloves | Removes microorganisms and prevents cross-contamination |
| Control bleeding (if present), cleanse wound with warm 0.9% sodium chloride solution, remove debris (if required). Realign skin tear | Cleans wound and prepares for dressing application<br>Allows for more accurate wound assessment |
| Apply wound dressing as required<br>Ensure dressing extends over the wound edge by at least 1.5–2 cm<br>Before applying, draw arrow on top of dressing in direction of skin flap and write due date for removal | Covers wound and prevents spread of microorganisms<br>Reduces risk of trauma on removal of dressing |
| Assist the individual to reassume a comfortable position | Promotes comfort of the individual |
| Remove and attend to the equipment appropriately. Perform hand hygiene | Prevents spread of microorganisms |
| Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer | Medico-legal requirement. Provides information about the wound, allows for the planning and implementation of care, monitors healing, and evaluates care. Allows for the planning and implementation of care |

*(ACSQHC 2012; 2015; AWMA 2010; Berman et al 2015; Crisp et al 2013; LeBlanc 2014; LeMone et al 2014; Lynn & LeBon 2012; NHMRC 2010; NMBA 2013; 2016; Rebeiro et al 2013; Rowley & Clare 2011; Smith et al 2011)*

healing principles, dressing selection and consideration of pain and potential infection.

Treatment regimens are best aimed at using low or non-adherent dressings which, when removed, will not strip the skin. Soft silicone or silicone-impregnated dressings are gentle to the skin and provide security to the skin flap. Foam dressings are also gentler to fragile skin and absorb exudate leaking from the wound. Skin sealants or protectants can be used to create a thin film between the skin and the dressing. Adhesive dressings such as film dressings and hydrocolloid dressings are generally discouraged because of the risk of further damage to the skin on removal.

Skin tears in the elderly do not respond well to suturing or staples, as the skin is too thin and fragile.

### Steps to manage a skin tear

1. Stop the bleeding
   - An alginate dressing can be used with light pressure to control the bleeding
   - Where possible elevate the limb
2. Clean the wound
   - Use warm sterile saline or water to clean the surrounding skin
   - If there is a skin flap gently peel back the flap and clean under the flap and the exposed wound
   - If the skin flap is viable lay the flap over the open area to act as dressing
   - Trim any non-viable flap
   - Categorise the skin tear and document on the individual's record
   - Apply a skin sealant or barrier to the surrounding (peri-wound) skin
3. Apply a dressing
   - Select a dressing based on the assessment of the individual, relevant protocols, the condition of the surrounding skin and any discolouration or bruising
   - If using skin closure strips leave space between the strips to allow exudate to drain
   - Aim to leave the dressing in place for several days to avoid disturbing the wound
   - Foam dressings should be marked with an arrow in the direction of the flap to assist removal
4. Review and reassess
   - Remove the dressing in the direction of the arrow being careful not to disturb the skin flap. Consider using adhesive removers to minimise additional trauma to the skin
   - Clean and reassess the skin flap; trim non-viable tissue
   - Assess for signs of infection and non-healing
   - Redress as necessary and document all care given in individual's records.

Where infection is a concern systemic antibiotics or a topical antimicrobial dressing, such as a silver-containing dressing, may be used to help manage infection.

*Helpful tip*: Applying a crepe bandage or a cotton tubular bandage to secure a non-adherent dressing will reduce the risk of further injury from the use of tape and dressing removal and use of a silicone dressing will also reduce the risk of additional trauma to the skin tear on dressing removal.

## LEG ULCERS

Chronic leg ulceration is a common and often recurrent condition, most commonly affecting the over-60 age group. The point prevalence of chronic wounds is estimated to be around 2% of Australians over 60 years of age (Graves & Zheng 2014). Graves and Zheng (2014) found that the total number of cases of venous leg ulcers (VLUs) in public and private hospitals in 2010–11 was 47 299. The cost on the Australian healthcare system of managing and treating leg ulcers is substantial, with the average cost in 2002 being $29 493 per wound (Santamaria et al 2002). A recent study by Graves and Zheng (2014) identified that the total healthcare cost of venous ulcers in both hospital and residential care settings was estimated to be US$802.55 million. This cost rises with the extended length of time taken to heal these wounds. **Leg ulcers** incur cost in hospital admissions and in the community nursing setting because of the need for frequent home visits (Johnson 2007).

Baker & Stacey (1994) in their seminal research study found that 58% of leg ulcers had been present for more than 3 months and 24% for more than 1 year, indicating the chronicity of the problem. Leg ulceration is not a disease but rather a symptom of an underlying disease process. Leg ulcers decrease an individual's quality of life, often causing severe discomfort, inconvenience and social isolation, as well as incurring loss of productivity in the workforce (Douglas 2001; Rich & McLachlan 2003). Non-compliance with treatment of venous leg ulcers is a common problem, which leads to a failure to heal and recurrence. However, there are many different types of leg ulcers and it is important to differentiate between them so that the correct management strategies can be followed. Leg ulcers caused by underlying venous disease are the most common type.

### Primary causes

Leg ulcers are classified according to the vasculature involved:

- Arterial, involving arteries and arterioles
- Venous, involving veins and venules
- Mixed arterial–venous, involving arteries, arterioles, veins and venules
- Lymphatic, involving the lymphatic drainage system.

### Arterial leg ulcers

The underlying cause of pure arterial ulcers is a lack of arterial blood supply caused by peripheral arterial disease, though this usually presents a more complex problem with coexisting disease such as heart disease or diabetes. A history of cardiovascular disease, stroke or intermittent claudication may indicate arterial disease. Predisposing factors are atherosclerosis, advanced age, diabetes mellitus, hypertension, obesity and smoking. These ulcers are frequently located between toes or at the tip of the toes, over phalangeal heads, metatarsal heads

or on the side of the sole of the foot and above the lateral malleolus. Arterial ulcers can present with a well-demarcated edge and a deep pale wound base. The ulcer may be painful unless diabetic neuropathy is present and the leg takes on a hairless, thin, shiny, appearance with dry skin. The toenails may be thickened and often brittle. The leg is pale when elevated and cool to touch. Pedal pulses are often diminished or absent.

## Venous leg ulcers

Ulcers caused by underlying venous disease are referred to as venous ulcers. They can be defined as a 'full thickness defect of the skin that persists due to venous disease of the lower leg' (AWMA & NZWCS 2011). Venous disease can occur for various reasons, a common cause being a deep vein thrombosis (DVT) that damages the valves or walls of the deep veins on the leg (post-thrombotic damage). Where the valves in the large veins (superficial and deep) are damaged they fail to close properly allowing venous blood to move up and down the vein. Blood is allowed to flow back down the leg (retrograde flow) and this is known as venous reflux. Additional pressure is created in the veins, and fails to fall when the combined actions of the calf muscle pump and foot pumps contract through walking. This is referred to as ambulatory venous hypertension. Over time the raised pressure in the veins causes fluid to leak into the tissues resulting in oedema (accumulation of fluid in extravascular tissue) and eventual skin ulceration.

These ulcers can take weeks or months to heal and accurate diagnosis of the underlying aetiology is essential to ensure correct management. Compression therapy using bandages or stockings is the accepted management option and has been shown to heal venous leg ulcers more rapidly compared to no compression (O'Meara et al 2012). Compression bandages or stockings aid venous return of blood to the heart (orthograde flow) and a reduction in venous reflux (see 'Compression therapy for venous leg ulcers' below).

In obtaining a diagnosis of venous disease the person may have a history of:

- Venous disease, confirmed by duplex ultrasound
- Varicose veins and/or surgery
- Family history of leg ulceration
- Proven DVT or phlebitis
- Surgery/fractures to the affected leg
- Episodes of chest pain/pulmonary embolism.

Predisposing risk factors are:

- Pregnancy
- Obesity.

Leg ulcers with underlying venous disease usually occur on the lower leg. They can be small in the pretibial area and anterior to the medial malleolus or larger and circumferential. These ulcers generally have uneven edges and a ruddy granulation tissue and appear to be superficial compared with the arterial ulcer. Discomfort is relieved by elevation of the leg. Venous ulcers are often accompanied by oedema, with fluid seepage and maceration of the surrounding skin. Pruritus and scale formation occurs. The leg can take on a reddish–brown pigmentation caused by haemosiderin, oedema is present and the leg can be quite firm to the touch. There is usually evidence of old healed ulcers, tortuous superficial veins and the limb may be warm to touch. Foot and leg pulses are present. Table 29.9 outlines the difference between venous and arterial ulcers.

## Diagnostic tools for the assessment of leg ulcers

- Comprehensive medical and surgical history
- Physical examination including palpation of specific relative pulses
- Doppler ultrasound measurements—ankle/brachial pressure index (ABPI)[1]
- Photoplethysmography (PPG) measurement of venous refill
- Transcutaneous oxygen perfusion measurements
- Duplex scans
- Arteriography.

## Arterial leg ulcer management strategies

The management of arterial leg ulcers is very different from the management of venous leg ulcers:

- Consultation with a vascular surgeon is recommended at an early stage
- Treatment of the underlying disease is important
- Angiography or angioplasty may be required
- Chemical sympathectomy may be required
- Bypass surgery or amputation may be required.

## Compression therapy for venous leg ulcers

Compression therapy is indicated in the management of pure venous leg ulcers. The aim is to reduce the venous hypertension in the leg through compression of the veins using strong bandages or stockings. This will return extracellular fluid to the venous system, reducing limb oedema. Compression of the lower leg narrows the major veins reducing the local blood volume and redirecting blood to the heart. It also narrows the diameter of the vessels increasing the velocity of flow through the vein. Compression can be applied as bandages, stockings or pneumatic compression (dynamic compression). These systems compress the entire lower leg and are contraindicated for individuals with poor arterial circulation, as this circulation can be further compromised. Pressure is determined by the tension (stiffness) of the bandage, the circumference of the limb and the width and number of layers applied (Partsch 2012; Thomas & Fram 2003). A pressure of 30–40 mmHg measured at the ankle aims to achieve a reduction in venous hypertension though it does not account for different limb sizes, bandage application techniques, posture and movement of the limb, condition of the bandage or stocking and skill of the bandager. The pressure may decline over a period of time and re-bandaging

[1]The presence of adequate arterial circulation is a not a default diagnosis for a venous leg ulcer. An ABPI may not be a reliable diagnostic tool in clients with diabetes where arterial calcification can prevent arterial compression and falsely elevate the systolic arterial pressure.

**TABLE 29.9 | Differentiating between venous and arterial ulcers**

| Indicator | Arterial | Venous |
|---|---|---|
| Predisposing factors | Arteriosclerosis<br>Advanced age<br>Diabetes<br>Hypertension<br>Smoking | History of deep vein thrombosis (DVT)<br>Valve incompetence in the deep, superficial or perforating veins<br>Obesity |
| Associated changes in the leg and skin | Thin, shiny, dry skin<br>Thickened nails<br>Absence of hair growth<br>Pallor on elevation of legs<br>Limb may be cool to touch | Firm ('brawny') oedema<br>Reddish brown pigmentation<br>Evidence of healed ulcers<br>Dilated and tortuous superficial veins<br>Limb may be warm to touch |
| Ulcer location | Between toes or at tip of toes<br>Over phalangeal heads<br>Above lateral malleolus (for diabetes or high occlusion), over metatarsal heads, on side or sole of foot | Anterior to medial malleolus<br>Pre tibia area<br>Generally lower third of leg |
| Ulcer characteristics | Well demarcated edges<br>Black or necrotic tissue<br>Dry ulcer bed<br>Deep, pale base | Uneven edges<br>Ruddy granulation tissue<br>Slough in wound bed |
| Pain | Exceedingly painful<br>Pain at rest, relieved by lowering leg to a dependent position | Moderate to no pain<br>Discomfort relieved by elevation of leg |
| Surrounding area | May have neuropathy | Leaking exudate can cause maceration and excoriation |
| Foot/leg pulses | Diminished or absent foot | Usually normal |

*(Carville 2012)*

is required. Pressure beneath the bandage is measured in three main ways: working pressure (when the individual is walking), resting pressure (at rest) and a third factor called the static stiffness index (SSI), which is the increase in pressure per centimetre increase in the circumference of the leg, or the difference in pressure between the supine and standing position (Partsch 2005a; 2012). A high SSI (above 10 mmHg) is considered a more inelastic compression system that produces a higher pressure when standing than when lying (Partsch 2005b; 2012).

Venous and mixed vessel disease ulcers are assessed for suitability to have compression therapy; the type and degree of pressure is determined upon completion of investigations and test. A medical practitioner or advanced practice nurse recommends the appropriate compression bandaging system to apply. An initial trial of bandaging is monitored for increased pain, discolouration of the toes, change of sensation (tingling or loss of sensation), increased oedema in the toes and individual compliance. If an individual is unable to tolerate compression bandages safely, lower compression levels can be applied to build tolerance. The type of bandage or stocking must also try to suit the lifestyle and ability of the individual in self-management.

## Compression bandages

Compression bandages are generally divided into elastic and inelastic bandages. This classification is suitable for a more powerful single layer elastic bandage but does not account for multilayer systems that use two or three layers of weak elastic bandages to achieve compression. Elastic bandages are highly extensible and accommodate changes in the shape of the limb with the contraction of the calf muscle when walking. This gives minimal changes in pressure beneath the bandage and sustained compression at rest. Inelastic bandages have minimal extensibility and greater fluctuations in pressure between walking and resting. Pressure is highest with walking as the expanded calf muscle pushes against the rigid bandage (Partsch 2012). Multilayer bandage systems of three or four layers combine inelastic and elastic bandages with a padding layer and/or crepe bandage where the components have different functions of protection, padding and retention. A Cochrane Review found compression increases ulcer healing rates compared with no compression. Multicomponent systems are more effective than single-component systems. Multicomponent systems containing an elastic bandage appear to be more effective than those composed mainly of inelastic constituents. Two-component bandage

systems appear to perform as well as the four-layer bandage (4LB). Individuals receiving the 4LB heal faster than those allocated the short stretch bandaging technique (SSB). More individuals heal on high-compression stocking systems than with the SSB. Further data are required before the difference between high-compression stockings and the 4LB can be established. Multilayer compression systems (compression bandages) appear to be more effective than single layer systems (O'Meara et al 2012).

The application of compression bandages requires advanced skills and knowledge to ensure correct application. A normally shaped leg has a narrower ankle and wider calf circumference. Compression levels are graduated when a bandage is applied with constant tension and overlap, with a higher pressure achieved at the ankle due to its narrower circumference, reducing by approximately 50% when it reaches below the knee (tibial tuberosity).

### Graduated compression stockings (GCS)

Graduated compression stockings have been shown to be as effective as multilayer compression systems (AWMA & NZWCS 2011). They are generally used for individuals with healed ulcers to prevent recurrence. Regular use and replacement is necessary to maintain compression.

### Pneumatic compression

Pneumatic compression is the application of an inflatable boot to the leg continuously, intermittently or in sequential cycles. It is used in the prevention of deep vein thrombosis, though there is some evidence to suggest it may play a role in the healing of venous leg ulcers.

### Preventing recurrence

Venous leg ulcer recurrence may be prevented with the use of long-term compression at the strongest compression tolerated by the individual (Nelson et al 2000) to increase compliance. In individuals with superficial venous insufficiency surgery and compression may be more effective than compression on its own (Barwell et al 2004).

### Personalised education and support

Leg ulcer education is centred on prevention of recurrence, chronic disease management and general health and lifestyle issues such as nutrition. In some areas leg ulcer clubs have been created to promote these aspects of care and to provide support and education about leg ulcers. These clubs also provide and allow ownership of the person's wound and disease (Kapp et al 2010).

Leg ulcers often require long-term complex dressing, regimens including packing of the ulcer to aid healing. See Clinical Skill 29.5.

## BURN INJURIES

Burns are considered one of the most traumatic injuries for a person to sustain. The physical trauma of a burn goes beyond the damage to the skin. A major burn can cause systemic complications in the short to medium term and physical and emotional complications in the medium to long term.

Dry heat, moist heat, chemicals, electricity or radiation can cause **burn injuries**. When a heat source comes in contact with the skin, the transfer of heat causes structural damage. Heat causes coagulation of the protein in tissue cells (cell damage starts at 41°C; protein coagulation at 50°C), and the depth of the burn is related to the amount of thermal energy dissipated in the skin, which is dependent on the temperature and duration of exposure.

After a burn injury, intravascular fluid is lost as the capillaries become more permeable. As the intravascular fluid volume decreases, the venous return and cardiac output fall. The clinical signs of 'shock' become apparent and tissue hypoxia threatens internal organs such as the kidneys. Other changes occur in organ function, in electrolyte levels and in metabolic function. Subsequently, complications of major burns can involve any body system because all systems are stressed during the injury and during healing.

### Classification of burns

Burn injuries are classified according to the depth of tissue injury. Where burn injuries were classified by first, second and third degree the classifications now reflect the anatomical thickness of the skin layers: epidermal, superficial dermal, mid dermal, deep dermal and full thickness (Table 29.10).

### Epidermal burns

In superficial burns only the epidermis is involved, with the basal layer of the epithelium remaining intact. The skin is dry, red (erythematous) and oedematous and the skin is hypersensitive. Superficial burns generally heal within 7 days without scarring and treatment is usually conservative to manage pain, maintain adequate hydration and moisturise the burned area.

### Superficial dermal burns

Partial thickness burns have damage to the epidermis and to the superficial dermis (papillary dermis). They may blister as serum is released from injured blood vessels and have a moist surface. They can be painful, blanch with pressure and have brisk capillary return indicating blood vessels are intact. If the blisters burst, the area beneath is pink, swollen and wet and blanches with pressure. When the superficial dermis has been injured, the raw area is resurfaced with epithelium growing from the undamaged walls of the sweat glands and hair follicles. Healing is usually complete within 14 days if there are no complications with minimal scarring, though there may be reduced pigmentation of the skin.

### Deep partial thickness burns

Deep partial thickness burns (mid dermal burns) extend into the reticular dermis. These burns may blanch with pressure but capillary return is sluggish or absent as blood vessels are destroyed; there is also less leakage of serum. Blisters are not usually present and the burn surface is moist or dry. Deeper partial thickness burns result in diminished sensation, as the dermal nerve endings are destroyed and the burn can be

## CLINICAL SKILL 29.5 Packing a wound

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile dressing pack and dressing materials<br>Additional light source (if required)<br>Gloves<br>Disposable apron<br>Normal saline<br>Additional cotton balls or gauze balls<br>Waterproof sheet (Bluey)<br>10 mL syringe<br>Sterile scissors<br>Sterile gloves<br>Waste receptacle<br>Dressing trolley<br>Mask and eye protection as required |

| **Skill activity** | **Rationale** |
|---|---|
| Wound packing is undertaken to provide a moist cover for the wound to prevent the introduction of microorganisms and to promote healing. Wounds requiring packing heal by secondary intent. The wound packing promotes healing for this type of wound. The type of dressing used also absorbs exudate. | |
| Assess the individual's record to determine previous appearance of wound and any previous dressings<br>Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for pain<br>Assess for any allergies<br>Visually assess the wound for signs and symptoms of infection and dressings used | Determines requirements for equipment and dressing requirements<br>Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Pain may be caused during the procedure<br>Determines any adverse reactions to wound irrigation solution, dressing or tape (if required) |
| Assist the individual to assume an appropriate position of comfort, ensuring that only the wound area is exposed<br>Obtain additional assistance if required | Promotes comfort and facilitates performance of the procedure<br>Assistance is available when required |
| Place the equipment in a convenient location near the bedside. Open procedure pack using corners. Assemble the required equipment, using aseptic technique. Drop sterile equipment into sterile field | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the dressing is being performed<br>Prevents contamination of sterile items<br>Additional items are available for use |
| Perform hand hygiene and loosen wound dressing | Prevents spread of microorganisms and allows ease of removal of wound dressing |
| Put on apron. Perform hand hygiene, apply gloves if required. If other PPE required put on before gloves | Prevents spread of microorganisms |
| Position dressing towel around the wound, remove old dressing and place in waste bag/container | Protects the wound from environmental contamination |
| Dispose of gloves and perform hand hygiene<br>Put on clean non-sterile gloves or sterile gloves if required | Removes microorganisms and prevents cross-contamination |
| Irrigate wound packing (if already present) with normal saline | Allows for packing to be removed without causing removal of healing tissue. Causes less discomfort for the individual |

*Continued*

| CLINICAL SKILL 29.5 Packing a wound—cont'd | |
|---|---|
| Observe the wound for size, union, signs of infection, exudate, odour, inflammation and healing. Assess for pain | Evaluates condition of the wound and stage of healing |
| Cleanse the wound with sterile normal saline in accordance with the practices of the healthcare facility, medical officer's orders or as directed by the nurse in charge. Clean from a clean area towards a less clean area, usually an outward direction | Wound cleansing removes debris from the wound. Avoids transferring wound exudate and normal flora from the surrounding skin into the wound, and thus prevents wound contamination |
| Using forceps, gently pack the wound with the required packing materials. (See medical officer's or wound management consultant's orders.) Ribbon or packing gauze is gently pushed into the wound cavity.<br>**Note:** Do not completely fill the wound with hydrogel or hydrocolloid rope as these will expand as they absorb exudate | Packing allows for secondary wound healing. |
| Using forceps apply an appropriate clean dressing over the wound to provide a moist wound-healing environment and secure it in position | Provides a moist wound environment. Facilitates healing, absorbs exudate, protects the wound from infection and irritation (e.g. from clothing) |
| Remove personal protective equipment and discard with used equipment in an appropriate waste receptacle | Prevents spread of microorganisms |
| Assist the individual to reassume a comfortable position | Promotes comfort of individual |
| Remove and attend to the equipment in correct manner. Perform hand hygiene | Prevents spread of microorganisms |
| Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer | Provides relevant information to other members of the healthcare team. Include date and time, appearance of wound and any exudate, cleansing solution, type of primary and any secondary dressing used, and the individual's response to the dressing. Medico-legal requirement. Allows for the planning and implementation of care |
| *(ACSQHC 2012; 2015; AWMA 2010; Berman et al 2015; Crisp et al 2013; LeMone et al 2014; Lynn & LeBon 2012; NHMRC 2010; NMBA 2013; 2016; Rebeiro et al 2013; Rowley & Clare 2011; Smith et al 2011)* | |

painless. Healing is slower as more skin structures, such as hair follicles, are destroyed. These burn injuries may require early surgical excision of dead tissue and skin grafting to speed recovery to reduce the risk of infection and minimise scarring. These burns will take longer to heal (>21 days).

### Deep dermal burns

Deep dermal burns leave damage to all layers of the skin and the injury may extend to underlying fat, muscle and bone. Epidermal appendages are destroyed and the burn area is painless. The appearance of the burned area can vary and may be white, waxy, tan coloured, red or charred. The area is dry and feels hard. Because all layers of the skin are destroyed early surgical excision of dead tissue and skin grafting or covering with artificial skin is performed, to assist closure of the burn area. Scarring will occur and, depending on the anatomical region involved, there may be functional impairment. These burns also take longer to heal (>21 days).

### Full thickness burns

Burns of this depth leave damage to all layers of the skin, the subcutaneous fat layer, muscle and often bone. The damaged tissue appears charred, firm and dry. There is no pain and limited or no movement of involved extremities. These burns may result from an electrical current or prolonged contact with flame; for example, an unconscious person unable to move from the source of the burn. They require surgical intervention for dead tissue removal and skin grafting. Scarring will occur to the damaged areas.

## Assessing burn severity

An experienced burn clinician should assess burn injuries, especially burns that require admission to hospital. The severity of a burn is largely dependent on its size and depth. Assessing burn depth and size correctly is important as treatment pathways differ depending on the severity of the burn.

## TABLE 29.10 | Burn depth characteristics

| | Superficial epidermal (e.g. sunburn) | Superficial dermal thickness (partial) | Mid dermal thickness (partial) | Deep dermal thickness (partial) | Full thickness |
|---|---|---|---|---|---|
| | | | | | |
| Pathology | Involves epidermis only | Involves epidermis and upper dermis; most adnexal structures intact | Involves epidermis and mid dermis; adnexal structures may be disrupted | Involves epidermis and significant part of dermis, with deeper adnexal structures damaged but viable | Epidermis, dermis and cell adnexal structures destroyed |
| Appearance | Dry and red, blanches to pressure. No blisters | Pale pink. Smaller blisters. Wound base blanches with pressure | Variable pale to dark pink, may have blisters present | Blotchy red or pale deeper dermis where blisters have ruptured | White waxy charred. No blisters. No capillary refill |
| Sensation | Painful | Increased sensation. Very painful and tender | Some nerve endings remain viable; pain is present but less severe than pain of superficial burns | Decreased sensation | No sensation |
| Circulation | Normal, increased | Hyperaemic<br>Rapid capillary refill | Capillary return is present but delayed | Sluggish capillary refill | Nil |
| Colour | Red, warm | Pink | Pale to dark pink | White/pale pink/blotchy red | White/charred/black |
| Blisters | None or (days) later or desquamation | Yes (within hours of injury) | Yes, may be present | Early—usually large blisters which rupture rapidly and slough | Epidermis and dermis destroyed, no blistering |
| Healing time | Within seven days | 7–14 days | 7–28 days | Over 21 days | Does not heal spontaneously |
| Scarring | No scar | Colour match defect. Low risk of hypertrophic scarring | Prolonged healing with possible scarring and contracture. Deeper areas or over a joint may need surgical intervention and referral to a specialist unit | High risk (up to 80%) of hypertrophic scarring | Wound contraction<br>Heals by secondary intention |

*ANZBA (2015); Victorian State Burns Clinical Practice Guidelines (2012)*

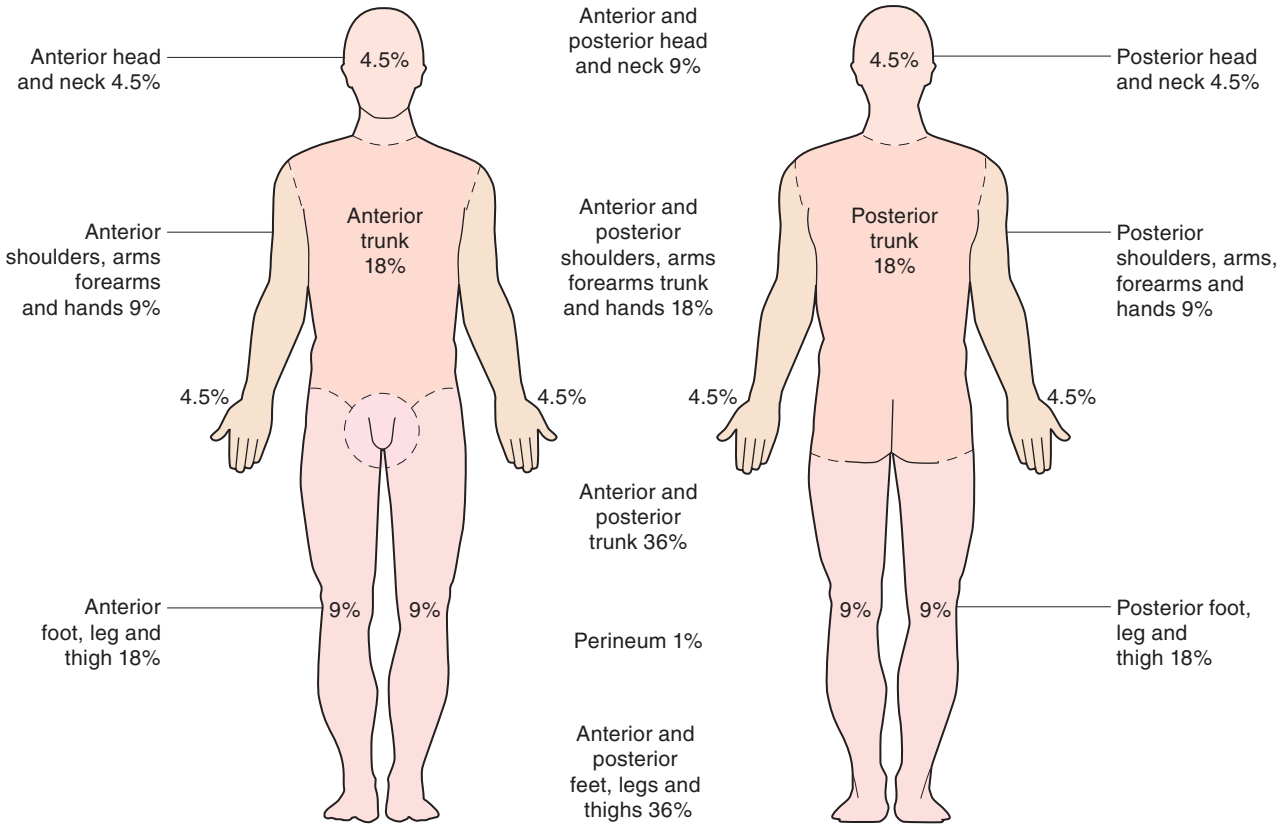


**Figure 29.6** Assessing burn surface area: rule of nines (adults)

Furthermore, the greater the severity, the greater the amount of fluid lost from the body, and the greater the degree of shock that ensues. To assess the size of a burn accurately, a chart is used on which the size is expressed as a percentage of the total body surface.

Two methods exist to calculate burn size: the 'rule of nines' (Figure 29.6) and the Lund–Browder method (Figure 29.7). The rule of nines divides the body into areas that equal 9% which, when totalled, equal 99% with the genitalia accounting for the remaining 1%. For example, the front and back of each leg is 9%, each arm is 4.5%; the upper and lower torso is 9%. This method is quick and easy though less accurate than the Lund–Browder method, which is more accurate as it allows for changes in body proportion with age. The numbers on each body portion on the chart indicate the percentage of body surface for that part. Both types of chart provide a means of determining the extent of the burn or the total body surface area (%TBSA). Areas of erythema are not included in the calculations.

## Causes of burn injury

While there are many ways a burn injury can be sustained, for example, thermal, chemical, electrical, friction or abrasion, all burn injuries cause cell death and tissue ischaemia. The Jackson's Burn Wound Model (Singh et al 2007) describes three areas of tissue injury: *zone of coagulation* (necrosis) nearest the source of injury, where there is irreversible tissue damage; *zone of stasis* (ischaemia), where there is damaged tissue and decreased circulation, but potentially viable tissue; and the *zone of hyperaemia*, in which there is oedema and reversible increased blood flow. Interventions that preserve tissue perfusion in the zones of stasis and hyperaemia potentially decrease burn wound progression or deepening tissue damage (necrosis). Where interventions are suboptimal there is the potential for a partial thickness burn to progress to a full thickness burn in the first 3 to 5 days, thus causing burn wound conversion and making burn depth assessment difficult.

### Thermal burns

Flame and scald burns are the most common types of thermal injury (ANZBA nd; Burns Registry of Australia and New Zealand nd) and are caused by three main mechanisms: conduction (coming into contact with hot objects e.g. hot fluids (scald burns)), radiation (e.g. heat lamp) and convection (e.g. explosion). Scald injuries account for over 38% of burns, flame burns for 32% and contact burns for 16% of all cases. The most common cause for burn injury among children was scalds (57%) followed by contact (20%) and flame (11%) (ANZBA nd; Burns Registry of Australia and New Zealand nd).

### Chemical burns

Chemical burns result from direct contact with the substance or through ingestion or inhalation of acids, alkalis or organic

Percentage of areas affected by growth

| | 0 | 1 | 5 | 10 | 15 | Adult age |
|---|---|---|---|---|---|---|
| A=0.5 head | 9.5 | 8.5 | 6.5 | 5.5 | 4.5 | 3.5 |
| B=0.5 one thigh | 2.75 | 3.25 | 4 | 4.25 | 4.5 | 4.75 |
| C=0.5 one leg | 2.5 | 2.5 | 2.75 | 3 | 3.25 | 3.5 |

To estimate the total of the body surface area burned, the percentages assigned to the burned sections are added. The total is then an estimate of the burn size.

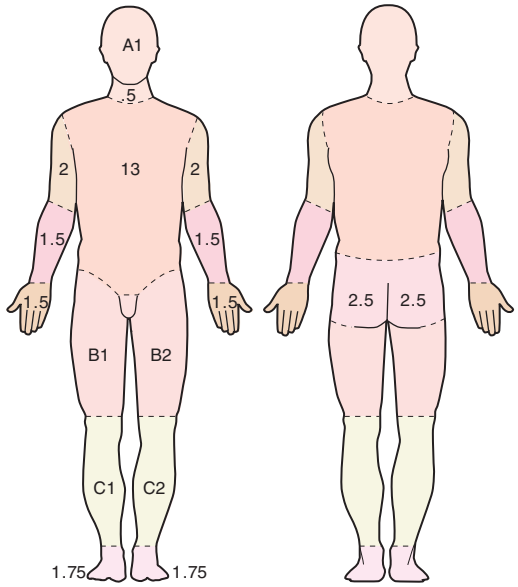


**Figure 29.7** Assessing burn surface area: Lund–Browder method

materials. The severity of the burn depends on the type and concentration (pH) of the agent and the duration of contact. Individuals with chemical burns should have treatment commenced at the scene of the injury. Contaminated clothing should be removed and the area irrigated with clean water, especially burns to the eyes, which require a minimum of two litres of water, before transfer to hospital (Cinat & Smith 2006).

### Electrical and lightning burns

Faulty electrical wiring, contact with overhead power lines and high voltage power cables can all be sources of electrical burns. The tissue damage from these burns can be underestimated due to the internal damage that results, as it is not always visible on admission and the skin can appear normal yet have muscular tissue destruction beneath it. There will be an exit wound as the electrical current has travelled through the body. Cardiopulmonary function must be assessed in these individuals. Lightning burns can cause cardiac arrest and serious nerve damage.

### Friction or abrasion burns

Friction burns are becoming more common, especially in children who injure themselves on exercise machines such as a treadmill. In adults friction burns result from car and motorbike accidents (road rash) (ANZBA nd; Burns Registry of Australia and New Zealand nd).

### Inhalation

There is a risk of inhalation injury in individuals who have been in fires as there is exposure to smoke, especially in an enclosed area such as a house fire. Inhalation injury should also be suspected and assessed in individuals with facial burns, singed nasal hairs and ash in the oropharynx. These burn injuries should always be referred to hospital for full assessment and monitoring.

## Management of the individual with burn injuries

Management is determined by the depth and size of the burn. Effective treatment must be in place in the first 24 hours to reduce the damaging effects of inflammation and to avoid burn wound conversion and deeper tissue injury and it begins with effective first aid. Smaller superficial burns may be managed in the primary health setting. Full thickness and sub-dermal burns should be hospitalised and managed in a specialist burn centre. Nursing Care Plan 29.1 provides an overview of nursing care for an individual with a burn injury.

### First aid for burn injuries

Adequate and appropriate first aid is vital to the successful management of a burn injury. Applying cool running water for the first 20 minutes within the first 3 hours of a burn injury is considered to be best practice for a burn injury (ANZBA 2015; Cuttle et al 2010). It can limit the extent of burn depth, the amount of pain and reduce the area of skin affected by the burn. Individuals with larger burns need to be monitored for hypothermia if cool running water is applied for longer periods. Lotions, creams, butter, aloe vera, toothpaste and ice are all to be avoided as they either mask the full extent of the burn or can interfere with the ongoing management. There is no agreement on the type of burn management a burn-injured individual should receive prior to transfer and consultation should be with the treating burn surgeon.

### When to refer to a specialist burn centre

The Australian and New Zealand Burn Association (ANZBA 2015) provides criteria for when an individual needs to be referred for specialist treatment:

- Burns greater than 10% of total body surface area (TBSA)
- Full-thickness burns greater than 5% of TBSA
- Burns of special areas—face, hands, feet, genitalia, perineum, circumferential limb or chest burns, and major joints
- Electrical burns
- Chemical burns
- Burns with inhalation injury
- Burns with pre-existing illness
- Burns at the extremes of age—young children and the elderly
- Burn injury in pregnant women
- Non-accidental burns
- Burns associated with major trauma.

## NURSING CARE PLAN 29.1

**Assessment:** Skin integrity impaired
Standard 8 Prevention and Management Pressure Injuries—NSQHS standard
**Issue/s to be addressed:** Immobility leads to pressure, shear and friction, and is the factor most likely to put an individual at risk for altered skin integrity. Extremes in age (very young and very old); inadequate nutrition, environmental moisture, (incontinence); and vascular insufficiency potentiate the effects of pressure and hasten the development of skin breakdown.
**Risk factors:**
Pressure on the tissue from impaired mobility, activity or sensation
Tissue integrity that is adversely affected by environmental factors (such as shear or friction forces acting on the skin)
Factors related to the individual (such as nutritional status, oxygen delivery, skin temperature, age and gender, the use of high-risk medicines (i.e. non-steroidal anti-inflammatories) or the presence of chronic disease)
**Goal/s:** The individual's skin remains intact, as evidenced by no redness over bony prominences and capillary refill <6 seconds over areas of redness

| Care/Actions | Rationale |
|---|---|
| Identify risk factors for pressure injuries using an agreed screening tool within 8 hours of admission<br>Undertake a comprehensive skin inspection | Tools can be effective in assisting clinicians to screen for pressure injury risk; this should be combined with clinical judgment<br>Healthy skin varies from individual to individual, but should have good turgor (an indication of moisture), feel warm and dry to the touch, be free of impairment (scratches, bruises, excoriation, rashes) and have quick capillary refill (less than 6 seconds) |
| Update risk and skin assessment daily, as well as when the individual's condition changes, on transfer to another department or facility and prior to discharge | Ongoing assessment is necessary in order to detect early signs of pressure damage, especially over bony prominences |
| Assess the individual's nutritional status | Nutritional screening is the process used to identify individuals who require a comprehensive nutrition assessment. This should be conducted on admission to the healthcare facility or at first visit in community settings |
| Assess skin over bony prominences (sacrum, trochanters, scapulae, elbows, heels, inner and outer malleolus); do not position individual on site of skin impairment | Areas where skin is stretched over bony prominences are at higher risk for breakdown because the possibility of ischaemia to skin is high as a result of compression of skin capillaries between a hard surface and the bone |
| Assess the individual's awareness of the sensation of pressure | Normally individuals shift their weight off pressure areas every few minutes; this occurs more or less automatically, even during sleep. People with decreased sensation are unaware of unpleasant stimuli (pressure) and do not shift weight. This results in prolonged pressure on skin capillaries and, ultimately, skin ischaemia |
| Assess for faecal and/or urinary incontinence and any environmental moisture; if the person is incontinent implement an incontinence management plan to prevent exposure to chemicals in urine and stool that can strip or erode the skin | Keeping skin clean and dry and the use of emollients promote healthy skin that will be resilient to any insults from irritants and shear and pressure. It is important to remember that skin damage from moisture increases the risk of pressure ulceration<br>The urea in urine turns into ammonia within minutes, and is caustic to the skin. Stool may contain enzymes that cause skin breakdown |

## NURSING CARE PLAN 29.1—CONT'D

| Care/Actions | Rationale |
|---|---|
| Assess amount of shear and friction on the person's skin | A common cause of shear is elevating the head of the person's bed; the body's weight is shifted downwards onto the individual's sacrum. Individuals should be positioned and supported to prevent sliding down in bed and creating shear forces. Limit head-of-bed elevation to 30 degrees. Using the knee brake on the bed will also help minimise the person's body slipping downwards in the bed. Common causes of friction include the person rubbing heels or elbows against bed linen and moving the patient up in bed without the use of a lift sheet |
| Assess the individual's ability to move (shift weight while sitting, turn over in bed, move from bed to chair) | Immobility is the greatest risk factor in skin breakdown |
| Assess surface that the individual spends majority of time on (mattress, cushion) | Individuals who spend the majority of time on one surface need a pressure reduction or pressure relief device to distribute pressure more evenly and lessen the risk for breakdown |
| Implement measures to prevent tissue breakdown associated with decreased mobility:<br>• Position the individual properly; use high-specification mattress or pressure redistributing support surface if indicated<br>• Instruct the individual to use overhead trapeze to lift self and shift weight at least every 30 minutes<br>• Lift and move the individual carefully using a turn sheet and adequate assistance<br>• Change the individual's position when in bed at least every 2 hours around the clock | Repositioning of an individual is undertaken to reduce the duration and magnitude of pressure over vulnerable areas of the body and to contribute to comfort, hygiene, dignity and functional ability<br>Regular positioning is not possible for some individuals because of their medical condition, and an alternative prevention strategy such as providing a high-specification mattress or bed may need to be considered<br>The timing of repositioning of the individual is determined by the individual's tissue tolerance; level of activity and mobility; general medical condition; overall treatment objectives; skin condition and comfort |
| Referral to other health professionals as clinically indicated for assessment and treatment | Other interprofessional team members (i.e. physician, nurse, speech pathologist, occupational therapist, physical therapist) should develop and document an individualised intervention plan based on the individual's clinical needs |
| Education—teach the individual and caregiver the cause(s) of pressure injury development:<br>• Pressure in skin, especially over bony prominences<br>• Incontinence<br>• Poor nutrition<br>• Shearing or friction against skin | Information should initially be provided to the person and their family/carer at the time of assessment and care planning, and throughout the episode of care. This ensures they understand the importance of this prevention plan. Reinforce the importance of mobility, turning or ambulation in prevention of pressure injury |

**Evaluation**

The individual's skin remained intact with nil erythema present. Interventions for this care/action were effective in preventing skin breakdown.
The individual was able to demonstrate understanding of pressure injury prevention actions.

*(ACSQHC Standard 8 2012; Klopp et al nd)*

## Emergency department management

The aims of initial management are to minimise further tissue damage, stabilise the individual, identify and assess further injuries and initiate fluid resuscitation. Assessment is made regarding the cause of the burn (flame, chemical, electrical), the time of injury, type of first aid given, tetanus history and loss of consciousness. Assessment of burn depth, size and location is then made. Burn management should not preclude resuscitation and emergency management of the individual.

## Hospital management

Once the individual is stabilised management will depend on a range of factors with the main aspects of care being:

1. Ongoing fluid management
2. Burn wound management
   - Prevention of infection
   - Debridement of dead tissue, blisters, loose skin
   - Rapid skin coverage
3. Adequate nutrition
4. Pain relief
5. Promotion of mobility
6. Scar management
7. Psychological support
8. Preparation for discharge.

## Fluid resuscitation

If the burned area is not too great (e.g. less than 15% in an adult, less than 10% in a child), the body generally compensates adequately for the fluid loss, and only the provision of extra oral fluids is indicated. In more extensive or severe burns, fluid loss is a major cause of shock, so fluid replacement is of prime importance. Fluid resuscitation rates are calculated from the time of injury and are based on the size and depth of the burn, age of the individual and pre-existing illnesses and other factors such as dehydration. The medical officer calculates the volume of fluid replacement required and prescribes the type of fluid to be administered. There are various resuscitation formulas; however, these should be used only as a guide to fluid replacement. Intravenous fluid administration is through peripheral and central access in large burns. Extensive full thickness burns may also require a blood transfusion to compensate for a reduction in erythrocyte numbers. Intravenous fluid replacement with electrolytes is continually calculated and adjusted according to need. Individuals with electrical and inhalation injuries have higher fluid requirements.

Monitoring techniques that may be performed to assess fluid requirements include:

- Insertion of a urinary catheter to enable hourly monitoring of urine output. Hydration aims at maintaining a urine output of 0.5–1.0 mL/kg/hour in an adult and 0.5–2.01 mL/kg/hour in a child (Cinat & Smith 2006; NSW Health 2014)
- Advanced monitoring methods including central venous pressure measurements, oxygen consumption and delivery, serum lactate, pulmonary artery catheter measurements and monitoring of base deficit (Cinat & Smith 2006).

## Wound management

Burn wound management is aimed at preventing infection and providing early skin coverage with dressings or skin grafts. The wound can change in depth and appearance over the first few days and treatment plans should reflect these changes. Wound care consists of regular observation, assessment, cleansing and debridement. Showers and bedside cleansing are used to remove old dressings and loose necrotic skin. Occlusive dressings maintain a moist wound environment, enhance the healing process and reduce the risk of scarring as well as reducing exposure to contamination. These are suitable for superficial dermal burns. Deeper burns require an antimicrobial dressing to decrease microbial load and reduce the risk of infection. Moist wound healing produces better cosmetic outcomes with less scarring. Negative pressure wound therapy (NPWT), though used less frequently in burn wounds, is placed over skin grafts to improve graft take (Runkel et al 2010). Permanent and temporary skin covers are discussed below.

Infection prevention is a priority and the most serious threat to further tissue necrosis and wound sepsis. Methods of preventing infection include:

- The use of aseptic non-touch technique (ANTT) principles to prevent cross-infection (see Clinical Interest Box 29.11)
- Topical antimicrobial dressings (silver dressings)
- Systemic antibiotic therapy
- Enhancing natural defences (e.g. by providing a high-protein/kilojoule diet and treating any anaemia).

***Escharotomies*** Eschar is dead tissue which may present in circumferential full thickness burns. The development of eschar causes increased tissue pressure, which may impair circulation and lead to ischaemic necrosis. An escharotomy (release of skin and subcutaneous tissue) is a surgical procedure performed to release constriction of the eschar to prevent secondary ischaemic necrosis. A longitudinal incision is made through the eschar and is extended across joints. As the eschar does not contain nerve endings the procedure is painless, but is still performed under an anaesthetic. It results in open wounds, which provide a portal for infection.

***Prevention of infection*** The burn wound provides an ideal culture medium for a range of microorganisms. Preventing infection is achieved by preventing contamination of the wound and preventing invasion of microorganisms into the tissues and bloodstream. A specialised burns unit may be available where the air is filtered, the individual is received into a bed prepared with sterile linen and isolation techniques are used to protect against infection. When a specialised unit is not available, the individual is generally nursed in a single room using protective isolation techniques.

***Debridement of dead tissue*** In Australia it is now the accepted standard of care for partial and full thickness burn injuries to be treated by early surgical excision of dead tissue (within 72 hours of injury) to prepare the burn area for grafting and primary closure. Blood flow is markedly increased by day 4. The individual must be stabilised and fully resuscitated. Early excision (in the first 24 hours) has been shown to: reduce blood loss in a paediatric population (Desai et al 1990); reduce mortality in individuals without inhalation injury (reduces bacteraemia limiting sepsis and multi-organ failure); and reduce length of hospital stay (Ong et al 2006). It also removes the major route of infection. Serial operations may be required within the first several days.

## CLINICAL INTEREST BOX 29.11 ANTT (aseptic non-touch technique also known as aseptic technique or surgical asepsis)

There are two types of ANTT: surgical and standard. The choice of surgical or standard ANTT is based on ANTT risk assessment and will also determine equipment selection and technique.

Standard aseptic non-touch technique (standard ANTT) is used within wound management procedures. The basic principle is that the key sites (e.g. wound) must not come into contact with any item (hand or equipment) that is not sterile.

Each procedure must be risk assessed. The ANTT technique will vary depending upon the risk assessment (i.e. size of key site and number of wounds and ability to protect key parts). Part of the risk assessment includes determining the length of the procedure and whether key parts and key sites will need to be touched during the procedure.

Sterile gloves are not always required for standard ANTT. Whether sterile or non-sterile gloves are worn depends on whether you can avoid touching the sterile parts of equipment that will come into contact with the susceptible areas (e.g. wound or cannula). If the procedure is complex or the patient is immunocompromised sterile gloves must be worn. If however you can carry out the procedure without touching the key part with your hands, non-sterile clean gloves may be worn.

Use of a dressing pack does not automatically make it a surgical ANTT procedure. Simple wound management techniques could be managed through standard ANTT. However, complex wounds, such as management of a wound drain, may require surgical ANTT.

| | |
|---|---|
| Standard ANTT (clean technique) | • Is a non-touch technique where hands wearing non-sterile clean gloves do not touch the sterile dressing surfaces that will be in contact with the wound bed<br>• Involves 5 moments of hand hygiene<br>• Maintain a clean environment by preparing a clean field, using clean (rather than sterile) gloves and dressing pack. Prevent direct contamination of materials and supplies<br>Examples:<br>• Wounds healing by secondary intention (except for those who are immunocompromised)<br>• Pressure injuries, leg ulcers, old tracheostomy sites<br>• Dehisced wounds (which will already by heavily colonised with environmental micro-organisms)<br>• Simple grazes<br>• Removing sutures |
| Surgical ANTT (aseptic technique) | • Is a strategy used in patient care to reduce exposure to microorganisms<br>• This is to maintain objects and areas as free from microorganisms as possible<br>• Sterile technique involves a surgical hand wash, use of a sterile field, use of sterile gloves for application of a sterile dressing, and use of sterile instruments<br>Examples:<br>• Insertion, re-siting, manipulating or dressing of an invasive device (i.e. intravenous line, central venous catheters, gastrostomy and jejunostomy tubes, tracheostomy tubes, chest drains, urinary catheter or wound drain)<br>Examples:<br>• Suturing of lacerations<br>• Acute traumatic wounds<br>• Where bone is visible<br>• Surgical wounds up to 48 hours postop if immunocompromised<br>• When patients are immunocompromised for both chronic and acute wounds |

*(National Safety & Quality Services 2014, Standard 3; NHMRC 2010; Rowley et al 2010)*

## Primary closure

Specialised dressings, skin closure with skin grafts or skin substitutes can all be used to achieve primary closure of a burn wound. All methods aim to achieve the same outcome of promoting healing, preventing infection and preventing scar development and contraction of scar tissue. Common methods of closure include skin grafting (split and full thickness), application of biological dressings (allografts, xenografts) or biosynthetic dressings.

***Skin grafting*** The ideal burn wound closure is with autograft; that is, using the individual's own skin. It is performed as the treatment of some deeper partial thickness burns and in the treatment of all full thickness burns. Skin grafting promotes healing, prevents infection and prevents the contraction of

scars. It is performed as early as possible in the treatment of some partial thickness burns and in the treatment of all full thickness burns. Split skin grafting involves the removal of thin sheets of the epidermis and some dermis (split thickness skin graft) or all of the dermis (full thickness skin graft) from a donor site, often the thigh, buttocks or back, and placing the skin over the debrided burned area.

In extensive burns the sheets of skin can be 'meshed' to give a net-like appearance and increase the body surface area to be covered. A full thickness graft includes the epidermis and the entire dermal layer, and is generally used when full thickness skin loss has occurred.

Skin from a source other than the individual's own body may be used as a temporary cover for large burned areas, to decrease fluid loss. The donor site is generally covered with a non-adherent dressing, a topical antimicrobial to reduce the risk of infection and graft failure and layers of dressing material to absorb blood and serum that ooze from the wound.

To promote successful transplantation, the graft must be immobilised to prevent displacement. Immobilisation is achieved by one of several methods, such as suturing, and the graft area is covered for protection. Successful 'take' of the graft depends on many factors, including absence of infection in the area, prevention or elimination of haematomas or seromas and adequate blood circulation.

***Skin substitutes*** Common methods of temporary or permanent skin coverage are biological (e.g. allografts, xenograft) or biosynthetic skin substitutes (e.g. Biobrane, PELNAC, Integra, Apligraf). Skin substitutes provide early coverage, reduce the risk of wound contamination and infection and reduce pain and fluid loss. They increase the rate of healing and decrease scarring. They are typically used in full thickness burns and generally consist of a bi-layered structure of an outer epidermal structure and an inner more biologically active dermal layer. They may also deliver growth factors. Some require a secondary procedure with split thickness skin grafting. The outer layer peels off as the wound heals underneath them. Early separation of the outer layer from the regenerated skin indicates an infection or a deeper wound requiring surgical treatment. Some surgeons will place a layer of nanocrystalline silver dressing over the skin substitute to reduce the risk of infection and loss of the dressing.

Skin from a source other than the individual's own body (allograft (cadaver skin) or xenograft (porcine skin)) may be used as a temporary cover for large burned areas, to decrease fluid loss (see Clinical Interest Box 29.1).

Bioengineered skin substitutes (e.g. cultured epithelial autografts) involve new techniques in which sections of the individual's unburned skin are grown in the laboratory, and later used to graft onto their burned areas.

***Non-biological dressings*** Superficial partial thickness burns may be managed with suitable dressings. This method of treatment has expanded over the last several years. The application of silver-containing dressings is used to prevent infection. Silver sulfadiazine (SSD) cream has been the most commonly used burn dressing; however, this treatment in the most part has been replaced by silver dressings (e.g. Acticoat™, Mepilex Ag™) that require less frequent changing, decreasing manipulation of the burn injury and graft site. These dressings are held in position with bandages and can remain in place for 3 to 7 days before being changed. Dressing changes are performed using strict aseptic precautions. For extensive burns the individual is given an analgesic before the dressing change or may be given a general anaesthetic before the procedure is performed. After the dressings have been removed, the wounds are cleansed and further debridement is performed where necessary before the burns are redressed.

***Donor site care*** The donor site is generally covered with a non-adherent dressing and layers of dressing material to absorb blood and serum that ooze from the wound.

## Providing adequate nutrition

In addition to the loss of erythrocytes and protein-rich serum, the hyper-metabolic response of the body to a burn rapidly depletes stores of energy. The individual must be provided with adequate carbohydrates, protein, fats, minerals, vitamins and fluid. Energy and protein requirements are generally assessed using a formula, and oral dietary intake is often augmented by nasogastric feeding or parenteral therapy to meet these requirements. Accurate monitoring of tolerance to the diet enables continual assessment of nutritional requirements. Nursing responsibilities include adherence to feeding protocols, daily calorie counts, understanding the enteral formulas and regular communication with the dietitian.

## Pain management

Superficial burn injury pain can be severe, as nerve endings are exposed. In deeper burn injuries the nerve endings are destroyed, and the person may say the burn does not hurt. Pain management is complex and challenging because the perception of pain has physical and psychological origins. Pain should be recognised from the individual's perspective and is the responsibility of the entire burn team. Inadequate pain management is distressing to the individual, the person's family and the burn team. Analgesic medications are commonly administered together with anxiolytic medications. Nursing measures also include explanation and assurance to the individual to reduce fear, and careful positioning may be beneficial. The nurse has a responsibility to observe the individual continually and to be directed by the person on the level of analgesia required. (More information on pain management is provided in Chapter 33.)

## Promoting mobility

Because of the nature of the injury, and its management, a person with burns may experience prolonged periods of immobility. Thus, the individual is subject to the complications of immobility, such as venous thrombosis, pneumonia, pressure injuries and contractures. (See Chapter 28 for measures to manage problems associated with immobility.) Regular and careful position changes are essential. Individuals must be positioned for comfort and repositioned frequently to

prevent pressure injuries and contractures. Splints and other devices may be used to improve positioning and to prevent contractures. The individual's limbs should be correctly positioned to decrease joint flexion.

Physiotherapy is essential for a person who is immobile, and involves chest physiotherapy and range-of-movement (ROM) exercises. ROM exercises may be performed actively or passively, and the degree of motion should be recorded to document progress. Ambulation is started as soon as possible and the nurse may be required to assist. If skin grafting has been performed, the individual will be required to increase ambulation slowly, as too rapid ambulation may damage new grafts.

### Scar and contracture management

Current management of burn scars comprises a combination of therapies from non-operative interventions to surgery for contracture release. Pressure placed directly over the healed burn tissue is commenced as soon as the new epithelium can tolerate the pressure without causing friction. Individuals with severe and extensive burns will have scarring and will normally have a tailored elastic compression garment applied. These garments are custom made to fit exactly over the burned area. Pressure garments are required to be worn between 6 months and 2 years after healing. Silicone gel sheets are also used to manage scar tissue. These can be worn under a pressure garment or on their own. Other treatments include prolonged stretching and splinting and mobilisation and massage of the scar. It is usual practice for non-operative methods to be applied before surgery is used. Surgery is required for contractures and where vital functional areas are exposed such as the eyelids.

### Providing psychological support

As a burn injury can have a devastating emotional impact on the individual and their significant others, psychological support is an extremely important aspect of care. After the injury, the person will experience various emotions such as fear of death, fear of disability and fear of disfigurement. Feelings of despair, anger, frustration, depression and guilt may all be experienced at any time after the burn. See Case Study 29.2.

Communication between team members caring for the individual is important to achieve adequate support for both them and their significant others. The nurse can help to provide support by:

- Developing a trusting relationship and being available to listen. The nurse should encourage the person to talk through their feelings and fears
- Providing information about all the procedures and equipment in a way that can be understood. Fear will be reduced if information is provided to the individual and significant others in a way that facilitates understanding of the injury, the treatment and the prognosis. People who are experiencing stress often have difficulty in remembering, so information should be repeated whenever necessary
- Assisting the individual to adapt gradually to body changes, and by being supportive when the person views their injury, particularly for the first time
- Supporting the individual's coping mechanisms for as long as necessary. The nurse should understand that any expressions of anger, aggression or intolerance are not being directed at the nurse personally. Rather, it is the person's way of reacting to the injury and its consequences
- Involving the individual in all aspects of care as much as possible, to promote independence and self-esteem.

## Complications of burns

In a severe burn all body systems become involved as the body attempts to maintain homeostasis and complications can involve any body system.

### Shock

Shock is due to loss of fluid from the circulation. The greatest loss of fluid occurs at the site of the burn, but loss also occurs throughout the body. Substances such as kinins, released by the body in response to the injury, increase capillary permeability, allowing serum to escape into the tissues. This loss of serum causes reduced blood volume (hypovolaemia), which may lead to severe shock. As a result of hypovolaemia, cardiac output decreases, blood pressure falls and acute renal failure and death may follow.

### Infection and graft failure

Infection may occur if microorganisms gain entry through areas where the skin has been damaged or destroyed. Although a burn wound is usually sterile initially, the area provides an ideal culture medium for a wide range of microorganisms. Necrotic tissue, oedema and transudate all provide a nutrient medium for bacteria. The individual's resistance to infection is reduced by factors such as shock, anaemia and electrolyte imbalance.

### Septicaemia

Septicaemia occurs when there is bacterial invasion of the tissues and bloodstream, and is a major cause of death in severely burned individuals. Septic shock is a form of shock that occurs in septicaemia, when endotoxins are released from bacteria in the bloodstream. The endotoxins cause decreased vascular resistance, resulting in a drastic fall in blood pressure. Pyrexia, tachycardia, rapid ventilations, confusion and coma may also occur.

### CASE STUDY 29.2

Peter is a 33-year-old man who has been recovering from extensive burns after an industrial accident. He is married and has 2 young children. What are some of the psychosocial issues Peter may face in his recovery from his burns and the associated complications?

### Pulmonary problems

Pulmonary damage can occur from smoke, chemical inhalation or carbon monoxide intoxication. In the acute period, pulmonary oedema may develop, and later pulmonary complications include pneumonia. The cause of death in many burn injury individuals is usually a pulmonary complication/s such as pneumonia (Cinat & Smith 2006).

### Psychological effects

A person who has been severely burned is likely to experience depression, anxiety and difficulty in adjusting to the consequences of injury. The person's significant others are likely to experience similar emotions. If a child has been burned, the parents are also likely to experience severe guilt feelings about the incident.

### Contractures, hypertrophic and keloid scars

Scar formation is a normal part of wound healing and in linear wounds is minimal. In large surface area wounds scars can create problems. Contractures, hypertrophic scarring and keloid formation frequently result after healing of a burn injury. Contractures occur over joints and functional areas. These are characterised by their interference with normal function of any joint that they cross and deformity of mobile structures. True keloid scars tend to extend beyond the margin of the original scar and continue to grow, failing to undergo scar maturation and size reduction. They can also recur after excision. Hypertrophic scars mature and reduce in size. They tend to stay within the boundaries of the original wound and after excision will tend to be a better scar than the original.

### Curling's ulcer

A Curling's ulcer is a duodenal ulcer that may develop in a person with severe burns. It is thought to be the result of stress.

## Preparation for discharge

Before discharge from hospital, it is important that the individual understands that the healed burned and grafted skin is very fragile and will break down more easily than normal skin. The individual must be informed that these areas are very vulnerable to extremes of temperature, irritant substances and physical trauma. As part of discharge preparation the nurse should advise the individual, or the parents of the young child, to:

- Avoid sunlight on the burned areas for at least 12 months. Burned and grafted skin tans unevenly and unpredictably and burns easily. Continuous use of sunscreen (SPF 30 or higher) is recommended
- Use non-irritant soaps and cosmetics on the burn areas
- Exercise care if engaging in activities such as sports in which there is the possibility that the burned areas may be bumped or damaged
- Wear clothing made from soft fabrics that will not irritate the healed burned or grafted areas
- Continue with prescribed management of the areas. Management may include the continual wearing of a tailored compression garment, or application of a cream to the areas. The person may also be required to follow a planned program of exercises designed to improve mobility
- Seek appropriate help, such as psychological counselling, when there is difficulty in adapting to a changed physical appearance.

# SURGICAL WOUNDS

Care of a surgical wound is directed towards promoting healing and preventing infection. In the immediate postoperative period, assessing for haemorrhage is a major responsibility of the nurse. Both the dressing and the bed linen under the individual should be checked for signs of haemorrhage. Any increase in blood staining on the dressing or an increase of blood in a drainage tube or bottle must be reported immediately to the nurse in charge. Strict asepsis is necessary when caring for surgical wounds and the nurse must follow the individual healthcare facility's protocol.

Adequate oxygenation of the tissues is promoted by deep breathing and coughing exercises, and early ambulation to promote full lung expansion will enhance oxygenation of the blood. Adequate circulation of blood to the area should be promoted to transport all the substances required for healing and combating infection. Adequate blood volume can be maintained by ensuring sufficient fluid intake, and circulation can be stimulated by exercises and mobility.

## Healing ridge

To assess healing for a surgical incisional wound it is important to understand how the healing ridge develops (Vuolo 2009). The healing ridge is a build-up of collagen fibres that begins to form during the inflammatory phase of wound healing and peaks during the proliferation phase. You should be able to feel this ridge between days 5 to 9 as you gently palpate the skin on each side of the suture line (Vuolo 2009). The presence of a healing ridge is a sign that healing is progressing (Vuolo 2009). If a healing ridge is not present or is incompletely developed healing isn't progressing as expected and there may be a risk of wound dehiscence.

Movement of the area should be restricted in the early stages of healing. If strain is placed on a wound, the newly formed granulation tissue may tear. The wound area should be stabilised, rested and supported.

## Surgical wound classification

### Clean wound

These wounds are made under aseptic conditions such as surgery, and heal by primary intention. These wounds generally do not require drainage.

### Clean contaminated wound

This is a wound made under aseptic conditions, but involving a body cavity that normally harbours microorganisms, such as the gastrointestinal, respiratory or urinary tract.

### Contaminated wound

This term applies to a wound in which microorganisms are likely to be present, and includes open, traumatic and accidental wounds and surgical wounds in which a break in asepsis occurred.

### Dirty wound

The term 'dirty wound' applies to traumatic wounds that are generally more than 4 hours old. Purulent discharge is evident. The wounds involve perforation of viscera and spillage of contents.

### Infected wound

Wounds that show signs of early infection are red, swollen, hot and painful. If not treated appropriately, cellulitis develops and may lead to conditions such as lymphangitis, lymphadenitis, bacteraemia, septicaemia and possibly even death.

## Surgical wound management

To provide the conditions necessary for healing, the wound must be free of dead or infected tissue, protected against external agents which may delay healing and provided with a moist environment, which is conducive to healing.

Controversy exists about many aspects of wound care, such as the type of dressing applied, frequency of dressing changes, cleansing procedures and solutions used.

See Clinical Skill 29.6: Removal of sutures and staples.

### Surgical site infection (SSI)

SSI is the most common postoperative complication and comprises approximately 20% of all healthcare-associated infections (Milne et al 2012). At least 5% of patients develop an SSI after a surgical procedure (NICE 2008). It is important that healthcare workers identify early signs and symptoms of possible infection and ensure they have put in place the required preventative actions outlined in the NICE guidelines (2008):

- Use an aseptic non-touch technique for changing or removing dressings
- Aim to leave the wound untouched for up to 48 hours after surgery. If you need to clean the wound during the first 48 hours use sterile saline
- Advise individuals that they may shower safely 48 hours post surgery if the suture line is intact and no bleeding or exudate.

Most healthcare facilities develop their own protocols and procedures for wound management and it is the nurse's responsibility to know these procedures and be aware of the protocols and regulations relating to wound care.

The key elements of postoperative wound management include timely review of the wound, appropriate cleansing and dressing, and early recognition and intervention of wound complications (Yao 2013).

**CRITICAL THINKING EXERCISE 29.4**

What discharge instructions would you give an individual about assessing for signs of wound infection?

## CLINICAL SKILL 29.6 Removal of sutures and staples

**Review and carry out the standard steps for all clinical skills/interventions**

| NMBA Decision-making Framework considerations: | Equipment: |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile dressing pack and dressing materials<br>Additional light source (if required)<br>Gloves<br>Disposable apron<br>Normal saline<br>Additional cotton balls or gauze balls<br>Waterproof sheet (Bluey)<br>Suture cutter<br>Sterile clip remover<br>Sterile safety pin<br>Gloves<br>Waste receptacle<br>Dressing trolley<br>Mask and eye protection as required |

| Skill activity | Rationale |
|---|---|
| Sutures and staples are removed once wound healing has occurred. Alternate sutures and staples may be removed with the remainder the following day. | |

*Continued*

| CLINICAL SKILL 29.6 Removal of sutures and staples—cont'd | |
|---|---|
| Assess the individual's record to determine previous appearance of wound and any previous dressings<br>Prior to commencing the procedure introduce self, identify the individual, obtain consent, validate and explain the rationale for the procedure, gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for pain<br>Assess for any allergies<br>Visually assess the wound for signs and symptoms of infection and dressings used | Determines requirements for equipment and dressing requirements<br>Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place<br>Pain may be caused during the procedure<br>Determines any adverse reactions to wound irrigation solution, dressing or tape (if required) |
| Assist the individual to assume an appropriate position of comfort, ensuring that only the wound area is exposed. Provide for privacy<br>Obtain additional assistance if required | Promotes comfort and facilitates performance of the procedure<br>Assistance is available when required |
| Place the equipment in a convenient location near the bedside. Open procedure pack using corners. Assemble the required equipment, using aseptic technique. Drop sterile equipment into sterile field | Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the dressing is being performed<br>Prevents contamination of sterile items<br>Additional items are available for use |
| Perform hand hygiene and loosen wound dressing | Prevents spread of microorganisms and allows ease of removal of wound dressing |
| Put on apron. Perform hand hygiene, apply gloves if required. If other PPE required put on before gloves | Prevents spread of microorganisms |
| Remove any dressing, examine the incision to determine the amount of healing and type of suture/clip used | Removes any exudate and dried blood, thus reducing the risk of infection |
| Removal of each intermittent suture involves:<br>• Starting with alternate sutures, using forceps to grasp the knot and gently raise it off the skin<br>• Cutting the suture as close to the skin as possible, away from the knot<br>• Pulling the cut suture up and out of the skin, ensuring that the exposed portion of the suture is not pulled through the tissues | Allows for assessment of union. Avoids risk of pulling exposed suture through the tissues, which prevents infection |
| Removal of a continuous suture involves:<br>• Using forceps to grasp the first knot and gently raise it off the skin<br>• Cutting the first suture on the side opposite the knot<br>• Cutting the same side of the next suture in line<br>• Lifting the first suture out in the direction of the knot<br>• Repeating the process down the suture line, using forceps to hold each suture where you would grasp the knot if the suture were intermittent | Minimises discomfort and ensures that the sutures are removed in the correct direction |
| To remove staples, position the extractor's lower jaws beneath the span of the first staple | The extractor reforms the shape of the staple and pulls the prongs out of the intradermal tissue |
| Squeeze the handles until they are completely closed then lift the staple away from the skin. Remove alternate staples at first. Repeat the process for each staple | Ensures that the incision has healed before removing all staples |

| CLINICAL SKILL 29.6 Removal of sutures and staples—cont'd | |
|---|---|
| Clean the wound with sterile normal saline to remove any blood or fluid left on the surface | Wound cleansing removes debris from the wound |
| If necessary, apply butterfly strips or tapes across the incision | Keeps the edges of the incision closed |
| Apply a light dressing if necessary | Provides additional support, and promotes union of the wound edges if healing is not complete |
| Remove personal protective equipment and discard with used equipment in an appropriate waste receptacle | Prevents spread of microorganisms |
| Assist the individual to reassume a comfortable position | Promotes comfort |
| Remove and attend to equipment in a correct manner. Perform hand hygiene | Prevents spread of microorganisms |
| Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer | Provides relevant information to other members of the healthcare team. Include date and time, appearance of wound and any exudate, cleansing solution, number of sutures or staples removed, dressing used and the individual's response to the procedure. Medico-legal requirement. Allows for the planning and implementation of care |
| *(ACSQHC 2012; 2015; AWMA 2010; Berman et al 2015; Crisp et al 2013; LeMone et al 2014; Lynn & LeBon 2012; NHMRC 2010; NMBA 2013; 2016; Rebeiro et al 2013; Rowley & Clare 2011; Smith et al 2011)* | |

## CRITICAL THINKING EXERCISE 29.5

Mrs Cooper, aged 72, attended the emergency department as her GP was concerned that her leg ulcer was infected. Mrs Cooper was admitted for a course of IV antibiotics. She is a widow who lives alone and her family does not live close to her. She is planned for discharge from hospital in the next 48 hours. When does discharge planning need to be started for Mrs Cooper? Explain. Identify some healthcare services that can be utilised to help Mrs Cooper with wound management.

## Summary

The integumentary system consists of the skin and its appendages: the hair, nails, sweat and sebaceous glands. The skin is the largest organ of the body and is composed of two layers. The epidermis is the thin outermost layer composed of epithelial cells, many of which are keratinocytes. Keratin has waterproofing qualities and is also responsible for the formation of hair and nails. Melanin, which is produced by cells in the deeper layer of the epidermis, gives colour to the skin and protects the body against the damaging effects of ultraviolet rays in sunlight. The dermis, or deeper layer of the skin, contains blood vessels, nerve endings, hair follicles and hairs, arrector pili muscles, sebaceous glands and sweat glands. Nails and hair protect certain areas of the body, for example, nails protect the tips of toes and fingers, while hair protects areas such as the scalp. The major functions of the skin are protection, thermoregulation, sensory perception, excretion, immunity, synthesis of vitamin D and to act as a blood reservoir.

Surgical wounds are the result of intervention by the surgeon and can range from an uncomplicated suture line to a more complex wound requiring drainage tubes or skin grafts. A surgical wound must be treated with strict aseptic technique and the nurse must be cognisant of the individual health organisation's protocols.

Pressure injuries result from ischaemic hypoxia of the tissues due to prolonged pressure in an area of the body, usually over a bony prominence. Both intrinsic and extrinsic predisposing factors contribute to the development of a pressure injury. Pressure injuries can be classified as stages I–IV, depending upon the amount of tissue damage. Risk assessment and preventative strategies that are employed by the nurse play an important role in ensuring that the incidence of pressure injuries, which are largely

*Continued*

predictable and preventable, is kept to a minimum. The nurse engages the multidisciplinary team to assist in the prevention of pressure injuries within the vulnerable individual population such as the elderly and frail.

Skin tears are a traumatic injury that can occur especially to the frail elderly population. Preventative strategies that pay particular attention to improving the condition of the person's skin, the environment and equipment used for caring for this vulnerable age group are important.

Leg ulcers are a costly and debilitating disorder and the nurse must be able to differentiate between the different types to employ the correct wound management method. The use of compression bandaging, which can be quite effective in the management of venous leg ulcers, is contraindicated and dangerous for the management of arterial leg ulcers.

Dry heat, moist heat, chemicals, electricity or radiation can cause a burn injury. The depth of tissue injury describes a burn and the size of the burn is estimated by using either the Lund–Browder method or the rule of nines. Complications include: shock, infection, scarring and contracture and adverse psychological effects. Medical and nursing management of an individual with burn injury will vary according to the severity of the injury. The care of the individual involves fluid and electrolyte replacement, prevention of infection, provision of adequate nutrition, relief of pain, promotion of mobility, providing psychological support and promoting healing of the injury.

The effects that disorders of the skin have on the individual range from minor and temporary, to major and life threatening. Some serious skin disorders affect the individual to the extent that self-concept and body image are severely impaired. Disorders of the skin may have a single cause or may result from several interrelated factors, while for some disorders the cause is unknown. Tests used to diagnose skin disorders include direct examination, biopsy, microscopic examination and skin testing.

With any skin integrity deficit, the psychological support for the individual is of major importance. Pain management and nutritional support are also vital. The correct method of wound care is essential and must be given with a clear understanding of the normal healing processes and the effect that certain pathologies have on those processes.

### DECISION-MAKING FRAMEWORK EXERCISE 29.1

A person you have been caring for has an open wound on their lower leg. You are asked to renew this dressing. A dry dressing is requested in their care plan. You remove the dressing with some difficulty as it has adhered to the wound. What actions would you take as an Enrolled Nurse in this situation?

## Review Questions

1. What are the major functions of skin?
2. What are the major factors that affect skin integrity?
3. Describe the four (4) stages of the wound healing process.
4. What factors can affect wound healing?
5. State the benefits of moist wound healing.
6. What are the major manifestations of skin disorders?
7. What are the four (4) stages of a pressure injury?
8. What care is required to prevent and manage pressure injuries?
9. What care is required to prevent skin tears?
10. What is the difference between an arterial ulcer and a venous ulcer?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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CHAPTER 30

# Promotion of health and wellbeing: nutrition

*Lynelle Jenkinson*

## KEY TERMS

adipocytes
anabolism
anorexia nervosa
basal metabolic rate (BMR)
body mass index (BMI)
bulimia nervosa
carbohydrates
catabolism
disaccharides
dysphagia
enteral
essential amino acids
fat-soluble vitamins
monosaccharides
non-essential amino acids
pagophagia
polysaccharides
recommended dietary intake (RDI)
total parenteral nutrition (TPN)

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define the key terms
- Identify the three major groups of nutrients
- List the six groups of vitamins required for health
- List the eight major elements or electrolytes required for health
- Identify the functions and common food sources of the essential nutrients
- Describe the physical characteristics associated with a usual nutritional status
- Identify factors and disorders that may affect an individual's nutritional status
- Identify commonly used assessment techniques to measure an individual's nutritional status
- State the components of a healthy balanced diet
- State the principles of good nutrition throughout the lifespan
- Recognise signs and symptoms of poor nutrition
- Describe how the healthy balanced diet can be adapted to meet specific dietary beliefs and/or requirements
- Apply appropriate principles to meet nutritional needs throughout the lifespan, during episodes of illness or alterations in physiological or psychological status
- Assist in meeting an individual's nutritional needs accurately and safely in relation to assisting at mealtimes
- Provide care for an individual requiring enteral and parenteral feeds

## CHAPTER FOCUS

This chapter focuses on the nutritional needs of individuals over the lifespan and how a person's wellbeing can be affected by an alteration in the quantity and quality of absorbed nutrients. Nurses are required to assess and educate individuals to maintain nutritional health status and provide information on how to undertake care related to nutrition. Nutritional practices and requirements may vary according to age, height, sex, religion, culture, socioeconomic factors and physical and psychological status. Nurses must be able to accommodate for all these different factors when they plan, care and provide health education for individuals.

## LIVED EXPERIENCE

Recently I was admitted to hospital for 2 weeks with a chest infection. When I was discharged I weighed only 40 kg since I had lost 5 kg during my stay. Often meals were brought into my room and left on the table out of my reach. When I would call the nurses they would hurry in and shove the tray over to me. I could see they were busy and they would run out of the room before I could ask them if they would be able to help me. Because of my severe arthritis I was unable to open a lot of the packaging the food was in. I could not open the small containers of milk or open the sugar so I could not even enjoy a cup of tea. By the time the kitchen staff came to collect the tray the food was cold and unappealing anyway. After a few days my daughter spoke to the nursing unit manager and nursing staff were encouraged to check I could reach my table and to open all the packaging. The other thing they did was to arrange for modified cutlery to be delivered with each meal. This meant I was able to feed myself with less pain. Another message I would like to give the nurses is that it is important to make sure patients have access to fluid. Each morning my water jug was put on my bedside but was also not within my reach since I was attached to oxygen and an IV drip. This means that I did not drink as much as I should and became very dehydrated which I believe was also not good for my recovery.

**Dulcie, 76 years old**

# NUTRITION OVERVIEW

Food and nutrition have long been recognised as important contributors to health. However, food and nutrition affect more than just the physical aspects of our health and wellbeing. The buying, preparing and eating of food is part of everyday life. For many cultures, including Australia, food is a focus for social interactions with family and friends. For some, it is also an economic concern (Australian Institute of Health and Welfare (AIHW) 2012a). Nutritional care in healthcare facilities requires a coordinated approach involving health professionals, support staff, the individual and their carers.

While eating has a psychosocial and cultural significance in life, the major roles of food intake are to provide nutrients necessary for the development and growth of cells and the replacement of substances required by cells to maintain efficient body function. Information about the ingestion and digestion of food and the absorption of nutrients is provided in Chapter 32. After the digested nutrients have been absorbed into the blood and lymph, they are distributed to the cells for further chemical processing, releasing the energy necessary for body function. The process of metabolism converts the nutrients into chemical forms that produce energy and rebuild body tissue. The two phases of metabolism are: **anabolism** (or constructive phase), when simple substances derived from the nutrients are converted into complex substances that can be used by the cells; and **catabolism** (or destructive phase), when these complex substances are reconverted into simpler forms to release the energy necessary for cell function (Harris et al 2014).

The term nutrition is used to describe all the processes by which the body uses food for energy, maintenance and growth (Gropper & Smith 2013). It is important to recognise that nutritional requirements vary in response to changes throughout the lifespan. Factors that increase the body's metabolic demand include the periods of rapid growth during infancy and adolescence, pregnancy and lactation, increased physical activity and periods of stress, disease or trauma. Metabolic requirements diminish with reduced energy demands, decreased physical activity and age (Brown et al 2014).

Adequate nutrition is partially dependent on the ability of the body to ingest and digest food, to absorb nutrients from the intestine and to excrete waste products. Additionally, the quality and quantity of food consumed has an important influence on an individual's current and future health status. It is important that a diet contains the essential nutrients for each stage of the lifespan in order to maintain health and wellbeing.

The World Health Organization (WHO) defines undernutrition or malnutrition as:

*When the body does not get the proper amount of energy (calories), proteins, carbohydrates, fats, vitamins, minerals and other nutrients required to keep the organs and tissues healthy and functioning well.*

**(WHO 2010)**

Food is not just a source of nutrients. It is important for good social and emotional health as well as physical health. Food and eating are part of the way people live their lives. The eating patterns of individuals and families are constantly being shaped and changed by a variety of factors. Some of these include:

- The kinds of food that is available at the local supermarket or shop
- Cultural, religious and family background
- The amount of time available to shop for, prepare and cook food
- The personal likes and dislikes of household members
- Values, attitudes and beliefs about food and eating
- Knowledge about food and nutrition
- Advertising campaigns and food promotions
- The amount of money that can be spent on the food budget
- Access to transport
- Food fads and fallacies
- Physical or psychological status of the individual such as allergies or an intolerance to specific foods or nutrients; difficulty in chewing or swallowing; level of independence/dependence; disorders that interfere with nutrition which may result in maldigestion, malabsorption or loss of nutrients. These, in turn, can lead to emotional states such as depression or anxiety, which may further impact on the physical or psychological status of the individual (AIHW 2012a).

## NUTRITION ASSESSMENT

Nutrition risk screening should be inclusive of the nursing assessment on admission. It is essential to obtain information about the individual's appetite; food preferences; height; weight; food allergies; dysphagia; chronic diseases; level of activity; assistance required for eating, feeding and drinking; and social or physiological issues. Observation of an individual's general appearance provides information about their general state of health and their nutritional status. Some characteristics of altered nutritional status are presented in Table 30.1. Assessing the individual's eating pattern and their nutritional status may also identify problems or risk factors.

The Academy of Nutrition and Dietetics/American Society for Parental and Enteral Nutrition (Stayner 2012) suggests that the criterion for the diagnosis of malnutrition is for the individual to display two or more of six characteristics:

1. Insufficient energy intake
2. Weight loss
3. Loss of muscle mass
4. Loss of subcutaneous fat
5. Localised or generalised fluid accumulation
6. Diminished functional status as measured by hand grip strength.

In addition to the physical characteristics associated with poor nutritional status, psychological symptoms may be evident. An individual with a poor nutritional status may experience irritability, lethargy, apathy or inability to concentrate. It is possible, however, that these symptoms and the physical signs presented in Table 30.1 may be related to an underlying condition and/or the person's nutritional status.

It is essential to determine the individual's nutrition risk by utilising a validated nutrition risk screening tool. The Malnutrition Screening Tool (MST) (Figure 30.1) is the most frequently reported screening tool utilised in Australian healthcare facilities. (For further information on MST see also Chapter 19.) Others include Subjective Global Assessment (SGA) and the Mini-Nutritional Assessment (MNA) (Ferguson et al 2010). The result of nutrition risk screening must be documented in the healthcare record.

Certain groups of individuals may be more at risk of a poor nutritional status, including those who are:

- Suffering emotional or physical stress
- Impaired cognitively or intellectually
- Alcohol, drug or nicotine dependent
- Post surgical procedure
- Diagnosed with a chronic illness
- Homeless
- Pregnant or lactating
- Older or the young
- Unaware of nutritional values
- Strict vegetarians
- Following 'fad' diets.

Any person identified at risk of malnutrition needs prompt referral to a clinical dietitian for further nutrition assessment or to other health professionals for the management of specific issues which may affect their nutrition status. This includes swallowing, biting, chewing difficulties, impaired upper limb function affecting self-feeding, poor dentition, mental health issues or cognitive issues. To maintain or promote an appropriate intake of food and therefore a good nutritional status, individuals should be encouraged to follow the principles of a balanced healthy diet that provides the body with essential nutrients. However, it is also important when looking after individuals to take into account that while the consumption of food provides for the physiological needs of a person, it can also contribute to their social and emotional needs.

### Nutritional assessment and the older person

When performing a nutritional assessment on an older person it is important that the nurse determines the type, quantity and frequency of food eaten. Unintentional weight loss is associated with a number of poor health outcomes. In the older person this can be attributed to a combination of protein–energy malnutrition, cachexia or physiological anorexia (a result of the ageing process on various body systems) (Soenen 2013). Identification of poor nutrition in older persons can occur on admission to hospital, nursing homes, during follow-up outpatient appointments or at GP clinics. This can lead to improved health outcomes and better quality

**TABLE 30.1 | Characteristics of altered nutritional status**

| Symptom | Nutrients |
|---|---|
| Poor growth | Protein, energy, iron, zinc, iodine, vitamin D, calcium, essential fatty acids, vitamin A |
| Poor immunity | Zinc, selenium, vitamin C, vitamin D, vitamin E |
| Poor appetite | Zinc, magnesium, iron, thiamin, niacin, folate |
| Fatigue/irritability | Protein, zinc, iron, chromium, pyridoxine, B12, folate, vitamin C |
| Moody/depressed | Protein, zinc, iodine, magnesium, thiamin, niacin, pyridoxine, B12, vitamin C, vitamin D |
| Migraine/headache | Riboflavin, B complex |
| Sleep disturbance | Magnesium, calcium, pyridoxine, niacin, vitamin C, vitamin D |
| Poor dream recall | Pyridoxine |
| Impaired memory/cognition | Iron, zinc, iodine, thiamin, niacin, B12, folate |
| Bone/joint pain | Calcium, zinc, iodine, boron, vitamin D, vitamin C, essential fatty acids |
| Diarrhoea | Zinc, iron, excess magnesium, excess vitamin C, niacin, B12, folate, biotin |
| Constipation | Water, dietary fibre, iodine/thyroid, iron, niacin |
| Irregular periods | Iodine/thyroid, iron, zinc, vitamin E, essential fatty acids |
| Mastalgia | Vitamin A, vitamin E |
| Premenstrual syndrome dysmenorrhoea/menorrhagia | Pyridoxine, calcium, magnesium, essential fatty acids |
| **Hair** | |
| Hair loss/dry/brittle/slow growth | Protein, zinc, iron, iodine/thyroid, riboflavin, biotin, essential fatty acids, vitamin A (deficiency or excess) |
| Premature greying hair | Copper, biotin, B12 |
| Dry scalp/flaking | Zinc, magnesium, selenium, biotin, vitamin A |
| **Eyes** | |
| Dark under eye circles | Iron |
| Pale conjunctiva | Iron |
| Impaired night vision | Zinc, vitamin A |
| Twitching eyelid/facial spasms | Magnesium, calcium |
| **Nose/taste/tongue/mouth** | |
| Poor smell/anosmia | Zinc, vitamin A |
| Impaired taste | Zinc, vitamin A |
| Pale tongue | Iron |
| Magenta/blue tongue | Riboflavin, biotin |

*Continued*

**TABLE 30.1 | Characteristics of altered nutritional status—cont'd**

| Symptom | Nutrients |
|---|---|
| Large pale, swollen tongue | Iodine/hypothyroid |
| Smooth bright red tongue | Riboflavin, pyridoxine, B12, folate, biotin |
| Raw, painful dark red tongue | Niacin, B12, folate |
| Berry-like red tongue | B complex |
| Cherry-tip tongue | Niacin, pyridoxine |
| Burning sensation/mouth/throat | Vitamin D |
| Lip cheilosis (burning/soreness) | Riboflavin, niacin, pyridoxine |
| Angular stomatitis | Thiamin, riboflavin, niacin, pyridoxine, folate, B12. iron |
| Bleeding gums | Riboflavin, vitamin C, vitamin K |
| **Nails** | |
| Vertical corrugations (pronounced) | Protein, riboflavin, zinc |
| Pronounced central ridge | Protein, iron, folate |
| Horizontal grooves | Past severe illness, protein, zinc, selenium, calcium |
| Leukonychia (white spots) | Zinc |
| White half moon at base of nails | Pyridoxine |
| Dry, thin, brittle nails | Protein, essential fatty acids, iron, calcium |
| Peeling/splitting nails | Protein, calcium |
| Spoon-shaped/brittle nails | Iron |
| Soft, papery bitten nails | Protein, zinc |
| Growth arrest/thickened nails | Protein, zinc |
| Yellow nails | Vitamin E |
| Eggshell nails | Vitamin A |
| **Muscles** | |
| Muscle pains/aches | Calcium, magnesium, potassium, selenium, thiamin, vitamin C, vitamin E, vitamin D, co-enzyme Q10 |
| Cramps | Calcium, magnesium, iron, potassium, sodium, vitamin D, vitamin C |
| Twitching/spasms | Calcium, magnesium, potassium, pyridoxine, vitamin D |
| Calf muscle tenderness | B complex, vitamin E |
| Weakness/wasting | Protein, thiamin, vitamin D, potassium, calcium |
| Decreased muscle reflexes | B complex, vitamin E |
| **Skin** | |
| Excessive ageing of skin/wrinkles | Vitamin E, essential fatty acids, iodine |
| Perifollicular hyperkeratosis (toad skin) | Zinc, vitamin A, B complex, vitamin C, essential fatty acids |

**TABLE 30.1 | Characteristics of altered nutritional status—cont'd**

| Symptom | Nutrients |
|---|---|
| Shark skin/dyssebacea (sebum plugs in follicles/face/body) | Riboflavin |
| Oily scaly seborrhoeic dermatitis (nasolabial folds/eyebrows/forehead) | Riboflavin, niacin, pyridixine, biotin, copper, essential fatty acids |
| Dry scaly/coarse/itchy dermatitis | Zinc, iodine, niacin, essential fatty acids, biotin, vitamin A, vitamin C, vitamin E |
| Dry 'fish scale' 'flaky paint' especially on the legs | Vitamin A, zinc |
| Hyperpigmentation non-scaly macules/patches | Insulin resistance, vitamin A, zinc, vitamin C, niacin, pyridoxine, B12, folate, essential fatty acids |
| Hyperpigmented scaly dermal patches on face/limbs (pellagra) | Thiamin, niacin, biotin, zinc, essential fatty acids |
| Liver spots (ceroid accumulation) | Vitamin E |
| Eczema | Biotin, zinc, essential fatty acids |
| Psoriasis | Vitamin D, vitamin A, essential fatty acids, zinc |
| Acne | Essential fatty acids, zinc, vitamin A, vitamin C |
| Wound healing | Protein, essential fatty acids, vitamin A, pyridoxine, vitamin C, zinc, biotin |
| **Nerves** | |
| Impaired coordination/balance disorientation/ataxic gait | Thiamin, B12 (neurological changes can occur without haematological changes), niacin, vitamin E |
| Neuropathy (weakness, ataxia, pins and needles, paraesthesia), foot/wrist drop, reduced tendon reflexes, numbness | Thiamin, riboflavin, pyridoxine, B12, carnitine, folate, magnesium, calcium, potassium, essential fatty acids, chromium, iron, vitamin E |
| Postural hypotension | B6/B complex, iron |

*(Wahlqvist 2011)*

of life (Agarwal et al 2013). Nurses should ask the older person about the following:

- Any special diets (e.g. low-salt, low-carbohydrate) or self-prescribed fad diets
- Intake of dietary fibre and prescribed or over-the-counter vitamins
- Use of aperients
- Weight loss and change of fit in clothing
- Amount of money individuals have available to spend on food
- Accessibility of food stores and suitable kitchen facilities
- Variety and freshness of foods.

The ability to eat (e.g. to chew and swallow) needs to be evaluated. Poorly fitted dentures or decreased taste or smell may reduce the pleasure of eating, so individuals may eat less. Individuals with decreased vision, arthritis, immobility or tremors may have difficulty preparing meals and may injure or burn themselves when cooking. Individuals who are worried about urinary incontinence and frequency may reduce their fluid intake; as a result, they may eat less food (Continence Foundation of Australia 2012).

While all older persons are at risk of poor nutrition, individuals diagnosed with dementia are at further increased risk of malnutrition. Throughout the assessment of the older person it is therefore essential that cognitive function be assessed (Alzheimer's Australia 2015).

It is important for the nurse to realise that ageing changes the interpretation of many measurements that reflect nutritional status in younger people. For example, ageing can alter height. Weight changes can reflect alterations in nutrition, fluid balance, or both. Despite these age-related changes, body mass index (BMI) is still useful in older persons. If abnormalities in the nutrition history (e.g. weight loss,

Malnutrition Screening Tool (MST)
Please circle appropriate answer to each question.

| | |
|---|---|
| Have you lost weight recently without trying?<br>If No<br>If unsure | <br>0<br>2 |
| If Yes, how much weight have you lost?<br>1–5 kg<br>6–10 kg<br>11–15 kg<br>>15 kg<br>Unsure | <br>1<br>2<br>3<br>4<br>2 |
| Have you been eating poorly because of a decreased appetite?<br>If No<br>If Yes | <br>0<br>1 |
| Total<br>If the score is 2 or more please refer to the dietitian | |
| Date Dietitian contacted | |
| Date seen by Dietitian | |

**Figure 30.1** Malnutrition Screening Tool (MST)
*(NSW Department of Health 2011)*

suspected deficiencies in essential nutrients) or BMI are identified, a thorough nutritional evaluation by the medical officer, which includes laboratory measurements, is indicated (Soderhamn 2012).

### CRITICAL THINKING EXERCISE 30.1

Discuss the importance of performing a nutritional assessment.

### CRITICAL THINKING EXERCISE 30.2

Dana is a 24-year-old under investigation by her GP with dizziness, heat intolerance and shakiness. She has had unintentional weight loss of 7 kg over the past 6 months despite a reported healthy appetite and increased calorie intake. Other symptoms reported include intermittent palpitations, hair loss, sweating and irritability. The provisional diagnosis is hyperthyroidism. What care should you arrange to assist Dana in planning, regaining and maintaining her weight?

## Healthy balanced diet

Eating a balanced diet is vital for good health and wellbeing. Food provides human bodies with the energy, protein, essential fats, vitamins and minerals to live, grow and function properly. People need a wide variety of different foods to provide the right amounts of nutrients for good health. Enjoyment of a healthy diet can also be one of the great cultural pleasures of life. The foods and dietary patterns that promote good nutrition are outlined in the Australian Dietary Guidelines (NHMRC 2013a). There are five principal recommendations to be considered equally important in terms of public health outcomes:

1. To achieve and maintain a healthy weight, be physically active and choose amounts of nutritious food and drinks to meet your energy needs
2. Enjoy a wide variety of nutritious foods from the five groups every day (see below)
3. Limit intake of foods containing saturated fat, added salt, added sugars and alcohol
4. Encourage, support and promote breastfeeding
5. Care for your food; prepare and store it safely (NHMRC 2013a).

The total amount of food that a person needs each day to provide themself with the energy and nutrient needs will vary depending on the person's age, sex and activity levels, and whether or not the person is pregnant or breastfeeding. The NHMRC (2006) provides **recommended dietary intake (RDI)** levels for energy and the various nutrients across various conditions, age and sex categories. The RDIs are specified in the nutrient reference values for Australia and New Zealand. RDIs or 'allowances' are the levels of intake of essential nutrients considered adequate to meet the nutritional needs of 97–98% of healthy individuals.

The Australian Guide to Healthy Eating (Figure 30.2) is Australia's current suggested food selection guide based on latest evidence and expert opinion (NHMRC 2013a). The Guide aims to promote healthy eating habits throughout life to assist in reducing the risk of chronic health problems, such as heart disease, obesity and type 2 diabetes. The Australian Guide to Healthy Eating is a visual representation of the Australian Dietary Guidelines. The aim of the Guide is to encourage the consumption of a variety of foods from each of the food groups every day in proportions that are consistent with the Dietary Guidelines and to drink plenty of water. The five foods groups are:

1. Bread, cereals, rice, pasta, noodles
2. Vegetables, legumes
3. Fruit
4. Milk, yoghurt, cheese
5. Meat, fish, poultry, eggs, nuts, legumes.

Furthermore, the Australian Guide to Healthy Eating highlights fats and oils should be eaten only occasionally or in small amounts.

For minimum recommended number of serves from the Australian Guide to Healthy Eating for adults see Figure 30.3.

## Nutritional needs of infants and children

Throughout all stages of development, a healthy balanced diet is necessary to provide the nutrients required for the body's

**Figure 30.2** The Australian Guide to Healthy Eating
*(NHMRC 2013a)*

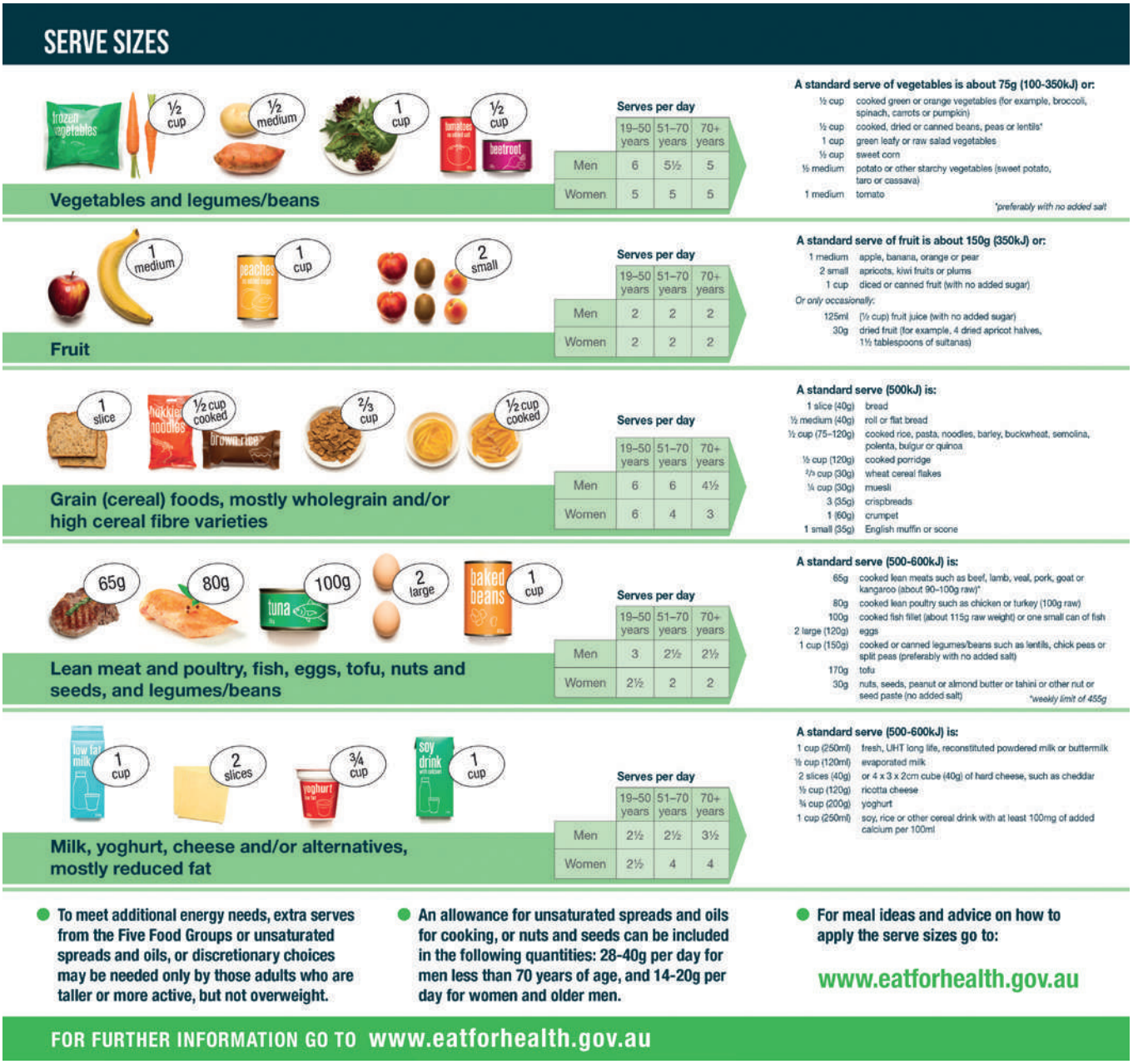


**Figure 30.3** Australian Dietary Guidelines—sample serves for adults *(NHMRC 2013a)*

needs. For information on maternal and newborn nutrition, see Chapter 45.

Breast milk or an appropriate infant formula should remain the main source of milk until 12 months of age (WHO 2013). Based on the currently available evidence it is recommended introducing complementary solid foods from around 4–6 months (NHMRC 2012). There is little evidence that delaying the introduction of complementary solid foods beyond 6 months reduces the risk of allergy (Australasian Society of Clinical Immunologists and Allergists (ASCIA) 2010). When a child is ready to eat solids, the parents/carers should consider introducing a new food every 2–3 days according to what the family usually eats (regardless of whether the food is thought to be highly allergenic). One new food should be introduced at a time so that reactions can be more clearly identified. If a food is tolerated, this should be continued as a part of a varied diet (ASCIA 2010).

The aim of introducing solids is to wean the infant off milk to prevent such problems as failure to thrive, malnutrition and anaemia, and also to educate the palate to different tastes and textures; eating therefore becomes largely a learning process. Rice cereal, pureed stewed fruit and vegetables are

suitable first foods. By 6–8 months of age, chewing movements begin and the infant can be introduced to more coarsely textured foods.

When the infant begins to grasp objects and put them in their mouth, they may be ready to be introduced to finger foods. An infant can take fluids from a cup at about 7–8 months of age. Giving fruit juice to a child from a bottle should be discouraged, as high fructose levels may contribute to the development of jaw and tooth deformity and dental caries, and excessive volumes of fruit juice may result in diarrhoea.

At about 12 months of age the infant should be eating a range of basic foods. The diet should consist of bread and cereals, fruit and vegetables, meat and/or other protein foods, milk and/or milk products and small amounts of butter or margarine. Salt, sugar and fatty foods should be avoided (NHMRC 2012).

**CRITICAL THINKING EXERCISE 30.3**

Ava, a 10-week-old infant, presents to emergency with frequent gagging and vomiting post feeds. Ava's mum, Linda, describes the emesis as large, non-projectile undigested milk with no reports of blood visible. Linda appears tired and describes Ava's frequent episodes of crying, and being unable to be consoled, particularly in the late afternoon. She is concerned that Ava is not tolerating adequate amounts of breast milk and is concerned she may become dehydrated. Ava is examined in the department and has bare weight of 4.2 kg, length 56 cm, head circumference 36.5 cm. What would you discuss with Linda and her medical officer?

## The toddler and preschool child

During this stage of development a child's rate of growth is slower than in infancy and this is normally reflected by a decrease in appetite, although appetite is generally unpredictable during these years. Toddlers are learning to feed themselves and to eat new foods. They should eat a variety of nutritious foods from all five food groups. Toddlers in particular need to ensure adequate iron and calcium intake, with low-fat diets not suitable for children less than 2 years. For minimum recommended number of serves from the Australian Guide to Healthy Eating for children see Figure 30.4.

Foods should be served at regular times in a calm and relaxed atmosphere. Because young children are active, snacks between meals are important. The foods offered for snacks should contribute to the nutritional needs of the child, while foods with poor nutritional value should be avoided. Small hard foods, such as nuts, raw carrots, etc., are potentially dangerous for the young child, as they may be inhaled and obstruct airways.

## The school-age child

During the first 12 months of life the foundation is laid down for good dietary practices. By the time the child is of school age, eating patterns are usually firmly established. As the child grows and develops, their tastes can change, and foods that were previously enjoyed may be refused, while the child may acquire a taste for other foods, due in part to social interaction and their changing physiological needs and subsequent sensory changes.

Nutritional requirements are similar to those for children of preschool age, although kilojoule needs are diminished in relation to body size (Figure 30.4). However, fat and protein reserves are being laid down for the increased growth needs of the adolescent period, and the school-age child should be encouraged to consume a healthy balanced diet consisting of foods from each of the five food groups and should be discouraged from consuming foods that have poor nutritional value. If the child consumes an excessive quantity of food and/or food that is high in kilojoules, and does not exercise, they may be at risk of childhood obesity and subsequent development of conditions such as adult-onset diabetes and cardiovascular disease. The Australian Institute of Health and Welfare (AIHW) (2015b) reported from the 2011–12 Australian Health Survey almost two-thirds (63%) of the population aged 18 and over are overweight or obese (35% overweight, 28% obese). Similarly, in children aged 2–17 results show one quarter (25%) of children are overweight or obese, with 18% being overweight and 7% obese.

While the prevalence of childhood overweight and obesity increased in Western countries during the 1980s to the late 1990s a number of more recent studies have reported a significant plateau in the prevalence of both overweight and obesity since the late 1990s (O'Dea et al 2014). The NHMRC (2013b) suggests a demonstrated association between childhood obesity and adult obesity. Furthermore, childhood obesity has been closely associated in later life with many diseases and conditions such as coronary heart disease, stroke, type 2 diabetes and osteoarthritis (Park et al 2012). Iron-deficiency anaemia is a more immediate nutritional problem in school-age children due to inadequate amounts of iron in the diet.

## Adolescence

From 10 years of age, children's bodies are developing rapidly to prime the body for reproduction. A pre-puberty growth spurt occurs earlier in girls than in boys, as they store more fat, which initiates adolescence faster (see Chapter 13). During adolescence, the need for nutrients including energy, protein, vitamins and minerals increases. During this time there can be major changes in the selection and volume of food; however, it is important to continue choosing nutritious foods across the food groups (NHMRC 2013a). Hormones alter senses such as taste to enable the adolescent to adapt to changing nutrient requirements. Some individuals at this age may be vulnerable to self, peer and social influences that alter their perception of appearance and self-worth and drastically modify their eating habits (see 'Eating disorders' later in this chapter). (See Case Study 30.1.)

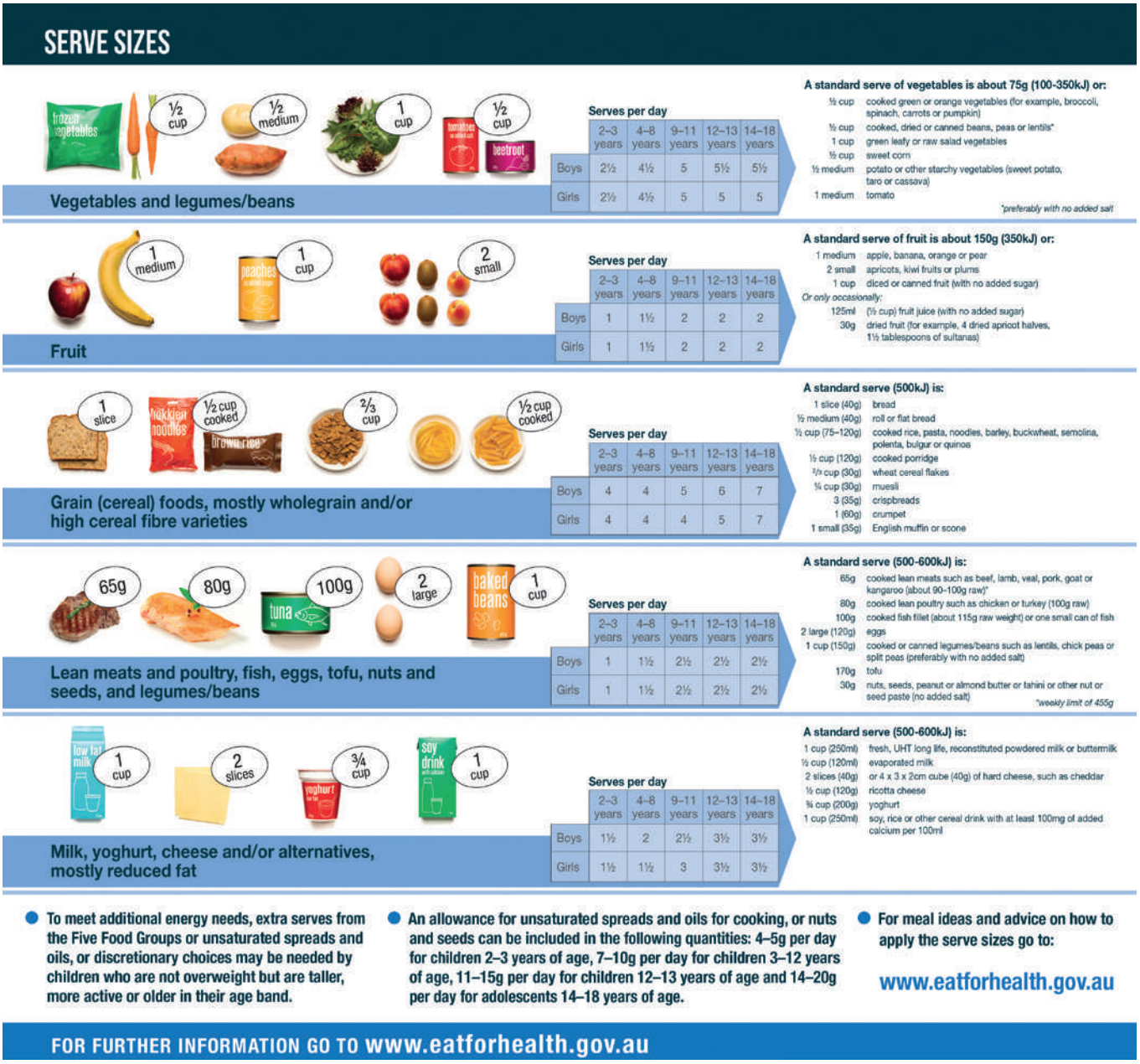


**Figure 30.4** Australia Dietary Guidelines—sample serves for children and adolescents *(NHMRC 2013a)*

## CASE STUDY 30.1

Amelia, a 12-year-old girl, has been brought into hospital for an adenoidectomy and tonsillectomy. While admitting her you discover she weighs 80 kg. She is accompanied by her mother who you notice is also overweight. As a nurse in the team looking after Amelia, it is important that your care of Amelia is person-centred and ensures that Amelia has the best possible health outcomes both in the hospital and on discharge.

1. What are the implications Amelia's weight may have on her short-term and long-term health?
2. Does Amelia's weight have any implications for her pre- and postoperative care? If yes what are these concerns?
3. How would you as the nurse caring for Amelia address her weight issue? Is it appropriate to also involve her parents in this discussion?
4. What nursing advice would you give to Amelia and her family? How would you address an issue like Amelia's diet, which could have health behavioural implications?

## Older persons

The ageing process has significant impact on nutrition due to a decline in biological and physiological function. Older individuals have reduced lean body mass and basal metabolic rate as well as often reduced appetite and energy expenditure. While requirements for some nutrients are reduced, WHO (2015) suggests that requirements for other essential nutrients may increase and recommend a review of the current recommended daily nutrient allowances.

## Energy requirements

In addition to the consumption of foods from the five food groups that provide the essential nutrients, dietary requirements need to be considered in terms of energy requirements. Energy is needed for all the chemical and physical activities of the body, such as muscular activity, production of glandular secretions and the synthesis of substances in cells. The amount of energy required is the amount necessary to maintain physiological processes and depends on factors such as age, sex, climate, body build, height and weight, level of physical activity and usual function or dysfunction.

Energy requirements are increased during periods of rapid growth; for example, during pregnancy, infancy and adolescence and when a person engages in a high level of physical activity. Certain types of body dysfunction, such as hyperthyroidism, can also increase the amount of energy required. Energy requirements are decreased when an individual's level of physical activity is low, with certain metabolic conditions, such as hypothyroidism, and during stages of development when there is little growth, such as old age (WHO 2004).

The two units of measurement that specify the energy value of food are calories and joules. A calorie is defined as the amount of heat required to raise 1 g of water by 1°C. A joule, which is the standard international (SI) unit of energy and heat, is equivalent to the amount of work performed when a 1 kg mass is moved 1 m by the force of 1 newton. One calorie is equal to 4.184 joules. As joules are very small units, it is more convenient to measure food energy in terms of kilojoules. One kilojoule (kJ) is 1000 joules.

The energy values of the three major types of nutrients are:

1. 1 g protein produces about 17 kJ
2. 1 g carbohydrate produces about 17 kJ
3. 1 g fat produces about 38 kJ (NHMRC 2006).

Energy expenditure varies with the level of physical activity a person engages in and ranges from about 5 kJ/min during sleep to about 120 kJ/min during heavy physical activity. When the intake of kilojoules is increased or energy expenditure is decreased, weight gain occurs. Conversely, loss of weight occurs when the intake of kilojoules is decreased or energy expenditure is increased (Nutrition Australia 2012). Basal metabolism is the term used to describe the minimal maintenance of all normal body functions at rest and in the absence of disease. The amount of energy required to support basal metabolism is measured when an individual is awake but at complete rest and has not eaten for at least 12 hours. The measurement is expressed as **basal metabolic rate (BMR)**, according to the number of kilojoules consumed per hour per square metre of body surface area (or per kilogram of body weight) (Harris et al 2014). The BMR is one diagnostic test commonly used to estimate nutritional needs. Variations in the BMR between individuals of the same weight and height may be due to alteration in body composition, such as muscle mass as opposed to fatty tissue, and the presence of certain disease states.

There are two types of measurement that may be used by clinicians when determining body fat and risk of chronic disease. These are the **body mass index** (BMI) and waist circumference.

The BMI is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres ($kg/m^2$). For example, the BMI of a male who is 1.83 m tall and weighs 115 kg is:

$$\frac{115}{1.83^2} = \text{BMI of } 34$$

The value obtained when this formula is used should be rounded to the nearest whole number.

BMI values are age-independent and the same for both sexes. However, BMI may not correspond to the same degree of fatness in different populations due, in part, to different body proportions. The health risks associated with increasing BMI are continuous and the interpretation of BMI grading in relation to risk may vary for different populations. Brown and colleagues (2013) outlined higher health risks associated with lower BMIs for Asian and Pacific Islander people and went on to suggest lower BMI guidelines for these populations.

A BMI value below 20 is common in certain ethnic groups, such as people of Asian descent, and in athletes, but otherwise indicates that a person is underweight. A BMI of 20–25 is within the healthy weight range. A BMI of 25–30 may indicate more muscular build or overweight, while a value of 28–40 is defined as moderate to severe obesity, and a value above 40 signifies morbid obesity (WHO Expert Consultation 2004). For graphical representation of BMI see Figure 30.5.

The waist measurement compares closely with a person's body mass index (BMI), and is another widely utilised scale of predicting an individual's risk of developing a chronic disease. Excessive body fat around the abdomen (central adiposity) is an indicator of internal fat deposits on the heart, kidneys, pancreas and liver. A waist measurement of greater than 94 cm for men and 80 cm for women is an indicator of increased risk of chronic disease development such as type 2 diabetes and cardiovascular disease (AIHW 2012b). An advantage of using waist circumference is that the measurement is not related to the individual's height; however, specific ethnic group waist measurements are yet to be determined. It is believed that they may be lower for Asian

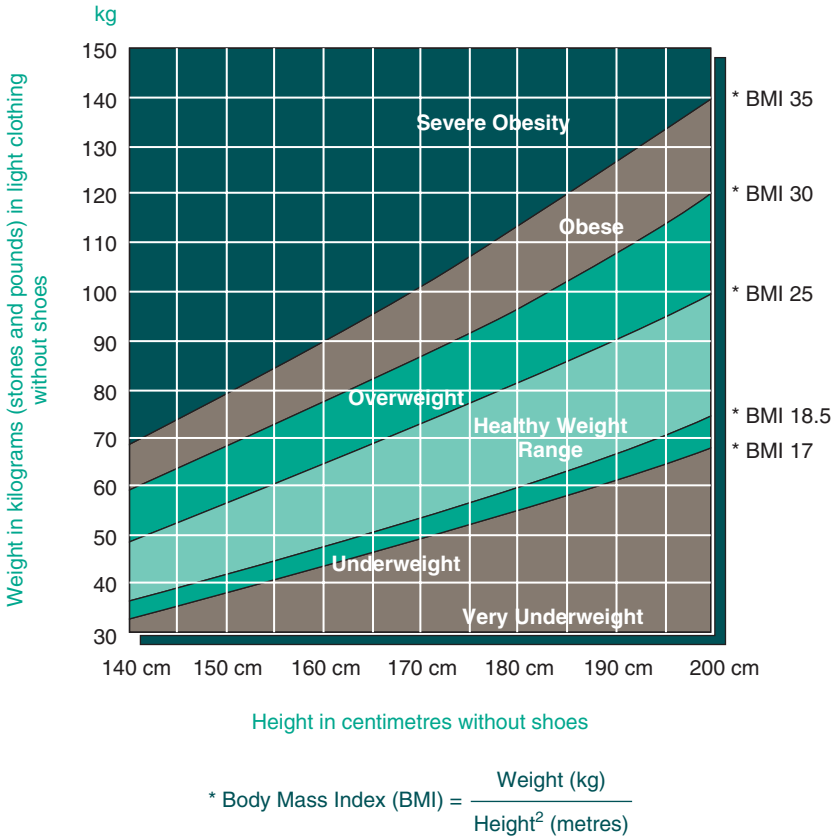


**Figure 30.5** Body mass index for adults
*(NHMRC 2013b)*

men than for Caucasian men and are likely to be higher for Pacific Islanders and African-Americans (men and women). The limited data currently available indicates that the risk factors in Aboriginal populations appear to be similar to those in Asian populations; and the risk factors in Torres Strait Islander populations appear to be similar to those found in Pacific Islander populations (NHMRC 2013b).

Measuring a person's waistline is a simple check for a nurse to perform and for accurate measurement the nurse should ensure that:

- Measurement occurs against the skin
- The person breathes out normally
- The tape measure is snug but does not compress the skin
- The correct place to measure the waist is horizontally halfway between the lowest rib and the top of the iliac crest. This is roughly in line with the individual's umbilicus (belly button) (WHO 2011).

## Glycaemic index

Glycaemic index (GI) classifies carbohydrate foods according to how rapidly glucose is released from them and absorbed into the blood. It has traditionally been used to treat individuals with diabetes mellitus but is now being used for establishing optimal diets for the general populace. The lower the GI the slower the rate of absorption and the slower the rate of insulin release. Complex carbohydrates such as starch provide lower GI nutrients and result in a more stable blood glucose level (Harris et al 2014).

Some simple carbohydrates, such as those found in fruits, have a lower GI value than some complex carbohydrates, such as those found in rice and potatoes. Foods with low-GI values have been used to treat hypercholesterolaemia and obesity. Low-GI foods include multigrain breads, bran, legumes, milk, yoghurt and fruits. High-GI foods, of which there are more than 70, include rice, potatoes, wholemeal and white bread, and some cereals. Further health benefits may be gained by including foods that are high in fibre.

# NUTRIENTS

Nutrients are chemical substances in food that provide energy, build and maintain cells or regulate body processes. The essential nutrients are:

- Carbohydrates
- Proteins
- Lipids (fats)
- Water
- Fibre
- Vitamins
- Mineral salts.

## Carbohydrates

**Carbohydrates** are a group of organic compounds that includes sugar, starch and cellulose. They are composed of one or more monosaccharide (single-sugar) units. Sugars can be classified as either simple or complex and are divided into groups according to the complexity of their molecular structure. Simple sugars, or **monosaccharides**, include glucose, fructose and galactose (Harris et al 2014). **Disaccharides**, which are a combination of two sugars, include sucrose, lactose and maltose. For example, glucose and fructose combine to form sucrose. Complex sugars or **polysaccharides** are a combination of many sugars and include starch, glycogen and cellulose. Before carbohydrates can be utilised by the body cells, disaccharides and polysaccharides must be converted by chemical digestion into glucose.

Carbohydrates provide energy, assist in the metabolism of fat and act as a protein sparer (if there is insufficient carbohydrate in the diet, protein is converted to glucose and used for energy). Carbohydrate foods also supply indigestible cellulose, which adds bulk to the intestinal contents, resulting in stimulation of peristalsis. The major food sources of carbohydrates are:

- Sugars, present in fruits, honey, cane sugar, milk and cereals
- Starch, present in vegetables, cereals and foods made from cereals (e.g. bread and pasta)
- Cellulose, present in vegetables, fruits and cereals (complex carbohydrates).

## Proteins

Proteins are a group of nitrogenous compounds composed of chains of amino acid subunits. Twenty-two amino acids have been identified in humans. Eight of these, the **essential amino acids**, the body is unable to make, and they must be obtained from dietary sources. The remaining 14 **non-essential amino acids** can be synthesised by the body. Before proteins can be utilised by the cells, they must be broken down by physical and chemical digestion into their constituent amino acids. According to the number and type of amino acids present, proteins are classed as either complete (containing all essential amino acids) or incomplete (lacking one or more essential amino acids) (Harris et al 2014).

Proteins build and repair tissue and supply energy (protein that is not needed for growth and repair of tissues is converted into glucose and stored in the liver and muscles as a reserve store of energy). The major food sources of protein are meat, fish, eggs, cheese, milk, poultry and soya beans (complete (or first-class) protein); and cereals, lentils, legumes and nuts (incomplete (or second-class) protein).

## Lipids (fats)

Lipids are a group of substances that are insoluble in water and are composed of fatty acids and glycerol. Fatty acids are classed as saturated or unsaturated. Saturated, or solid, fats are chiefly of animal origin, such as butter, and contain a full complement of hydrogen. Unsaturated, or soft or liquid, fats are chiefly of vegetable origin, such as margarine, and are capable of adding more hydrogen to their molecular structure.

Before fats can be utilised by the body cells they must be broken down by chemical digestion into their constituent fatty acids and glycerol. Fat supplies energy and may be used in the tissues or stored in adipose tissue, which functions to support and protect nerves and organs from trauma, insulate the body to prevent excessive heat loss or gain and as a reserve store of fuel. Fats also supply the **fat-soluble vitamins** A, D, E and K as well as stimulating adolescence, fertility and mood, and suppressing appetite through the action of hormones such as leptin, secreted by **adipocytes** (Harris et al 2014).

The major food sources of fat are animal fats, present in meat, butter, cream, egg yolk, cheese and fish oils, and vegetable fats, present in margarine, cocoa and oils such as olive, safflower, corn and peanut.

## Water

Water is a chemical compound obtained by the body from food and fluid and as a result of the metabolism of protein, fat and carbohydrate in the tissues. Water constitutes about 60% of the total body weight in an adult and is present as intracellular fluid and extracellular fluid. Water is also the basis of all body secretions and excretions.

Water is necessary for the digestion, absorption and metabolism of food, for the production of secretions and for the maintenance of body fluids. Water is also necessary for the regulation of body temperature by evaporation of sweat, and for the elimination of waste products through the kidneys, bowel, skin and lungs.

Water is present in all body fluids and as part of the cellular structure of solid foods. Foods vary in water content; fruit and vegetables contain about 80–90% water, meat contains about 70% and bread contains about 35%.

## Fibre

Dietary fibre, often referred to as cellulose, is the fibrous parts of food that the digestive system has difficulty in digesting. Fibre creates bulk in the stools, which enhances defecation and is used to prevent or minimise symptoms of certain disorders, such as haemorrhoids, diverticular disease, formation of gallstones, simple constipation and intestinal cancer (Harris et al 2014). Foods with high fibre content are fruits, vegetables and wholegrain products. Clinical Interest Box 30.1 provides discussion of the effects of constipation on the older person.

## Vitamins

Vitamins are a group of organic compounds that, with few exceptions, must be obtained from dietary sources. Although they have no energy value, they are essential for normal metabolic and physiological bodily function. The term vitamin was first used in 1912, and letters of the alphabet were assigned to them as they were discovered. Now that more is

### CLINICAL INTEREST BOX 30.1
### Constipation and the older individual

Constipation can occur at any age but is common in the elderly, associated with diminished exercise, fibre and fluid intake, as well as diminished neurogenic gastrointestinal regulation. Measures to avoid constipation are required to reduce the incidence of conditions such as diverticulosis, megacolon, carcinoma, strokes and heart attacks. A nutritional assessment of dietary intake is required, as is examination for any underlying pathologies, such as those causing disorders such as iron-deficiency anaemia from per-rectal bleeding. The clinical features of this anaemia include constipation, lethargy, easy exhaustion, pale conjunctivae and **pagophagia** (craving for ice). Iron is obtained in large quantities from meat, and many older individuals may be unable to obtain and consume or absorb the required amounts. Iron-replacement therapy may be required; however, supplemental iron can result in constipation, false-positive occult blood test and gastrointestinal upset.

*(Rao & Go 2010)*

known about their composition, the chemical name for a vitamin is frequently used.

Vitamins are classed as being either water- or fat-soluble. The water-soluble vitamins are easily destroyed during the preparation and prolonged cooking of food. If they are consumed in excess of the body's need, they are excreted in the urine. Fat-soluble vitamins are oxidised by exposure to air, light and high temperatures. As fat-soluble vitamins are not soluble in water, any excess is stored in the body, and a condition known as hypervitaminosis may occur, which may result in organ failure (Harris et al 2014).

Excessive intake of vitamin A over long periods can result in hypervitaminosis A, a condition characterised by yellow discolouration of the skin (often mistaken as jaundice), loss of appetite and dry itchy skin. Excessive intake of vitamin B may result in allergic-type reactions. Hypervitaminosis D may occur if excessive amounts of vitamin D are taken in and is characterised by nausea, vomiting, diarrhoea, general irritability and severe impairment of kidney function. In normal circumstances a healthy balanced diet will provide the body with sufficient quantities of all vitamins without the need for supplemental vitamin ingestion. Table 30.2 describes the functions and effects of vitamin deficiencies.

### Mineral salts

Mineral salts are a group of compounds that play an important role in metabolism, maintenance of blood pressure, cardiac function, fluid and electrolyte balance, acid–base balance and the regulation of other body processes. Storage and processing of food does not alter its mineral content, although mineral salts may be lost when food is soaked or cooked in water. The elements that mineral salts contain are classed as either major or trace elements; trace elements are present in only minute quantities in the body. A mineral salt that has the property of being a conductor of electrical current is referred to as an electrolyte. The functions and effects of mineral salt deficiencies are listed in Table 30.3.

## DIETS TO MEET INDIVIDUAL NEEDS

A person's normal diet depends on their age, pattern of eating and the food they choose. Dietary requirements may change during illness; for example, an individual may avoid eating foods that cause adverse reactions such as indigestion, nausea or diarrhoea. The diet may also need to be adapted as part of their treatment during certain conditions and disease states.

While acknowledging the factors that influence a person's choice of foods and observing any restrictions to their diet in the management of disease processes, nurses should encourage the consumption of healthy balanced meals following the Australian Healthy Eating Guide principles.

Furthermore, individuals should become aware of the information in the labels of prepared and packaged foods. Notice should be taken of the expiry date and the presence of preservatives and other additives. The listing of ingredients on the packaging denotes the relative quantities of each ingredient, with the major ingredient listed first. The remainder are listed in order of decreasing quantities.

Individuals may choose, or may be prescribed, certain diets, as follows.

### Healthy balanced diet

A healthy balanced diet is one without dietary restrictions or modifications. An individual may select the foods they prefer within the principles of good nutrition and diets based on age, health and cultural or religious beliefs. Some individuals choose to follow a diet in which specific foods or nutrients are restricted or increased, as part of a commitment to a healthy lifestyle. Other people will follow a diet based on cultural or religious commitment.

A healthy approach to eating based on the Australian Dietary Guidelines is depicted in Figure 30.2.

### Vegetarian diets

Individuals may choose to follow a vegetarian diet for health, personal, ecological or religious reasons. Vegetarian diets exclude all flesh foods, such as meat, fish and poultry, and have an intake high in plant foods. The lacto (milk)-ovo (egg) vegetarian diet includes milk, other dairy products and eggs, while a lacto-vegetarian diet includes milk and other dairy products but excludes eggs. The vegan diet (strict vegetarian) excludes all animal-derived products and consists of plant foods only (Nutrition Australia 2011).

### Religious and cultural diets

Certain religious or cultural groups have particular rules concerning the choice, preparation and storage of specific items

## TABLE 30.2 | Vitamins and health

| Vitamin | Functions | Sources | Effects of deficiency |
|---|---|---|---|
| Vitamin A (retinol or carotenes) | Sustains normal vision in dim light, promotes healthy growth of epithelial tissue and bone and therefore raises resistance to infection | Cod liver oil, liver, kidney, egg yolk, milk and dairy products, yellow fruits and yellow and green vegetables | Night blindness, keratinisation of epithelial tissue (and therefore less resistance to infection), stunted growth, zinc deficiency |
| Thiamine (B1) | Nerve function<br>Energy and carbohydrate metabolism | Yeast extract, wholegrain cereals, meats, leafy green vegetables | Polyneuritis, beriberi, Wernicke–Korsakoff syndrome, lack of muscular and mental development |
| Riboflavin (B2) | Energy and protein metabolism, cellular respiration, healthy skin and mucous membranes | Liver, yeast extract, milk and dairy products, eggs, green leafy vegetables | Fissures at the corner of mouth (cheilosis), angular stomatitis, glossitis, dermatitis, failure to thrive |
| Niacin (B3) | Energy utilisation; metabolism of fat, carbohydrate and protein; nervous system function | Liver, bran, meat, fish, yeast extract, legumes | Pellagra (diarrhoea, dermatitis, dementia); glossitis, anaemia |
| Pantothenic acid (B5) | Metabolism of carbohydrates, protein and fat; formation of haemoglobin and acetylcholine | Offal, yeast, fish, meat, egg yolk, apricots | Fatigue, sleep disturbances, headaches, personality changes, irritability |
| Pyridoxine (B6) | Protein metabolism, nervous system function, formation of red blood cells | Liver, fish, meat, wholegrain cereals, bananas, avocado, egg yolk, peanuts | Neuritis, depression, anaemia, EEG and ECG changes, cheilosis, renal stone formation |
| Cyanocobalamin (B12) | Formation of red cells and nucleic acids | All foods of animal origin | Pernicious anaemia, CNS atrophy, vision loss |
| Biotin | Synthesis of fatty acids, metabolism of carbohydrates and fat, gluconeogenesis | Liver, brewer's yeast, fish, offal, soya beans | Lethargy, dermatitis, EEG and ECG changes, hypercholesterolaemia |
| Folic acid (folacin, folate) | Metabolism, DNA and RNA synthesis, formation of haemoglobin | Liver, citrus fruit, offal, nuts, leafy green vegetables | Macrocytic anaemia, malabsorption |
| Vitamin C (ascorbic acid) | Formation of collagen, assists in wound healing, maintenance of capillaries, production of neurotransmitters, aids absorption of iron | Citrus fruits, tropical fruits, berry fruits, tomatoes, potatoes, green vegetables | Delayed healing, bleeding tendencies, scurvy, reduced nervous system and muscle function |
| Vitamin D (calciferol) | Calcium and phosphorus metabolism, immune function | Cod liver oil, fish, butter, margarine, egg yolk, sunlight on the skin | Rickets, osteomalacia |
| Vitamin E (alpha-tocopherol) | Antioxidant action protects the cell membrane, prevents heart disease and delays the ageing process (not yet confirmed) | Wheatgerm, vegetable oil, wholegrain cereals, nuts, legumes | Muscle degeneration, haemolytic anaemia in the newborn, infertility, malabsorption |
| Vitamin K (menadione) | Formation of clotting factors II, VII, IX and X; assists in regulating calcium metabolism | Liver, leafy green vegetables, egg yolk, synthesised by bacterial flora in the gastrointestinal tract | Bleeding tendencies |

*(Mann & Truswell 2012)*

**TABLE 30.3 | Mineral salts and health**

| Mineral | Functions | Sources | Effects of deficiency |
|---|---|---|---|
| **Major elements found in mineral salts** | | | |
| Calcium (Ca) | Formation of bones and teeth, muscle contraction, normal blood clotting, activator for enzymes and neurotransmitters | Milk, yoghurt, cheese, sardines, salmon, sesame seed paste | Osteoporosis, tetany and severe muscle spasms, osteomalacia |
| Phosphorus (P) | Formation of DNA, bones and teeth; nerve and muscle function | Milk, cheese, meat, fish, eggs | Anaemia, weight loss, abnormal growth |
| Sodium (Na)<br>Potassium (K)<br>Chloride (Cl) | Act closely together in the maintenance of osmotic pressure balance between intra- and extracellular fluid; nerve and muscle function, maintenance of acid–base balance | Salt, fruits, vegetables, monosodium glutamate | Cell and tissue fluid abnormality, arrhythmias, muscular weakness |
| Magnesium (Mg) | Activator of enzymes; nerve and muscle function | Cereals, nuts, leafy green vegetables, dried beans | Anorexia, nausea |
| Iodine (I) | Formation of thyroxine | Seafoods, vegetables, iodised salt | Goitre, myxoedema and hypothyroidism, stillbirths and spontaneous abortions, mental and growth retardation, cretinism |
| Iron (Fe) | Formation of haemoglobin, necessary for the transport of oxygen | Liver, red meats, eggs, leafy green vegetables | Iron-deficiency anaemia, pagophagia, lethargy and exhaustion, poor tissue regeneration |
| **Minor (trace) elements found in mineral salts** | | | |
| Zinc (Zn) | Metabolism, collagen formation, component of certain enzymes, healthy skin and hair | Wheatgerm, oysters, meat, cheese, wholegrain cereals | Impaired healing, poor condition of the skin, growth retardation, fatigue, hair loss, behavioural changes |
| Copper (Cu) | Aids iron absorption; nerve function | Shellfish, nuts, wholegrain cereals | Neutropenia, hypochromic anaemia, vascular disorders |
| Cobalt (Co) | Synthesis of vitamin B12 | Leafy green vegetables | Pernicious anaemia due to vitamin B12 deficiency |
| Sulfur (S) | Constituent of amino acids | Protein foods | Deficiency is rare |
| Selenium (Se) | Antioxidant | Fish, liver, cereals | Muscular dystrophy, delayed growth, renal and cardiac degeneration |

*(Whitney et al 2013)*

in the diet; however, individuals may vary in their adherence to religious dietary doctrines and the nurse should not assume that all people who are of a particular faith strictly follow the religious dietary restrictions. Some examples of religious dietary restrictions are:

- Hinduism (Hindu): people of the Hindu faith abstain from eating beef products and follow a vegetarian diet. Stimulants are forbidden
- Islam (Moslem, Muslim): all pork and pork products, alcohol and caffeine are forbidden. Any meat consumed must be from animals slaughtered according to strict rules (Halal). Ramadan, a period of fasting, forbids eating or drinking of any substance from sunrise to sunset for one lunar month
- Jehovah's Witness: dietary restrictions against any foods that are prepared with blood, for example, some meat

pies and blood sausages. Additionally, some Jehovah's Witnesses may refuse to eat meats if they are unsure if the meat presented was not properly bled. There are no specific 'rules' for correct bleeding of an animal so it is best to discuss this requirement with the individual and their family
- Judaism (Jewish faith): foods must be 'kosher' (prepared according to Jewish law) and only certain parts of an animal may be eaten. All pork, shellfish and predatory birds are prohibited. Meat and dairy products are never eaten at the same time and are required to be stored and prepared separately. Certain periods of fasting are observed, such as Yom Kippur, a 24-hour fast. Passover, lasting 8 days, prohibits the consumption of leavened (yeast-containing) bread. Cooking is not permitted on Saturdays (the Sabbath)
- Mormon (Church of Jesus Christ of Latter Day Saints): meat, although not forbidden, is eaten infrequently. Drinks containing caffeine (e.g. tea, coffee and cola) are not permitted. Tobacco is also forbidden
- Roman Catholic: Ash Wednesday and Good Friday are specified days on which abstinence from meat is obligatory. In addition, Roman Catholics are required to fast for 1 hour before taking Holy Communion
- Seventh-Day Adventist: a lacto-vegetarian diet is commonly followed and stimulants such as coffee, tea and alcohol are not permitted (Office of Multicultural Interests 2013).

## Therapeutic diets

A specific diet may be prescribed to rectify a nutritional deficiency, to decrease specific nutrients or to provide modifications in the texture or consistency of food. If a therapeutic diet is prescribed, it is important that the individual understands the reasons for any restrictions or modifications. Information about various therapeutic diets is provided in Table 30.4. Nursing Care Plan 30.1 shows a sample nursing care plan for an individual on a restricted diet.

## Diets for wound healing

Nutrition is intricately interrelated with wound healing. It is important that appropriate nutritional support be provided to individuals as a part of their wound care plan. Malnutrition has a negative impact on wound management including: delayed wound repair, decreased wound strength and increased risk of skin breakdown. Alternatively, nutritional supplementation has demonstrated positive effects of accelerated wound healing (AWMA 2010). Large wounds cause a large increase in an individual's metabolic rate and therefore require altered intake of energy, protein, carbohydrate, fat, vitamin and minerals (Choo et al 2013). It is therefore not therapeutic for persons with chronic wounds to follow restrictive diets until wound repair has been achieved.

The National Safety and Quality Health Standards were developed to improve the quality and standardise care within Australian healthcare settings. Preventing and managing pressure injuries mandates that individuals with pressure injuries must be managed according to best practice guidelines. Improved nutrition is highlighted by the Australian Commission on Safety and Quality in Health Care (ACSQHC) as an implementation strategy to address risk reduction (ACSQHC 2012; 2015). See Chapter 29 for further information on wound healing.

## Diets and mental health

Just as physical health is interrelated with nutrition so too is mental health. For individuals with mental illness a range of factors increase the risk of poor nutrition: specific symptoms of disorder, diet and lifestyle choices, medication side effects, cognition and poor social determinants. General dietary goals of individuals should be based on the Australian Guide to Healthy Eating to improve both physical and mental health. Specific therapeutic diets (e.g. low tyramine) may be appropriate with particular antidepressant medications or to assist treatment of depressive symptoms (e.g. omega-3 fats, folate and magnesium) (ACI 2013).

### CRITICAL THINKING EXERCISE 30.4

Tyra is 30 weeks gestation with her first child. While she is usually healthy she has been experiencing breathlessness, and tiring easily throughout the day. She complains of light headedness, craving ice and leg cramps. Her GP has discussed oral iron replacement therapy; however, she is concerned regarding the side effect of constipation from this treatment. What diet and care would you recommend to Tyra?

### CRITICAL THINKING EXERCISE 30.5

Mel, 24, who is a strict raw vegan, is hospitalised for severe abdominal pain and dysmenorrhoea. She asks you for jugs of ice to chew on, although she is allowed clear fluids. You suspect pagophagia as a result of blood loss. What other signs or symptoms may reinforce your diagnosis of anaemia and what plan would you devise to prove the anaemia and improve her blood count?

### CRITICAL THINKING EXERCISE 30.6

Belinda, 32 is admitted to the medical ward with mastitis. Her 3-week-old baby is rooming in so she can continue breastfeeding. What are some nutritional considerations needed?

# NURSING PRACTICE AND NUTRITIONAL NEEDS

Each institution has its own system for delivering meals, and the nurse should ensure that both the individual and their immediate environment are prepared in readiness for mealtimes in accordance with local facility policy and procedure.

## TABLE 30.4 | Therapeutic diets

| Diet | Description | Indications |
|---|---|---|
| Clear liquid | No solids permitted and only fluids that leave no residue, are non-irritating and non-gas forming are allowed (e.g. water, black tea or coffee, clear soups and fruit drinks) | Obstruction or irritation of the gastrointestinal tract<br>Preparation for colonoscopy<br>Postoperatively before starting on solids |
| Full liquid | All fluids, plus foods that become liquid at room temperature (e.g. jelly and ice-cream) are permitted | Progression from clear liquids<br>Before starting on solids<br>Inability to chew or swallow solids |
| Soft | Semi-solid easily digested foods are permitted, e.g. soup, cooked cereal, milk pudding, mashed or pureed vegetables and fruit, eggs, soft meats and fish | Advancing from a liquid diet<br>Individuals with chewing or swallowing difficulties<br>Certain gastrointestinal disorders |
| Low fibre | Foods that can be absorbed easily and leave no colour or residue are permitted (e.g. clear soup, tender meat, fish or chicken, eggs, refined cereal products, jelly, ice-cream) | As part of preparation for colonoscopy<br>Colitis<br>Before and after surgery on the lower colon |
| High fibre | Foods that contain residue that adds bulk to the faeces and stimulates peristalsis (e.g. fruit, vegetables, nuts, wholegrain products) | Prevention of cancer<br>Prevention and treatment of constipation<br>Hypercholesterolaemia |
| Low kilojoule | The number of kilojoules is reduced below the usual daily requirement. Foods that are low in fat or refined carbohydrate are permitted | Weight reduction |
| High kilojoule | The number of kilojoules is increased above the usual daily requirements. Foods that are high in carbohydrate, protein and fat are included | Weight gain. To replace and repair damaged tissue (e.g. after severe burns) |
| Low cholesterol | Foods that are high in fat and cholesterol are restricted (e.g. butter, cream, whole milk, cheese, egg yolk, meat) | Prevention or treatment of heart disease, atherosclerosis, high serum cholesterol levels |
| Low fat | Foods that are high in fat are restricted (e.g. butter, cream, whole milk, cheese, fatty meat) | Liver or gallbladder disorders<br>Irritable bowel syndrome<br>Weight reduction |
| Low protein | The amount of protein is restricted and fat and carbohydrate is increased | Kidney or liver failure |
| High protein | The amount of protein is increased and foods high in complete protein are included (e.g. meat, fish, eggs, cheese, milk) | To replace and repair damaged tissue |
| High iron | Foods that are rich in iron are included (e.g. liver, red meat, green leafy vegetables) | Prevention and treatment of iron-deficiency anaemia |
| Controlled carbohydrate (diabetic) | The amounts of carbohydrate, kilojoules and protein are controlled to meet nutritional needs, to control blood sugar levels and to maintain an appropriate body weight | Diabetes mellitus |
| Controlled sodium | Foods that are high in sodium are omitted and no salt is added to food | Cardiovascular disease. Certain kidney diseases, liver failure, fluid retention (oedema) |
| Gluten restricted | Foods that contain gluten are eliminated (e.g. wheat, rye, oats, malt, barley). Rice and corn are permitted | Coeliac disease |
| High vitamin | A balanced healthy diet that includes foods that are high in one or more deficient vitamins | Vitamin deficiency diseases (e.g. night blindness)<br>Anaemia (e.g. vitamin B12, folate)<br>Beriberi<br>Scurvy<br>Rickets |

*(Mahan et al 2012)*

## NURSING CARE PLAN 30.1

**Assessment:** Marcus is a 31-year-old male, 198 cm tall and 140 kg. BMI >30, categorising him as obese. His waist circumference is 150 cm. BP 132/86, HR 98, fasting BGL 7.2 mmol, and reports breathlessness on minimal exertion
**Issue/s to be addressed:** Nutrition altered, more than body requirements—overweight, obesity
**Goal/s:** Decreased body mass index to healthy range
Decreased waist circumference to healthy range
Increased activity level to 30 minutes of exercise 5 days per week

| Care/Actions | Rationale |
|---|---|
| Weekly body weight recorded | Weight loss or gain should be recorded to determine effectiveness of care plan |
| Dietitian referral | Dietitians are a member of multidisciplinary team with a detailed understanding of nutrition to assist in weight loss |
| Formulate eating plan with appropriate caloric intake and nutritional needs | Weight loss is associated with a negative calorie input to output balance |
| Educate individual to keep a daily food and fluid diary | Quantification of intake, and a visual record may also help individual to make more appropriate food choices and serving sizes |
| Facilitate water intake 2 L minimum per day | Water assists in the excretion of by-products of fat breakdown and helps prevent ketosis |
| Discuss mindful eating and consciousness of nutritional habits | Non-hungry eating is a commonly recognised symptom in obese individuals |
| Discuss role of regular exercise | The combination of diet and exercise promotes loss of adipose tissue |

**Evaluation**

6 weeks following implementation of care plan Marcus has had weight reduction of 8 kg and waist circumference decrease of 3 cm. He has decreased breathlessness on exertion and increased activity tolerance with walking 30 minutes 5 days per week. He has maintained a food diary of all intake during the time period. He has identified poor portion control as a trigger for his overindulgence. Marcus reports water intake of approximately 1.5 L per day with a reported effort to increase to the recommended 2 L.

The following aspects of nursing practice in meeting patient nutritional needs are in accordance with information taken from ACI (2012) and NSW Department of Health (2011).

## Assisting individuals at mealtimes

### Key aspects related to providing individuals with meals

- Ward mealtime should be coordinated with nursing care to minimise disruptions.
- Nursing care should be planned to ensure that there are no unpleasant sights, sounds, smells or treatments being performed during mealtimes, as these could interfere with appetite.
- Individuals should be offered the use of toilet facilities, and their hygiene needs should be attended to before meals arrive in the ward.
- Individuals who require assistance/supervision during mealtimes should be identified.
- Ambulant individuals may need assistance to a table; non-ambulant individuals should be assisted into a comfortable position. Either sitting upright in bed or out of bed if appropriate.
- Eating areas should be cleared of unnecessary items to provide space for the meal tray; the tray should be placed within reaching distance for the individual.
- When the meals arrive the nurse should ensure that each individual receives the correct meal, prepared in the correct manner according to their dietary, ethnic, cultural or religious requirements and that all the necessary items meet the individual's needs. This includes the provision of adaptive aids, cutlery and drinking devices for eating/drinking.
- Medications that are required before, during or after the meal are administered (e.g. insulin).
- During mealtimes ensure allocation of appropriate staff, carers, relatives and volunteers to meet individual needs (e.g. by cutting food, opening packets, pouring fluids or help with feeding).
- Nursing staff should provide supervision and assistance with eating and drinking where there is clinical risk (e.g. suspected dysphagia, eating disorders).
- If an individual is not able to eat what has been provided, measures should be taken to obtain an alternative meal type or other form of nourishment.
- The nurse should observe the individual's intake of food and fluid, complete clinical assessment of intake and inform nursing, medical or dietitian staff if the individual's intake declines. Intake needs to subsequently be recorded in food and fluid records accurately.

- Following the meal, the nurse should ensure that the individual has the opportunity and equipment to perform normal hygiene (e.g. cleaning of hands, face and teeth or dentures).

Certain individuals may experience difficulty or be unable to feed themselves for a variety of reasons, including age, general weakness, pain due to surgery, paralysis or limitation of movement due to, for example, the presence of arm splints, intravenous lines or casts. An individual who is dependent may experience embarrassment if they require assistance at mealtimes; the nurse should therefore endeavour to make mealtimes as normal and enjoyable as possible. Clinical Skill 30.1 outlines how to assist with eating and drinking.

## Key aspects related to assisting an adult at mealtimes

- Ensure that the individual is comfortable before starting a meal.
- Elimination and hygiene needs should be attended to before a meal is started.
- The individual may require to be assisted into a comfortable position and the table adjusted to the appropriate height.
- The meal should be placed where it can be seen and smelt, to stimulate the appetite.
- Condiments (e.g. salt and pepper) should be provided and may be added to the food, provided the individual is not on a salt-restricted diet.
- The nurse should ascertain whether the individual prefers one food at a time or a combination (e.g. meat alone, or combined with a vegetable). It is also important to ensure that food or fluids are not too hot or cold.
- Suitable utensils should be selected (e.g. an individual may prefer to eat using a spoon rather than a fork). The amount of food placed on the utensil should be easily managed by the individual. The utensil should be placed gently into the front of the mouth, to avoid injury or stimulation of the gag reflex.
- The food should be presented at a rate that meets the individual's needs, giving them sufficient time to chew and swallow each mouthful and to maintain dignity.
- Sips of fluid should be offered during the meal. A flexible straw, rather than a cup or glass, may be easier for some individuals to manage.
- To maintain dignity and to promote independence, the individual should be encouraged to be as independent as possible and may be encouraged, but never forced, to eat a meal.
- Allow the individual to wipe their mouth with a serviette during the meal, or assist if necessary.
- On completion of the meal, the individual's hygiene and comfort needs should be met. The nurse should report and document the intake of food and fluid.

## Key aspects related to assisting a child at mealtimes

Mealtimes in a hospital should be pleasant unhurried occasions and the environment should be one that enables the child to enjoy mealtimes. The nurse should communicate effectively with the parent/carer and child to ensure that the appropriate foods are being served. Some guidelines are:

- Mealtimes should be free from distractions
- Servings need to be small to minimise the psychological reaction to a large-sized serving
- Adequate time should be allowed for the meal to be eaten without hurrying
- The child should be prepared for the meal. Toilet needs should be attended to, nappy changed if necessary, hands and face washed, serviette or bib provided, distractions such as toys put away and the child made comfortable in bed or seated on a chair at a table
- The child should be discouraged from eating in front of the television or electronic devices (Hare-Bruun et al 2011)
- Painful or emotionally distressing procedures should not be performed immediately before or after a meal, and activities should be timed so that a child does not become too tired to eat a meal
- Meals should be served attractively, in amounts appropriate to the age and the condition of each child
- Children should be encouraged to feed themselves, even though they may do it in a 'messy' fashion
- Assistance should be given if the child is unable to manage or to use distractive therapy to maintain input
- Some children may need coaxing, but a child must never be forced to eat (Australian Government Department of Health 2011).

Uneaten food should be removed without comment and the nurse in charge informed. If the child's illness is causing anorexia, other forms of nutrition may be offered. Refusal to eat may be an attempt by the child to gain more attention, or it may be that the foods are different in appearance, presentation, availability of condiments or timing to the meals they are used to eating. Every attempt should be made to provide nutritious foods that the child enjoys. In a clinical setting, a lot of patience may be required to assist a child to eat a healthy balanced diet, particularly if their carers are not present. The child may be apprehensive of their setting, in pain, used to different foods or their diet at home may be of a poor standard.

Children should be observed for any adverse reaction to food and the nurse in charge and/or medical officer informed if a child vomits before, during or after a meal; develops diarrhoea; or develops what may be an allergic reaction to a food, such as a rash, pruritus or breathing difficulties.

## Key aspects related to assisting an individual with dementia at mealtimes

The general nutritional requirements of an individual with dementia are similar to those of others of the same age;

## CLINICAL SKILL 30.1 Assisting with eating and drinking

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| Am I educated?<br>Am I authorised?<br>Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Appropriate adaptive aids (e.g. plate guard)<br>Dysphagia cup<br>Cutlery<br>Straw<br>Clothes protector and or serviette |

| **Skill activity** | **Rationale** |
|---|---|
| Validate the medical/speech pathology/nursing order in the individual record (if applicable) | Ensures correct procedure is about to take place |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Critically think through the assessment data and problem solving—level of consciousness, position of individual, dysphagia, chronic diseases that require dietary management, food allergies, appetite, assistance needed (personnel and equipment), social and psychological issues that may affect eating, appetite or food and drink choices, food texture, fluid viscosity, check if individual is wearing dentures if applicable | Evaluate each aspect and its relationship to other data to help identify specific problems and modifications of the procedure that may be needed for the individual |
| Assist the individual into the high Fowler's position or sit out of bed unless contraindicated<br>If contraindicated elevate head of bed >30 degrees<br>Individual to be centred in midline position, head flexed forwards and down | Reduces risk of gastro-oesophageal reflux and aspiration by ensuring individual is safely positioned prior to commencement of feeding<br>Promotes comfort and reduces risk of choking<br>Sitting out of bed promotes independence of individual and increases enjoyment of meal |
| Perform hand hygiene | Prevents cross-infection and contamination |
| Ensure that appropriate food and fluid textures are given to individual | Food texture checked and appropriate texture given to individual to prevent choking and or aspiration<br>Fluid viscosity checked and appropriate viscosity given to individual to avoid aspiration |
| Raise the individual's bed to appropriate working position based on your height or position a chair opposite if assistance with feeding required so you are sitting face to face | Prevents strain and abides by WHS policies and procedures<br>Improves communication and interaction |
| Present meal in a safe manner to individual<br>Ensure meal tray/drink is not placed within individual/s reach if it has been identified that the individual requires assistance and/or supervision for eating<br>Provide assistance to open packaging if required<br>Ensure individual is alert before commencing feeding<br>Ask individual for preference for food<br>Understand the risks associated with assisting an individual to eat and drink (e.g. suspected dysphagia, eating disorders)<br>Assist only as necessary<br>Allow hot food to cool<br>Check food is not stuck in buccal region | Prevents aspiration and/or injury from hot food/fluid<br>Assists with meal set-up<br>Promotes independence and involvement if possible<br>Prepares for potential risks and an emergency situation |

*Continued*

| CLINICAL SKILL 30.1 Assisting with eating and drinking—cont'd | |
|---|---|
| Ensure each mouthful of food is presented in a safe manner to individual<br>Introduce each mouthful of food verbally and visually to individual ensuring an appropriate size<br>Ensure appropriate pacing is employed | Assesses tolerance to the procedure<br>Alerts individual to next mouthful of food<br>Ensures prior mouthful is swallowed prior to next being presented |
| Ensure observation is maintained throughout meal<br>Any concern regarding safety, food and nutrition care should be reported immediately to the Registered Nurse/medical officer<br>Cease meal if there are any signs of choking, aspiration, reduced level of consciousness, food stuck in cheek, excessive spillage from mouth/drooling, food coming out of nose, not swallowing food after several attempts or regurgitation, vomiting | Maintains individual's safety<br>Documents dietary intake<br>Ensures all staff are aware of the individual's nutrition needs |
| On completion of meal leave individual sitting upright, clean individual's mouth/face, remove clothes protector, restore bed height, provide individual with call bell<br>Document in healthcare record/nutrition care plan/FBC if appropriate, wash hands<br>Report to Registered Nurse dietary intake, level of assistance and any swallowing difficulties<br>Clinical handover must include the transfer of nutrition care information | Ensures individual is treated with respect and courtesy during interactions<br>Ensures documentation is completed<br>Ensures the transfer of nutrition care is included in clinical handover<br>Appropriate care can be planned and implemented |
| *(Agency for Clinical Innovation 2012; ACSQHC 2012; 2015; Berman et al 2015; Dempsey et al 2014)* | |

however, due to cognitive decline they may require a range of interventions to support intake:

- Assistive feeding devices to promote independent provision of food and fluids
- Finger foods may allow the person to regain the enjoyment of eating if they have experienced the loss of adequate manual dexterity to control cutlery
- Encourage support of family and caregivers at meal time
- Specific diet to meet personal food taste
- Contrasting-coloured crockery may assist the individual distinguish food/fluids
- As oral intake diminishes artificial nutrition may be necessary (Evans & Best 2015).

## Key aspects related to assisting an individual with chewing or swallowing difficulties

Some individuals who experience difficulty in chewing or have dysphagia due to, for example, glossitis, stomatitis, cerebral vascular accidents or dental conditions, are at risk of malnutrition because of limitations to the types of foods they can chew and swallow safely. Clinical Interest Box 30.2 provides an example of how gastro-oesophageal reflux can affect the nutritional status of a child. Individuals may require modifications to the consistency of food. Depending on the cause and degree of difficulty, the individual's needs may be met by:

- Referral to a speech pathologist to ascertain the cause of the problem by observing the individual's swallowing reflex and by investigations such as salivagrams, fluoroscopy or barium swallows
- Providing meals comprised of soft foods or thickened fluids
- Initiating the swallowing reflex by gentle pressure on the tongue with the feeding utensil
- Offering all food and fluid carefully and monitoring to avoid or detect aspiration
- Placing the food into the unaffected side of the mouth in individuals with a facial paralysis (e.g. Bell's palsy) or after a cerebrovascular accident. The nurse should ensure that food does not accumulate in the cheek of the affected side (Department of Communities, Child Safety and Disability Services 2013).

## Key aspects related to assisting an individual with visual impairment at mealtimes

- It is important to encourage independence; the nurse should therefore consult the individual about the type of assistance that would be most beneficial. For example, individuals may find it helpful if the nurse describes the meal by referring to the plate as a clock face. The nurse should state where each food on the plate may be located (e.g. the meat at 2 o'clock, the potatoes at 4 o'clock and the beans at 6 o'clock).
- To avoid injury the individual should be made aware of the proximity and location of hot articles (e.g. cups of

## CLINICAL INTEREST BOX 30.2 Gastro-oesophageal reflux and failure to thrive

Failure to thrive is a term used in paediatrics to describe an infant, toddler or child who fails to gain weight when measured against percentile charts for age, head circumference and height. In infancy failure to thrive can be associated with mild to severe alterations in nutritional state as a consequence of numerous clinical disorders.

A common condition is gastro-oesophageal reflux (GOR), which can be due to lax cardiac sphincter muscle or changes in coordination of oesophageal peristalsis. GOR can cause oesophagitis from intermittent bathing of oesophageal tissue in stomach acid. Common symptoms may also include food refusal, diminished intake, prolonged feeding times, distractibility, sleep disorders and continued crying, which may lead some to diagnose an infant as a 'colicky baby'. Diagnosis is made by history and monitoring oesophageal pH over a 24-hour period. Treatments may include thickening agents, post prandial prone positioning while awake, positioning up to 30 degrees from the horizontal while sleeping, peristaltic medications and gastric acid inhibitors. Changing the infant's diet is not suggested (i.e. from breast milk to formula or, if formula fed switching to an alternative formula type).

*(Royal Children's Hospital Melbourne 2010)*

tea or coffee) and the nurse should ask if assistance to pour the fluids is required.
- If the individual is unable to feed themself, they should be asked to indicate when they are ready for the next mouthful.
- Self-feeding should be encouraged at all ages to promote independence and dignity. When an individual is being fed, the nurse should perform the procedure in a relaxed and confident manner, with due regard for maintaining their dignity. A variety of self-help devices are available to assist individuals in feeding themselves (Figure 30.6) (Vision Australia 2012).

### Assistive feeding devices

Self-help feeding devices (Figure 30.6) may be helpful for an individual who has poor vision, limited arm mobility, limited grasp or reduced coordination and include:
- Plate guards, which attach to one side of the plate and are used to assist an individual to place food on the eating utensils
- Angled or swivelling utensils (e.g. forks and spoons that are angled to assist individuals with a limited range of arm or hand movement)
- Weighted utensils for individuals with limited hand control (e.g. Parkinson's)

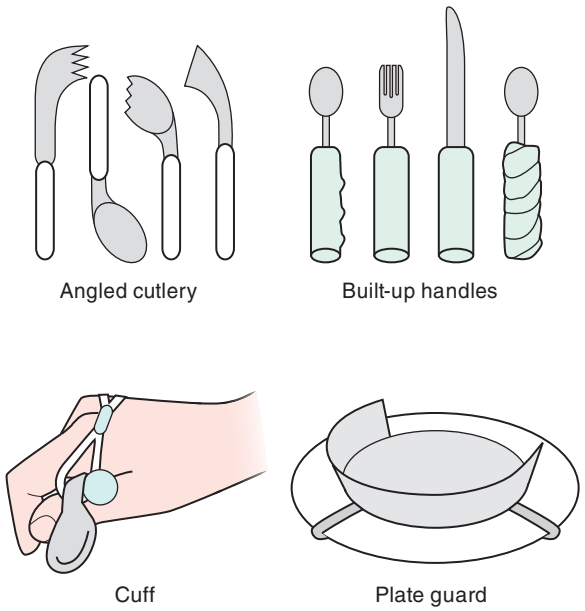


**Figure 30.6** Assistive feeding devices

- Utensils with built-up handles. The thicker handles are beneficial for individuals with diminished grasp or who experience joint pain or discomfort (e.g. arthritis)
- Cuffs, which are placed over an individual's hand, with a spoon or fork inserted into the slot in the cuff. A cuff may be beneficial for an individual with diminished grasp or movement.

## COMMON DISORDERS ASSOCIATED WITH NUTRITION

Although many disorders are related to a specific nutrient deficiency, the common disorders of nutrition may be classified as malnutrition, obesity, eating disorders and nutrient loss as a result of vomiting or diarrhoea.

### Malnutrition

Malnutrition occurs as a consequence of continued poor nutrition status and may be described as the condition in which nutrients are being used or lost by the body in excess of the intake and absorption or utilisation of nutrients. Identifying factors that put an individual at risk is an important step in ensuring that all individuals have their individual nutritional needs met. People who are at risk of malnutrition include those who:
- Are experiencing increased metabolic demands or protracted loss of nutrients (e.g. due to burns, surgery, inflammatory conditions or infections, vomiting, diarrhoea, physical or psychological trauma, hormonal imbalance or prolonged pyrexia)
- Are not consuming oral food or fluid for more than a few days
- Have a BMI value below 20 or who have recently experienced a loss of more than 10% of their normal body weight

- Are alcohol or drug dependent
- Are receiving medications or treatments that have an anti-nutrient or have catabolic properties (e.g. immunosuppressants or anti-tumour agents)
- Have a disorder that results in defective digestion, utilisation or absorption of nutrients (e.g. gastrectomy, diabetes mellitus, Crohn's disease).

The NSW Agency for Clinical Innovation (ACI) reports malnutrition in hospitals is frequently undetected and untreated. From a 24-hour survey across 56 Australian and New Zealand hospitals assessing the nutritional status and dietary intake of adult hospitalised patients, Agarwal and colleagues (2010) found malnutrition rates in Australian acute hospitals were between 30% and 50%.

Early identification of individuals at risk of malnutrition enables early nutrition intervention to be initiated. Adverse consequences of malnutrition include:

- Increased infection rate
- Delayed wound healing
- Increased risk of complications (e.g. pressure injuries, sepsis, falls, adverse drug reactions and interactions, decline in mental health)
- Muscle wasting and weakness
- Dehydration
- Impaired mobility
- Decreased response and/or tolerance to treatment
- Decreased quality of life
- Decreased life expectancy
- Increased use of medication
- Increased length of stay
- Increased re-admission (ACI 2012; Queensland Health 2013).

Treatment includes identifying the cause and providing adequate nutrients. See Clinical Interest Box 30.3 on high rates of malnutrition in the elderly.

## Obesity

Obesity is the condition in which there is an excess of body fat, and is determined by calculating the individual's BMI or waist measurement. Obesity is due mainly to an imbalance of energy intake from diet and energy expenditure (through physical activities and bodily functions). Genetic and environmental factors play a role (AIHW 2015a). Obesity may result from excessive kilojoule intake, metabolic disturbances, side effects of drugs such as steroids, an inadequate expenditure of energy or from a combination of factors. Obesity may have serious consequences, including cancer, premature cardiovascular disease, breathing difficulties, hypertension, diabetes mellitus, gallbladder disease or psychosocial problems (AIHW 2015a). Obese people may also demonstrate undernourishment in essential vitamins and minerals, even though excess food is consumed (Berman et al 2015).

Principles of treatment include reducing dietary intake and any causative drugs or hormones, while planning exercise, dietary and behaviour modification and the administration of medications such as appetite suppressants, hormonal therapy or oral substances containing; for example, cellulose.

### CLINICAL INTEREST BOX 30.3 High rates of malnutrition in hospitalised individuals

Agarwal et al (2010) conducted a ground-breaking Australian study involving 56 hospitals across Australia and New Zealand. The 3122 participants were involved in an audit of nutritional status and dietary intake of adult hospitalised individuals using the Malnutrition Screening Tool. This study revealed alarming levels of malnutrition. In hospitalised persons, based on the International Classification of Diseases (Australian modification), participants were deemed malnourished if their body mass index was <18.5 kg/m$^2$. Malnutrition prevalence was recorded as 32% with a further 41% of the participants deemed 'at risk' of malnutrition. Fifty-five per cent of malnourished participants consumed ≤50% of the food offered with 'Not hungry' the most common reason for poor food consumption. This study highlights the prevalence of malnutrition in the Australian population. With the burden of increased morbidity and mortality surrounding malnutrition as well as the associated financial burden on the healthcare system it is essential nursing staff implement early nutrition interventions and referral to members of multidisciplinary teams.

*(Agarwal et al 2010)*

Surgical interventions are sometimes indicated in instances of morbid obesity. A variety of surgical procedures is available and most are aimed at reducing the capacity of the stomach (Cobbols & Lord 2012). See Nursing Care Plan 30.1 for an example of the nursing care required for obese individuals.

## Eating disorders

The two most recognised disorders of eating are anorexia nervosa and bulimia nervosa. **Anorexia nervosa** is characterised by self-imposed starvation, weight phobia and consequent emaciation. Body image, with a consequential loss of weight, becomes the individual's prime focus and is the result of a belief that their body is too fat, even when extreme emaciation is evident with BMI <18.5 (Brown et al 2014). **Bulimia nervosa** is characterised by episodes of 'bingeing' on large quantities of food, followed by purging with laxatives or self-induced vomiting.

The causes of both disorders are difficult to determine, but most experts agree that they result from an interaction of biological, psychological and sociocultural factors. Treatment, which is difficult and varied, includes behaviour modification, psychotherapy and, in some cases, hospitalisation until the desired weight is achieved (National Eating Disorders Collaboration 2014).

## Nutrient loss as a result of vomiting

Vomiting, if prolonged, may result in significant nutrient deficiency, dehydration and electrolyte disturbance. To correct

the imbalance, oral, enteral, intravenous therapy or total parenteral nutrition (TPN) may be indicated. Vomiting is not a disease itself but is a symptom of disease and may occur as a result of:

- Diseases of the stomach, intestines, liver, biliary system, pancreas or peritoneum
- Hypersensitivity to certain foods
- Ingestion or presence of irritants
- Acidosis, either metabolic or respiratory
- Pain
- Adverse reaction to, or a side effect of, certain medications
- Hormonal changes during early pregnancy
- Disturbances of equilibrium (e.g. travel sickness, vestibulitis)
- Disorders of the central nervous system (e.g. concussion, cerebral oedema, brain tumours)
- Psychological factors (e.g. apprehension, unpleasant sights or smells).

Vomiting (emesis) is the expulsion of the contents of the stomach or small intestine and is a reflex action caused by stimulation of the emesis centre in the medulla oblongata. When this centre is stimulated the glottis and nasopharynx close, the cardiac sphincter of the stomach relaxes and contractions of the diaphragm and abdominal muscles occur. As a result of the increased intra-abdominal pressure, the stomach or intestinal contents are forced upwards and are expelled through the mouth. Vomiting may be preceded by a feeling of sickness (nausea) and accompanied by salivation, sweating and pallor. In conditions such as intestinal or sphincter obstruction, 'projectile' vomiting may occur, in which the vomited material is ejected with great force (Harris et al 2014).

Vomiting should be assessed in terms of the nature of vomiting (effortless or projectile) and the characteristics of the material vomited (vomitus). Observations made of the vomitus may assist in determining the cause of vomiting and include observations of the:

- Consistency: the vomitus may consist of fluid, partially digested or undigested food
- Colour: vomitus may vary in colour from clear to yellow, to brown or green. The presence of bile tends to colour vomitus yellow or green and may indicate propulsion of the contents of the small intestine into the stomach
- Presence of blood: blood may be present as bright red streaks or clots, or may have a 'coffee grounds' appearance. The latter occurs when blood has been partially digested by gastric acid secretions. Vomiting of blood is called haematemesis. Forceful vomiting may induce blood-stained vomit (e.g. Weismann's tear)
- Odour: vomitus is usually sour smelling, but a 'faecal' odour indicates reflux of bowel contents due to an intestinal obstruction (e.g. paralytic ileus)
- Quantity: if possible, vomitus should be measured in millilitres to assess the amount of fluid being lost, particularly if haematemesis is present.

### Key aspects related to care of an individual who is vomiting

- If the individual is sitting, place an emesis bowl under the chin and position a towel to protect clothes and bedding.
- If the individual is lying down, lift and turn the head to one side to reduce the risk of aspiration.
- Ensure privacy, as individuals will feel distressed and embarrassed by the incident.
- Ensure dentures do not become dislodged.
- The nurse should stay with the individual to provide comfort and support, to ensure aspiration is recognised or prevented and to splint an abdominal wound or area of pain to reduce further pain or dehiscence of wounds, if present.
- The vomitus should be removed as soon as the episode is over to reduce the risk of a recurrence caused by the sight, smell or thought of the vomitus.
- Soiled linen or clothing should be changed and removed immediately from the room.
- Hands and face should be washed to refresh the individual and to remove any vomitus.
- Oral hygiene should be attended to by cleaning teeth, plates or dentures and providing a suitable mouth rinse to eliminate any unpleasant aftertaste.
- The individual should be assisted into a position of comfort and permitted to rest quietly.
- If anti-emetics are ordered they should be administered by appropriate nursing staff.
- Assess hydration status including urine output, mucous membranes, thirst, skin turgor and capillary refill.
- Take measurement of individual's blood glucose level to recognise/treat hypoglycaemia (Emergency Care Institute 2015).
- The nurse should report and document (in healthcare record, fluid balance chart) the incident so that appropriate nursing or medical actions may be implemented. An anti-emetic medication may be prescribed by a medical officer and administered to reduce nausea and to prevent further vomiting.

## Alternative methods to meet nutritional needs

An alternative method of meeting nutritional needs may be indicated when an individual is unable to consume food or fluid orally. Alternative methods include total parenteral nutrition (TPN), intravenous therapy and tube feeding via orogastric, nasogastric, nasoduodenal, nasojejunal, gastrostomy, gastroduodenal or gastrojejunal tubes.

### Total parenteral nutrition

**Total parenteral nutrition (TPN)** is sometimes referred to as hyperalimentation and involves the parenteral administration of a complete nutritional preparation that contains high concentrations of essential nutrients and which may include intralipid solutions, containing fats (Harris et al 2014). This method of feeding may be indicated when it is not possible

for the individual's nutritional needs to be met via the digestive tract.

Hypertonic solutions are administered through a catheter that has been inserted into a large vein, such as the subclavian vein. Further information about intravenous therapy can be found in Chapter 26. The solution containing nutrients enters directly into the bloodstream. TPN solutions administered by this route provide a medium for rapid bacterial growth and, because the tubing provides access for the entry of microorganisms, contamination and septicaemia must be prevented. The catheter is inserted by a medical officer using sterile equipment and technique. Care of the equipment throughout the course of treatment requires strict asepsis.

Management of an individual who is receiving TPN is the responsibility of the Registered Nurse (RN), and the individual must be monitored continually to prevent or detect possible complications. Complications that may result from TPN include:

- Hyperglycaemia or hypoglycaemia
- Fluid and electrolyte imbalance
- Catheter-related septicaemia
- Infection of the catheter site
- Extravasation of blood from the vein as a result of catheter trauma
- Air emboli
- Liver failure
- Diarrhoea or constipation.

The nurse may be required to assist with the care of an individual receiving TPN and must be aware of the scope of their role in promoting safety and comfort (Reghim & Zeltoun 2012).

## Intravenous therapy

Intravenous therapy involves the introduction of a solution or solutions into a peripheral or central vein. Information about intravenous therapy is provided in Chapter 26.

## Enteral tube feeding

Naso-enteric tubes are orogastric, nasogastric, naso-duodenal or nasojejunal tubes used to administer a range of nutritional feeds to an individual for a variety of reasons, including:

- Malabsorption (e.g. inflammatory bowel disorders)
- Surgery (e.g. oral or throat surgery)
- Central nervous system disorders (e.g. paraplegia, unconsciousness, pharyngeal paralysis)
- Metabolic disorders (e.g. hyperinsulinaemia, hypoglycaemia)
- Food refusal or **dysphagia**, when the individual is too ill or weak to eat normally.

Selecting the most appropriate device for an individual is multifactorial. The device selection should always include the individual and include consideration of anticipated feeding duration and the individual's clinical condition and social circumstances (Fletcher 2014).

The nurse should be aware of the policies and regulations regarding their role and responsibilities in both insertion and management of **enteral** tubes.

### Nasogastric tubes

Feeds given by a nasogastric tube inserted via the nares into the stomach (Figure 30.7) are normally administered to individuals who experience short-term difficulties in nutrition, or when surgically placed tubes such as gastrostomy tubes (see below) may be contraindicated by the individual's physical condition. For information on insertion of a nasogastric tube see Clinical Skill 30.2. Following insertion it is essential nursing progress notes are completed abiding to institution documentation policies. See Progress Note Example 30.1.

### Nasoduodenal and nasojejunal tubes

Tubes placed into the duodenum or jejunum are used for individuals with gastric disorders that contraindicate gastric placement, such as severe reflux, partial or total gastrectomy and malabsorption.

### Gastrostomy tubes

Feeding via a gastrostomy tube may be indicated if there has been recent surgery or an obstruction in the upper part of the digestive tract, or as a long-term treatment for feeding difficulties. A gastrostomy tube is a hollow tube, often composed of silicone, inserted through the abdomen into the stomach by a surgeon either through an external approach, via an incision through the abdominal wall, or endoscopically via the mouth through the stomach and through the abdominal wall. The opening around the tube may be sutured to prevent leakage or accidental removal (Figure 30.8) or held in place by the use of an inflatable balloon and a flange or similar device that applies pressure to hold the tube against the inside wall of the stomach.

Gastrostomy (percutaneous endoscopic gastrostomy (PEG) and jejunostomy (percutaneous endoscopic jejunostomy (PEJ)) devices are used for long-term nutritional support, generally more than 6–8 weeks (Berman et al 2015). Fluid enteral feeds are normally introduced 24 hours later through the tube, into the lumen of the stomach, duodenum or jejunum. Some tubes may require replacement to prevent or treat occlusion or disintegration; long-term silastic tubes may be left in situ indefinitely. In the event of accidental tube removal, the individual should have a Foley or Malecot catheter available, to enable a medical officer to ensure the stoma's patency and continuity of feed.

Prepared enteral feeds are administered either by:

- Intermittent or bolus feeds, in which a solution is administered at regular intervals (e.g. every 4 hours). Administered to individuals who are able to tolerate volumes at a rate they could normally drink orally. A syringe or giving set is attached to the end of the nasogastric tube and filled with the feed or fluid, which is allowed to flow in slowly by gravity or by the use of an enteral feeding pump. The rate of administration can be adjusted; for example, by the height at which the syringe or set is held at, or by adjusting the enteral pumping rate; or
- Continuous feeds, in which a gravity infusion set or a controlled enteral feeding pump is used that can deliver the fluid at a regulated rate over a predetermined time.

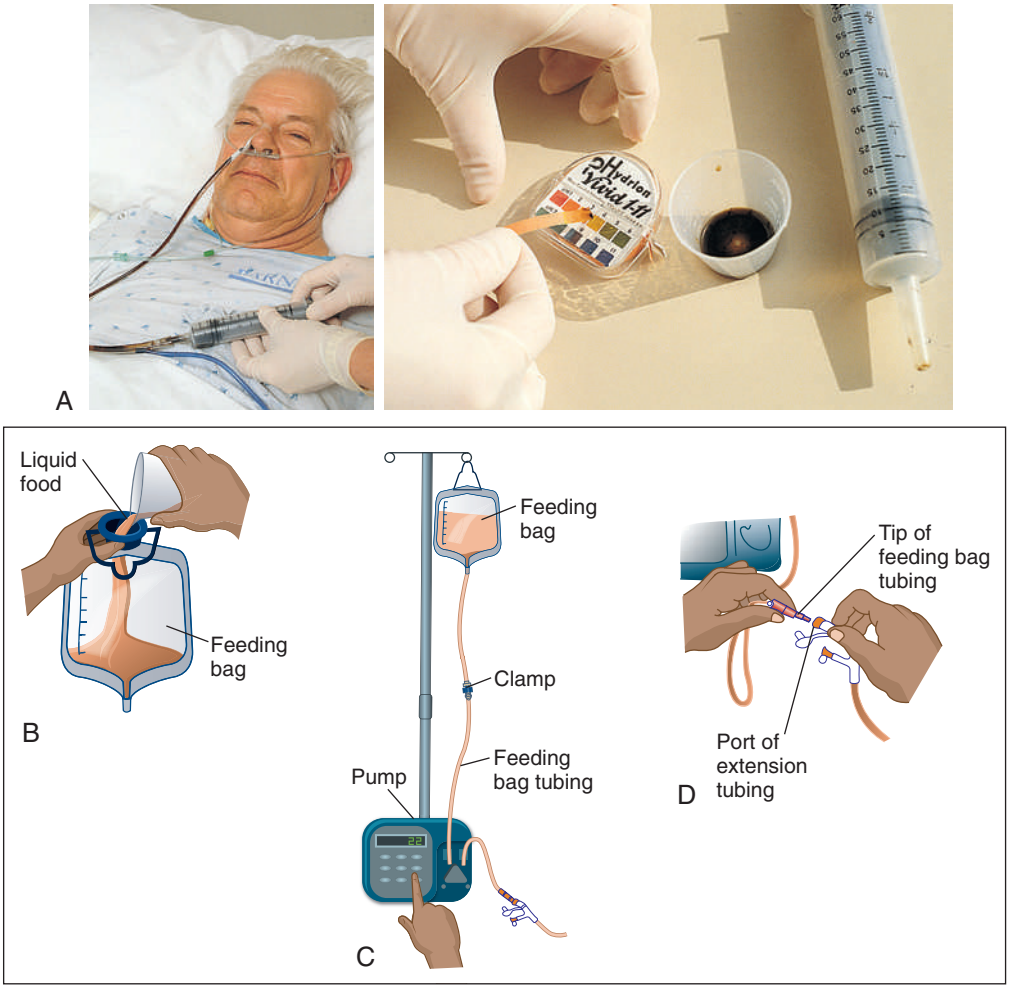


**Figure 30.7** Administering enteral feeds via nasogastric tubes

A: Confirm placement B: Pour formula into feeding container C: Connect tubing through infusion pump D: Connect to NG

(***A:*** *Crisp & Taylor 2013*; ***B–D:*** *Adapted from Fairview Health Services 2016*)

## CLINICAL SKILL 30.2 Inserting a nasogastric tube

**Review and carry out the standard steps for all clinical skills/interventions**

**NMBA Decision-making Framework considerations:**

Am I educated?
Am I authorised?
Am I competent?
If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator.

**Equipment:**

Appropriate-sized gastric tube (large or fine bore tube)
Nasofix or hypoallergenic tape (approx 7 cm × 2.5 cm split in half for 5 cm of its length to look 'Y-shaped'
Lubricant (KY gel) if tube not self-lubricating
10 mL and 20 mL syringes
Water or moist cotton buds (if permitted)
Kidney dish
PPE (non-sterile gloves, goggles and apron)
Yankauer sucker and suction
Emesis bag/bowl
Tissues
Protective sheet
Plastic bag
Equipment for observations ($O_2$ saturation)
Safety pin
Spigot or drainage bag if required
pH indicator paper/strip

*Continued*

## CLINICAL SKILL 30.2 Inserting a nasogastric tube—cont'd

| Skill activity | Rationale |
|---|---|
| Validate the medical orders in the individual's record | Ensures correct procedure is about to take place |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Critically think through the assessment data and problem solving—individual's health status (baseline observations), contraindications and special precautions for nasogastric tube insertion, privacy, comfort measures | Evaluate each aspect and its relationship to other data to help identify specific problems and modifications of the procedure that may be needed for the individual |
| Place the equipment in a convenient location near the bedside. Assemble the required equipment including suction equipment or equipment related to providing nutrition as indicated prior to beginning the procedure<br>Raise the bed to the appropriate working position based on your height | Ensures all equipment is at individual's bedside to maximise efficiency<br>Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |
| Assist the individual into the high Fowler's position with neck flexed unless contraindicated<br>Spinal and neurological individuals must be positioned as per medical orders | Facilitates tube insertion and reduces risk of gastro-oesophageal reflux and aspiration<br>Avoids neck extension as it closes oesophagus, opens trachea and promotes aspiration |
| Perform hand hygiene<br>Don appropriate PPE as per infection control protocols | Prevents cross-infection and contamination of tubing |
| Clean nares if necessary and examine nostrils for deformity/obstruction and nasal surgery to determine best side for insertion<br>If nasogastric tube is being reinserted the other nostril should be used | Asking the individual to breathe through one nostril while occluding the other will help ascertain if one nostril has an occlusion<br>Minimises risk of irritation and pressure necrosis around the nose |
| Measure the portion of tube to be inserted by extending it from the tip of the individual's nose to the earlobe and from the earlobe to the xiphoid process<br>Note length and mark this measurement on the tube | Determines the insertion length of the tube to ensure the tube is inserted an adequate distance so that the distal tip rests in the stomach |
| Flush fine bore nasogastric tube with 10 mL of water to activate the Hydromer coating | Ensures easy removal of stylet after insertion and confirms correct positioning |
| Lubricate the first 5–10 cm of the tube with water-soluble lubricant<br>*Note*: Some small-bore tubes self-lubricate when dipped in water | The use of lubricant will ease insertion by decreasing friction |
| Grasp the tube with your hand and gently insert it into the nostril guiding it posteriorly and inferiorly straight back along the floor of the nose<br>Ask the individual to sniff to ease the passage of the tube from nose to oropharynx<br>Have an emesis basin and tissues in the individual's lap<br>Pause a moment if the individual is coughing or gagging | Insertion of the NGT can stimulate the gag reflex |

| CLINICAL SKILL 30.2 Inserting a nasogastric tube—cont'd | |
|---|---|
| Instruct the individual to tilt the head slightly forwards | Flexing the head forwards allows the tube to follow the posterior wall of the nasopharynx and enter the oesophagus rather than the trachea |
| Instruct the individual to swallow while you gently but steadily advance the tube. Coincide advancement of the tube with the individual swallowing<br>DO NOT give sips of water as the tube is being inserted. If the individual has a dry mouth but impaired gag reflex the mouth may be moistened with a cotton bud prior to requesting them to swallow or ask individual to sniff to elevate the soft palate | The muscular movement of swallowing helps advance the tube<br>Minimises risk of aspiration |
| If resistance is met withdraw the tube 1–2 cm and rotate the tube slowly with downward advancement towards the closest ear<br>Do not force the nasogastric tube<br>Abort procedure and attempt other nostril<br>Withdraw the tube immediately if the individual exhibits signs of distress or a change in respiratory status, if individual begins to cough or change colour or if the tube coils in the individual's mouth | Prevents adverse individual outcome such as pneumothorax, aspiration, trauma to surrounding tissues, incorrect tube placement into lungs or cranium |
| Advance tube until the pre-measured mark is reached<br>When the pre-measured mark has been reached secure the tube to the individual's nose using Nasofix or hypoallergenic tape ensuring the tube does not cause pressure on the naris<br>If inserting a fine-bore nasogastric tube do not remove stylet until correct placement has been confirmed by x-ray and documented in individual's health record<br>To prevent tension on the tube place a piece of tape onto the nasogastric tube (distal end) and attach it to individual's clothing | Ensures the tube does not move out of the stomach |
| Perform and document observations and compare to pre-procedure observations<br>Notify the Registered Nurse/medical officer if there is a significant deviation from baseline observations or if there is a change in the individual's condition | Ensures individual has not been compromised by insertion of nasogastric tube |
| Ensure correct position of the nasogastric tube<br>Aspirate 5 to 10 mL of gastrointestinal fluid. Observe amount, colour and test pH using pH indicator paper/strip<br>Obtain post-insertion chest/upper abdominal x-ray<br>The medical officer must document correct placement in the individual's file prior to the administration of any medications, fluids or formula<br>Once correct placement has been confirmed and documented reactivate the Hydromer coating with another 10 mL of water before removing the stylet<br>The stylet must not be reinserted<br>If using a large-bore tube for aspiration attach a spigot or drainage bag to the main lumen of the nasogastric tube | Ensures the tube is in the correct location and not in the trachea<br>Gastric fluid pH is usually 1.0–4.0, indicating the tube is in correct position<br>pH of pleural fluid is usually >6, indicating incorrect position |
| Discard the equipment appropriately<br>Remove gloves. Perform hand hygiene | Prevents cross-infection |

*Continued*

| CLINICAL SKILL 30.2 Inserting a nasogastric tube—cont'd | |
|---|---|
| Lower the bed keeping the individual upright and ensuring individual comfort<br>Ask the individual to report any complications during and post procedure if able | Promotes rest and relaxation, monitors for adverse effects |
| Document in individual's healthcare record reason for nasogastric tube insertion, nostril used, type and size of tube, insertion distance and the external length of the tube (from nostril to tip)<br>Report the procedure and any abnormal findings to Registered Nurse/medical officer | Documentation and reporting increases the communication between healthcare professionals and complies with legal requirements for reporting change |
| *(Agency for Clinical Innovation 2012; ACSQHC 2012; 2015; Berman et al 2015; Crisp & Taylor 2013; Dempsey et al 2014; LeMone et al 2014; NSW Department of Health Policy 2009)* | |

| PROGRESS NOTE EXAMPLE 30.1 | |
|---|---|
| 12/08/2015<br>0810 hrs | Nursing: NG inserted as per Dr Smith orders above. NG size 16F inserted Left naris to 30 cm without difficulty. Placement confirmed with universal paper pH = 4. RN Pepper witness to pH. NG Gastrolyte commenced as per fluid order. Dr Smith aware of same.<br>***L. Jensen* (Jensen) EN** |

Continuous feeds are administered to individuals who have experienced difficulty in tolerating bolus doses, or for individuals with malabsorption, reactive hyperinsulinaemia, diarrhoea or other metabolic problems.

Depending on the institution and the nutrition required, the enteral feed may come pre-packaged, for example in cans, and will not require refrigeration, while other solutions stored in containers such as waxed cardboard or made in-house do require refrigeration.

The nurse should be aware of the policies and regulations in their healthcare setting regarding their role and responsibilities in checking the location of the tip of the nasogastric tube (see Clinical Skill 30.3).

## Care specific to gastrostomy type tubes

For individuals who may be discharged home or to encourage independence with enteral tubes in situ, the individual may be taught how to test, administer and perform the care required independently. Part of the education involves discussing some of the complications and how to deal with them, as described below.

***Care and cleaning of gastrostomy tube and equipment***

*Abdominal distension*. Determine tube position by testing the aspirate with pH-sensitive paper. Before administering an enteral feed or fluid, gas may be vented (released) from the stomach to avoid distension. Venting is achieved by removing a spigot, unscrewing a cap and/or releasing an obstructive clamp, or by inserting a catheter and raising the tube to a vertical position.

*Hanging times*. In a warm environment, feeds can be contaminated by pathogens. For maximum hanging times local policies and procedures should be abided by. Times may vary depending on the individual's condition (e.g. immunocompromised), the type of feed and environment (e.g. hospital setting or person's home).

*Home* Cleaning. Feeding equipment, syringes, etc. can be washed with warm soapy water and left to air dry and can be used for 3 days. The equipment should be washed again in warm soapy water immediately before each use.

*Flushing*. Flush tube pre and post feeding. Flush tube pre and post medications. If the individual is on continuous feeding the gastrostomy tube should be flushed every 4 hours.

***Skin care*** The area around the gastrostomy site requires daily cleaning with warm soapy water to remove build-up of secretions from the stoma site and to prevent infection. Creams and dressings are not recommended if there is no redness or inflammation. The tube and the surrounding pressure device should be rotated in the stoma daily to prevent adhesion or ulceration of the surrounding skin. The skin around the site should be inspected for redness, oozing, swelling or bleeding (Forest-Lalande 2012a).

## Common problems associated with enteral feeding

***Aspiration*** This is the most life-threatening complication (Stayner 2012) and occurs when gastric contents, saliva, food or nasopharyngeal secretions have been inhaled into the respiratory tract. Signs and symptoms of aspiration include tachypnoea, increased work of breathing, wheeze, crackles,

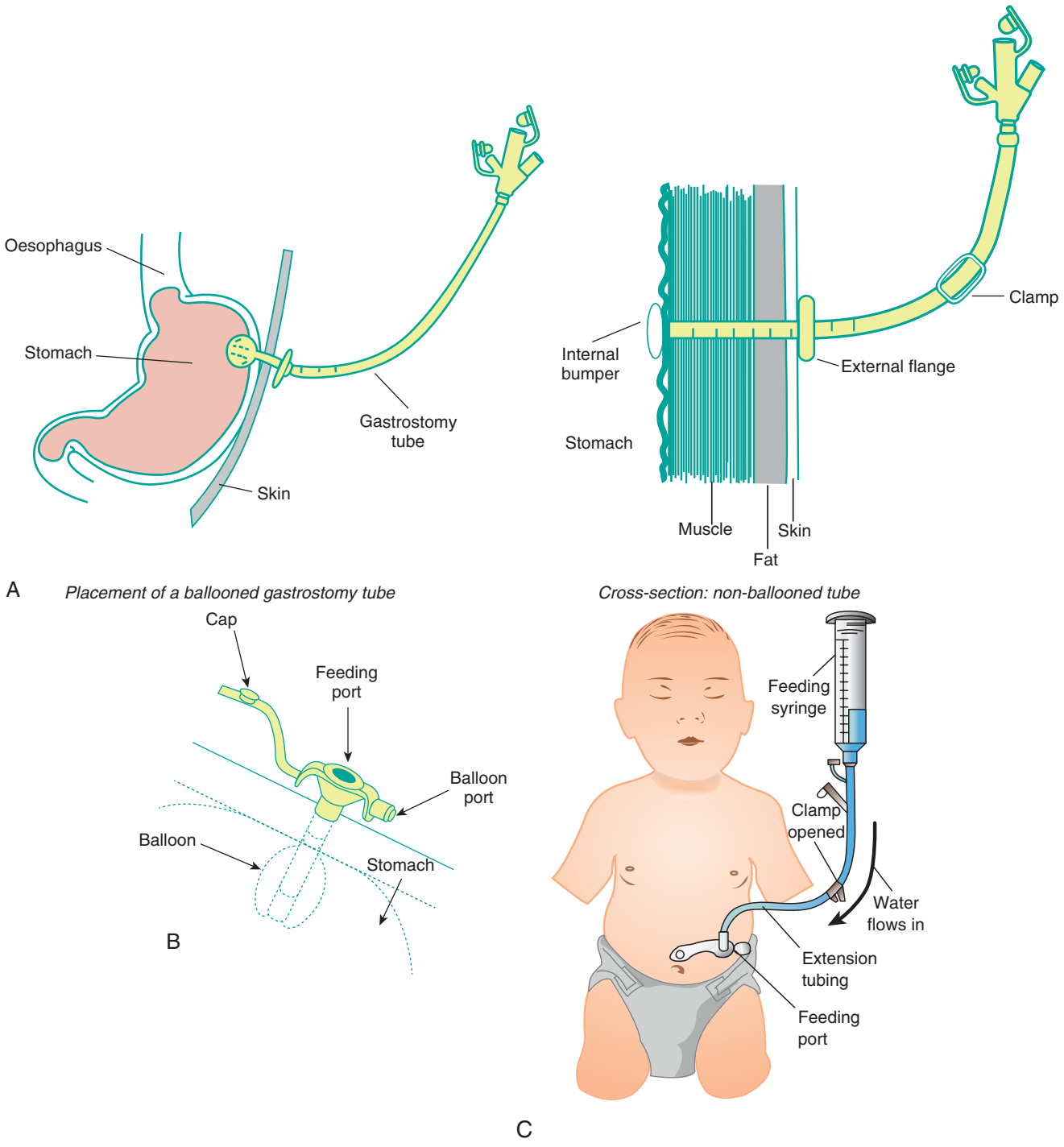


**Figure 30.8** Gastrostomy feeding

A: Gastrostomy placement B: When not in use the end of the tube is capped C: Administration of bolus feed

## CLINICAL SKILL 30.3 Enteral feed

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| Am I educated?<br>Am I authorised?<br>Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Enteral feeding pump<br>Enteral feeding set<br>Prescribed enteral feed or ready-to-hang formula<br>IV pole<br>PPE (non-sterile gloves, apron, gown)<br>20 mL oral/enteral syringe<br>pH indicator paper/strip<br>Stethoscope<br>Glucometer to obtain blood glucose by finger-stick |

| **Skill activity** | **Rationale** |
|---|---|
| Validate the medical officer and dietitian's order in the individual's record | Ensures correct procedure is about to take place |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Critically think through assessment data and problem solving—provide privacy, correct position of nasogastric tube, documentation of order, individual's baseline weight and laboratory values, electrolyte and metabolic abnormalities such as hyperglycaemia and fluid volume excess or deficit and auscultate for bowel sounds | Evaluate each aspect and its relationship to other data to help identify specific problems and modifications of the procedure that may be needed for the individual<br>Baseline objective data is used to measure the effectiveness of the feeds<br>Absent bowel sounds may indicate decreased ability of GI tract to digest of absorb nutrients |
| Confirm documentation of enteral feeding regimen (type, route, volume and flow rate) by medical officer and dietitian<br>Ensure correct position of nasogastric tube has been confirmed by a post-insertion chest/upper abdominal x-ray and documented by medical officer in individual's health records prior to administration of medications or fluids | Ensures correct feeding regimen<br>Ensures correct position of nasogastric tube prior to administration of medication or fluids |
| Place the equipment in a convenient location near the bedside. Assemble the required equipment including suction equipment or equipment related to providing nutrition as indicated prior to beginning the procedure<br>Raise the bed to the appropriate working position based on your height | Ensures all equipment is at individual's bedside to maximise efficiency<br>Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |
| Perform hand hygiene and don gloves. Other PPE may also be required | Prevents cross-infection and contamination reducing transmission of microorganisms |

## CLINICAL SKILL 30.3 Enteral feed—cont'd

| | |
|---|---|
| Check the tube length measurement at the nostril is unchanged compared to the documented correct tube length confirmed by the medical officer by post-insertion x-ray<br>Placement on chest/upper abdominal x-ray must be confirmed and documented by a medical officer where there is suspicion of tube displacement or if the individual has been retching, vomiting or violent coughing<br>With a torch examine the back of the individual's mouth to ensure tube has not curled up in the back of the throat<br>Aspirate gastric contents to check for gastric residual. Return aspirated contents to stomach unless the volume exceeds 150 mL<br>Measure pH of aspirated GI contents<br>Test pH by using pH indicator paper/strips. Gastric aspirate has a pH <5<br>Observe the aspirate appearance | Check correct tube placement prior to commencement of the formula<br>Presence of gastric secretions indicates that the distal end of the tube is in the stomach. Residual volume of greater than 150 mL may indicate gastric emptying is delayed<br>The pH of fluid aspirated from tube of fasting individuals is helpful in differentiating between gastric and respiratory placement and gastric and small bowel placement<br>Gastric fluid is usually cloudy and grassy green or tan to off-white in colour |
| Individual should be positioned in high Fowler's position or elevate head of bed >30 degrees<br>Where this is contraindicated the individual should be positioned laterally (left side) to protect the airway during and for at least 60 minutes post cessation of enteral feeding | Reduces risk of gastro-oesophageal reflux and aspiration by ensuring individual is safely positioned prior to commencement of feeding |
| A closed enteral feeding system ready to hang is generally used; it has a maximum 24-hour hang time post connection with a giving set<br>Giving set must to be changed at time of a closed enteral feeding system being hung<br>Decanted formula should not be hung for more than 8 hours<br>Ensure non-touch technique when preparing and handling formula and nasogastric tube<br>Enteral feeding delivery set must be replaced at least every 24 hours<br>Time and date should be specified on giving set label | Ensures correct enteral feed and hang time<br>Prevents contamination of formula and nasogastric tube<br>Tubing and formula must be free of contamination to prevent bacterial growth |
| Ensure formula is at room temperature<br>Shake formula container well<br>Close roller clamp at lower end of spike giving set to prevent air entering the tube<br>Connect tubing to container or prepare ready-to-hang container and fill container and tubing with formula<br>Connect distal end of tubing to the proximal end of the feeding tube<br>Hang pack on IV pole and adjust height<br>Connect tubing through enteral feed pump, prime line as per manufacturer's instruction<br>Set flow rate as ordered | Ensures correct administration of formula<br>Cold formula may cause gastric cramping and discomfort |
| Assess individual while feeding is in progress for signs of intolerance to enteral feeding (e.g. vomiting, reflux, nausea, diarrhoea, distension, large residual aspirate volumes)<br>If formula is not tolerated inform Registered Nurse who will assess and notify medical officer and dietitian | Ensures formula is tolerated by individual |
| During continual enteral feeding the nasogastric tube should be flushed with 30 mL of tap water 3 times a day unless clinical indication prevents this volume of fluid. Chart the amount of water used to flush on fluid balance chart<br>Consult with Registered Nurse if the feeding tube is blocked<br>Measure amount of residual aspirate every 4 hours<br>When tube feedings are not being administered cap or clamp the proximal end of the feeding tube after flushing the tube with 30 mL water | Continuous feeding delivers a prescribed hourly rate of feeding which reduces risk of abdominal discomfort<br>Flushing the tube with water reduces the risk of sediment forming and blocking the tubing<br>Individuals receiving continuous feeding should have tube placement confirmed and residual aspirate checked every 4 hours<br>Prevents air entering the stomach between feeds |
| Discard the equipment appropriately<br>Remove gloves/PPE. Perform hand hygiene | Prevents cross-infection |

*Continued*

## CLINICAL SKILL 30.3 Enteral feed—cont'd

| | |
|---|---|
| Lower the bed keeping the individual upright and ensuring individual comfort<br>Ask the individual to report any complications during and post procedure if able | Promotes rest and relaxation, monitors for adverse effects |
| Monitor the cleanliness and effectiveness of the tape securing the nasogastric tube to the nose. Tape should be replaced daily<br>During tape change observe for signs of pressure necrosis around the nose | Ensures the correct tube placement and absence of pressure areas |
| Monitor blood glucose level (BGL) as per facility/organisation policy<br>Document intake on fluid balance chart<br>Monitor intake and output every 24 hours<br>Weigh individual daily until administration rate is reached for 24 hours then 3 times per week<br>Observe return of normal laboratory values<br>Record and report amount and type of feed, individual's tolerance of feed, adverse effects and patency and placement of tube | Monitors individual's tolerance of glucose<br>Ensures accurate intake is recorded<br>Intake and output are indications of fluid balance or fluid volume excess or deficit<br>Weight gain is an indicator of improved nutritional status. Sudden gain of more than 900 g in 24 hours may indicate fluid retention<br>Improving laboratory values indicate improved nutritional status |

*(Agency for Clinical Innovation 2012; ACSQHC 2012; 2015; Berman et al 2015; Crisp & Taylor 2013; Dempsey et al 2014, LeMone et al 2014; NSW Department of Health Policy 2009; Rebeiro et al 2013)*

hypoxaemia, fever, cyanosis and cough. Feed should be immediately ceased and not recommenced until reviewed by medical officer (Stewart 2014).

***Tube occlusion*** Occasionally tubes can become occluded because of inadequate flushing, feeds being too thick or the administration of certain crushed medications. To unblock the tube, a volume of 20–30 mL (adults) of water can be administered into the tube with pulsatile pressure or by massaging the tube—do not milk the tube by stretching the tube and squeezing it (ACI 2014).

***Tube migration/obstruction*** Verify placement and discontinue feeding until medical review.

***Accidental removal*** Rinse tube and replace it as soon as possible—do not recommence feeds until tube position has been verified.

***Balloon burst*** Check balloon volume by withdrawing water into syringe, change tube.

***Bleeding*** Bleeding may indicate the presence of an infection or trauma to the tube. Bleeding is stopped by localised pressure or 'stomahesive' dressing, and the incident documented and reported.

***Redness*** Localised redness with or without swelling may indicate inflammation from acidic gastric contents due to, for example, the tube being too small for the stoma, the flange being too loose on the skin or perishing or bursting of the balloon in the stomach. Any ooze can be checked for acidity using pH-sensitive paper. If acid is detected, a waterproof cream can be applied to prevent further irritation of the skin by acid (Forest-Lalande 2012b). The use of dressings to soak up the fluid or topical antacids may cause further skin breakdown. The size of the tube and the flange's location need to be checked daily to prevent migration. An indelible pen can be used to mark the lower limit of the tube, and the measurement is recorded on the care plan. In some cases an individual may require a tube to be replaced with a larger-diameter one.

Complications with tubes or flanges are reported to a medical officer or a stomal therapist. In some situations, particularly after surgery, primary and/or secondary peritonitis may be caused by inadequate pressure from the flange and balloon and subsequent poor sealing of underlying tissues.

***Diarrhoea*** If the feeds are administered too rapidly or the individual is intolerant to the feed, diarrhoea may develop. This may be minimised by slowing the rate of the feed or changing the feed type. If symptoms persist a medical officer should be contacted.

***Granulation of gastrostomy site*** Granulation of the surrounding tissue occurs as a healing response but can interfere with the comfort of the tube. To prevent granulation the stoma should be washed daily and the tube turned daily (ACI 2014). A literature review conducted by Warriner & Spruce (2012) provided a range of current treatment modalities for hypergranulation including: surgical removal, silver nitrate cauterisation, topical low-dose steroid application, topical antimicrobials and foam dressings.

***Hypoglycaemia*** Individuals who have bolus feeds administered too rapidly, in excessive quantities or who may have a lax pyloric sphincter are at risk of the feeds entering the duodenum too rapidly and causing hyperinsulinaemia and consequential hypoglycaemia. See Clinical Interest Box 30.4 for other electrolyte disturbances that may result.

## CLINICAL INTEREST BOX 30.4 Refeeding syndrome

First discussed in prisoners of war post WWII, refeeding syndrome is the derangement of serum electrolytes, vitamins and fluid resulting from over-aggressive treatment of malnourished individuals. In response to carbohydrate load, insulin is released, leading to increased glycogen, fat and protein synthesis. This triggers sudden uptake of potassium, phosphate and magnesium. This intracellular movement results in hypokalaemia, hypophosphataemia and hypomagnesaemia (Khan et al 2011). Symptoms of lethargy, shortness of breath, muscle weakness, GI upset, ataxia and delirium are indicative of these electrolyte disturbances. Individuals at an increased risk of developing Refeeding syndrome are children, individuals with greater than 10% weight loss in 4 weeks, anorexia for more than 7 days and chronic alcoholism. It is recommended electrolyte abnormalities are corrected prior to commencement of refeeding at a rate of 10–20 kCal/kg/day before gradually increasing over week.

*(Sydney Children's Hospital 2013; Khan et al 2011)*

## Summary

Nutrition is necessary for the development and growth of cells and for the replacement of substances required by the cells to maintain efficient body function. A diet that contains the essential nutrients is essential throughout each stage of the lifespan, and people should be encouraged to follow the principles of good nutrition and to eat a balanced healthy diet. Food provides energy that is necessary for all the chemical and physical activities of the body. Energy requirements vary according to age, sex, body composition and presence of ailments or conditions. Each nutrient performs a specific function, and a nutrient deficiency may result in body dysfunction.

Many factors influence an individual's eating pattern, and choice of foods and illness may necessitate certain changes in dietary intake. Modification of the consistency of food may be indicated, or a specific diet may be prescribed for therapeutic purposes. The nurse should assist individuals to meet their nutritional needs and the nurse may need to assist or feed an individual who is unable to feed themself. If an individual is unable to consume food or fluid orally, an alternative method of meeting their nutritional needs may be necessary.

Problems associated with nutrition should be identified so that appropriate medical, nursing and dietitian care can be planned and implemented to meet the individual's nutritional needs.

## DECISION-MAKING FRAMEWORK EXERCISE 30.1

You are working on a gastrointestinal ward and caring for Kathleen, a 47-year-old woman, day 4 post open laparotomy appendectomy. This morning she has been vomiting and complaining of severe cramping abdominal pain. On taking her vital signs you find she is tachycardic and diaphoretic. Her abdomen is distended and on auscultation has decreased bowel sounds. In response you call the Medical Emergency Team to review Kathleen. The medical officer requests you insert a nasogastric tube (NGT) immediately to alleviate a paralytic ileus. During your course you had NGT insertion demonstrated and had practised in the nursing lab. Since starting on the ward you have assisted with multiple insertions and have almost completed the local hospital accreditation course.

Using the nursing practice decision-making framework:

1. What would your response to the medical officer's request be?
2. What would be the appropriate nursing action to ensure Kathleen receives the requested treatment?

## Review Questions

1. What information should be included in the nutrition assessment of an individual?
2. What are the national Healthy Eating Guidelines?
3. Individuals should be recommended to have a low or high GI diet? Why?
4. List the essential nutrients.
5. What are the common disorders associated with nutrition?
6. What are principles of good nutrition suggested by the NHMRC?
7. What are other diets to meet individual needs?
8. What are potential alternative methods to meet nutritional needs and when should these be considered?
9. What are the common problems associated with gastrostomy tubes?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Dietitians Association of Australia (2015): http://daa.asn.au/

Food Standards Australia and New Zealand (2014): http://www.foodstandards.gov.au/Pages/default.aspx

NSW Department of Health (2013) National Nutrition Policy: www.health.gov.au

NSW Department of Health (2014) Nutrition and Healthy eating: www.health.gov.au

Nutrition Australia (2015): nutritionaustralia.org

# Nursing care: urinary elimination and continence

*Auxillia E Madhuvu*

CHAPTER 31

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define the key terms
- Describe the transport mechanisms in the body related to the urinary system
- Explain homeostasis as related to the urinary system
- Discuss fluids, electrolytes and acid–base balance
- Name the parts of the urinary system and describe the structure and function of each part
- Identify the factors that affect urinary elimination and associated problems throughout the lifespan
- Describe the different types of urinary incontinence and possible causes
- Describe the major manifestations of urinary system disorders
- State the diagnostic tests used to assess urinary system function
- Consider the psychosocial aspects of care from a person-centred and relationship care perspective
- Assist in planning and implementing nursing care for the person with a urinary system disorder

## KEY TERMS

atrophy
bladder
continence
cystitis
enuresis
incontinence
kidney
micturition
pyelonephritis
ureter
urethra
urethritis
urinalysis
voiding

## CHAPTER FOCUS

The urinary system is responsible for maintaining homeostasis and eliminating waste products of body metabolism through the excretion of urine. Many factors can affect the formation of urine and the subsequent excretion of urine and this chapter provides an overview of the main issues. Nursing management of persons with urinary elimination disorders requires an informed understanding of factors impacting on an individual's lifestyle and a care plan to adequately respond to these needs, as well as the sensitivity to sustain the person's sense of dignity and self-esteem throughout.

## LIVED EXPERIENCE

I walked into the emergency department screaming with lower abdominal pain. The nurse opened the door to let me into the examination room. She asked me a few questions, checked my blood pressure and temperature. She asked when I last passed urine and whether it was a lot of urine or just a few drops. 'A few minutes ago', I replied, 'and just a few drops', as I did not want to talk more about my dribbling problem at this stage! She reached out and grabbed a machine to check how much urine was in my bladder. As she pressed on my lower abdomen with the scan I screamed so that other staff members come in to help. The nurse looked puzzled! Another staff member said, 'Quickly, let's put in a urinary catheter.' Within a few minutes the catheter was inserted. What a relief! All the pain went away, it felt like magic. I realised that my urine dribbling which I didn't want to talk about was the actual problem.

**Alfious, age 65**

# THE URINARY SYSTEM

The urinary system (Figure 31.1) filters waste products from the blood and excretes them in the form of urine. The urinary system is also instrumental in regulating the rates of elimination of water and electrolytes from the body. By regulating the volume of the body fluid, the urinary system helps maintain blood pressure and the electrolyte content and pH of the blood. The urinary system consists of the **kidneys**, which filter blood; the **ureters**, which transport urine to the bladder; and the **bladder**, which stores the urine until it is excreted via the **urethra**.

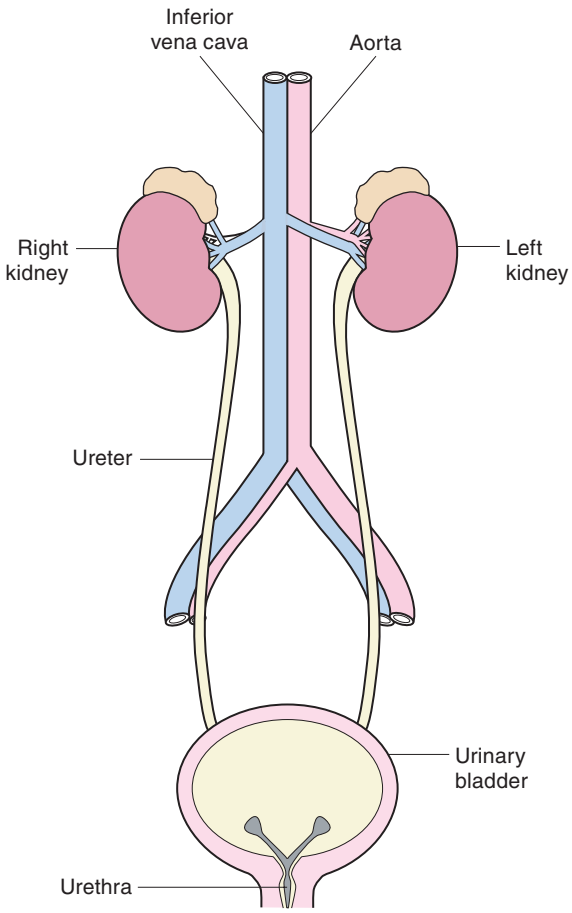


**Figure 31.1** The urinary system

## The kidneys

Each kidney contains at least 1 million nephrons, together with their collecting tubules or ducts. The nephron (Figure 31.2) is the functional unit of the kidney. Each nephron is composed of a vascular and tubular system that allows for the formation of urine. The nephrons are located in the renal tissue, with most in the cortex and some extending deep into the medulla of the kidney.

The adult kidney weighs 120–170 g, is 10–13 cm in length, 5–6 cm wide and 3–4 cm thick. The kidneys are protected and supported by renal fascia and by layers of perirenal fat. They are positioned at approximately vertebral level of T12 to L3, the right kidney usually slightly lower than the left.

The function of the kidneys is to maintain homeostasis. Homeostasis is the process that controls the body's internal environment. External variables may change such as heat, cold, fluid, diet and stress but to sustain the body in a state of equilibrium, receptors in the body identify if something is off balance and trigger a negative feedback. The urinary system maintains homeostasis by:

- Filtering the blood to maintain its normal composition, volume and pH

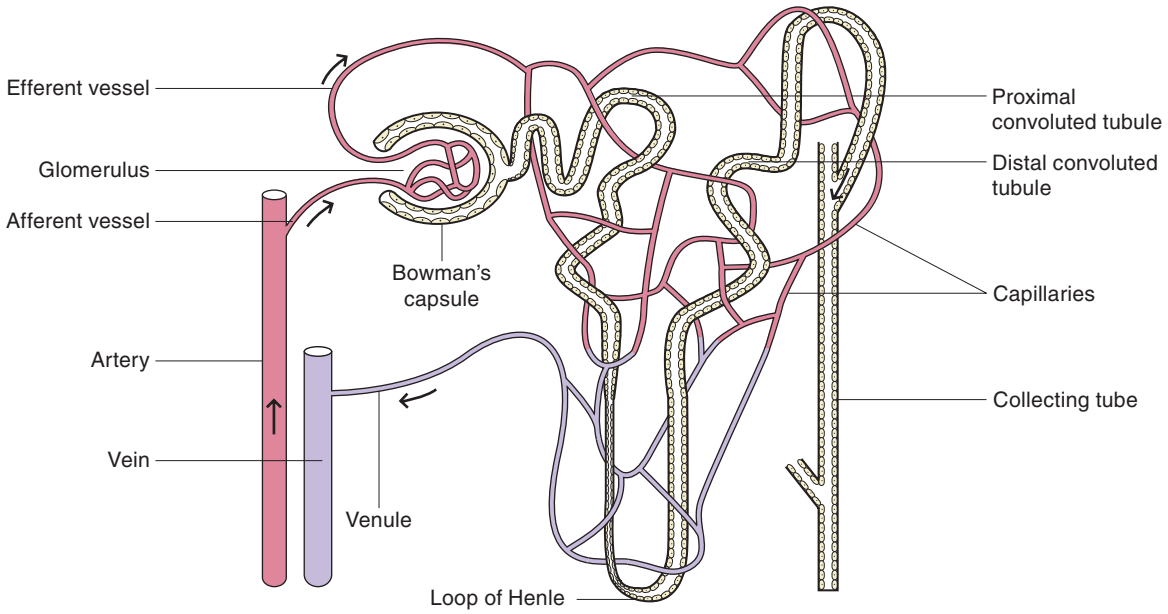


**Figure 31.2** The nephron

- Regulating water balance and electrolytes
- Regulating acid–base balance in the blood
- Eliminating filtered wastes from the blood and reabsorbing required substances back in the blood
- Regulating blood pressure
- Producing erythropoietin in response to hypoxia and reduced renal blood flow (Marieb & Hoehn 2012; Vance & Harold 2010).

In carrying out these functions the kidneys excrete urine. Urine is made up of water and dissolved substances that are in excess of the body's need to function, and includes by-products of metabolism, such as urea. These substances are transported into the bloodstream, which enters the kidney via a branch of the renal artery. The nephron is the functional unit of the kidney. Each nephron is composed of a vascular and tubular system that allows for the formation of urine. The nephrons are located in the renal tissue, with most in the cortex and some extending deep into the medulla of the kidney. The blood is filtered from there through the glomerulus (see Figure 31.2), where glucose, minerals, urea, other soluble substances and water pass through to the renal tubule.

Kidney function is controlled by both the nervous and the endocrine systems which in turn control:

- Adrenaline, secreted by the adrenal, or suprarenal, glands, which helps maintain the high level of blood pressure in the glomerulus
- Antidiuretic hormone (ADH), secreted by the pituitary gland, which controls the amount of water reabsorbed from the tubules
- Aldosterone, secreted by the suprarenal glands, which controls the tubules' reabsorption of mineral salts.

### Composition of urine

In health, with adequate hydration, urine is a clear, amber-coloured slightly acidic fluid composed of 96% water, 2% urea and 2% mineral salts, uric acid and creatinine (Marieb & Hoehn 2012).

## The ureters

The ureters are two narrow, thick-walled muscular tubes, 25–30 cm long, which originate in the renal pelvis of each kidney. They pass down the posterior abdominal wall and into the pelvic cavity to enter the posterior base of the bladder. The ureters enter the bladder at an oblique angle so that, as the bladder fills and contracts, urine is not forced back towards the kidneys. The walls of the ureters consist of an outer fibrous coat that is continuous with the renal capsule, a middle coat of involuntary muscle and a lining of transitional epithelium. The function of the ureters is to carry urine from the kidneys to the bladder, by means of peristaltic action. The involuntary muscle layer in the walls of the ureters contract 1–5 times per minute to force urine into the bladder (Marieb & Hoehn 2012).

## The urinary bladder

The urinary bladder is a hollow muscular organ that acts as a reservoir for urine and is supported by the detrusor muscle. The detrusor muscle is a layer of the urinary bladder wall made of smooth muscle fibres arranged in spiral, longitudinal and circular bundles; its competency is vital to maintaining continence. In the female it is in front of the uterus and in the male it sits in front of the rectum. The walls of the bladder consist of:

- A covering of peritoneum over the upper portion (the fundus)
- A layer of involuntary muscle
- A layer of connective tissue
- A layer comprised of mucous membranes which are formed into folds (rugae) which increase the surface

areas of the bladder walls, enabling the bladder to expand when full and contract when empty.

The trigone of the bladder is a triangle formed by the two ureteric orifices, where the ureters enter the bladder, and the urethral orifice at the neck of the bladder. A band of the detrusor muscle encircles this opening to form the internal urethral sphincter; incompetence of this sphincter may have an impact on continence (Marieb & Hoehn 2012; McCance & Huether 2014).

**Micturition** (or **voiding**) is the act of passing urine. While the normal capacity of the adult urinary bladder is about 450 mL, the bladder is capable of expanding to hold larger amounts. The bladder fills slowly over a period of time and, when it holds about 300–500 mL, a desire to empty the bladder is experienced. Bladder capacity ranges from 600 mL to 1000 mL, depending on the person. A reflex initiated by impulses from stretch receptors in the bladder wall regulates the process of micturition. The sensory neurons transmit the impulses to the spinal cord, where they are relayed to the brain, which in turn stimulates parasympathetic neurons that innervate the bladder wall. When a person is ready to pass urine, these impulses cause the bladder muscles to contract, the internal urethral sphincter relaxes and the desire to urinate is activated. The person is then able to voluntarily relax the external sphincter and void at an appropriate time and place. Urine is usually excreted in amounts of 1–2 L in 24 hours (Marieb & Hoehn 2012).

### The urethra

The urethra (Figure 31.3) is a muscular tube extending from the neck of the bladder to the external meatus. In the female the urethra is about 2.5–4 cm long and opens at the external urethral orifice in front of the vaginal opening. The external sphincter guards this opening. In the male the urethra is about 15–20 cm long and opens at the tip of the penis. The male urethra has a double function: it forms a passage for urine as well as semen. It is guarded by an external sphincter immediately below the prostatic portion of the urethra. The function of the urethra is to provide a passage for urine from the bladder, out of the body (Marieb & Hoehn 2012).

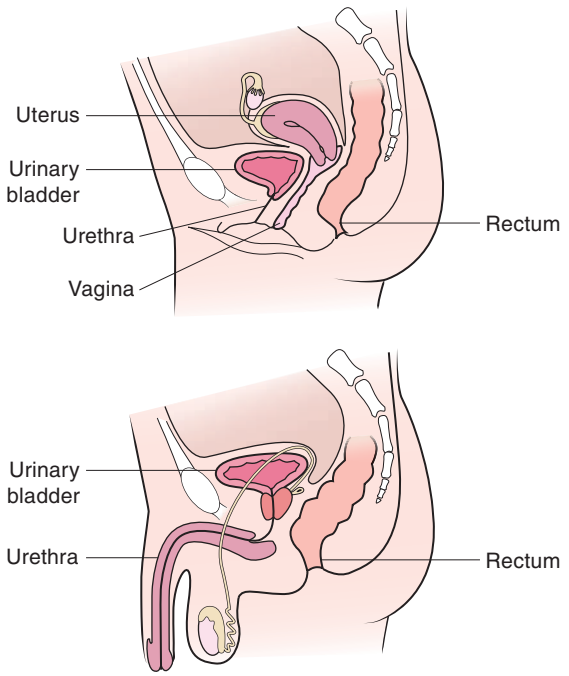


**Figure 31.3** Position of the female and male urethra

## ALTERATIONS IN URINARY SYSTEM FUNCTIONING

The kidneys are essential in the maintenance of homeostasis, as they regulate the rates of elimination of water and electrolytes from the body and contribute to the maintenance of a constant blood pH and blood pressure. The kidneys also eliminate metabolic waste products and toxic substances. Therefore, any dysfunction in the formation or excretion of urine can have major adverse effects on homeostasis (Berman et al 2015).

### Changes in kidney structure

Atrophy of the kidneys because of destruction of the renal tissue can occur in many chronic renal diseases. Kidney **atrophy** is when a kidney becomes smaller in size due to kidney disease or because the kidney is non-functioning. Mostly it has to do with impaired blood supply to the kidneys. Alternatively, the kidneys can become enlarged because of blockage of the ureters, enlargement of the prostate gland or from invasion of the kidneys by neoplastic cells. If there is an obstruction lower down in the urinary tract, the ureters may become enlarged in diameter as they fill with urine that cannot pass the obstruction (Marieb & Hoehn 2012).

### Fluid and electrolyte imbalance

Water accounts for half or more of young adult body weight. It occupies two main cellular compartments: intracellular and extracellular. Intracellular fluid is within the cell and extracellular fluid is outside the cell. Extracellular fluid consists of blood plasma and interstitial fluid. Very small changes in the electrolyte concentration in different fluid compartments will cause water to move from one compartment to another. If the kidneys are unable to concentrate the urine by regulating reabsorption, the loss of a large amount of dilute urine may result in fluid imbalance. If the kidneys fail to excrete sufficient water, an increase in the total circulating fluid volume impedes cardiovascular function. Renal disease may result in abnormal retention or loss of sodium, potassium, calcium or phosphorus (Marieb & Hoehn 2012; Porth 2011).

### Acid–base balance and elimination of wastes

Normal metabolism produces an excess of acids. To compensate, the kidneys excrete acids and return bicarbonate to the plasma and extracellular fluid. An acid–base imbalance (metabolic acidosis) will result if this function is impaired; that is,

if there is an increased amount of acid or a decreased amount of base in the body. Normal arterial blood pH is 7.35 to 7.45. If the pH rises above 7.45 a person is said to be in alkalosis, pH below 7.35 results in acidosis. The kidneys must also continually filter and excrete nitrogenous wastes derived from protein metabolism (Marieb & Hoehn 2012; Porth 2011).

### Urine output

Alterations in urine output may be temporary or long term. Urine output may be decreased, as in obstruction of the ureter or acute or chronic renal failure, or it may be increased, as during the diuretic stage of acute renal failure. The passage of urine along the urinary tract may be impeded by an obstruction, such as a tumour or calculus (Kidney Health Australia 2014).

### Manifestations of urinary system disorders

Disorders of the urinary system may produce signs and symptoms that vary according to the site and severity of the problem.

#### Pain

Pain is more common in acute, rather than chronic, disorders of the kidneys and urinary tract. Pain that originates from the kidneys is generally experienced as a dull ache in the lower back and may radiate to the lower abdominal area. Pain associated with renal colic is sudden and severe. It is felt in the lower back and may radiate to the groin area. Nausea and vomiting frequently accompany this type of pain.

Suprapubic pain may result from spasms or overdistension of the bladder, as in acute retention of urine. An infection of the lower urinary tract, such as **cystitis** or **urethritis** (inflammation of the urethra), commonly causes pain and burning during and/or after voiding. Strangury is the term used to describe slow and painful spasmodic discharge of urine frequently associated with a 'burning' sensation.

### Changes in voiding pattern

There may be an increase in the frequency of voiding, problems controlling the passage of urine, difficulty in initiating micturition or a sense of urgency associated with the need to void.

### Changes in output

Changes in the output of urine include voiding increased or decreased amounts and cessation of the production or secretion of urine.

### Changes in the urine

Abnormalities of the urine associated with urinary system disorders include changes in the normal colour, clarity or odour of urine. The urine may be blood stained or dark amber, cloudy or smoky in appearance. Chronic renal disease can result in pale, almost colourless urine. A foul smelling 'fishy' odour is commonly present when there is a urinary tract infection (UTI) (Berman et al 2015; Kidney Health Australia 2014).

### Other manifestations

A person with a lower UTI commonly experiences pyrexia, malaise, nausea and vomiting, and pelvic and abdominal discomfort, whereas those with renal disease may experience hypertension, oedema, anorexia, nausea and vomiting, skin changes and neurological symptoms such as headache or altered consciousness (Berman et al 2015; Marieb & Hoehn 2012; McCance & Huether 2014).

## CHANGES TO VOIDING PATTERNS

Any change to voiding patterns needs to be recorded to establish a history. There are various terms for changes, listed in Table 31.1, which are universally understood by health professionals but lay terms may need to be used when discussing the symptoms with the individual or their family. The use of a fluid balance chart to record and analyse intake and output is vital for assessment, as is a bladder diary (see example in Figure 31.4), which provides a more in-depth assessment, including activities and dietary and fluid intake, and gives a more holistic view of an individual's voiding pattern (McGloin 2015).

### Nursing interventions

When a person is experiencing altered voiding patterns, the cause must be identified and treated. Difficulty in passing urine may result from an obstruction to the outflow of urine but may also be caused by other factors such as:

- Anxiety, stress, nervousness or embarrassment associated with the need to use toilet aids
- The need to remain in a supine position when using toilet aids
- The effects of medications, anaesthesia or the acute stress of surgery
- Pain following surgery or a burning sensation which can lead to tension in the muscles controlling the urethral opening
- Altered cognitive state
- Being in unfamiliar environment (Nyman et al 2013).

Nursing actions that may be implemented to induce micturition include:

- Using standard precautions for dealing with body fluids
- Relieving pain. If a person is experiencing pain, the cause should be identified and treated. Nursing actions to relieve pain include ensuring that the person is positioned comfortably, checking any splints or dressings to detect whether they are causing the pain and checking for prescribed analgesia
- Ensuring adequate privacy and sufficient time for the person to void. If possible, the person should be left alone to use the toilet aids (e.g. commode, bedpan or urinal) as they may be self-conscious about the need to eliminate in the presence of others. Ensure the person's safety and that the call bell is accessible

**TABLE 31.1 | Alterations in urinary elimination patterns**

| Term | Definition |
|---|---|
| Anuria | The absence of urine production, or a urinary output <100 mL/day (<30 mL/hour) |
| Dribbling | Dribbling of urine from the urethra despite voluntary control of micturition. It may be at the end of micturition or continuous |
| Dysuria | Pain and burning on micturition, usually as a result of an infection or obstruction |
| Frequency | Voiding at frequent intervals (i.e. <2 hourly) |
| Haematuria | The presence of blood in the urine |
| Hesitancy | Difficulty starting micturition |
| Incontinence | The inability to control the passage of urine |
| Nocturia | Excessive or frequent urination at night |
| Oliguria | A decreased urine production resulting in an output <500 mL/day |
| Polyuria | The excretion of an abnormally large volume of urine |
| Retention | The accumulation of urine in the bladder as a result of being unable to empty the bladder completely |
| Residual urine | The volume of urine remaining after voiding |
| Urgency | The feeling of needing to void immediately |

*(Marieb & Hoehn 2012)*

- Ensuring awareness of cultural differences in position and environment for voiding by communicating sensitively with the person
- Being alert for difficulties which may impede normal urination in time or environment; for example, coexisting conditions impairing physical or cognitive functioning
- Assisting the person to assume a natural voiding position. Whenever possible the person should be permitted to use the toilet but, if this is contraindicated, an upright position may assist. Males may find it easier to pass urine if allowed to stand. Refer to Clinical Skill 31.1
- Helping the person to relax. Unless contraindicated, a warm shower or bath, or the pouring of warm water over the genitalia of a female, may stimulate micturition. Further stimulation techniques may include the sound of running water (e.g. turning on a nearby tap)
- Encouraging the person to drink adequate amounts of fluids, unless this is contraindicated. The recommended fluid intake for adults is 1400–2000 mL per day
- Using clear signage to indicate the location of toilet facilities.

If these actions fail to induce micturition and the person is uncomfortable because of a distended bladder, it may be necessary to implement further actions, such as inserting a urinary catheter. After using bedpan, perineal care is required to make sure the person is clean and comfortable. Refer to Clinical Skill 31.2.

## Screening and investigations

### Urine tests

Various sources of information can be collected through the use of daily charts such as fluid balance charts, or bladder diaries which record voiding patterns and which may note, for example, an interrupted stream or difficulties in voiding as well as a history of the person's elimination pattern. As the body's normal metabolism produces wastes that must be eliminated regularly to maintain effective body function, the observation of urine and the person's ability to eliminate it provides the nurse with objective assessment data. The elimination of urine, or voiding, should be voluntary and painless. The frequency with which urine is passed varies with each individual. Factors that affect the frequency of voiding and the volume of urine include fluid input, bladder capacity, response to the need to void and the availability of toilet facilities. The frequency of voiding, and often the amount of urine voided, can be increased by a large fluid input, fear or anxiety, exposure to a cold environment and some disease states, and decreased by a low fluid input, exposure to a hot environment and some disease states.

***Preparation*** Standard precautions apply for all collection of body fluids. If urine is to be collected for a screening

**BLADDER DIARY**

Name: ..... Date: .....

Where were you living/staying at the time you were recording this: at home or other?

.....

This is a record of issues which may interfere or shed light on how your individual urinary system works. Add a comment in the squares if you wish to: this is your record. Begin a new form for each day and continue until you see a pattern emerge.

| Urinary output | Morning | Evening | Night (did you wake up to go to the toilet?) |
|---|---|---|---|
| Amount of urine at each visit to the toilet<br>Large +++<br>Medium ++<br>Small + | | | |
| Accompanying symptoms? e.g. pain, fullness, urgency? | | | |
| Intake:<br>Amount and what did you drink? (coffee, tea, juice, fizzy drink, alcohol?) | | | |
| Food intake:<br>Short description of amount and food type, e.g. curry, ice cream, beetroot, asparagus | | | |
| Has your bowel opened today? | | | |
| Medication:<br>Prescription, over-the-counter and herbal/vitamin remedies | | | |
| Exercise:<br>Short description | | | |
| Further comments:<br>i.e. environment: 'on a long haul flight', 'toilets were revolting, held on', 'bad day, stayed in bed', 'sedentary day in the office' | | | |

**Figure 31.4** Bladder chart

*(Compiled by Sue Brown 2011)*

**urinalysis**, the person is requested to void into a clean bedpan or urinal or a suitable clean receptacle (Figure 31.5). The urine should not be contaminated by faeces or menstrual blood, as a false assessment may result. The urine is transferred from the toilet utensil into a clean container for observation and analysis immediately after collection. Correct and ongoing identification of sample is of paramount importance.

***Observation*** In health, urine is clear, amber in colour and has a faint odour. Menstruation or any other vaginal discharge and certain medications, supplements or foods can alter the colour and odour of urine and certain diseases will vary the condition and clarity of the urine, so it is important to document what is observed and smelt. Further observations should note if the urine is cloudy or if there is sediment present (Table 31.2).

## Urinalysis (routine)

Reagent strips are used to screen urine samples. Should the urine contain pigments, for example, from vitamin supplements (often bright yellow), they may affect the efficacy of the test. Check each container for use-by date, and ensure the strips are dry and that the container has an efficient closure. Each manufacturer may vary slightly in application of the test so check information as to how to read the strip and the time

## CLINICAL SKILL 31.1 Assisting with toileting: bedpan, urinal, commode

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Bedpan traditional or slipper<br>Urinal<br>Commode chair<br>Pan/urinal cover<br>Monkey bar<br>Waterproof sheet/bluey/absorbent pad<br>Toilet paper<br>Gloves<br>Hand hygiene available for individual—water, face washer, towel, disposable wipes |

| **Skill activity** | **Rationale** |
|---|---|
| **Assist with toileting using bedpan/urinal** | |
| A bedpan or urinal is used to assist an individual with toileting when they are unable to move from the bed to the toilet. The individual will have a rest in bed order, or may be too physically unwell to mobilise. | |
| Identify individual<br>Introduce yourself, explain the procedure to the individual<br>Gain consent | Reduces anxiety and gains individual's consent and cooperation |
| Assist individual to comfortable position (sitting or semi-Fowler's) | Provides ease of access to insert bedpan |
| Place waterproof sheet/bluey/absorbent pad under the individual | Absorbent pad will collect any spilt urine and prevent bed from becoming wet |
| Place bedpan under individual<br>Urinal is placed between individual's thighs. Handle is placed away from the mattress. Penis is placed in to the neck of the urinal | Ensures accurate collection of urine or faeces |
| Provide call bell for individual and allow for privacy | Dignity and privacy are maintained |
| Assist individual with use of toilet paper | To remove urine and faecal matter from the perineal area |
| Remove bedpan/urinal and cover | Prevents contents from being viewed during transportation to pan room/flusher |
| Pathology samples or full ward tests taken as required | Collection of specimens for testing to assist with diagnosis of infections |
| Measurements taken as required and documented on fluid balance chart | Measurements required for maintaining fluid balance |
| Hand hygiene performed | Prevents the spread of infection |
| Hand hygiene provided for individual | Prevents the spread of infection. Provides hygiene requirements for the individual |
| Individual made comfortable and curtains opened | Comfort needs are attended to |
| Report and document all relevant information, including type and date of specimen, correctly in the healthcare record and any complications | Medico-legal requirement. Allows for the planning and implementation of care |

## CLINICAL SKILL 31.1 Assisting with toileting: bedpan, urinal, commode—cont'd

### Assist with toileting using commode

A commode chair is used to assist an individual with toileting when they are unable to move from the bed to the toilet or commode chair. The individual may have a sit out of bed order, or a rest in bed order with toilet privileges, or may be too physically unwell to mobilise. Using a commode chair may provide the individual ease of voiding or opening bowels.

| | |
|---|---|
| Commode is placed close to the bed or chair with brakes applied | Provides ease of access. Brakes prevent chair from moving |
| Pan placed into commode chair | Collects urine or faeces |
| Individual is assisted onto the commode | Prevents individual from falling |
| Provide call bell for individual and allow for privacy | Dignity and privacy are maintained |
| Assist individual with use of toilet paper | To remove urine and faecal matter from the perineal area |
| Assist individual into the bed or chair | To maintain safety |
| Hand hygiene performed | Prevents the spread of infection |
| Hand hygiene provided for individual | Prevents the spread of infection. Provides hygiene requirements for the individual |
| Individual made comfortable and curtains opened | Comfort needs are attended to |
| Remove commode and transport to the pan room | Remove from vicinity of individual's bedside. Testing or collection specimen is better undertaken in the pan room. Contents are disposed of in the correct manner |
| Samples or full ward tests taken as required and documented | Collection of specimens for testing to assist with diagnosis of infections |
| Measurements taken as required and documented | Measurements required for assisting with recording of fluid balance |
| Hand hygiene performed | Prevents the spread of microorganisms |
| Report and document all relevant information, including type and date of specimen, correctly in the healthcare record and any complications | Medico-legal requirement. Allows for the planning and implementation of care |

*(Berman et al 2015; Crisp & Taylor 2013; LeMone et al 2011; Lynn et al 2012; Rebeiro et al 2013; Smith et al 2011)*

needed for a result before commencing the test. There are a large number of diseases that contribute to abnormal readings, many of which are not well known or will require a specialist response. Listed below are the common causes for abnormalities:

- The presence of leucocytes and nitrates may indicate the presence of bacteria
- The presence of protein indicates disease or trauma although, as a person ages, the kidneys become less efficient and protein may be detected
- The presence of acetone and glucose may indicate diabetes, although there are other reasons for their presence
- The presence of blood in urine—haematuria—may indicate contamination (e.g. menstrual blood), trauma or infection
- The presence of bilirubin suggests changes or infection to the liver and biliary system.

In health, urine has a pH of between 4.5 and 8.0; that is, slightly acidic (average is 6.0). A value of 7.0 is neutral, below 7.0 is acid, and above 7.0 is alkaline. pH is frequently affected by what the person has ingested; for example, acid food or a vegetarian diet. The pH value will also be altered in the presence of bacteria or renal calculi and an incorrect result will be obtained if the urine has been left standing for some time.

In health, a specific gravity of between 1.005 and 1.030 is usual. Specific gravity is a measure of the concentration of particles in the urine and reflects the ability of the kidneys to concentrate or dilute urine. It will be altered in over- or under-hydration.

Disposal of excreta is via the toilet or specified equipment in a 'dirty utility' space. Equipment is cleaned and sterilised

## CLINICAL SKILL 31.2 Perineal care

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Monkey bar<br>Waterproof sheet/bluey/absorbent pad<br>Toilet paper<br>Gloves<br>Hand hygiene available for individual—water, face washer, towel, disposable wipes |

| **Skill activity** | **Rationale** |
|---|---|
| Identify individual<br>Introduce yourself, explain the procedure to the individual<br>Gain consent | Reduces anxiety and gains individual's consent and cooperation |
| Place bluey or towel under individual's buttocks | Absorbent pad will collect any spilt fluids and prevent bed from becoming wet |
| Assist individual to comfortable position (supine) with legs flexed | Provides access to perineal area |
| Cover the upper body and legs with a towel | Allows for exposure to the genital area and maintains the individual's dignity |
| Apply gloves | Protects self from exposure to body fluids. Gloves form part of the personal protective equipment required for standard precautions |
| Females: wash and dry inner thighs. Wash the labia from the front towards the anus to remove fluids. Repeat procedure if required, rinsing cloth for each pass. Dry area well. Inspect for signs of excoriation, abnormal odour or excess secretions. Position individual onto the side to gain access to the buttocks. Spread the buttocks, clean and dry the anal area. Apply protective ointments and medications as required or ordered | Cleans the area and identifies any abnormal findings |
| Males: wash and dry inner thighs. Wash and dry the penis. If the individual is uncircumcised retract the foreskin to expose the glans. Clean and dry the scrotum. The individual may be required to be positioned onto their side to allow for greater access to the posterior scrotal folds. Spread the buttocks, clean and dry the anal area. Repeat procedure if required, rinsing cloth for each pass. Dry area well. Inspect for signs of excoriation, abnormal odour or excess secretions. Apply protective ointments and medications as required or ordered | Cleans the area and identifies any abnormal findings |
| Remove gloves and perform hand hygiene | Prevents spread of infection |
| Return individual to a position of comfort. Replace bedclothes | Provides comfort and dignity for the individual |
| Remove equipment from the individual's bedside | Leave bedside neat and tidy. Used equipment is disposed of in the correct manner |
| Perform hand hygiene | Prevents spread of infection |
| Report and document all relevant information, including type and date of specimen, correctly in the healthcare record and any complications | Medico-legal requirement. Allows for the planning and implementation of care |

*(Berman et al 2015; Crisp & Taylor 2013; LeMone et al 2011; Lynn et al 2012; Rebeiro et al 2013; Smith et al 2011)*

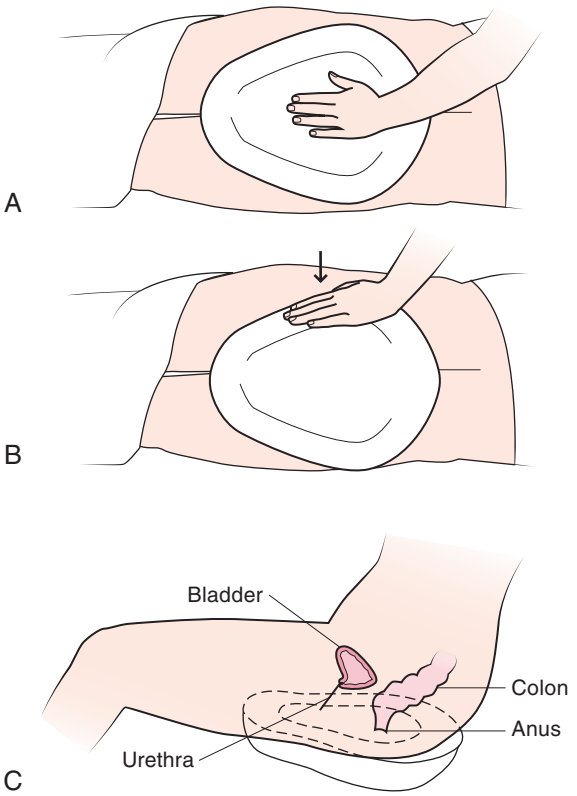


**Figure 31.5** Positioning a bedpan

A: Another method of placing a bedpan is used when the person is unable to help. The person lies on one side and the bedpan is placed firmly against the buttocks B: The nurse pushes down on the bedpan and towards the person C: The person is positioned on the bedpan so that the urethra and anus are directly over the opening

according to facility policy. Standard precautions are maintained throughout the procedure.

Accurate data collection and recording is vital evidence for assessment and diagnosis. Step-by-step method of urinalysis is outlined in Clinical Skill 31.3.

## Urinalysis (laboratory)

Abnormal findings from a routine urinalysis often require further investigation by a laboratory and this will be ordered by the medical officer or nurse practitioner.

Adequate information about the person and the specimen must be provided. The label on the specimen container must contain the person's name, registration number, the date and time of collection and the method used to collect the specimen; for example, catheter specimen of urine. When a specimen is despatched for laboratory analysis it must be accompanied by the appropriate signed request form with type of collection and the specific laboratory tests to be performed.

Specimens must be sent to the laboratory as soon as possible after collection; if delay is anticipated the specimen must be refrigerated as soon as possible. Depending on ambient temperature, urine left for more than 2 hours without some

**TABLE 31.2 | Abnormalities of urine detected by observation**

| Observation | Deviation from normal | Possible cause |
|---|---|---|
| Colour | Pale | High fluid intake, other factors that dilute the urine, such as diuretic medication or disease (e.g. diabetes mellitus) Indication of adequate hydration |
| | Dark or brown | Concentrated urine due to dehydration or presence of bile pigment (e.g. in liver or gallbladder disease), or indication of poor hydration |
| | Smoky | Presence of occult blood |
| | Red | Presence of frank blood |
| | Bright yellow, blue or green | Specific medications |
| | Mucous plugs, viscous, thick | White blood cells, bacteria, pus or contaminants such as prostatic fluid or vaginal discharge may cause cloudy urine |
| Odour | Ammonia | Decomposing urine |
| | Foul-smelling 'fishy' odour | Infected urine |
| | Sweet smelling | Presence of glucose (e.g. in diabetes mellitus) |
| Foreign substances | Pus | Urinary tract infection |
| | Stones, gravel | Calculi in urinary tract |
| Amount | Higher than normal in 24 hours | High fluid intake, diuretic medications, diseases (e.g. diabetes mellitus) |
| | Lower than normal in 24 hours | Obstruction to the flow of urine Diseases that reduce the normal production of urine (e.g. renal failure) |

*(Pagana et al 2013)*

## CLINICAL SKILL 31.3 Urinalysis

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Urinalysis reagent testing strip<br>Paper towel<br>Urine collection container<br>Non-sterile gloves<br>Eye protection as required<br>Waste receptacle |

| **Skill activity** | **Rationale** |
|---|---|
| Urinalysis involves the physical, chemical and microscopic examination of urine. Reagent strips detect and measure various compounds which may be found in urine. | |
| Validate the medical request for specimen collection ensuring no contraindications | Ensures correct procedure is about to take place |
| Identify individual<br>Introduce yourself, explain the procedure to the individual<br>Gain consent | Reduces anxiety and gains individual's consent and cooperation |
| Urine specimen is collected in appropriate vessel or container from the individual and taken to appropriate area for testing | Collection of specimen is required prior to testing |
| Observe urine for colour, amount, odour and presence of any foreign substances | Abnormalities in the urine may indicate renal impairment or presence of microorganisms |
| Prepare testing area by placing absorbent paper towel onto bench top | Paper towel will absorb any fluids spilt |
| Apply gloves | Prevents spread of infection |
| Check test strips are in date, how to read strip and time required for a result prior to commencing | Out-of-date test strips or inaccurate timing may not give an accurate result |
| Uncap bottle and remove reagent strip from bottle. Recap bottle | Prevent contamination of remaining strips in bottle |
| Note the time the reagent strip is inserted into the urine | Not all tests read are read at the same time |
| Dip reagent strip into the collected urine making sure to cover all testing areas on the strip | Allows for accurate testing |
| Holding the test bottle on its side and using this as a guide, without touching the test strip against the bottle, match the test areas of the reagent strip against the bottle when the required reaction time has been reached | Test results are noted against colour matching on the reagent test strip bottle. Touching the strip against the bottle will lead to cross-contamination |
| Dispose of urine sample, test strip, absorbent towel and gloves into correct receptacles | Correct disposal prevents cross-contamination and spread of infection |
| Perform hand hygiene | Prevents spread of infection |
| Document findings in correct charts | Medico-legal requirement. Allows for the planning and implementation of care |
| Report and document all relevant information, including type and date of specimen, correctly in the healthcare record and any complications | Medico-legal requirement. Allows for the planning and implementation of care |

*(Berman et al 2015; Crisp & Taylor 2013; LeMone et al 2011; Lynn et al 2012; Rebeiro et al 2013; Smith et al 2011; Medline Plus 2015)*

form of preservation such as refrigeration is unlikely to produce an accurate result and should be discarded due to decomposition of the urine and increased microbial activity.

If the person is responsible for collecting the urine specimen, the nurse should provide the person with the information necessary to ensure that the collection is performed correctly.

All urine excreted during a timed collection, for example, during a 24-hour period, is collected and sent for laboratory analysis to measure the quantity of various substances present, such as specific hormones. Table 31.3 describes the results of urinalysis.

### Mid-stream specimen

This method of collection is used to obtain a sample of urine that is not contaminated by microorganisms from outside the urinary tract and therefore must be collected in a sterile receptacle. The urine is sent to the laboratory to be tested for the presence of microorganisms and their sensitivity to antibiotics. The aim is to collect the middle portion of the stream of urine. A suggested method of collection is outlined in Clinical Skill 31.4.

### Catheter specimen

A catheter specimen of urine is obtained from a person who has an indwelling catheter. The insertion of a catheter for the sole purpose of obtaining a urine specimen is generally avoided because of the risk of introducing microorganisms into the urinary tract. Collecting a specimen from the end of the catheter that is connected to the drainage tubing should be avoided and best results are achieved if urine is aspirated using a sterile syringe and needle through the sampling port.

### Suprapubic bladder aspiration

The suprapubic bladder aspiration procedure is not commonly used but, when necessary, it is performed by a medical officer,

**TABLE 31.3 | Results of urinalysis**

| Test | Normal values | Deviation | Possible causes |
|---|---|---|---|
| pH | 4.5–8.0 | Elevated (alkaline (above 8.0))<br>Lowered (acidic (below 4.5)) | Urinary tract infection, chronic cystitis, metabolic or respiratory alkalosis, acute and chronic renal failure, low-protein diet<br>Diabetic acidosis, fever, pulmonary emphysema, diarrhoea and dehydration, high-protein diet |
| Specific gravity | 1.005–1.030 | Elevated (above 1.030)<br>Lowered (below 1.005) | Low fluid input, vomiting, diarrhoea, hepatic disease, congestive cardiac failure, presence of abnormal substances in the urine (e.g. protein)<br>High fluid input, diabetes insipidus, certain kidney diseases |
| Protein (proteinuria) | Nil | Present | Kidney infections<br>Acute glomerulonephritis, pyelonephritis, diabetes mellitus (types 1 and 2), acute febrile states, hypertension, congestive cardiac failure |
| Glucose (glycosuria) | Nil | Present | Diabetes mellitus (types 1 and 2), pancreatitis, pain, Cushing's syndrome, hyperthyroidism, administration of corticosteroids, stress |
| Ketones (ketonuria) | Nil | Present | Diabetes mellitus (type 1), fever, starvation, pregnancy, trauma, vomiting and diarrhoea |
| Bilirubin (bilirubinuria) | Nil | Present | Liver disease (hepatitis, cirrhosis), biliary obstruction |
| Blood (haematuria) | Nil | Present | Urinary tract disease or trauma, acute nephritis, renal calculi, renal carcinoma, use of anticoagulants, chronic kidney infection |
| Nitrite | Nil | Present | Urinary tract infections, pyelonephritis, cystitis, urethritis |
| Urobilinogen | 0.1–1.0 | Elevated (above 1.0)<br>Lowered (below 0.1) | Liver disorders (cirrhosis, hepatitis), congestive cardiac failure, blood disorders (e.g. haemolytic anaemia, pernicious anaemia, thalassaemia)<br>Obstruction of the bile duct, antibiotic therapy, cancer of head of pancreas |
| Leucocytes | Very few | Increased | Urinary tract infection, bacteriuria |

*(Pagana et al 2013)*

## CLINICAL SKILL 31.4 Mid-stream urine collection

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile specimen pot<br>Commercially produced specimen pack<br>Biohazard specimen transport bag<br>Gloves<br>Moist towel or wipes<br>Hand hygiene equipment |

| **Skill activity** | **Rationale** |
|---|---|
| Mid-stream urine specimen obtains a urine specimen that is not contaminated by microorganisms from the hands or urethra. Accurate urine collection for a MSU can only be achieved if the individual is able to follow instructions. | |
| Validate the medical request for specimen collection ensuring no contraindications | Ensures correct procedure is about to take place |
| Identify individual<br>Introduce yourself, explain the procedure to the individual<br>Gain consent | Reduces anxiety and gains individual's consent and cooperation |
| Explain to individual how to obtain a specimen that is free of tissue and stool:<br>• Perform hand hygiene<br>• Wash genital area<br>• Female: hold labia open. Males: draw back foreskin<br>• Pass the first part of the stream into the toilet<br>• Collect the urine into the specimen container taking care not to void on the outside of the container<br>• Pass the remaining stream into the toilet. | Promotes cooperation and individual's participation. Where appropriate individual can collect clean-voided specimen independently |
| Specimen container is labelled with the individual's name, date of birth and UR number | Correct specimen is sent for testing |
| Pathology form is checked for the individual's details | Correct form and specimen are sent to pathology department. Correct test will be undertaken in the pathology department |
| Provide individual with equipment to cleanse perineum (see Clinical Skill 31.2 Perineal care). Assist individual if required<br>Perform hand hygiene | Individuals usually prefer to wash their own perineal area when possible. Prevents external microorganisms from contaminating the specimen<br>Prevents the spread of microorganisms |
| Using surgical asepsis, open outer package of commercial specimen kit | Maintains sterility of specimen container |
| Apply gloves | Prevents introduction of microorganisms into urine specimen from nurse's hands |
| Individual voids 30–60 mL of urine into the toilet or toilet utensil | Flushes any residual microorganisms out of the urethra |
| Collect the next 20–30 mL of urine in a sterile container (e.g. sterile kidney dish). If able the individual provides the urine specimen directly into specimen container | Mid-stream specimen is collected. This is the required portion sent for analysis<br>Mid-stream specimens contain fewer microorganisms than the first pass or final stream of urine |
| The individual completes voiding into the toilet or toilet utensil | The remainder of the urine is not required for collection |

| CLINICAL SKILL 31.4 Mid-stream urine collection—cont'd | |
|---|---|
| Pour collected urine specimen into labelled sterile specimen container. If individual voids directly into specimen container, wipe container to remove any urine<br>Remove gloves and perform hand hygiene<br>Ensure individual has facilities for their own hand hygiene | Specimen can be sent for analysis<br>Specimen container is free from urine<br>Prevents cross-contamination |
| Label specimen according to organisation's policies and procedures. Despatch specimen to the laboratory with the request form, or store specimen in refrigerator | Decomposition and cell growth occur if urine is left standing, and may provide a false result |
| Report and document all relevant information, including type and date of specimen, correctly in the healthcare record and any complications | Medico-legal requirement. Allows for the planning and implementation of care |
| Note: Indicate on laboratory slip if individual is menstruating. | |
| *(Berman et al 2015; Crisp & Taylor 2013; LeMone et al 2011; Lynn et al 2012; Rebeiro et al 2013; Smith et al 2011; NHMRC 2010a; 2010b)* | |

using sterile equipment and aseptic technique. It involves the insertion of a needle through the skin over the suprapubic area into the bladder. A quantity of urine is aspirated, placed in a sterile container and despatched to the laboratory. After this procedure the nurse should observe the puncture site for bleeding, and the urine for the presence of blood.

### Straining urine

Stones, or calculi, are insoluble substances formed of mineral salts that may develop in the kidneys. They can range in size from microscopic to the size of grains of sand or gravel to several centimetres in diameter. If it is known or suspected that a person has developed renal calculi, careful observation of the urine is achieved by straining it to detect the passage of stones. Any stones collected are sent for laboratory examination, which reveals their exact composition and helps to identify their cause. The urine is strained by pouring it through a fine substance such as gauze or filter paper.

## Further diagnostic tests

Tests that may be performed to assist or confirm the diagnosis of urinary system disorders include the following.

### Blood tests

Blood may be obtained and tested in the laboratory to assess renal function. The tests most often performed are:

- Serum creatinine measurements, which reflect the ability of the kidneys to excrete creatinine, the waste product of energy metabolism
- Blood urea nitrogen (BUN) levels, which reflect the ability of the kidneys to excrete urea
- Uric acid levels, which may indicate renal dysfunction if elevated
- Measurement of haemoglobin and haematocrit levels, white blood cell counts, serum potassium and phosphorus levels.

### Ultrasound and radiology diagnostic tests

Bladder scans can provide a non-invasive method of assessing residual urine in the bladder and reduce the frequency of catheterisation (Rigby & Housami 2009). These are often portable scans available for use by nurses and other medical personnel and may not require the person to visit a specialist department. More complex ultrasound can identify the size and position of the kidneys and if there are any swellings or cysts associated with them. It will show if there is any dilation (widening) of the tubes which may be the result of blockage. It does not show function.

An intravenous pyelogram (IVP) is an x-ray examination of the urinary tract in which an injection of dye is given into a vein so that the function of the kidneys is shown by passage of the dye through the kidneys and down the tubes (ureters) that drain them to the bladder. A retrograde pyelogram involves the insertion of catheters into the ureters through a cystoscope. Contrast medium is introduced through the ureteric catheters into the pelvis or the kidneys, and x-ray films are taken.

Cystoscopy: the cystoscope is an endoscopic instrument which is passed into the bladder through the urethra in order to inspect its lining. The procedure is carried out either under a general anaesthetic with a rigid instrument or under regional anaesthesia with a flexible cystoscopy.

Computerised axial tomography (CAT) scan of the abdomen may be performed to identify kidney size or structural alterations within the urinary system. It may be done with or without contrast medium.

### Renal biopsy

A biopsy of kidney tissue may be taken for microscopic tissue examination. After injection of local anaesthetic a special biopsy needle is inserted through the skin to obtain a sample from the cortex of the kidney. After a renal biopsy the person

must be monitored closely for haematuria, rapid weak pulse, pallor or low blood pressure, as these may indicate haemorrhage from the biopsy site.

## SPECIFIC DISORDERS OF THE URINARY SYSTEM

Disorders of the urinary system may be classified as congenital, infectious, immunological, degenerative, neoplastic, obstructive, traumatic or those resulting from multiple causes.

### Congenital disorders

Certain disorders may be present at birth, although the manifestations may not become evident for some time. Vesico-ureteric reflux is a mechanical problem that may be congenital or acquired. Abnormal backflow of urine from the bladder to the ureter(s) increases the hydrostatic pressure in the ureters and kidneys. Reflux into the kidneys causes damage to the renal parenchyma and reflux nephropathy. In the congenital form the child is born with a short ureter, which often grows to normal size as the child develops and matures, so that the condition resolves. Acquired vesico-ureteric reflux may be caused by repeated UTIs, by inadequate functioning of the detrusor muscles in the bladder or from a high pressure within the bladder as a result of an obstruction (Hockenberry & Wilson 2010). Symptoms of the disorder generally appear only in the presence of a UTI and there may be no symptoms with chronic infection. The condition may not be diagnosed until signs of renal damage become evident.

Polycystic kidney disease is an inherited disorder characterised by grape-like clusters of fluid-filled cysts that enlarge the kidneys. There are two forms of this disorder, one affecting children and the other affecting adults. In its infantile form the disorder manifests as bilateral masses in the kidney areas, with symptoms of respiratory distress and cardiac failure. Adult polycystic disease is frequently asymptomatic until the person is about 40 years of age. Initial symptoms include hypertension, haematuria and low back pain. UTI is common and progression to renal failure is gradual.

Hypospadias is abnormality or malformation of the penis whereby the urethra is not at the end of the penis but found at any location on the under surface of the penile shaft or scrotum in severe cases. It affects 1 in 150 boys and is usually detected at birth. Symptoms range from penis not being straight, no straight stream of urine and the foreskin being all at the back of the penis (Levitt & Reda 1988; The Royal Children's Hospital 2015).

### Infectious disorders

Infection may occur in any part of the urinary tract, as urine provides an ideal medium for the growth of microorganisms. Most commonly they gain access to the urinary tract by ascending the urethra although, rarely, they may descend from the kidneys to the lower urinary tract.

**Pyelonephritis** is inflammation of the renal pelvis and may be an acute or chronic condition. Acute pyelonephritis results from bacterial infection of the kidneys, commonly as a consequence of a lower UTI. A person with acute pyelonephritis may experience severe pain or a continual dull ache in the kidney region, as well as pyrexia, nausea and vomiting and fatigue. Rigors may be present, and urination may be frequent and painful. The urine is generally cloudy, blood stained and offensive in odour. Chronic pyelonephritis can result in the formation of renal scar tissue, which may in turn lead to chronic renal failure. This condition most commonly occurs in persons who experience recurrent acute pyelonephritis as a result of a urinary tract obstruction or vesico-ureteric reflux.

Cystitis is inflammation of the urinary bladder, and is usually the result of bacterial contamination. Cystitis is more common in females than in males because of the short length and proximity of the urethra to the bowel and vagina. The urine is generally cloudy and offensive and may contain blood cells. Urethritis, inflammation of the urethra, may result from bacterial infection or traumatic irritation such as catheterisation.

Organisms responsible for infections are numerous: *Escherichia coli* is a common infective organism; altered hygiene habits, sexual activity or bowel disorders may contribute to the infective process. Other causative organisms may be transmitted sexually, such as *Chlamydia trachomatis* and *Neisseria gonorrhoea*.

Symptoms of urinary tract infections may include dysuria and the presence of pus in the urine but often manifest differently in different age groups (Carter et al 2014; Bardsley 2014). Table 31.4 outlines the age-related symptoms of UTI.

**TABLE 31.4 | Age-related symptoms of UTI**

| Younger persons (symptoms tend to be specific) | Older persons (symptoms tend to be less specific) |
|---|---|
| Frequency/urge | May/may not be present |
| Continent | Episodes of incontinence |
| Pyrexia/chills | Not always present |
| Burning of micturition | Seldom present |
| Low back/low abdominal pain | Lower abdominal tenderness |
| Lethargy | Lethargy |
| Loss of appetite/nausea | Loss of appetite |
| Mentally alert | Altered mental state |

*www.webmd.com/urinary-incontinence-oab/tc/urinary-problems-and-injuries-age-12-and-older-topic-overview; www.agingcare.com/Articles/urinary-tract-infections-elderly-146026.htm*

## Degenerative disorders

Degenerative disorders include disorders in which there are degenerative changes in the renal structure or changes in the blood vessels that supply the kidneys. Degeneration occurs over a long period, and the person may not experience any symptoms until significant damage has occurred. Nephrosclerosis is necrosis of the renal arterioles, resulting from untreated or uncontrolled hypertension that impairs the blood supply of the kidneys. Renal damage occurs from a combination of fibrosis of the blood vessel walls and the resulting ischaemia. The person presents with high blood pressure, headaches, visual disturbances and altered neurological functioning. The urine contains protein and blood. If untreated, this condition can lead to renal and cardiac failure.

Analgesic nephropathy results from chronic ingestion of substances containing phenacetin. Aspirin–paracetamol combinations have also been found to cause similar renal tubule damage. The person complains of low back pain, haematuria and the symptoms of uraemia (nausea, vomiting, pruritus, muscle cramps). If end-stage renal failure develops, dialysis or kidney transplantation will be necessary (Berman et al 2015).

## Neoplastic disorders

Tumours that arise in the urinary system may be benign or malignant. Kidney tumours are generally malignant and usually well advanced before haematuria, the first and most common sign, appears. Later features include pain as the tumour enlarges and presses on adjacent structures, nausea and vomiting, loss of weight and metastatic symptoms such as bone pain. Wilms' tumour is a rare malignant tumour of the kidneys that occurs primarily in children (Kidney Health Australia 2014).

Bladder tumours are generally malignant, and more common than kidney tumours. Most occur in men over age 50. Evidence shows that prolonged exposure to certain substances such as aniline dyes is associated with increased incidence of bladder cancer. A variety of other carcinogenic substances, such as artificial sweeteners, are linked to bladder cancer. The prime manifestation of a bladder tumour is intermittent haematuria.

Prostate cancer is the most common cancer other than skin cancer in Australian men over the age of 50. Cancer of the prostate is commonly diagnosed through a screening blood test which indicates raised prostate specific antigen (PSA) (Andrology Australia 2015). As the tumour develops it causes the prostate gland to increase in size and causes difficulty in initiating micturition, a feeling that the bladder is not empty after voiding and dribbling of urine after micturition. Acute retention of urine may occur if the flow from the bladder is severely obstructed. Surgical intervention for conditions relating to the prostate can lead to erectile dysfunction and continence issues.

## Obstructive disorders

Obstruction of the urinary tract may be caused by factors other than the presence of tumours and calculi.

Benign prostatomegaly (enlargement of the prostate gland surrounding the male urethra) may compress the urethra and cause urinary obstruction. The cause of hypertrophy of the prostate gland is not fully understood but is probably related to hormonal mechanisms. It is more common in men over age 50. The first sign that there may be prostate problems may be when a man experiences the urge to pass urine more frequently, experiencing hesitancy and/or an interrupted stream. Sexual dysfunction is often experienced as the prostate enlarges. Some men may experience pain at the base of the scrotum and penis (Andrology Australia 2015). A digital rectal examination performed by the person's medical officer can ascertain if the prostate is enlarged.

Hydronephrosis, or dilation of the renal pelvis, may result from obstruction of the urinary tract. The build-up of pressure behind the area of obstruction eventually results in damage to the kidneys, and renal dysfunction. Causes of hydronephrosis include prostatomegaly, urethral stricture, calculi, congenital abnormalities and neurogenic bladder. The person usually presents with dull lower back pain and tenderness, decreased urine flow, dysuria and haematuria. Infection or renal failure can occur if the problem is not corrected.

Calculi are stones that form in the kidneys and urinary tract. Most stones form in the kidneys and pass down into the ureters or bladder. They are usually composed of calcium salts or uric acid. Multiple small calculi may remain in the renal pelvis or pass down the ureter, while a staghorn calculus remains in the kidneys. Although the precise cause is unknown, predisposing factors in the formation of calculi include some medications, dehydration, metabolic factors, infection, prolonged immobility and urinary stasis (Vance & Harold 2010).

The major symptom of calculi is pain, felt as a dull ache while the stone remains in the kidney. Stones which are localised to the kidneys may be treated with extracorporeal shock wave lithotripsy (ESWL). Stones which pass into the ureter may be treated with ESWL or, if lower down, may be removed using ureteroscopy.

If a stone passes into the ureter, the person may experience excruciating colicky pain that is frequently accompanied by nausea and vomiting.

## Traumatic disorders

Injuries to the kidney or urinary tract can have serious consequences. Because the kidney receives a large amount of blood from the abdominal aorta via the renal arteries, even a small laceration can cause massive haemorrhage. Injuries to the kidney include contusion, haematoma and laceration. The renal artery or renal vein may be ruptured. Symptoms include haematuria, back and abdominal pain and symptoms of hypovolaemic shock if the injury is severe. Bladder trauma may be associated with pelvic fractures or result from a blunt or penetrating injury. Symptoms of bladder injury include haematuria, dysuria, decreased urinary output, suprapubic pain and tenderness. Scrotal or perineal swelling may occur if urine escapes from the damaged bladder into surrounding tissues.

## Disorders of multiple cause

Chronic renal failure is the gradual loss of functional nephrons and may be due to several causes, including chronic kidney infections, polycystic kidneys, renal vascular disease, hypertension and obstructive diseases such as calculi, nephrotoxic agents and diabetic nephropathy. The condition produces major changes in all body systems.

It consists of four phases: diminished renal reserve, renal insufficiency, renal failure and end-stage renal disease. During the first phase, renal damage occurs but the person may be asymptomatic. With renal insufficiency the kidneys still function, but urinary concentration is impaired and blood urea levels are elevated. The renal failure stage produces uraemia, metabolic acidosis, electrolyte imbalance and impaired urine dilution. In the end stage, renal function is severely impaired and most other body systems are affected. When renal function is impaired to such an extent that conservative treatment is no longer effective, dialysis therapy and/or kidney transplantation are necessary (Health Insite 2012).

### CASE STUDY 31.1 EXPLORING ONE OF THE DISORDERS OF THE URINARY SYSTEM

Alfred, an 84-year-old, has been to see his doctor for a routine examination. On questioning he revealed that he has been experiencing difficulty with ambulation due to joint pain in his hip. Blood tests show he has slightly elevated PSA and, on digital rectal examination, an enlarged prostate.

On questioning, Alfred admits to having urinary frequency and nocturia, explaining that he often has to get up to 'spend a penny' at night. Upon further questioning he explains that he has noticed increased difficulty with starting and stopping urination and when it does start it is very slow. This has happened over several months but he has been too embarrassed to seek medical advice. Alfred also describes symptoms of joint stiffness and discomfort which make it difficult to do many of the things he once used to do.

1. What do the results of Alfred's blood and physical examination suggest?
2. What is the treatment for the condition and what is the prognosis?

# INCONTINENCE

**Continence** can be defined as the ability to control excretion in a timely and appropriate manner. **Incontinence** is the involuntary loss of urine and can occur at any time. Causes for this distressing symptom can be as a result of infection, changes to the neurological or endocrine system, physiological, pharmacology or psychological changes and other idiopathic causes (Carcio 2014). In children bedwetting (**enuresis**) is a relatively common occurrence which may resolve over time. Persons who experience involuntary leakage frequently lack self-esteem, and may experience physical discomfort and social isolation. Incontinence in adults is categorised into five main categories:

1. Urge: the sudden desire to void resulting in involuntary leakage
2. Stress: the involuntary loss of urine when exercising, coughing or laughing
3. Overflow: incomplete evacuation of urine from the bladder which results in a pool of urine remaining in the bladder. Not only is this a reservoir for bacteria but pressure can build up, resulting in overflow of urine being involuntarily released
4. Transient: sudden onset of incontinence often associated with infection
5. Reflex: loss of bladder control, often the result of neurological trauma or disease.

There can also be a mixed presentation of symptoms. Sensitive probing concerning the history of continence and accurate reporting aid assessment of appropriate initiatives.

## Lifespan issues

Children: micturition is normally under voluntary control by about 2–3 years of age; however, children often experience enuresis into their school years. There are a variety of interventions to assist children experiencing this situation and effective data collection including incidence, external factors such as stress or emotional trauma, absence of infection, pharmacology or disease profiles is necessary. Children frequently outgrow the symptom but the psychosocial implications can have a long-term negative impact.

Adolescence: incontinence can be continuous throughout childhood as a result of infection, toilet avoidance (especially at school), constipation or disease. This stage of development is also a time when some adolescents become sexually active and incontinence related to a bladder infection (cystitis) and associated vaginitis or epididymitis may be experienced. Some adolescents are often reluctant to seek help and the need for sensitivity in responding to this age group is vital (Deshprande et al 2012).

Pregnancy and postpartum incontinence: the effectiveness of pelvic floor exercises in helping to improve the musculature of the pelvic region has long been acknowledged and use of these exercises has resulted in improvement in the post-childbirth incidence of incontinence (Seshan & Sivaram 2012). During pregnancy, mechanical and hormonal factors cause changes in renal physiology, most commonly resulting in frequency of voiding and stress incontinence. Many postpartum changes, including damage to the pelvic floor during vaginal delivery, have long-term continence effects and these are less acknowledged, with many mothers assuming that involuntary loss of urine is normal after the birth of a baby. This condition has an adverse effect on the mother—from physiological, psychological and sexual perspectives (Carcio 2014).

Menopause: urge and stress incontinence increase in women post menopause, and complications such as obesity and type 2 diabetes can exacerbate the symptoms.

Older adults: while continence issues in adolescents and adults are experienced mainly by women, prostatic enlargement in men and the resultant effects of surgery increase the incidence of incontinence in men. The increase in metabolic syndrome in men and women, obesity and neurological changes also contribute to incontinent events. There are frequently mixed aetiologies (causes) in this age group.

## Nursing interventions

Interventions can only be effective when a thorough assessment has been completed. Incontinence issues are highly individualised and the nurse needs to respond to each individual person's needs. Therefore, care plans must be initiated in consultation with the person or their families (see Nursing Care Plan 31.1).

- Use standard precautions for dealing with body fluids
- Use accurate documentation and assessment to aid all health professionals in treatment
- Encourage person to consume fluids unless contraindicated; at least 1500 mL daily, as an inadequate fluid input may further decrease the functional capacity of the bladder
- Recommend weight reduction where applicable
- Establish and maintain Kegel exercise routine (Clinical Interest Box 31.1)
- Use of the NeoControl® or similar chair—which creates therapeutic pulsed magnetic field to provide powerful stimulation of vital pelvic floor muscles—as an adjuvant to pelvic floor exercises. These chairs are being increasingly deployed in the community setting
- Be aware of the person's physical and social environment; for example, wet clothing or bedclothes should be removed immediately and taken from the room to prevent offensive odours. The person should be provided with clean dry clothing and applicable continence aids. Air freshener should be available
- Provide easy access for ambulant persons to the toilet, which should be clearly marked and have suitable rails and/or equipment to assist them to void comfortably. Non-ambulant people should be provided with toilet utensils relevant to their need. Some persons may find it easier to use a commode and men often find it easier to void while standing. Any request for use of toilet facilities should be responded to promptly (Department of Health and Ageing 2015)
- Keep the skin clean and dry as constant moisture on the skin may lead to excoriation and the development of decubitus ulcers. When the person is incontinent their skin should be washed with mild soap and water and gently dried. Particular attention is paid to the genital area, the groin and the crease between the buttocks
- Be aware of the various medications that may be prescribed in the management of incontinence, and their side effects; for example, antibiotics to treat a UTI

### NURSING CARE PLAN 31.1 A PERSON WITH URINARY INCONTINENCE

**Assessment:** Mrs Jones (80 years) had been admitted to the acute ward the previous evening following a fall. This morning the nurse noticed an odour of urine and felt the sheets were damp. Mrs Jones acknowledged she had difficulties getting to the toilet in time and was deeply traumatised by the event. She repeatedly asked the nurse not to tell anyone, and said that she managed well at home.
**Issue/s to be addressed:** Type of urinary incontinence identified (may be mixed in presentation).
**Goal/s:** Person will report relief from urinary incontinence or a decrease in incidence.
Person will gain confidence in ability to self-manage with education and management strategies.
Person will maintain skin integrity and social hygiene effectively.

| Care/Actions | Rationale |
|---|---|
| Maintain standard precautions | To avoid further infections |
| Perform a complete urinalysis | To determine underlying medical disorders and to have a baseline for comparison purposes later |
| Maintain bladder diary for at least 72 hours | To establish continence pattern |
| Review all medications in consultation with the medical officer | To determine if any are thought to be contributing to the incontinence |
| Teach pelvic floor exercises | To help strengthen the pelvic muscles |
| Review person's fluid intake and types of fluid consumed | To check if the person is taking any fluids which might irritate the bladder (e.g. alcohol and caffeine) as this can cause urgency |
| Provide the person with information about the Continence Foundation of Australia | To seek further support |
| Explain continence aids available to allay person's anxiety | |

**Evaluation**

Person reports urinary continence or reduced incidence of incontinence episodes.
Person reports maintenance of pelvic floor exercises at least three times daily.
Person's fluid intake is at least 2 L per day (if not contraindicated by coexisting disease).
Person understands the role and function of the Continence Foundation of Australia.

## CLINICAL INTEREST BOX 31.1
## Pelvic muscle (Kegel) exercises

Exercise program for making pelvic floor muscles stronger:

- Check with a continence adviser or physiotherapist to ensure that exercises are being performed correctly
- Find the right muscles: when passing urine, stop the flow mid-stream. Then relax and finish passing urine. The muscles you tighten and pull upwards to stop the flow of urine are the pelvic floor muscles. Tighten the muscles around the anus by imagining that you are trying to stop passing wind
- Test your muscle strength: women—place one or two clean fingers in the vagina and tighten the pelvic floor muscles; men—press one finger on the area between the anus and scrotum; when the pelvic floor muscles are tightened, this area will move up and away from the finger
- To do the exercise, squeeze the muscle identified and hold for a count of 10 seconds. Relax for a count of 10 seconds. It may take 2 weeks to be able to hold for 10 seconds
- Do the exercise three times a day: 15 in the morning, 15 in the afternoon and 20 at night. Or for 10 minutes three times a day. Try to work up to 25 repetitions at one time. It will take about 2 weeks to notice a difference. Within a month of regular exercise, there should be a decrease in instances of incontinence.

*(adapted from deWit & O'Neill 2013)*

- Continue to screen urine for infection or underlying disease
- Ensure continence aids are suitable, affordable and adequate for the individual. The PadNavigator™ helps you find the right continence pad when a disposable absorbent product has been recommended following a continence assessment (see www.brightsky.com.au/ClinicalSupport.aspx)
- Where necessary provide a referral to a specialist continence nurse and more information such as from the Continence Foundation of Australia
- Assist in changes to lifestyle and planning (e.g. use of the National Toilet Map).

### Specific interventions

- *Stress incontinence*: encourage use of pelvic floor exercises
- *Urge incontinence*: implement planned bladder-retraining regimens to promote continence or to modify incontinence. These regimens often include timed intervals for toileting; for example, the regimen may start at 2-hourly periods and, if continence is achieved, then the timing is increased until a suitable pattern is attained. Kegel exercises may assist in maintaining continence (Continence Foundation of Australia 2015)
- *Enuresis*: use monitoring devices with an alarm system
- Consider a penile sheath (condom drainage) with tube and collection bag for those male persons suffering neurological damage to the bladder. Before any appliance is fitted, the penis must be cleaned and dried and observation made to ensure that the foreskin is not retracted. The appliance is placed over the penis and secured in position. A special adhesive tape is commonly used and care must be taken to ensure that it is not applied too tightly. The tubing from the appliance is connected to either a bedside collection bag or a leg bag. The penis should be observed for oedema and discolouration; if detected, the appliance is removed immediately and reapplied more loosely. At least every 24 hours the appliance is removed and the penis cleaned and dried before reapplication. Use of such appliances should be discontinued if there are signs of skin excoriation, persistent oedema of the penis or UTI. Refer to Clinical Skill 31.5.

### CRITICAL THINKING EXERCISE 31.1

When Mrs Santi arrives at the doctor's surgery following the birth of her third child, she is tearful and anxious. After careful probing you discover that she no longer socialises for fear of being incontinent. Discuss the factors that may have caused this condition. Suggest nurse-initiated tests to assist in assessment. What interventions would you discuss with Mrs Santi?

## CATHETERS

A catheter is a tube that is inserted into the bladder to drain urine. It is inserted through the urethra or, less commonly, through a small incision in the suprapubic area. A catheter may be inserted to empty the bladder then removed immediately, or it may be left in the bladder. A catheter that remains in the bladder may be either clamped and released at specified intervals, or connected to tubing and a bag to enable continuous drainage. A catheter that remains in the bladder is referred to as indwelling. A self-retaining catheter is used for this purpose. It has a small balloon which sits at the neck of the bladder to prevent the catheter falling out, and which is filled with sterile water after the catheter is inserted.

Catheters are graded according to the French scale, and the larger the number the larger the lumen of the catheter. Sizes range from 1 to 30 French gauge (Fg), and the size is selected to suit the person's needs. The Catheter Compass™ helps you select the right catheter for a person when a urological or continence review has resulted in the

## CLINICAL SKILL 31.5 Applying a sheath/condom drainage device

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Condom catheter<br>Urine drainage bag or leg bag and straps<br>Gloves<br>Adhesive tape<br>Basin with warm water, soap, washcloth, towel |

| **Skill activity** | **Rationale** |
|---|---|
| A condom catheter is used for a male individual who is incontinent but can void on his own. | |
| Identify individual<br>Introduce yourself, explain the procedure to the individual<br>Gain consent | Reduces anxiety and gains individual's consent and cooperation |
| Assess the need for and the individual's willingness to use a condom catheter | If the individual is unwilling, he may detach the condom catheter |
| Raise the individual's bed to appropriate working position based on your height<br>Assist the individual to assume an appropriate position of comfort, ensuring that only the wound area is exposed. Provide for privacy | Promotes comfort and facilitates performance of the procedure |
| Assess the condition of the skin on the penis<br>Use measuring device for circumference of penis | Urine incontinence places the skin at risk for breakdown<br>Allows for correct size to be used and prevents leakage of urine |
| Place the individual in a supine position. Cover the upper torso with a blanket, then fold the sheet down so it covers the legs and can be lowered to expose the genitalia | Provides privacy, dignity and comfort for the individual<br>Prevents unnecessary exposure |
| Prepare the urinary drainage bag for easy attachment to the condom catheter. Roll the wider tip of the condom sheath towards the narrower tip | Prepares the system for use |
| Perform hand hygiene. Apply gloves | Prevents spread of microorganisms |
| Wash and dry the penis and surrounding skin | Cleanses the skin before application of the condom device |
| Apply the double-sided elastic tape in a spiral fashion from the base of the penis downwards (or as manufacturer indicates) | Provides a surface on which the condom catheter can be attached without impeding circulation in the penis. Some condom catheters attach with a velcro strip over the sheath |
| Grasp the penis along the shaft. Hold the condom sheath at the tip of the penis and smoothly roll the sheath onto the penis, leaving 2.5–5 cm of space between the tip of the penis and the drainage tube of the condom sheath | Positions the condom catheter on the penis. Allows free passage of urine into the collecting tube and drainage bag |
| Position the penis downwards and connect the drainage tube to the collection bag | Allows urine to flow into the collection bag |
| Return bed to the low position and make the individual comfortable; place call bell within reach | Provides comfort and security |

*Continued*

| CLINICAL SKILL 31.5 Applying a sheath/condom drainage device—cont'd | |
|---|---|
| Remove gloves and perform hand hygiene | Prevents spread of microorganisms |
| Document the date, condition of the genital area, size and type of sheath applied, type of drainage collection attached to the sheath, amount, colour and character of urine obtained in bag, and the individual's tolerance of the procedure | Medico-legal requirement. Allows for the planning and implementation of care. Documents use of condom drainage |
| Check the penis after 30 minutes and then every 2 hours to ensure catheter is not twisted | Ensures that the catheter is not too tight and impairing circulation; twisting of the catheter impedes urine flow |
| *(Berman et al 2015; Crisp & Taylor 2013; LeMone et al 2011; Lynn et al 2012; Rebeiro et al 2013; Smith et al 2011)* | |

recommendation of an intermittent or indwelling catheter (see www.brightsky.com.au/ClinicalSupport.aspx). It is important that a suitable size is selected to avoid leakage of urine around the catheter, or trauma to the urethra or bladder. Indwelling catheters are for single use only.

## Reasons for catheterisation

One of the most common nosocomial infections in hospital is urinary tract infection and many of these can be attributed to catheterisation (Lo et al 2014). As a result, catheterisation is now performed only when considered absolutely necessary, which may include when:

- Monitoring renal function and output hourly during a critical event
- Facilitating a bladder washout or instilling medication
- A post-surgical event occurs
- Acute/chronic retention occurs
- Using investigative procedures such as urodynamic studies.

Use the Bright Sky Catheter Compass™ to help you identify the type of catheter that best suits the person (see www.brightsky.com.au).

## Insertion of a catheter

The procedure of catheter insertion is called catheterisation and is performed using sterile equipment and aseptic technique. Standard precautions are maintained by all personnel involved. As a catheter can cause trauma to the urethral or bladder mucosa and is a potential source of UTI, it is inserted only when absolutely necessary.

In addition to preparing the equipment, it is necessary to prepare the person by ensuring adequate lighting and privacy, placing the person in a supine position with legs extended and promoting comfort and privacy during the procedure. Refer to Clinical Skill 31.6.

## Bladder irrigation

Bladder irrigation or washout may be performed to ensure patency of the catheter, to remove sediment or blood clots or to introduce an antibiotic or bacteriostatic agent. Bladder irrigation may be continuous or intermittent. To prevent urinary tract obstruction continuous irrigation may be necessary to flush out small blood clots that can form after prostate or bladder surgery. During bladder irrigation, sterile equipment and aseptic technique are used to avoid introducing microorganisms. A triple lumen catheter is needed to perform bladder irrigation. One lumen is used to introduce the irrigating solution into the bladder, a second lumen allows the fluid to drain out and the third lumen allows the instillation of fluid into the balloon that holds the catheter in the bladder.

For continuous irrigation, a container of irrigating solution is suspended on a stand and the tubing from the container is attached to the catheter. Drainage tubing from the catheter is attached to a urine collection bag positioned below the level of the person's bladder. A clamp is used to regulate the rate at which the solution flows into the bladder. During irrigation the inflow and outflow tubing is checked to ensure the free flow of fluid. The outflowing fluid is checked for changes in the appearance and presence of blood clots. Both the inflowing and the outflowing fluid must be measured and documented and the collection bag emptied as necessary. The outflow volume should be greater than the inflow volume—allowing for urine production.

Intermittent irrigation involves the gentle introduction of small amounts of prescribed solution. Using a syringe, the solution is introduced into the distal end of the catheter. Small amounts, 30–50 mL for example, are introduced in succession and usually allowed to drain out by gravity. The technique is repeated until the prescribed amount of solution has been used, or until the return fluid is clear. The solution being introduced and returned is measured and documented, and the return fluid observed for changes in appearance or presence of blood clots.

## Intermittent catheterisation

Intermittent catheterisation is either a one-off procedure to assess the urine within the bladder, or the insertion and removal of a catheter several times a day to empty the bladder. Intermittent catheterisation is widely used in neurogenic bladder dysfunction such as spinal cord injury, spina bifida,

## CLINICAL SKILL 31.6 Catheterisation of females

**Review and carry out the standard steps for all clinical skills/interventions**

**NMBA Decision-making Framework considerations:**

1. Am I educated?
2. Am I authorised?
3. Am I competent?

If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator.

**Equipment:**

Bactericidal alcohol hand disinfection
Procedure trolley/suitable clean surface if in community setting
Catheter pack (basic) containing:

- 1 sterile field 60 × 60 cm
- 2 long trays
- 1 paper dressing towel
- 8 cotton balls
- 2 non-woven swabs 7.5 × 7.5 cm
- 2 fenestrated drapes 50 × 50 cm
- 1 pair exam gloves
- 2 aqua dressing forceps
- Pre-connected catheter drainage

OR
Selection of appropriate catheters (smallest bore catheter possible)—it is advisable to take a spare catheter in addition to the one you want, and one of a different/smaller size
Sterile single-use lubricant (water soluble)
1 pair of sterile gloves
1 pair unsterile gloves
Universal specimen container, if required
Cleansing solution 0.9% sodium chloride
10 mL sterile water (inflation of balloon) or as recommended by manufacturer of catheter
Disposable plastic apron/protective clothing
Sterile catheter drainage bag
Disposable waterproof sheet for bed protection
Catheter drainage bag stand, if required
Sterile 10 mL syringe
Goggles
Catheter securing device (e.g. flexi-track)

| Skill activity | Rationale |
|---|---|
| Identify individual<br>Introduce yourself, explain the procedure to the individual<br>Gain consent<br>Take individual's history | Reduces anxiety and gains individual's consent and cooperation |
| Manage environmental factors prior to commencing procedure | Reduces the risk of contamination by movement, touch and proximity |
| Provide written information to individual | Encourages individual to report any problems that may occur while catheter in situ<br>Individual is more relaxed |
| Perform hand hygiene | Reduces risk of infection |
| Clean appropriately sized trolley, and allow time to dry | Ensures key parts are adequately contained in aseptic field<br>Reduces risk of infection<br>If surface is left wet, asepsis is compromised<br>Prevents cross-contamination |
| Gather equipment and inspect packaging for damage; check sterility, indicators and expiry dates; place equipment required on the bottom shelf | Ensures equipment is sterile<br>Top shelf acts as a clean working surface |

*Continued*

| CLINICAL SKILL 31.6 Catheterisation of females—cont'd | |
|---|---|
| Perform surgical hand scrub as stated by manufacturer | Reduces the risk of healthcare-associated infection and cross-contamination<br>ABHRs are more effective, quicker to use and better tolerated by hands than an antiseptic hand wash, and can be accessed at the point-of-care |
| Open the outer cover of the catheterisation pack, ensuring aseptic technique is maintained, and slide the pack onto the top shelf of the trolley | Aseptic technique aims to prevent pathogenic organisms, in sufficient quantity to cause infection, from being introduced to susceptible sites by hands, surfaces and equipment |
| Open other sterile equipment onto tray, ensuring aseptic technique is maintained:<br>• catheter<br>• 10 mL syringe for balloon inflation<br>• urinary drainage bag | Prepares equipment<br>Sequencing |
| Don goggles | Prevents cross-contamination and catheter-associated urinary tract infection (CAUTI) |
| Perform hand hygiene | Prevents cross-contamination and catheter-associated urinary tract infection (CAUTI) |
| Don sterile gloves | Prevents cross-contamination and catheter-associated urinary tract infection (CAUTI)<br>Sterile gloves are used to minimise the risk of contamination |
| Organise catheter pack contents and other equipment on sterile field ensuring aseptic technique is maintained<br>Connect the catheter to the drainage bag<br>Separate trays<br>Place forceps on field<br>Place swabs in one tray<br>Place cotton balls/swabs in other tray<br>Place 1 × fenestrated drape on field<br>1 paper dressing towel on field<br>Place gloves on field | Maintains an aseptic continuously closed urinary drainage system which will reduce the risk of cross-contamination<br>Creates a protective field |
| Remove sterile gloves and perform hand hygiene | Hands may become contaminated via small defects in gloves or on removal |
| Add other sterile equipment to opened pack that is required ensuring asepsis is maintained<br>Pour saline or cleansing solution into receiver with cotton balls<br>Pour 10 mL water into receiver for inflating balloon<br>Squeeze the lubricating gel into receiver with swabs and water (the lubricant does not need to be antiseptic or anaesthetic) | Decreases risk of contamination if receivers are organised and placed in a position that can be easily utilised<br>The lubricant dilates and lubricates the urethra |
| Perform hand hygiene | Prevents cross-contamination |
| Position the individual<br>Place the individual in the dorsal position, with knees flexed and separated, and feet slightly apart on the bed. If individual is able to position herself she may stay in supine position until required<br>Ensure that the individual is not exposed and maintain warmth | Provides a clear view of the urethral meatus<br>Provides comfort and maintains dignity |

| CLINICAL SKILL 31.6 Catheterisation of females—cont'd | |
|---|---|
| Place a waterproof sheet under the buttocks | Protects the sheet |
| Don gloves | Prevents cross-contamination |
| Carefully pick up receiver with cleansing solution and cotton balls and place between individual's legs | Applies manual handling principles |
| Separate the labia minora so that the urethral meatus is visualised<br>If there is difficulty in identifying the urethral orifice, consider re-positioning the individual (e.g. raising the buttocks; ask individual to place hands on buttocks, therefore lifting buttocks slightly, or turning to left lateral position ensuring you have good lighting) | Reduces risk of introducing microorganisms from the genital/anal area into the urinary tract<br>Provides better access to urethral orifice and helps to prevent labial contamination of the catheter |
| Clean both the labia and around the urethral orifice with sterile normal saline using single downward strokes | Avoids contamination with bacteria from perineum and anus |
| Remove tray and put in waste (bin) | Prevents cross-contamination and decreases risk of contamination field |
| Remove gloves<br>Perform hand hygiene<br>Don sterile gloves | Prevents cross-contamination<br>Sterile gloves can touch sterile field |
| Apply fenestrated drape | Creates and extends protective field |
| Place paper dressing towel across the individual's thighs | Reduces risk of equipment becoming contaminated during the procedure and extends sterile area |
| Fill the syringe with 10 mL of water and place in receiver | Syringe is ready when required |
| Dip tip of catheter into the lubricant | Facilitates easier and more comfortable insertion |
| With your non-dominant hand separate the individual's labia with the swabs, and give traction upwards<br>Pick up the catheter with dominant hand and insert in the meatus. Gently advance the catheter along the urethra until it reaches the bladder and urine flows out.<br>Insert the catheter 2 cm deeper<br>Urine should be visible in drainage tube | Gives a good view of the meatus and minimises the risk of contamination of the urethra<br>Less risk of contamination, and ready for insertion<br>Inadvertent inflation of the balloon in the urethra causes pain and urethral trauma<br>Length of catheter inserted must be in relation to the anatomical structure of the urethra. The average female urethra is about 3.8 cm long |
| If catheter is not to be left in, remove it gently when urine ceases to flow, or the required amount of urine has drained<br>Document amount, colour, odour | Catheters are not left in any longer than necessary, and are removed gently to avoid discomfort |
| If a self-retaining catheter is being used, connect the syringe with the correct amount of sterile water to the port on the catheter, ensure syringe is firmly in place, inflate the balloon slowly with a gentle constant force, having first ensured that the catheter is draining adequately according to manufacturer's instructions | Inflated balloon keeps the catheter in the bladder. Inadvertent inflation with the balloon in the urethra causes trauma and pain<br>Use of less than recommended number of millilitres can result in asymmetrically inflated balloon |
| Remove fenestrated drape and equipment from bed<br>Legs may be straightened | Ensures comfort |

*Continued*

| CLINICAL SKILL 31.6 Catheterisation of females—cont'd | |
|---|---|
| Ensure the drainage bag is kept lower than the catheter and the individual's bladder<br>Never allow the tubing to loop or kink; position the drainage bag at the foot of the bed<br>Support the bag in a holder if required at the end of the bed<br>Ensure bag is not touching the floor; clip tubing to secure tubing to the sheet | Failure to keep drainage bag below the level of bladder and upright can slow emptying of bladder, causing individual discomfort and potentially increasing the risk of contamination of the collection system<br>Position drainage bag in such a way as to avoid individual contact<br>Improperly arranged tubing can kink or hang lower than the drainage bag, leading to impeded flow of urine<br>Urine flows from catheter, along the tubing and into the bag. Avoids blocking the flow of urine through the tubing |
| Secure the catheter to the individual's inner thigh<br>The securement should be placed where the catheter is stiffest, typically just below the bifurcation<br>Ensure that the catheter does not become taut when individual is mobilising | If the catheter is not secured properly, it may migrate from its intended point of stabilisation<br>Stabilising urethral catheters can reduce adverse events such as dislodgement, tissue trauma, inflammation and urinary tract infection<br>Movement-induced trauma can lead to urinary tract infections and tissue necrosis |
| Ensure that the labia are cleaned after the procedure | To avoid skin irritation |
| Help the individual into a comfortable position. Ensure that the individual's skin and the bed are both dry | If the area is wet or moist, secondary infection and skin irritation may occur |
| Measure the amount of urine | To be aware of bladder capacity for individual<br>Monitors renal function and fluid balance |
| Take a urine specimen for laboratory if required | To rule out UTI at time of cauterisation and monitor CAUTI |
| Dispose of equipment in a plastic clinical-waste bag and seal the bag before moving the trolley | To prevent environmental contamination |
| Document:<br>Catheter type/balloon/gauge/length<br>Batch number/lot number<br>Expiry date<br>Date of insertion<br>Reason for catheterisation or changing catheter<br>Individual's reaction to catheterisation and any complaints due to catheter in situ<br>Problems with catheter insertion and type of problem<br>Description of urine, colour and volume drained<br>Specimen collected<br>Identity of person inserting catheter | To provide a point of reference or comparison in the event of later queries |
| *(Australia and New Zealand Urological Nurses Society 2013; Australian Commission on Safety and Quality in Health Care (ACSQHC) 2010; 2011; 2012; 2013; Australian Nursing and Midwifery Council 2002; Berman et al 2015; Crisp & Taylor 2013; Geng et al 2012; Gould et al 2008; Gray 2008; Hanchette 2012; Wound, Ostomy and Continence Nurses Society 2012; Joanna Briggs Institute 2010; Lynn et al 2012; NHMRC 2010a; 2010b; Rebeiro et al 2013; Rowley & Clare 2011; Vahr et al 2013; White et al 2013; World Health Organization 2009)* | |

multiple sclerosis or motor neuron disease. Intermittent catheterisation reduces the incidence of UTI and improves quality of life and allows for self-catheterisation, giving greater independence to the person (Newman & Wilson 2011). Side effects can include bleeding, urethritis, stricture and the potential for UTI. Men may have difficulty inserting the catheter past the prostate while women may have difficulty identifying the urethra (Bardsley 2014).

## NURSING INTERVENTIONS

- Use standard precautions when addressing all catheter care needs
- Maintain accurate and frequent records of catheter care and status of output
- Use accurate documentation and assessment to aid all health professionals in treatment
- Maintain skin integrity

- Support person in accessing further information: persons may find the changes to body image profoundly distressing and assistance may be required in areas of psychosocial and sexual support
- Encourage fluids if medically approved
- Encourage mobility where feasible
- Perform a routine urinalysis to screen for infection or for further underlying disease
- Ensure disposal of urine is via the toilet or as per facility protocol.

Nursing care after the insertion of an indwelling catheter is similar for both male and female persons and is planned and implemented to promote comfort, maintain the flow of urine and minimise the possibility of a UTI. The nurse needs to ascertain whether the catheter is to be clamped and released at specified intervals to provide intermittent drainage or if it is to be connected to a drainage bag for continuous drainage. If intermittent drainage has been prescribed, the end of the catheter is clamped. At specified intervals, for example, every 4 hours, the clamp is released to enable the urine that has accumulated in the bladder to drain. Aseptic technique should be used during this procedure to prevent the entry of microorganisms into the open catheter. An intermittent drainage regimen is commonly implemented before removal of an indwelling catheter, to promote and restore any lost bladder tone.

If continuous drainage has been prescribed, actions to promote free flow of urine and prevent stasis of urine include:

- Standard precautions to be observed at all times and constant awareness of increase for potential of infection in catheterised patents considered at all times
- Positioning the tubing so that it is not obstructed or kinked in any way (see Clinical Interest Box 31.2)
- Maintaining the tubing and drainage bag at a level below the person's bladder
- Ensuring that the person has a fluid input of at least 2000 mL daily, unless this is contraindicated
- Taping the catheter to the inner thigh to reduce movement of the tube to prevent ascending infection. If continuous drainage is being used, the system should remain closed and sterile. If it is necessary to disconnect any part of the system, an aseptic technique must be used. To promote comfort and reduce the risk of ascending infection, the urethral meatus and catheter near the point of entry should be cleansed at least twice daily and whenever necessary, for example, after a bowel action. Cleansing should be performed by wiping in the direction away from the urethral meatus to avoid contaminating the urinary tract. An uncircumcised male's foreskin should be retracted before cleansing, and replaced after cleansing
- Observing the urine at least 8-hourly and any deviations from normal reported immediately. Any inflammation of the urethral meatus, or pain or distension over the bladder area, should also be responded to swiftly. The nurse should observe for signs that urine is not bypassing or leaking around the catheter. This may be caused by bladder spasm, blockage of the catheter or tubing or insertion of a catheter of incorrect size. If leakage occurs it should be reported and documented. To test the patency of a catheter or to remove clots or sediment, a Registered Nurse may perform irrigation of the catheter or the bladder after review by a medical officer
- Taking care not to allow the urine to be drained too rapidly when a catheter is being used to drain urine from an over-distended bladder; for example, during acute retention of urine. Decompressing the bladder too quickly may result in bladder trauma or physiological shock; therefore, no more than 1000 mL should be released at any one time
- Using urine meters (burettes) in conjunction with drainage systems when precise measurements of urine output, such as hourly measurement, are required. A meter is commonly a rigid plastic container attached to the drainage system and is calibrated to measure small volumes
- Using disposable closed drainage sets consisting of tubing and a collection bag. The collection bag is emptied at specified intervals or when it is almost full, and the tubing left in position until the entire set is changed or removed (Figure 31.6). The bag is emptied by releasing the valve at the bottom of the bag, using aseptic technique to avoid introducing infection
- Observing the key steps related to emptying and changing collection bags as outlined in Clinical Skill 31.7.

### CLINICAL INTEREST BOX 31.2 Tubing positioning

If an individual with an indwelling catheter reports that they have a feeling to void, ensure that you investigate this. The problem could be caused by the catheter being kinked, twisted or blocked.

## Removal of a catheter

Depending on how long a catheter has been in position, the medical officer may prescribe bladder retraining before its removal. Bladder retraining involves clamping the catheter for specified periods, such as 2–4 hours, then releasing it to empty the bladder. This technique is repeated for several hours to help restore the bladder's muscle tone. Removing a catheter requires aseptic technique. Key aspects related to the procedure and after care include:

- Obtaining a specimen of urine for laboratory analysis if necessary, before the catheter is removed
- Ensuring that all water from the balloon is withdrawn before removing the catheter

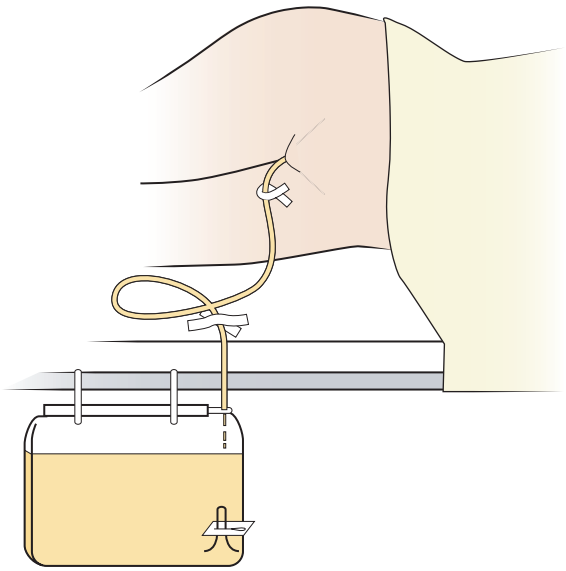

**Figure 31.6** Closed urinary drainage system
*(deWit 2005; redrawn from Potter & Perry 2008)*

- Gently withdrawing the catheter from the urethra, using aseptic technique. If this appears to be difficult ask the patient to relax and gently cough. The catheter may also need a slight rotation to aid withdrawal
- Offering a bedpan or urinal immediately after the catheter is removed, as catheter removal often creates a desire to void
- Encouraging the intake of fluids to stimulate urine production, to dilute the urine and to help decrease any discomfort the person may experience on resuming voiding
- Observing and documenting urine output after the catheter is removed. If the person is voiding only small amounts, the bladder may not be emptying completely, and the medical officer should be informed
- Observing for and reporting any difficulty with voiding, incontinence, dribbling or bladder distension
- Documenting the date and time the catheter was removed and the person's response to the procedure
- Disposing of equipment in line with facility protocols. Refer to Clinical Skill 31.8.

## CLINICAL SKILL 31.7 Emptying collection bags

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Gloves<br>Jug<br>Goggles<br>Waterproof apron/gown |
| **Skill activity** | **Rationale** |
| To empty a bag, maintain an aseptic continuously closed urinary drainage system (i.e. minimise unnecessary opening of the system), but empty catheter bags frequently enough to maintain urine flow and prevent reflux. | |
| Perform hand hygiene<br>Don disposable gloves when handling the system<br>Don goggles<br>Don waterproof gown | Effective intervention for preventing healthcare-associated infection (HAI) in procedures that generate splashes or sprays<br>Emptying catheter bag requires protective eyewear/full-length face shield<br>Gloves can protect both individuals and healthcare workers from exposure to infectious agents that may be carried on hands<br>As part of standard precautions, don waterproof gown (single-use plastic aprons are recommended for general use when there is the possibility of sprays or spills to protect clothes that cannot be taken off) |
| Place the jug below the valve and release valve, avoid splashing and prevent contact of the drainage spigot with the non-sterile collecting container | Allows urine to drain from the bag into the jug |
| When the bag is empty, tighten the valve | Prevents subsequent drainage of urine out of the bag |
| Remove the jug, observe the urine and measure | Assists in evaluating the individual's urinary status |

## CLINICAL SKILL 31.7 Emptying collection bags—cont'd

| | |
|---|---|
| Empty urine from jug into sluice, rinse the jug, place the container in the pan washer, remove PPE and wash if required, return them to their home, perform hand hygiene | Prevents cross-contamination |
| Report any deviations from normal and document accordingly | Appropriate care can be planned and implemented |
| Ensure the drainage bag is kept lower than the catheter and the individual's bladder<br>Never allow the tubing to loop or kink<br>Position the drainage bag at the foot of the bed<br>Support the bag in a holder if required at the end of the bed<br>Ensure bag is not touching the floor, clip tubing to secure tubing to the sheet | Failure to keep drainage bag below the level of bladder and upright can slow emptying of bladder, causing individual discomfort and potentially increasing the risk of contamination of the collection system<br>Position the drainage bag in such a way as to avoid individual contact<br>Improperly arranged tubing can kink or hang lower than the drainage bag, leading to impeded flow of urine<br>Urine flows from catheter, along the tubing and into the bag. Avoids blocking the flow of urine through the tubing |
| Ensure the catheter is secured to the individual's inner thigh. The securement should be placed where the catheter is stiffest, typically just below the bifurcation | If the catheter is not secured properly, it may migrate from its intended point of stabilisation<br>Stabilising urethral catheters can reduce adverse events such as dislodgement, tissue trauma, inflammation and urinary tract infection<br>Movement-induced trauma can lead to urinary tract infections and tissue necrosis<br>Prevents movement and urethral traction |
| Measure the amount of urine | To be aware of bladder capacity for individuals<br>Monitors renal function and fluid balance |
| Document procedure in healthcare record<br>Description of urine, colour and volume drained<br>Inform the individual how to care for the device | To provide a point of reference or comparison in the event of later queries |
| *(White et al 2013; NHMRC 2010a; 2010b; Geng et al 2012; Vahr et al 2013)* | |

## CLINICAL SKILL 31.8 Removal of indwelling urinary catheter

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Disposable gloves<br>Goggles<br>Syringe for deflating balloon<br>Disposable pad (to protect bed)<br>Gauze swabs/disposable wipes |
| **Skill activity** | **Rationale** |
| Check volume of water that was inflated into balloon (this will be written in nursing progress note from insertion and is also located on the port for balloon inflation/deflation) | To confirm how much water is in the balloon<br>To ensure balloon is completely deflated before removing catheter |
| Position individual and place waterproof sheet in area where spillage may occur | Absorbent pad will collect any spilt urine and prevent bed from becoming wet |

*Continued*

| CLINICAL SKILL 31.8 Removal of indwelling urinary catheter—cont'd | |
|---|---|
| Perform hand hygiene | Prevents spread of infection |
| Open syringe ensuring asepsis is maintained<br>Slide the plunger of the syringe up and down the barrel of the syringe several times to 'loosen it up' | Prevents spread of infection<br>Ensures withdrawal of plunger occurs and it does not adhere to the front of the syringe barrel |
| Back off luer lock or slip tip syringe to 0.5 mL and insert into the inflation port<br>Allow the pressure within the port to force the plunger back and fill the syringe with water<br>Do not use suction on the syringe but allow the solution to come back spontaneously | Auto-deflation and excision of inflow channel are best methods of catheter deflation<br>Painless urinary catheter removal<br>Pressure profilometry shows balloon cuffing is associated with increased balloon retention force<br>Increase in balloon retention force increases the tube friction force (exponential relationship) |
| Check amount of fluid in syringe corresponds to that which was inserted at insertion<br>Remove syringe and discard contents | Ensures balloon is completely deflated before removing catheter |
| Ask individual to breathe in and then out: as individual exhales, gently remove the catheter, placing it on the waterproof sheet or wrapping the catheter in your glove. (Male individuals should be warned of discomfort as the deflated balloon passes through the prostatic urethra) | Relaxes pelvic floor muscles |
| If catheter does not easily come out, stop, inform RN | Failure of balloon to deflate<br>Trauma to urethra if catheter removed while water in balloon |
| Clean meatus using gauze/disposable wipe, clear away equipment, make the individual comfortable | Provides comfort and dignity for the individual |
| Remove gloves and perform hand hygiene | Principles of 5 moments |
| Dispose of catheter and drainage system in appropriate waste | Reduces risk of cross-contamination to others |
| Inform individual to notify you when they void and amount<br>May need to scan bladder with bladder scanner to assess whether there is any residual urine | Ensures they have voided post removal of IDC<br>Monitors residual in bladder |
| Report any deviations from normal and document accordingly | Ensures appropriate care can be planned and implemented |
| Document procedure in healthcare record stating time of removal, description of urine, colour and volume drained, amount in stating R/O IDC | Provides a point of reference or comparison in the event of later queries |
| *(White et al 2013; NHMRC 2010a; 2010b; Chung & Kirkland 2012; Geng et al 2012; Vahr et al 2013)* | |

## SPECIALIST UROLOGY NURSING ACTIVITIES

The nurse may be required to assist in the preparation of a person before specific diagnostic procedures and to monitor their condition afterwards. Catheterisation may be necessary to obtain a specimen of urine or to treat acute urinary retention.

### Urinary diversion

A person whose bladder has been removed, for example because of malignancy, will require urinary diversion. Various surgical techniques that divert the flow of urine are available (Figure 31.7):

- Ureterosigmoidostomy involves the implantation of the ureters into the sigmoid colon, resulting in urine being passed via the rectum

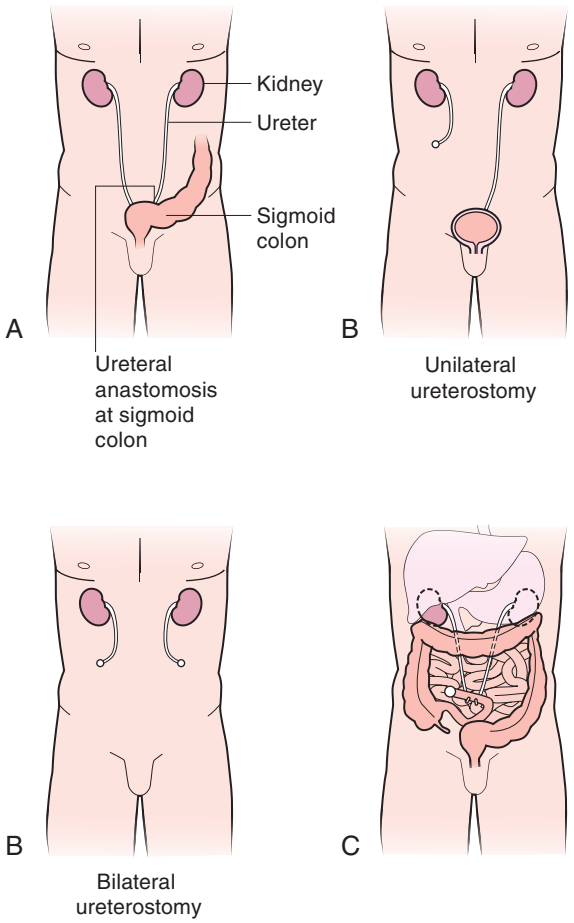


**Figure 31.7** Urinary diversion

A Ureterosigmoidostomy B Cutaneous ureterostomy C Ileal conduit

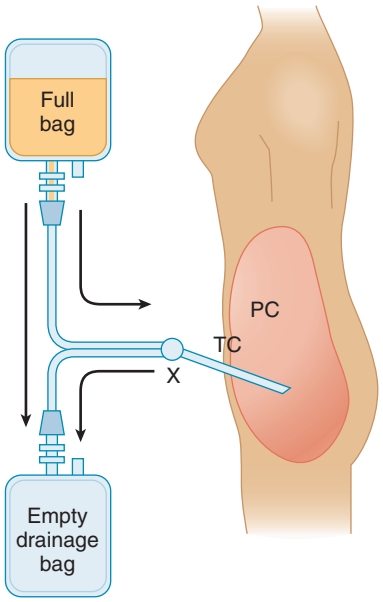


**Figure 31.8** Peritoneal dialysis

*(Greenberg 2009)*

- Cutaneous ureterostomy involves bringing the ureters through the abdominal wall, with urine draining out through the stoma(s) into an ostomy appliance
- Ileal conduit involves resection of part of the ileum. Both ureters are implanted into the proximal end of the ileal segment, and the distal end of the ileum is brought through the abdominal wall to form a stoma. The urine then drains out through the stoma into an ostomy appliance. This particular surgical technique is generally considered to be the most satisfactory if urinary diversion is required.

Care of the person with a urinary stoma is similar to the care required by a person who has a stoma created for the passage of faeces. The main aspects of care are the selection and management of ostomy appliances, care of the stoma and surrounding skin and provision of psychological support.

## Dialysis

Chronic kidney disease (CKD) and dialysis treatment is a serious health issue requiring a multifaceted approach to treatment, including medication, monitoring of fluid and diet intake and a plan which incorporates the concerns and impact on family and carers (Lemmon & Nurse 2015). Dialysis is a specialised nursing function which centres on delaying the progression of disease, preventing further complications and administering and maintaining the dialysis program. It involves the transfer of solutes across a semi-permeable membrane, and the removal of waste products, excess salts and fluid from the blood. The method of dialysis is determined by the person's condition and may be performed by the person at home if the facilities are available, in a specialised unit or a in mobile dialysis unit in rural and remote settings.

There are two types of dialysis: peritoneal dialysis (Figures 31.8 and 31.9) and haemodialysis.

In peritoneal dialysis the person's peritoneum provides the semi-permeable membrane. The procedure may be performed on an intermittent or continuous basis. A catheter is placed in the abdominal cavity, and dialysate is instilled through the catheter. Through diffusion and osmosis, waste products together with excess electrolytes and fluid are transported from the blood into the dialysate.

In haemodialysis the semi-permeable membrane is contained within a dialysis machine. Haemodialysis is performed an average of three times per week for a period of 4–6 hours. This method requires regular and convenient access to the person's blood circulation. Several systems are available that provide this access, including an arteriovenous shunt or the creation of an arteriovenous fistula. An arteriovenous shunt is an artificial passageway that allows blood to flow from an artery to a vein without going through a capillary network (Figure 31.10A). An arteriovenous fistula is created surgically

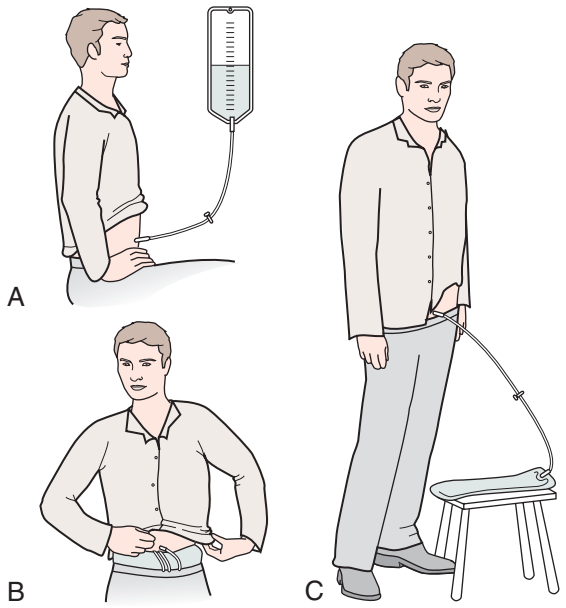


**Figure 31.9** Continuous ambulatory peritoneal dialysis (CAPD)

A: A bag of dialysate is attached to a tube in the person's abdomen so that the fluid flows into the peritoneal cavity B: While the dialysate remains in the peritoneal cavity, the individual can roll up the bag, place it under their clothes and go about their normal activities C: The bag is unrolled and suspended below the pelvis, which allows the dialysate to drain from the peritoneal cavity

to provide vascular access for haemodialysis (Figure 31.10B). During haemodialysis, the person's blood is passed through the artificial kidney (haemodialysis machine) and then returned to the person's own circulation. The person's blood is anticoagulated during haemodialysis to prevent clotting in the tubing and machine. Although dialysis is a lifesaving treatment, it is nonetheless accompanied by risk.

## Nursing intervention

Once a person commences dialysis they have to deal with considerable changes to their lifestyle. These changes may impact on the person psychologically, resulting in depression, anxiety, feelings of guilt and fear of death. They may have to deal with changes in the role in family, changes in employment status, financial concerns and a reduced social network (Rayyani et al 2014). Many persons self-manage their dialysis. The time and support needed varies greatly from person to person; the nurse's role is to be in partnership with the person to generate optimum health outcomes by:

- Creating a connection with the person to promote self-esteem, dignity and independence
- Planning support and care with person, carers and health professional team which is both person-centred and relationship-centred
- Maintaining standard precautions when addressing all care needs
- Maintaining accurate and frequent records of care

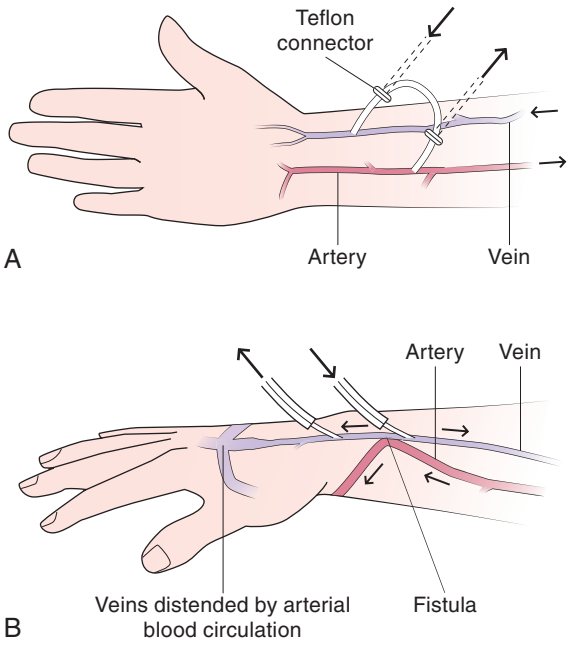


**Figure 31.10** A: Arteriovenous shunt B: Arteriovenous fistula *(Game et al 1989)*

- Using accurate documentation and assessment to aid all health professionals in treatment
- Monitoring vital signs, weight and urinalysis
- Encouraging therapeutic lifestyles, such as stopping smoking, safe alcohol intake and increased sustainable exercise
- Encouraging maintenance of and providing support for diet and/or fluid restrictions
- Relieving pain: if a person is experiencing pain, the cause should be identified and treated. The nurse should report any complaints of pain immediately to the Registered Nurse or medical officer
- Frequently assessing puncture sites for peritoneal dialysis and haemodialysis fistulae sites for infection and bleeding. Table 31.5 outlines the complications of dialysis.

### CRITICAL THINKING EXERCISE 31.2

Mr Dobson has been admitted to a surgical urology ward to commence treatment for renal failure. He lives in a small town 150 km from the nearest medical centre. What aspects would you need to consider in his long-term care? How would you commence a care plan based on person-centred care for this person? Where would you direct him for long-term information on his condition?

## Renal transplant

Renal transplant is a surgical procedure replacing an individual's failed kidney with a healthy kidney from a donor. The recipient's own kidney may be either left or removed.

The donor ureter is anastomosed either to the recipient's ureter or to the recipient's bladder. The transplanted kidney usually begins to produce urine within a very short time after the operation.

Close monitoring of the person after surgery is essential to assess renal function and to detect early signs of rejection of the new kidney. To help prevent graft rejection, which may occur within 1–30 days or up to several years after the transplant, immunosuppressive drugs are administered. As immunosuppressive drugs increase the risk of infection, protective isolation techniques may be implemented. A successful kidney transplant enables the person to lead a life free from the restrictions associated with dialysis therapy. However, immunosuppressive therapy will need to be continued as well as close monitoring of renal function and general health status. There are ethical, cultural and religious divides concerning the transplantation of organs and these issues need to be treated with sensitivity (Lemmon & Nurse 2015).

**TABLE 31.5 | Complications of dialysis**

| Peritoneal dialysis | Haemodialysis |
|---|---|
| Peritonitis | Haemorrhage, from heparinisation or from accidental disconnection of the apparatus |
| Obstructed catheter due to fibrin clot formation | Infection, at the insertion site or from contaminated equipment |
| Excessive protein loss | Thrombosis at the insertion site |
| Hyperglycaemia, if the dialysate contains high level of dextrose | Oedema of the hand or ischaemia of the fingers, as a result of the shunt or fistula |
| *Candida* or herpes zoster infections | Air embolism |
| Abdominal hernia or uterine prolapse, due to persistently raised intra-abdominal pressure | Hypotension from fluid and sodium removal |
| Psychological reactions to the therapy (e.g. anger or depression) | Psychological reactions to the therapy (e.g. anger or depression) |
| Perforation of abdominal structures by the catheter | Hypothermia or hyperthermia as a result of a malfunctioning thermostat on the machine<br>Hypertension (e.g. from fluid overload) |

*(Tzanakaki et al 2014)*

## DECISION-MAKING FRAMEWORK EXERCISE 31.1

You are the Enrolled Nurse who is looking after Jane Stewart post abdominal hysterectomy. Jane complains that she can't pass urine and has abdominal pain with a scale of 8/10. You did bladder scanning and there is 800 mL urine in the bladder. You have informed the medical officer who ordered an indwelling catheter to be inserted. You have only inserted a catheter once as a student and you don't feel confident. (Review Progress Note Example 31.1 as a sample of how this case information would have been documented.)

Jane is in excoriating pain.

1. What are you going to do in this situation?
2. Is your decision in the person's best interest and why?

## PROGRESS NOTE EXAMPLE 31.1

| | |
|---|---|
| 24/06/15<br>1430 hrs | Nursing: Ms Jane Stewart at 1230 hrs complained that she was not able to pass urine and had an abdominal pain score of 8/10. Bladder scanning showed 800 mL in the bladder (refer to print out). Dr Williams was informed and ordered size 12FG indwelling catheter to be inserted. Catheter size 12FG inserted aseptically by RN Judson at 1330 hrs. Catheter drained 750 mL of urine straight away. Catheter left in situ, urine output to be measured hourly, fluid balance chart implemented. Ms Stewart stated she felt so much better and reported no pain.<br><br>***E. Lewis* (Lewis) EN** |

## Summary

The urinary system is essential for homeostasis. It is the means by which the body rids itself of a variety of metabolic wastes and maintains fluid and electrolyte balance. The urinary system consists of the kidneys, the ureters, the urinary bladder and the urethra. The kidneys filter the blood to maintain its normal composition, volume and pH. In carrying out this function, the kidneys secrete urine.

Urine forms by the processes of filtration, selective reabsorption and secretion. Urine is composed of water, urea, mineral salts, uric acid and creatinine. When the kidneys form urine it passes down the ureters by peristaltic action to the bladder. It is then stored in the bladder until micturition is initiated and is excreted from the body through the urethra. Micturition is initiated when the bladder walls are stretched, usually when the bladder holds about 300 mL of urine. Urine is a waste product of metabolism, and regular elimination is necessary for the maintenance of normal body function. Elimination of urine is affected by various factors ranging from the intake of food and fluids to the changes that occur as a result of certain disease states.

As part of the assessment of a person's elimination status, urine is observed and tested in the ward or sent to the laboratory for analysis. The nurse must ensure that specimens are collected and tested correctly so that accurate results are obtained.

Problems associated with the elimination of urine may occur, and the implementation of certain nursing actions may be necessary to assist the person to meet elimination needs. All procedures must be thoroughly understood so that the desired effects are achieved and safety and comfort are promoted.

Normal functioning of the urinary system may be impaired as a result of changes in kidney structure, changes in the ability of the kidneys to secrete and excrete urine or alterations in the passage of urine through the urinary tract. The major problems associated with urinary system disorders are pain, changes in voiding pattern or urine output and changes in the urine. Disorders of the urinary system can be classified as those that are congenital, resulting from multiple causes, infectious, immunological, degenerative, neoplastic, obstructive or traumatic in origin.

Diagnostic tests used to assess urinary system function include laboratory analysis of urine, blood and tissue, radiological examination and endoscopy.

Care of the person with a urinary system disorder includes preventing and managing altered elimination of urine, promoting comfort, maintaining skin integrity and maintaining nutritional and fluid status. Nursing activities include observation and collection of urine and assisting in the care of a person who requires intervention to eliminate urine.

Of primary importance is the need to support the person in what can be an intensely embarrassing time which impacts on their personhood. Sensitivity, education, maintenance of dignity and appreciation of the psychosocial changes often experienced by persons with chronic conditions are key to successful nursing outcomes. As the act of urination is a personal one, cultural differences are often not expressed or understood in the wider multicultural societies of Australia and New Zealand so the nurse needs to investigate these differences with understanding and compassion.

## Review Questions

1. All of the following are normally found in the excreted urine except:
   water
   glucose
   urea
   mineral
2. List indications for urinalysis:
   on admission
   when suspecting UTI
   on discharge
   when a patient is on FBC
3. Why do urinary tract infections occur in women more than in men?
4. List the disorders that affect urinary elimination.
5. List different types of urinary incontinence.
6. Describe at least three (3) different aids used for incontinence.
7. List at least six (6) diagnostic tests that may be performed to determine urinary function.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

agingcare.com/Articles/urinary-tract-infections-elderly-146026.htm

Andrology Australia (men's health): www.andrologyaustralia.org

Auckland Sexual Health: www.ashs.org.nz/fact_sheets.html

Australian Council of Stoma Associations Inc.: www.australianstoma.com.au

Continence Foundation of Australia: www.continence.org.au/

Homeostasis, a multimedia resource: www.phys.unsw.edu.au/biosnippets/

Kidney Health Australia: www.kidney.org.au

webmd.com/urinary-incontinence-oab/tc/urinary-problems-and-injuries-age-12-and-older-topic-overview

# Nursing care: bowel elimination and continence

*Kelly Gray*

CHAPTER 32

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define key terms relating to the digestive system
- Describe the anatomical position and structure of the digestive system
- Describe the physiological functions of the various areas of the digestive system
- Explain how the presence of bile influences the colour of faeces
- Describe normal faeces and the defecation process
- Identify the factors that affect bowel elimination
- Identify appropriate nursing actions to assist the individual to meet their bowel elimination needs
- Perform procedures described in this chapter accurately and safely, including the observation, collection and testing of faeces, assisting individuals with bowel elimination and changing ostomy devices
- Briefly describe the specific disorders of the digestive system
- Describe the diagnostic tests that may be performed to assess digestive system function
- Consider the psychosocial aspects of care from a person-centred and relationship care perspective
- Employ critical thinking to provide care for individuals with alterations in bowel elimination

## KEY TERMS

colon
colostomy
constipation
defecation
diarrhoea
endoscopy
enema
faeces
flatulence
haemorrhoids
hepatitis
ileostomy
impaction
incontinence
peristalsis
peritoneum
stoma
stomatitis
suppository

## CHAPTER FOCUS

The digestive process enables consumed food and fluids to be broken down into nutrients and electrolytes that can be absorbed by the body for cell energy and function. Various factors that influence normal bowel elimination are explored in this chapter. Observation of the individual's ability to eliminate faeces, together with observation of the faeces, provides the nurse with an objective assessment of the individual's bowel elimination status. As a result, nursing care may be planned and implemented in conjunction with the individual and other healthcare providers to meet bowel elimination needs in a dignified and appropriate manner.

## LIVED EXPERIENCE

I have suffered with constipation all my adult life and have needed to use laxatives regularly. After a conversation with the practice nurse at my medical clinic I now realise that changes to my diet and eating habits, exercising more and altering and increasing what I drank, like having more water, have had a positive impact on my bowel health.

**Rosa, 50 years, Financial Manager**

# THE DIGESTIVE SYSTEM

The digestive process enables consumed food and fluids to be broken down into nutrients and electrolytes that can be absorbed by the body for cell energy and function. This process is achieved through five basic activities: ingestion, movement of the food, digestion, absorption and defecation (Lloyd Jones 2015). Any condition that causes a change in these activities can have a detrimental impact on the person's health and quality of life. Healthy bowel function is maintained by routine elimination habits, a nutritional diet with the recommended amount of fibre and fluid intake and daily mild exercise to stimulate colonic motility. The various factors that can affect normal digestion and bowel elimination are explored in this chapter. Observation of the individual's ability to eliminate **faeces**, together with observation of the faeces, provides the nurse with an objective assessment of the individual's bowel elimination status.

## The digestive process

The digestive system is comprised of the gastrointestinal (GI) or alimentary tract and the accessory organs of digestion which include salivary glands, the liver, pancreas and gallbladder (Kozier et al 2014; Johnstone et al 2014). The GI tract is a muscular tube about 9–10 m in length, which extends from the mouth to the anus (Figure 32.1). The structure of the GI tract is similar for most of its length and consists of an outer covering, middle layers of involuntary muscle and connective tissue and an inner mucous membrane lining (Johnstone et al 2014) (Figure 32.2).

The inner mucous membrane lining which can be found in the mouth and the oesophagus, acts as a protective surface against scratches or grazes which can be caused by food travelling through the oesophagus (Johnstone et al 2014). This layer also secretes mucus into the digestive tract.

The submucosa is composed of connective tissue which contains many large blood and lymph vessels. This layer allows the gastrointestinal tract to stretch to allow food to pass through it (Johnstone et al 2014). It also contains muscles that propel the food through the tract (Johnstone et al 2014).

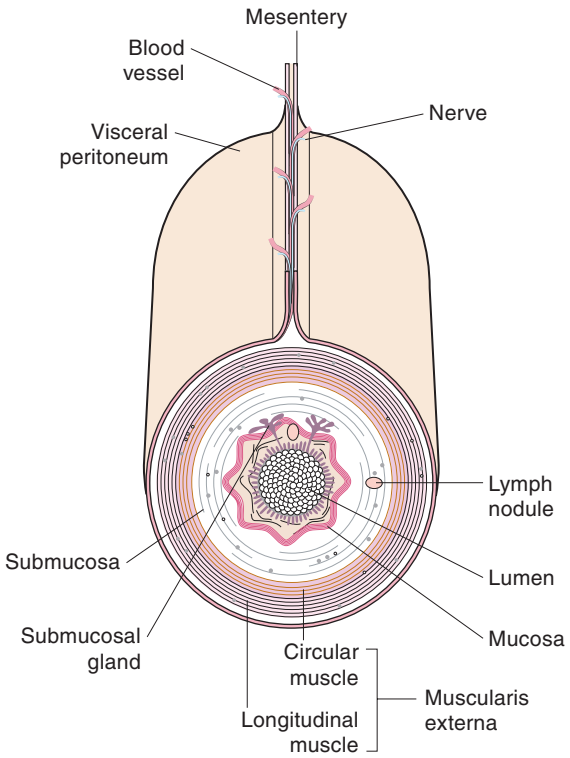


**Figure 32.1** Structure of the alimentary canal

The outer covering of the GI tract consists of fibrous tissue (the serosa) or, in the abdomen, the peritoneum. The **peritoneum** is a double-layer serous membrane that secretes serous fluid to prevent friction between the abdominal organs. The peritoneum forms a lining for the abdominal cavity (parietal layer) and a covering for most of the abdominal organs (visceral layer). The mesentery, which is formed by the

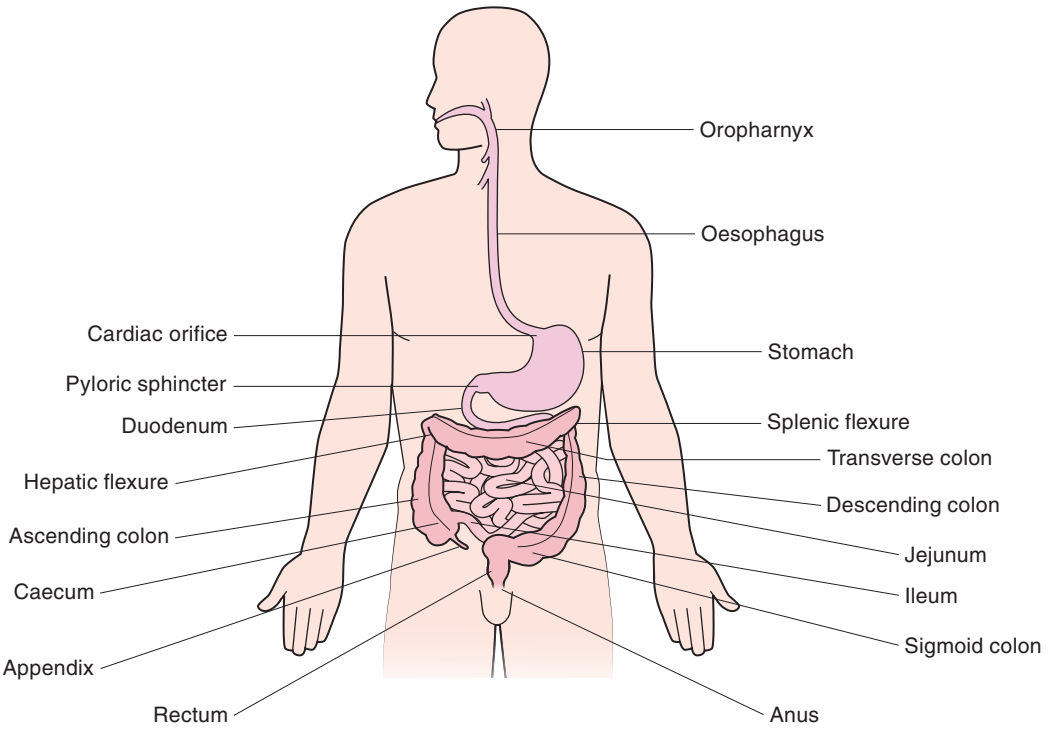


**Figure 32.2** The parts of the alimentary canal

peritoneum, covers the intestines and attaches them to the posterior abdominal wall.

The organs that make up the GI tract are the mouth, the oropharynx, the oesophagus, the stomach, the small intestine and the large intestine.

## The mouth

The process of ingestion usually begins in the mouth. The mouth, or oral cavity, has boundaries of muscle and bone and is lined by mucous membrane. The lips protect its anterior opening and keep food in the mouth (Johnstone et al 2014). The cheeks form the lateral walls, the hard palate forms its anterior roof and the soft palate forms its posterior roof. It also contains the uvula, a finger-like muscular projection hanging down from the midline of the soft palate which prevents food from entering the nasopharynx during swallowing (Johnstone et al 2014).

***Components of the mouth*** The mouth contains the tongue, the teeth and the salivary glands. Once food is placed in the mouth, the teeth break down the food into smaller particles through chewing. The teeth are embedded in the maxillae and the mandible. All teeth have the same basic structural organisation but differ in shape and size. Each tooth is made up of an ivory-like substance called dentine; a central pulp cavity containing blood and lymphatic vessels, nerves and connective tissue; and a thin layer of enamel covering the crown. In children there are 20 deciduous (milk) teeth, consisting of 10 in each jaw; in adults there are 16 permanent teeth in each jaw. In each jaw there are four incisors, used for biting; two canines, used for tearing; four premolars, used for crushing; and six molars, used for grinding. A wisdom tooth is the third molar tooth and it is the last tooth to erupt. Wisdom teeth usually erupt from ages 18 to 25 years.

The salivary glands (an accessory digestive organ), of which there are three pairs, pour secretions into the mouth. Saliva is a watery fluid containing ions, mucin and the digestive enzyme salivary amylase. Salivation is largely initiated by sensory stimulation, including the presence of food in the mouth, and by taste and smell. Saliva has the following functions:

- Moistens and softens food
- Contains mucin, which acts as a lubricant to aid swallowing
- Moistens the mouth
- Has an antibacterial activity
- Enables molecules to dissolve on the surface of the tongue and stimulate the taste buds
- Contains the enzyme salivary beta-amylase, which begins the chemical digestion of starch.

The salivary glands produce approximately 1 L of saliva per day (Patton & Thibodeau 2013).

The tongue consists of a mass of voluntary muscle and is covered by squamous epithelium. On the upper surface of the tongue there are many small projections called papillae, which contain taste buds, the sensory endings of the nerve that perceives taste (Johnstone et al 2014). The taste buds also stimulate secretions from the stomach, pancreas and gallbladder in preparation for the digestion of food (Johnstone et al 2014). The tongue is a very mobile organ which is important in the chewing (mastication) of food, the formation of a bolus and swallowing the formed bolus of food, and is also essential for speech.

## The pharynx

The next phase of digestion involves the movement of food. From the mouth the food is moved into the pharynx. The pharynx is a tube that begins behind the nose and ends at the top of the oesophagus and trachea (Sander & Dark 2014). The pharynx is divided into three sections: the oropharynx, the laryngopharynx and the nasopharynx. The oropharynx and the laryngopharynx are shared by the respiratory and the digestive systems (Johnstone et al 2014).

The oropharynx is the muscular canal forming the passage between the oral cavity and the major parts of the GI tract. Food is moved from the mouth into the oropharynx through swallowing (Johnstone et al 2014). The laryngopharynx is a common passageway for both food and air. The epiglottis prevents food from entering the trachea and this ensures that food progresses through to the oesophagus (Johnstone et al 2014). If food is inhaled this will cause coughing and, in severe cases, respiratory distress.

## The oesophagus

The food continues its movement through the digestive system by moving from the pharynx to the oesophagus. The oesophagus is a muscular tube about 20–25 cm long, extending from the pharynx above to the stomach below (Johnstone et al 2014). It lies behind the trachea, is midline through the neck and thorax, and passes through the diaphragm to join the stomach. The oesophagus has an outer layer of fibrous tissue, a layer of involuntary muscle, a layer of connective tissue and a lining of mucous membrane. The function of the oesophagus is to carry food to the stomach by means of peristaltic action.

**Peristalsis** is a wave-like progression of alternate contraction and relaxation of the muscle fibres of the oesophagus or intestines, by which contents are propelled along the GI tract. The mucosa of the oesophagus secretes mucus which acts as a lubricant and assists in the movement of food (Johnstone et al 2014). At rest, the opening between the oesophagus and pharynx (oesophageal sphincter) is closed. During swallowing the muscles contract causing the sphincter to open, allowing the bolus of food to pass down into the oesophagus. A wave of contraction in the circular muscle layer then propels the bolus down to the stomach (Lloyd Jones 2015). The bottom end of the oesophagus acts as a functional sphincter; as the peristaltic wave approaches the sphincter, the muscle relaxes and allows food to enter the stomach. The sphincter then closes again and prevents regurgitation of gastric contents back into the oesophagus (Lloyd Jones 2015).

## The stomach

The stomach is where the process of digestion begins. The stomach (Figure 32.3) is located in the upper left quadrant of the abdomen and is commonly described as being 'J shaped'. However the size and shape of the stomach can vary according to its contents. The stomach looks small when empty but can increase in size in response to the amount of food the individual consumes (Johnstone et al 2014). The stomach is divided into five areas: the cardia, the fundus, the body, the antrum and the pylorus (Marieb & Hoehn 2013). The cardia is the first section of the stomach closest to the oesophagus. A functional sphincter called the cardiac sphincter allows food from the oesophagus to enter the stomach. The fundus is the upper rounded portion of the stomach, the body is the main part of the stomach, and the antrum is the lower part of the stomach. The pylorus acts as a valve to control emptying of the stomach contents into the small intestine.

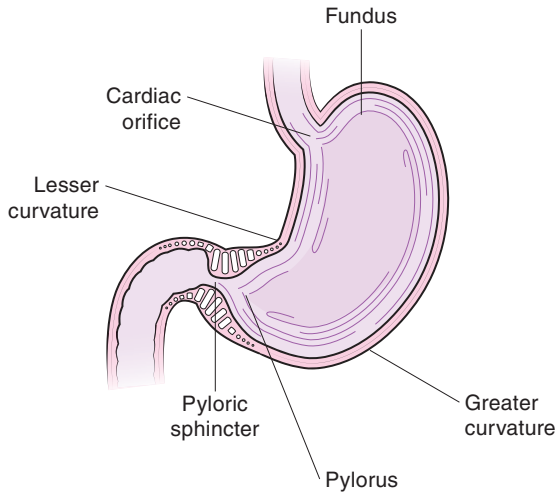


**Figure 32.3** The stomach

Within minutes of entering the stomach mechanical and chemical breakdown of the food occurs (Lloyd Jones 2015). Contraction of the stomach muscles mixes the food with gastric juices and assists in breaking down the ingested food. The body produces an estimated 2 L of gastric secretions a day (Waugh & Grant 2014) which include:

- Hydrochloric acid, which is released in response to the hormone gastrin, and activates pepsins, providing an optimal pH for pepsin activity, and destroys bacteria
- Intrinsic factor, which is vital for the absorption of vitamin B12 from the diet, which is needed for the development of erythrocytes
- Mucus, which is secreted by the surface cells of the stomach mucosa and forms a lining that protects the mucosal cells from the gastric contents
- Gastric enzymes (pepsinogens), which are inactive until exposed to hydrochloric acid, when the active pepsins are released. Pepsins act as a catalyst in the chemical breakdown of protein, forming polypeptides and free amino acids.

The secreted gastric juices break down the food into chyme which has a semi-solid consistency (Johnstone et al 2014). The contractions of the stomach muscles move the chyme to the pyloric sphincter where small amounts of chyme are pushed through into the small intestine (Johnstone et al 2014). The stomach acts as a temporary reservoir for food, stores the food and later releases it at a rate that is optimal for digestion. The rate of emptying of the stomach depends on the:

- Consistency of the chyme
- Degree of opening of the pyloric orifice

- Force of the peristaltic contractions
- Type of food in the stomach (fats tend to delay emptying, while carbohydrates are usually emptied quickly).

The average time for the stomach to empty after a meal is 4–6 hours. The gastrocolic reflex is a physiological reflex controlling peristalsis; it involves an increase in motility of the colon in response to fullness in the stomach and digestion in the small intestine. This reflex is responsible for the urge to defecate following a meal.

## The small intestine

The process of digestion continues in the small intestine and this is where the majority of absorption also takes place. The small intestine is a coiled muscular tube about 5–6 m in length, extending from the pyloric end of the stomach to the large intestine (Johnstone et al 2014). The small intestine is divided into several anatomically recognisable areas: the duodenum; the proximal section, which is the widest section and is about 20 cm long and curved; the jejunum, which is the middle section and is about 2.5 m long; and the ileum, which is the distal section and is about 4 m in length (Johnstone et al 2014).

Intestinal glands in the mucous membrane secrete an intestinal juice containing enzymes to complete the digestion of food. An opening in the duodenum (ampulla of Vater) allows for the entry of the common bile duct, carrying bile from the liver, and the pancreatic duct, carrying pancreatic juice. The absorption of nutrients such as iron, calcium and fat-soluble vitamins A, D, E and K from the ingested food takes place in the small intestine (Lloyd Jones 2015). At the junction of the ileum and the caecum of the large intestine is the ileocaecal valve, which prevents a backward flow of contents from the large to the small intestine.

The wall of the small intestine is capable of several different types of movement:

- Peristalsis, which ensures an onward movement of the contents of the intestine
- Segmentation, which ensures mixing of the intestinal contents. Segmentation contractions occur regularly, causing the chyme to be broken up into segments. Breaking the chyme into segments increases the surface area of chyme that is in contact with the mucosal membrane of the small intestine, thus increasing the rate of absorption (Johnstone et al 2014). Chyme enters the caecum through the ileocaecal valve, which is normally closed but opens briefly to allow a small amount of chyme through with each peristaltic wave.

## The large intestine

By the time chyme enters the large intestine most of the absorption has taken place (Lloyd Jones 2015). The main function of the large intestine is the formation and expulsion of faeces (Johnstone et al 2014). The large intestine is a muscular tube about 1.5 m in length and 6 cm in diameter, which extends from the end of the ileum to the anus (Figure 32.4) (Johnstone et al 2014). Lying in the abdominal and pelvic cavities, the large intestine may be divided into regions that are distinguished by their anatomical structure and position:

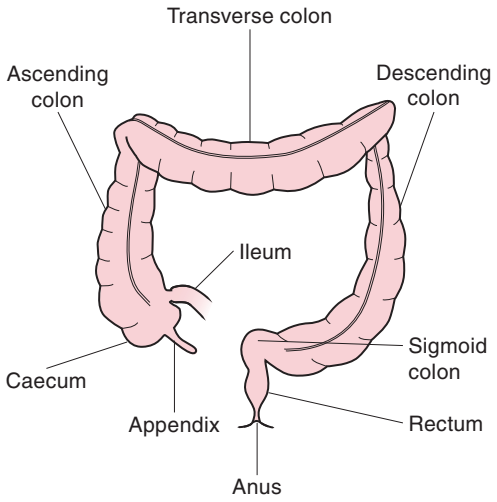


**Figure 32.4** The large intestine

- The caecum, a blind-ended sac about 6 cm long and 7.5 cm in diameter, leads into the ascending **colon** and has the appendix attached. Studies suggest that the appendix is part of the immune system within the body
- The ascending colon, which is about 15 cm long and passes up the right side of the abdominal cavity to the lower surface of the liver
- The transverse colon, which is about 50 cm long and crosses the upper abdomen from right to left then curves in the vicinity of the spleen
- The descending colon, which is about 25 cm long and passes down the left side of the abdomen to the left iliac region
- The sigmoid colon, which is variable in length and is the S-shaped continuation of the descending colon and lies in the pelvic cavity
- The rectum, a straight tube about 12 cm long that forms the last section of the large intestine
- The anal canal, the terminal part of the rectum, about 4 cm in length. The canal opens on to the external skin at the anus. The anal canal contains the internal and the external anal sphincters. The sphincters seal off the end of the alimentary canal and are normally constricted.

As well as the formation and expulsion of faeces the large intestine also:

- Absorbs large amounts of water and some mineral salts
- Produces microorganisms (mainly bacteria) that are necessary for the normal functioning of lymphatic tissue in the large intestine and thus resistance to infection. These bacteria also synthesise vitamins B and K
- Secretion of mucus to lubricate faeces.

Though absorption of water takes place in the large intestine, water makes up 60–70% of the weight of faeces

(Santiago et al 2014). The forming faeces also contain fibre, indigestible cellular plant and animal matter, dead and live microbes, digestive enzymes, epithelial cells from the walls of the gastrointestinal tract together with the mucus they secrete, fatty acids and bile pigments. Faeces also contain dead cells shed from the intestinal lining as well as waste products such as bile pigments and toxic substances.

## The accessory digestive organs

The accessory digestive organs are vital in the digestive process. Although food does not pass through these organs, digestion could not occur without these organs. The accessory organs secrete enzymes into the GI tract which are actively involved in the process of digestion. An enzyme is a substance, usually protein in nature, that initiates and accelerates a chemical reaction. The accessory organs are the salivary glands, the pancreas, the liver and the biliary tract.

### The pancreas

The pancreas is a soft gland, lying across the abdominal cavity behind the stomach (Hendry et al 2014). It is divided into a head, which fits into the curve of the duodenum; a central portion, or body; and a tail, which extends out to the spleen. The pancreatic duct runs centrally through the length of the pancreas, while smaller ducts carry the pancreatic juice secreted by the pancreas into the central duct. The pancreatic duct joins the common bile duct from the liver to enter the duodenum (Figure 32.5).

The bulk of the tissue in the pancreas is composed of exocrine cells, which produce pancreatic juice. The pancreas secretes about 1200 mL of pancreatic juice daily. The overall function of pancreatic juice is the digestion of nutrients. The pancreas is simulated to release the pancreatic juices by the presence of chyme in the duodenum (Hendry et al 2014). Scattered among the exocrine tissue are groups of hormone-secreting cells, the islets of Langerhans, which contain four distinct cells of which the beta cells are crucial to the production of insulin.

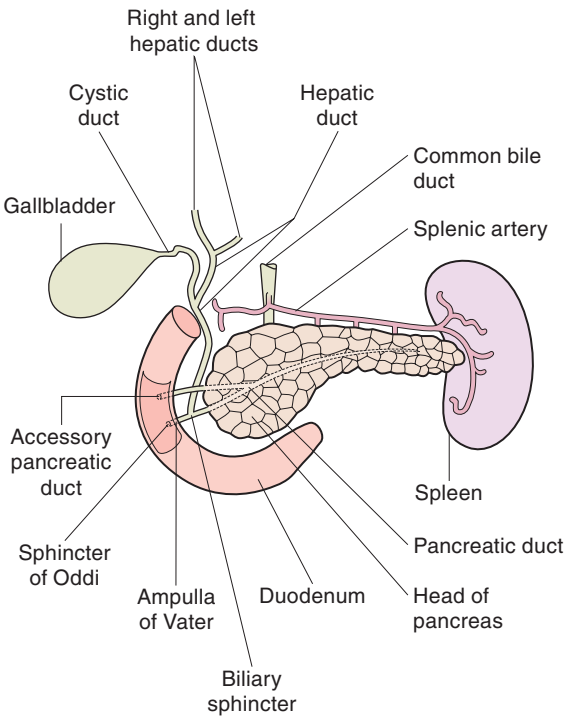


**Figure 32.5** The pancreas and neighbouring structures

### The liver

The liver is the second largest organ in the body after the skin (Bostock-Cox 2014). The liver is an organ situated in the right upper quadrant of the abdominal cavity, immediately beneath the diaphragm (Patton & Thibodeau 2013). The greater part of the liver lies in the right upper abdomen but the organ extends across to the left upper abdomen (Figure 32.6). The liver is divided into two parts: a large right lobe and a much smaller left lobe.

The liver has many functions but those involved in the digestive process include:

- Producing bile—a watery fluid containing a variety of organic and inorganic substances, but no enzymes. Bile aids in neutralising stomach acids and emulsifying fats (Penny 2013). As much as 1 L of bile may be secreted by the liver per day and stored in the gallbladder before it is released into the duodenum.
- Storing carbohydrates, proteins, fats and vitamins which are converted into nutrients and then released either in bile or in the bloodstream (Penny 2013).

The biliary tract, which transports bile from the liver to the duodenum, consists of the left and right hepatic ducts, the common hepatic duct, the cystic duct, the gallbladder and the common bile duct (Figure 32.7).

### The gallbladder

The gallbladder is a small, pear-shaped, muscular sac that lies on the inferior surface beneath the right lobe of the liver (Hendry et al 2014). The main function of the gallbladder is to store and concentrate bile until it is needed for digestion (Hendry et al 2014). When chyme that contains fats or lipids enters the duodenum, the gallbladder contracts and releases bile to digest the fats (Hendry et al 2014).

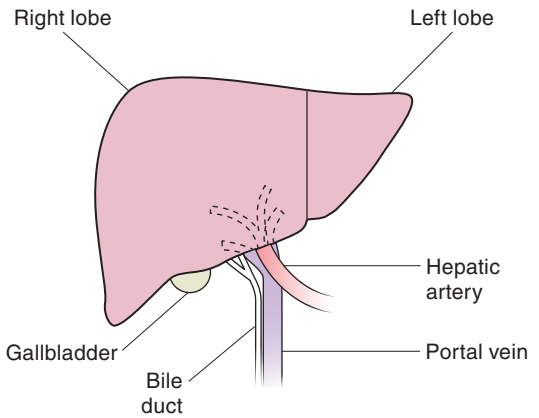


**Figure 32.6** The liver

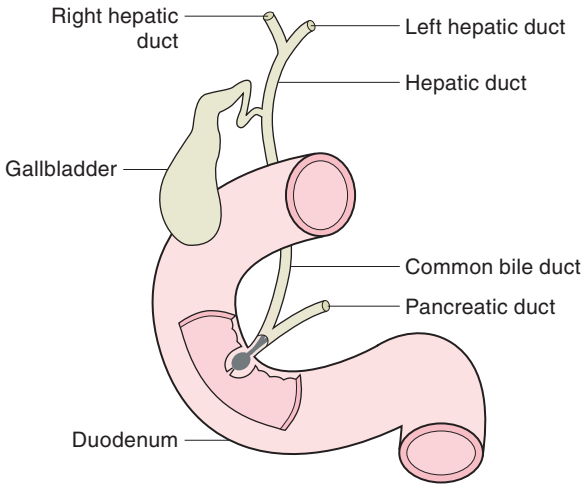


**Figure 32.7** The biliary tract

## Faecal matter and defecation

The frequency of bowel actions depends on the individual. A normal range can be from three times a day to three times a week (Commonwealth of Australia 2013). Faecal matter varies significantly in appearance, depending on diet and health. It is usually brown in colour which results from a combination of bile and bilirubin.

Most of the time the rectum is empty of faeces; however, when a mass movement forces faeces into the rectum the desire to defecate is initiated. Faeces collect in the sigmoid colon before entering the rectum. As the faecal mass enters the rectum the defecation reflex and the desire to defecate are initiated. If it is not convenient, **defecation** can be delayed temporarily, as within a few seconds the reflex contractions cease and the rectal walls relax (Kozier et al 2014; Marieb & Hoehn 2013). An individual with a good bowel function is able to:

- 'hold on' for a short time after feeling the urge to defecate
- start a bowel action once they are ready to (i.e. once they are sitting on the toilet)
- completely empty the rectum when they have a bowel action (Commonwealth of Australia 2013).

## Meeting elimination needs

The individual's elimination status is assessed by obtaining information about elimination practices, bowel actions and their medical and surgical history (Gardiner & Wallace 2014). A list of any medications the individual is taking should also be perused as some medications can affect bowel elimination (Gardiner & Wallace 2014). The nurse should enquire about the individual's usual pattern of defecation and whether they have experienced any recent alterations to this pattern (see Clinical Interest Box 32.1). Information should also be obtained about the individual's usual fluid and dietary intake so that, whenever possible, it can be maintained or improved to facilitate normal elimination. Information about their usual level of activity should also be sought for the same reason. The nurse should identify early signs of any problems associated with elimination so that appropriate care can be implemented to assist the individual to meet their elimination needs. The nurse should also be aware of the numerous factors that affect bowel elimination:

- Age: developmental changes affect bowel elimination throughout life. As the body develops and changes, so do the size of the small and large intestines, amount of secretions and rate of peristalsis. Infants have developing digestive tracts, so complex foods are poorly digested, peristalsis is rapid and control of the bowel is not coordinated by the neuromuscular system until 2–3 years of age. During adolescence, the rate of gastric secretions increases and as ageing increases the rate of peristalsis is reduced. The slowing of nerve impulses delays the sensation to defecate and can lead to constipation
- Cultural influences: the use of different toilet equipment, where and when defecation is deemed to be appropriate, as well as dietary input all impact on the individual's ability to maintain their usual elimination pattern. Changes to environment plus the challenges and/or anxieties associated with assimilating into a new or different culture may similarly alter the elimination patterns. Adherence to fasting practices will also affect elimination patterns
- Privacy: ensuring adequate privacy and sufficient time for the individual to pass faeces. If possible, the individual should be left alone to use the toilet aids (e.g. commode or bedpan) as they are generally self-conscious about the need to eliminate in the presence of others. Ensure the individual's safety and that the call bell is accessible
- Position: any interference from the usual body position (e.g. due to surgery or changed environment) can lead to difficulty defecating and the inability to empty the rectum properly (Commonwealth of Australia 2013). Children, older people or those with a disability may require special needs
- Routine: changes to normal routine can cause an interruption to the individual's normal gastrocolic reflex

### CLINICAL INTEREST BOX 32.1 Clinical consideration when assessing bowel patterns

Some individuals may be embarrassed when nurses ask them about their bowel functioning. Therefore it is important to ensure that questioning is conducted in an appropriate way, place and time. Nurses should adapt their use of terminology to the individual they are dealing with. For example, the nurse may ask a child 'Have you had a poo today?' instead of 'Have you used your bowels today?'

*(adapted from deWit & O'Neill (2013))*

- Diet and fluid intake: any changes to diet will affect elimination. An inadequate fluid intake can result in hardening of the stool contents and discomfort when defecation occurs. The recommended fluid intake for adults is 1400–2000 mL/day. This may be contraindicated in individuals with cardiac and renal disorders
- Physical activity: physical activity promotes peristalsis, while inactivity reduces motility of the bowel. It is recommended that all individuals perform regular mild exercise to promote regular bowel elimination
- Infection: the infection process can directly affect the protective lining of the gastrointestinal tract
- Pain: pain on defecation may be due to the presence of lesions such as haemorrhoids or anal fissures. *Tenesmus* is the term used to describe persistent ineffectual spasms of the rectum accompanied by the desire to empty the bowel; it may be associated with disorders such as inflammatory bowel disease
- Psychological state: the psychological state of a person influences the motility and secretions of the gastrointestinal tract. If a person is angry, anxious or stressed, the secretions and motility of the bowel are increased and can lead to diarrhoea. Alternatively, a person who is depressed will have reduced secretions and motility of the bowel, which could lead to constipation
- Pregnancy: as the fetus develops in size during pregnancy, the pressure it exerts on the bowel is increased, impeding the movement of faecal matter through the bowel
- Medication: laxatives are used to soften the stool to ease the discomfort in defecating. Excessive or chronic use of laxatives leads to reduced bowel muscle tone and less responsiveness to the normal stimulation of defecation. There are also numerous medications that affect the bowel and careful scrutiny of drug regimens is required
- Surgery and anaesthetics: anaesthetics stop bowel peristalsis. Direct and prolonged surgery and nerve damage to the bowel can lead to a prolonged period of reduced peristalsis.

## Promoting a healthy bowel elimination program

A program to promote bowel elimination is an important part of the nursing care plan for an individual. The goal of a bowel management program is to assist the individual to evacuate the bowel comfortably and completely at a determined time without laxative support, by promoting privacy, regular mild exercise, high-fibre foods and an adequate fluid intake. It is important for nurses to support the individual with their bowel elimination while hospitalised as failure to do so may result in a delayed discharge (Knowles et al 2015). With the appropriate support the individual's overall lifestyle can become healthier, and general wellness and outlook improve (see Clinical Interest Box 32.2).

### CLINICAL INTEREST BOX 32.2 Nursing assessment relating to bowel problems

- Past history
- Vital signs, weight, height and BMI
- Assessment of stool, habits and frequency
- Hydration and nutrition status
- Mobility
- Hygiene
- Medications
- Coexisting medical conditions
- Psychosocial (including cultural influences) and environmental factors
- Cognitive function
- Continence status
- Skin integrity assessment

*(Burch 2013b; Gardiner & Hilton 2014; Thomas 2014)*

### Diet

The role of diet is pivotal for a functioning digestive system and the individual's overall health. It is important that the individual includes adequate dietary fibre in their diet. Fibre is important in bowel function as it absorbs water and makes stools bulkier (Commonwealth of Australia 2013). While a high-fibre diet is indicated with constipation, a low-fibre diet is required in the presence of diarrhoea. Specialised diets are often required such as gluten- or dairy-free diets and the potential for poor nutritional intake is increased if bloating, pain or nausea is present. Adequate fluid is also required, particularly in the presence of certain drugs, but fluids known to increase constipation such as alcohol and coffee should be used judiciously. Diet is complex, due not only to the disease process but also as a result of cultural norms, the individual's age and the normal likes and dislikes we all experience. While it is difficult to meet all individuals' needs, an effort to ensure adequate nutrition is of paramount importance for health and wellbeing (Stewart 2014).

### Monitoring elimination

Daily bowel charts recording the bowel movement within a 24-hour period and analysis of a pattern over a week or month will demonstrate any changes. Use of a bowel diary which adds further information such as fluid and diet as well as activities and changes to lifestyle will allow the individual to identify issues which may impact on their elimination changes or habits (Gillibrand 2012).

### Examining faeces

To detect and identify abnormalities, faeces are examined by observation (see Table 32.1 and the Bristol Stool Chart (Figure 32.8)), by chemical testing in the workplace or by analysis in the laboratory. Laboratory analysis of faeces

**TABLE 32.1 | Common characteristics of altered presentation of faeces**

| Colour | Odour | Presentation | What it may mean |
|---|---|---|---|
| Grey, 'clay coloured' | Strong | Within normal range | Flow of bile blocked |
| Dark/Black | Strong | 'Tarry', 'sticky' | Intestinal bleeding |
| Dark/Black | Slight | 'Tarry' | ? taking iron pills or other drugs? |
| Pale yellow | Strong | 'Greasy' | Pancreatic malfunction |
| Pale yellow | Slight to strong | | Use of 'diet pills' |
| Fresh blood | Slight | Within normal range | Haemorrhoids |
| Red | Slight | Within normal range | Ingestion of foods (e.g. beetroot) |
| Green | Strong | Within normal range or loose | Rapid transit through the intestines |
| Meconium | None | Viscous and sticky | Only evident in new born babies; disappears in the first few days of life |
| Mucus | | | Inconsistent or increasing amounts may indicate underlying disease (e.g. Crohn's disease, ulcerative colitis) |
| Undigested food | | | If occurs infrequently and with no other symptoms (e.g. diarrhoea), unlikely to be of concern |

*(Jarvis & Watt 2012; Reid-Searl & Hewerdine 2010)*

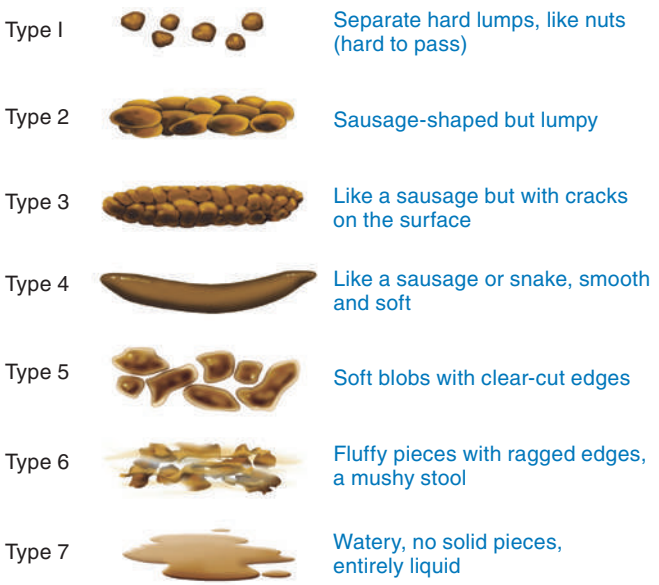


**Figure 32.8** Bristol Stool Chart
*(© The Rome Foundation)*

provides information about the condition and functioning of the digestive system. Testing the faeces for abnormalities involves analysing the specimen for the presence of blood, parasites and/or their ova, bile, fat, pathogenic microorganisms or pancreatic enzymes (Santiago et al 2014).

### Environment

Evacuation is for most adults an intensely private function, preferably done away from people listening. Infants of every culture instinctively adopt a squatting position to evacuate faeces and this was the manner for centuries for most people and is still the preferred method in many parts of the world. The invention of indoor plumbing altered this for much of the developed world, and the porcelain toilet is now considered the norm in most places in Australia. The individual's sitting position on the toilet may need investigation to optimise a relaxed and natural posture to aid elimination (Commonwealth of Australia 2013).

## Common problems associated with elimination of faeces

### Constipation

**Constipation** is the infrequent passage of dry hard stools and is often the result of some deficiency in the three elements necessary for normal bowel activity: dietary fibre, adequate fluid input and sufficient physical activity (Gardiner & Hilton 2014). It affects people regardless of age, race, gender or socioeconomic status (Hussain et al 2015) but is more prevalent in females and those over the age of 65 (Gardiner & Hilton 2014). Constipation can cause psychological and physical distress, serious pain and embarrassment (Thomas 2014). When constipation occurs, the individual often strains

to produce hard dry stools, has a sensation of not emptying their rectum completely, experiences sensations of an obstruction or blockage, has less than three bowel actions a week and may be required to manually assist with the evacuation of faeces (Gardiner & Hilton 2014). Constipation is often accompanied by abdominal distension and discomfort, nausea, headache and diminished appetite (Gardiner & Hilton 2014). Natural measures to prevent constipation include:

- Sufficient dietary fibre: foods such as wholegrain cereals, fruit and vegetables contribute bulk and induce peristalsis (Gardiner & Hilton 2014)
- Adequate fluid input: at least 1500 mL/day is necessary to help keep the intestinal contents in a semi-solid state for easy passage and excretion
- Responding to the desire to empty the bowel as soon as practicable (Gardiner & Hilton 2014)
- Maintaining a regular time for bowel movement
- Maintaining regular exercise (Gardiner & Hilton 2014)
- Relaxing and assuming a natural position when having a bowel action. Some people find the use of a small footstool to promote thigh flexion helpful (Commonwealth of Australia 2013)
- Avoiding undue anxiety about bowel habits. While some people have a bowel action every day, it is quite normal for others to have a 2- to 3-day interval between bowel actions.

Other measures to assist elimination from the bowel may be necessary, including:

- Laxatives: substances taken orally that promote evacuation of the bowel by increasing bulk, softening the faeces or lubricating the walls of the colon (see Table 32.2) (Gardiner & Hilton 2014)
- Suppositories: small solid masses medically ordered and inserted into the rectum to promote the evacuation of faeces (Day et al 2014)
- **Enemas**: the introduction of fluid through the anus into the lower colon to promote the evacuation of faeces (Day et al 2014).

### CASE STUDY 32.1

Rosa, 86, is admitted with severe constipation. While you are interviewing Rosa she states that she has managed her constipation in the past with laxatives, and that she restricts her fluid intake because she suffers with urinary incontinence. She has not been as mobile since her right knee replacement 1 month ago.

1. What do you think may be contributing to Rosa's constipation?
2. What key changes can you suggest to Rosa to maintain a regular bowel elimination program?

## Suppositories

**Suppositories** may be ordered and inserted into the rectum to promote the evacuation of faeces or to facilitate rectal administration of a drug (see Chapter 24).

Suppositories prescribed to promote a bowel action are composed of various substances, such as glycerine. Evacuant suppositories act by softening and lubricating the faeces to facilitate easy passage and excretion, or by increasing

**TABLE 32.2 | Laxatives in common use**

| Category | Example | Action | Route | Time frame |
|---|---|---|---|---|
| Bulking agents | Metamucil, Normacol | Increase weight and water absorbent properties of the faeces | Oral | 48–72 hours |
| Stimulant laxatives | Senna, Durolax, Dulcolax | Increases intestinal mobility | Oral | 6–12 hours |
| | Suppositories | Inserted rectally | Rectal | 10–20 mins |
| Faecal softeners | Liquid paraffin<br>Coloxyl | Oil softens the faeces | Oral | 24–72 hours |
| Osmotic agents | Magnesium salts (Epsom salts) | Increase the water content of faeces | Oral | 0.5–3 hours |
| | Lactulose<br>Duphalac<br>Actilax | | Oral | 4–72 hours |
| | Glycerine suppositories | | Rectal | 15 mins |
| | Microlax enema | Inserted rectally to draw water into the rectum to produce a bowel movement | Rectal | 30 mins |

*(Gardiner & Hilton 2014; Day et al 2014)*

peristalsis through the irritation of intestinal sensory nerve endings. The nurse must be aware of the different types of suppositories available and work within the scope of practice regarding the checking and administration of drugs. Types of medications that may be administered rectally by suppository include those used to relieve constipation, and medications used for the treatment of nausea and pain.

## Enemas

To give an enema is to introduce a solution into the rectum and sigmoid colon (see Clinical Skill 24.3 in Chapter 24). Most commonly it is ordered and administered to promote the evacuation of faeces and alleviate constipation, to prepare a bowel for diagnostic procedures or surgery or to begin a bowel training program.

## Impaction

**Impaction** occurs when the faeces remain in the rectum for a long time and a large hardened mass develops that is difficult and often painful to expel (Halawi et al 2012). There are certain groups of individuals who are more at risk of impaction including residents of nursing homes, those with advanced neurological diseases or renal failure, those who are immobile and those who have a poor intake of fibre or fluids (Halawi et al 2012). Liquid faeces continue to build up behind the obstruction and may move around the obstruction leading to faecal overflow (Halawi et al 2012).

***Treating impacted faeces*** When the condition occurs it is a result of prolonged constipation, poor bowel habits, inactivity, dehydration, use of constipation-inducing drugs or incomplete bowel cleansing after a barium swallow or enema. If measures to promote a bowel action, such as a suppository or enema, are ineffectual, surgical removal of the mass may be prescribed. If medically approved, encourage fluids and exercise once evacuation is complete and the individual is rested (Kozier et al 2014; Crisp et al 2013).

## Flatulence

Excessive formation of gas in the stomach and intestines is called **flatulence**. If the gas is not expelled, the intestines become distended and the person may experience abdominal discomfort and swelling. Flatus is the term used for gas in the intestine that is expelled through the anus. Flatulence may result from swallowed air, the consumption of gas-forming food or liquid or bacterial action within the intestines.

## Diarrhoea

**Diarrhoea** is the discharge of frequent, loose unformed stools resulting from the rapid passage of contents through the intestines. Perceptions of what constitutes diarrhoea may be influenced by familial, social and cultural factors so it is essential that a clear history is elicited from the individual (Gordon 2013). The person with diarrhoea may be exhausted from frequent defecation and the presence of accompanying abdominal distension and pain. If diarrhoea is prolonged, the absorption of nutrients and fluids is impaired and the person begins to show signs of fluid and electrolyte loss (Calder & Hall 2012). Diarrhoea is a symptom of various conditions, including:

- Irritation or inflammation of the gastrointestinal tract; for example, due to pathogenic infection (Calder & Hall 2012), highly spiced foods or medications that increase intestinal motility
- Disorders of digestion or absorption
- Disorders that affect secretion and function of bile or pancreatic juice, such as in obstructive jaundice
- Emotional states such as anxiety or stress.

Diarrhoea should be assessed in terms of the frequency of defecation and the characteristics of the faeces. The cause of diarrhoea must be investigated and treated. Key aspects related to the care of an individual with diarrhoea include:

- Reducing intestinal peristalsis: dietary management of an adult individual involves the withholding of food until the diarrhoea diminishes, then the gradual resumption of food. Foods low in fibre may be provided initially to reduce stimulation of the intestines
- Administering any prescribed medications: anti-diarrhoeal medications may be prescribed, as may antispasmodic preparations, to reduce abdominal cramps and pains
- Maintaining fluid input to replace lost fluids and to prevent dehydration. Oral fluids are given if tolerated, or fluids may be administered intravenously (Gordon 2013). Input and output should be observed and documented as part of the individual's fluid balance assessment
- Ensuring that the individual has adequate privacy whenever toilet facilities are being used, and that used toilet utensils are removed from the room immediately
- Ensuring that the individual's hygiene needs are met: after each bowel action the anal area and buttocks should be cleansed with a mild soap and thoroughly dried. A protective cream may be applied to reduce discomfort, and the area should be observed for signs of excoriation (Gillibrand 2012)
- When using a bedpan or commode chair, the individual may be embarrassed by the odours associated with diarrhoea, so measures to eliminate odours should be taken. Any soiled linen should be changed and removed from the room immediately. The room should be well ventilated, and room deodorants may be used with discretion
- Implementing isolation precautions should be considered until diagnosis of the cause (e.g. pathogenic infection) to prevent cross-infection.

### CRITICAL THINKING EXERCISE 32.1

John, 22 years of age, returned with long-term diarrhoea from a 6-month stint volunteering in a developing country. What are the nursing implications of this and how would you help him?

### CRITICAL THINKING EXERCISE 32.2

Francine, an elderly individual, is admitted with a history of 3 days of diarrhoea. What are the possible causes of diarrhoea? What is your primary concern for this individual? What key information should be charted regarding the bowel actions?

## Faecal incontinence

Faecal **incontinence** is the inability to control the excretion of faeces (Mayer et al 2013). Risk factors for faecal incontinence include increasing age, poor physical or mental health, anorectal procedures, diarrhoea and female gender (Mayer et al 2013). Having a vaginal birth may lead to damage of the anal sphincter, causing faecal incontinence in 33–50% of women who experience such an injury (Tan et al 2013). Management includes continence pads, lifestyle modification, pelvic floor training and drug therapy (Nazarko 2013). Surgical intervention is an option in some cases (Nazarko 2013). The cause must be identified and treated, the person's hygiene needs attended to and measures taken to maintain the individual's dignity and self-esteem.

## Artificial openings into the intestine

As a result of certain disorders such as obstruction or tumours in the bowel, the passage of faeces through the rectum and anus may not be possible (Burch 2013a). In these instances, the surgical creation of an artificial opening, called a **stoma**, takes place. Faecal elimination occurs through the stoma, which may be created as a temporary or a permanent measure. There are two different types of stomas that can be created: a colostomy and an ileostomy. A **colostomy** is formed when the large bowel or colon is pulled through a surgical incision made in the abdomen (Burch 2013a). The faecal matter produced from this type of stoma is soft and formed (Burch 2013a). An **ileostomy** is formed from the ileum and produces loose stools (Burch 2013a).

## Care of individual with a stoma

A stoma may be created in order to be used permanently or temporarily. A temporary stoma may be created to divert faecal contents to allow the bowel to rest; for example, as part of the treatment regimen in an inflammatory bowel disease. A permanent stoma is indicated principally in colorectal cancer after a partial or total colectomy has been performed. The site is selected according to which part of the bowel is affected and with consideration of the individual's physique, clothing, occupation and any other factors that may influence the individual's ability to successfully manage the care of the stoma.

In many healthcare institutions a stoma therapist liaises with the individual and surgeon to select the most appropriate site. The site of the stoma (Figure 32.9) will determine the consistency of the faecal matter excreted through it. The closer the stoma is to the small intestine, the more liquid the faeces will be. Figure 32.10 illustrates the types of colostomy or ileostomy that may be created. An ileostomy will produce approximately 300–800 mL of faecal matter daily requiring the stoma appliance to be emptied 4–6 times a day (Burch 2013b). The colostomy should be active daily with multiple episodes of flatus being noted (Burch 2013b). The stoma appliance will require changing on a regular basis (see Clinical Skill 32.1: Changing an ostomy appliance).

Care of the individual with a stoma includes the selection and management of appliances (Figure 32.11), care of the

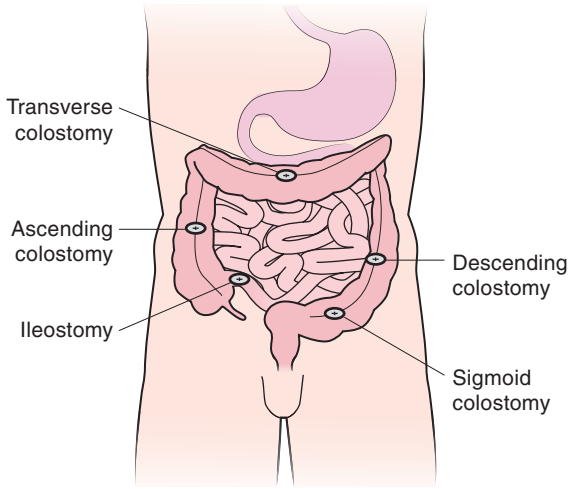


**Figure 32.9** Stoma sites

### NURSING CARE PLAN 32.1

**Assessment:** Individual experiencing faecal incontinence
**Issue/s to be addressed:** Risk of skin excoriation
**Goal/s:** To maintain skin integrity

| Care/Actions: | Rationale: |
|---|---|
| Ensure skin is cleaned after each episode of incontinence<br>Use barrier cream on sacral area<br>Stay hydrated and eat a well balanced diet | Reduces risk of skin irritation and excoriation<br>Acts as a protective barrier for skin<br>Adequate nutrition helps to maintain skin integrity |

**Evaluation**

Skin should be checked regularly for signs of irritation and excoriation.
Skin integrity intact.

## PROGRESS NOTE EXAMPLE 32.1

| | |
|---|---|
| 22/5/2015<br>1430 hrs | Nursing: Individual assisted with changing of the colostomy appliance. Skin surrounding stoma is intact and free of irritation. Stoma is pink and has been active today. Formed stools passed. Nil mucus or blood noted in stool. |

***J. Grey* (Grey) EN**

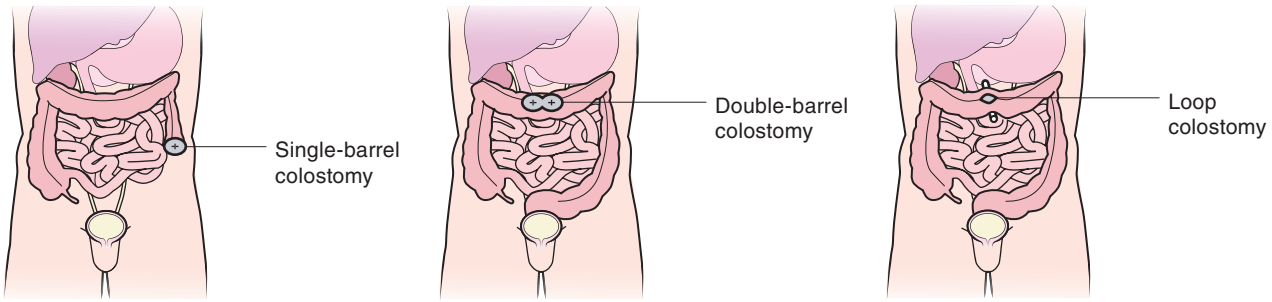


**Figure 32.10** Types of colostomy

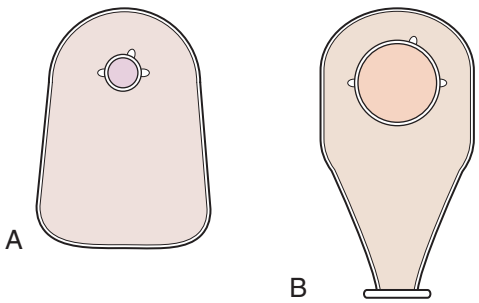


**Figure 32.11** Ostomy appliances
A: Non-drainable stoma bag B: Drainable stoma bag

stoma and surrounding skin, colostomy irrigation, meeting nutritional needs and providing psychological support (Burch 2013b). A stoma therapist may be available to assist in the preparation of the individual and their significant others before the operation and also plays a major role in providing support and education after the operation. Dietary changes may be necessary and are made in partnership with the individual, stoma therapy nurse and dietitian (Burch 2013b).

When planning care considerations the individual's altered body image and/or the impact on intimate relationships need to be responded to in a sensitive, private and dignified manner. When sexual dysfunction as a result of altered body image, depression or illness impacts on the individual and their partner they may need referral to a professional.

For the latest information and research findings on this subject, see the Australian Council of Stoma Associations website: www.australianstoma.com.au.

See Progress Note Example 32.1 as to how you might document the changing of a colostomy appliance.

# DISORDERS OF THE DIGESTIVE SYSTEM

## Specific disorders

Any changes to the nutritional status of the individual will impact on their elimination process and may be ongoing, depending on the nature of the disease process. There are many and varied disorders of the alimentary tract but the following are some of the disorders commonly encountered in practice.

### Stomatitis

**Stomatitis** is a term that refers to inflammation of the mouth (Sargeant & Chamley 2013). It may be a primary condition or a symptom of another disease. Inflammation may affect the lips, tongue, gums, mucous membranes or palate. Stomatitis is characterised by pain, bleeding, swelling, ulceration and halitosis and can often be managed with good oral hygiene and by treating the underlying disorders that are contributing to the condition, such as vitamin deficiencies (Sargeant & Chamley 2013).

### Parotitis

Parotitis is inflammation of the parotid glands (Barskey et al 2013), which may also be related to poor oral hygiene, dryness of the mouth or infection. Infectious parotitis (mumps) is an acute viral disease (Barskey et al 2013). Parotitis may also result from a calculus in the parotid gland.

### Dry mouth

Dry mouth can result from dehydration, mouth breathing, medical conditions such as diabetes and stroke and is a common side effect of many drugs including antihistamines, diuretics and sedatives (Sargeant & Chamley 2013). The

## CLINICAL SKILL 32.1 Changing an ostomy appliance

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Pouch, clear drainable colostomy/ileostomy in correct size with attached skin barrier<br>Pouch closure device<br>Adhesive remover<br>Disposable gloves<br>Deodorant<br>Gauze pads or washcloth<br>Towel or disposable waterproof barrier<br>Basin with warm water<br>Scissors<br>Skin barrier paste<br>Sealant wipes |

| **Skill activity** | **Rationale** |
|---|---|
| Explain the procedure to the individual and provide privacy | Reduces anxiety and embarrassment |
| Place the equipment in a convenient location and raise the bed to appropriate working height | Facilitates performance of the procedure in an organised manner |
| Perform hand hygiene and put on gloves | Prevents contamination |
| Remove the old appliance gently and place it in a plastic bag. Remove the skin barrier (if applicable) | Avoids damage to surrounding skin surface |
| Wipe the stoma and surrounding skin, using swabs and warm water. Pat dry | Cleanses the skin of mucus and faecal drainage |
| Inspect the stoma and surrounding skin. The stoma should be pink or red, and free from excoriation | Deviations from normal must be reported immediately so that appropriate action can be planned |
| Apply the skin barrier to the surrounding skin | Protects the skin |
| Remove the adhesive backing and place the new appliance over the stoma. Ensure that it is secured firmly in position with no gaps exposing the skin around the base of the stoma | Prevents leakage of faeces |
| Assist the individual into a comfortable position and attend to their needs. Restore the bed height, tidy the bed and surrounding area | Promotes comfort |
| Remove the equipment and attend to it in the appropriate manner. Perform hand hygiene | Prevents odour and cross-contamination |
| Document and report the procedure | Appropriate care can be planned and implemented |

*(Black 2014; Burch 2014a; 2014b)*

condition can be associated with thrush, a condition caused by the *Candida* fungus, and which is a common complaint in children and older individuals.

### Gastro-oesophageal reflux disease

Gastro-oesophageal reflux disease (GORD) occurs when gastric acid refluxes back into the oesophagus (Talalwah & Woodward 2013a). Symptoms include persistent heartburn and acid regurgitation, dry cough, halitosis and nausea. In severe cases the symptoms include weight loss and severe chest pain (Talalwah & Woodward 2013b). A hiatus (diaphragmatic) hernia—the herniation of the stomach through the diaphragm into the thoracic cavity—may be one cause of GORD. Changes to diet and lifestyle may aid the individual. Certain prescription medications, and in some cases surgical intervention, may also be required (Talalwah & Woodward 2013b).

## Gastritis

Gastritis is inflammation of the gastric mucosa and may be acute or chronic (Smith 2013). Acute gastritis is associated with irritation of the mucosa related to the ingestion of irritating foods, alcohol, caffeine or certain medications. It may also be caused by food poisoning, microorganisms or psychological stress. Chronic gastritis is commonly associated with an underlying disorder such as a gastric ulcer, chronic alcohol abuse or malignancy. Many people with chronic gastritis have no symptoms, while others experience anorexia, a feeling of fullness, eructation (burping) and vague epigastric pain (Smith 2013). The same symptoms appear in acute gastritis, and the individual may also experience abdominal cramps, nausea, vomiting and diarrhoea. Haemorrhage may occur, presenting as haematemesis (vomited blood) and/or occult blood in the faeces or melaena. A common cause of gastric ulcers is the infection caused by *Helicobacter pylori* (*H. pylori*). Investigations for *H. pylori* include breath tests, as well as blood and stool tests (Smith 2013).

## Gastroenteritis

Gastroenteritis is inflammation of the stomach and intestines. It is an acute disorder characterised by diarrhoea, nausea, vomiting and abdominal cramps (Beckett & Bright 2013). Gastroenteritis has many causes, including the ingestion of bacteria, amoebae, parasites, viruses, toxins or food allergens; and drug reactions. The symptoms vary according to the cause, the extent to which the digestive tract is involved and the age of the individual. Viral gastroenteritis is easily spread and is more common in colder months (Beckett & Bright 2013). The symptoms of viral gastroenteritis appear 12–48 hours after exposure of the virus and include nausea, vomiting and diarrhoea (Beckett & Bright 2013). Infants, older adults and debilitated individuals are more vulnerable to the rapid loss of fluid and electrolytes that occurs with the condition.

## Haemorrhage

Gastrointestinal haemorrhage may occur as a result of a variety of disorders. Common causes of bleeding from the upper digestive tract are peptic ulcer disease, oesophageal varices, malignancy and erosive gastritis (Kyaw & Chan 2014). Upper gastrointestinal haemorrhage may be accompanied by haematemesis or melaena. Causes of bleeding from the lower digestive tract include haemorrhoids, fissures, inflammatory bowel disease, polyps, diverticular disease and malignancy. Haemorrhage from the lower intestinal tract may present as bright-red blood excreted through the anus, or as occult blood present in the faeces. If blood loss is severe, the signs and symptoms of hypovolaemic shock will be evident.

## Peptic ulcer

A peptic ulcer is a localised area of erosion occurring in the stomach or duodenal (the beginning of the small intestine) lining (Regidor 2013). The most common cause of peptic ulcer is a stomach infection associated with the *H. pylori* bacteria but a small percentage are caused by anti-inflammatory drugs such as aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) (Tang & Chan 2012). Malignancy may also be a cause of perforation into the lining of the stomach or duodenum. Symptoms vary in each individual but may include pain described as gnawing, dull, aching or 'hunger-like'; fullness; bloating and nausea (Crosby & Dexter 2013).

## Cholecystitis

Cholecystitis is the acute inflammation of the gallbladder wall and is caused by stones in the cystic duct in 90% of cases (Thomas 2013). The gallbladder becomes dilated and filled with bile, pus and blood. Risk factors for cholecystitis include increasing age, female gender, obesity or rapid weight loss, certain ethnic groups and pregnancy (Thomas 2013). Symptoms include right upper quadrant pain that may radiate to the right shoulder or back, nausea, vomiting and loss of appetite (Thomas 2013). Cholelithiasis is the term used to describe the presence of stones or calculi in the gallbladder (Felicilda-Reynaldo 2012). Choledocholithiasis is the presence of gallstones in the common bile duct (Felicilda-Reynaldo 2012). Major manifestations of choledocholithiasis are similar to those of cholecystitis. If a stone obstructs the common bile duct, jaundice may be evident. Gallstones may be formed by cholesterol that is supersaturated in fat and crystallises or by unconjugated bilirubin that binds to calcium, or a combinations of these products (Felicilda-Reynaldo 2012).

## Hepatitis

**Hepatitis**, which is inflammation of the liver, may be viral or non-viral in origin. Viral hepatitis is classified as infection with hepatitis A virus (HAV), hepatitis B (HBV), hepatitis C (HCV), hepatitis D (HDV) or hepatitis E (HEV).

Hepatitis B, C and D usually occur as a result of parenteral contact with infected body fluids. Hepatitis A and E are typically caused by ingestion of contaminated food or water (World Health Organization (WHO) 2015). The individual may have few symptoms or may experience headaches, fatigue, anorexia, pyrexia, dark urine, pale faeces, liver enlargement, jaundice and pruritus. Healthcare workers are at risk of contracting hepatitis B and C through body fluids and therefore standard precautions must be scrupulously adhered to at all times.

Hepatitis A is a viral infection of the liver generally spread via the faecal–oral route, either through contaminated food or water or direct contact with an infectious person (Galmes-Truyols et al 2013). The course of the infection is usually short term and a vaccination against hepatitis A is available.

Hepatitis B (serum hepatitis) is generally transmitted parentally by contact with infected blood. The virus may also be spread via contact with body secretions such as saliva, vaginal secretions, menstrual blood and semen and from infected mother to her baby, during passage through the birth canal or via breast milk (Peate & Jones 2014). The incidence of hepatitis B is higher in people who receive blood or blood products, use or share contaminated needles or engage in unprotected sexual practices (Peate & Jones 2014). The

infection may persist for an extended time, resulting in chronic liver failure and cirrhosis, but the majority of people with hepatitis B will recover. The World Health Organization (2015) reports that there are 240 million people worldwide who are chronically infected with hepatitis B and an estimated 780 000 die annually from the virus. Adult vaccination against hepatitis B involves three doses given over 6 months.

Hepatitis C is a virus that is a major contributor to liver-related morbidity and mortality (Jack 2014). It is spread through blood-to-blood contact such as blood transfusions and shared needles, and can lead to cirrhosis and end-stage liver disease (Jack 2014). Medical treatment in countries where there is no access to single-use sterile equipment for procedures, or testing of donated blood for viruses, can also be a risk factor for contracting the virus (Jack 2014). There is no vaccination currently available for hepatitis C (Jack 2014).

Hepatitis D is most commonly seen in developing countries and is caused through a defective virus that needs the hepatitis B virus to exist (Ahn & Gish 2014). Vaccination against hepatitis B can also protect individuals from the D strain of the virus (Ahn & Gish 2014).

Hepatitis E is a viral disease more common in developing countries. The highest rates of hepatitis E infection occur in regions where there is poor sanitation and sewage management that promotes the transmission of the virus, such as Central and South-east Asia, North and West Africa and Mexico. In most cases it will resolve (Hepatitis Australia 2013).

Non-viral hepatitis generally results from exposure to certain toxins and medications and excessive use of alcohol. Manifestations of the disorder are similar to those of viral hepatitis.

**CRITICAL THINKING EXERCISE 32.3**

Maria has arrived in ER pointing to her epigastric region and moaning in pain. Her ECG is normal. What would be your first considerations in preparing her for investigations?

## Diverticular disease

Diverticulosis is characterised by asymptomatic sac-like protrusions (diverticula) in the colon wall where the mucosa herniates at weakened points (Reddy & Longo 2013). Faecal matter becomes trapped in the pouches and the resulting inflammation is called diverticulitis (Reddy & Longo 2013). Diverticulitis causes mild to severe abdominal pain, some nausea and altered bowel habits (Reinhard 2014). In severe cases, the diverticula can rupture, producing abscesses or peritonitis (Reddy & Longo 2013). It increases in incidence with ageing and there is no gender bias in presentation but cultural factors are thought to impact on the disease process as a result of the highly refined diet found in the developed world (LeMone et al 2013; Reinhard 2014).

## Irritable bowel syndrome

Irritable bowel syndrome (IBS) is defined as a chronic functional gastrointestinal disorder with symptoms of bowel dysfunction, often accompanied by abdominal pain and bloating (Barboza et al 2014). The condition is thought to result from food intolerance, psychological distress or in the presence of increased gastrin levels and affects more women in the developed world than men. Treatment may involve the use of antispasmodics, antidepressants, lifestyle coaching, an increased intake of probiotics and altered dietary intake (Barboza et al 2014).

**CRITICAL THINKING EXERCISE 32.4**

Julianne, 28, has been diagnosed with IBS. What are the classic symptoms affiliated with IBS? What individual education points can you cover with Julianne to assist her in managing IBS?

## Coeliac disease

Coeliac disease is an abnormal response to gluten by the immune system, causing small bowel damage. Symptoms include diarrhoea and malabsorption which prevents uptake of essential nutrients. Treatment requires a continuing gluten-free diet to resolve the symptoms (LeMone et al 2013).

## Hernia

A hernia is the protrusion of an organ or the fascia of an organ through the wall of the cavity that normally contains it (Hammond 2014). Various types of hernias are named according to their location: umbilical, inguinal, femoral, intestinal and incisional; the last occurring at the site of an abdominal incision. If the protrusion can be pushed back into the cavity the hernia is said to be reducible (Hammond 2014). The major complication of an intestinal hernia is strangulation, when the blood flow to the protruding loop of bowel may be obstructed resulting in necrosis. Repair of the hernia involves surgery to place mesh over the hernia orifice thus preventing the protrusion of the organ (Hammond 2014).

## Bowel obstruction

Bowel obstruction is a mechanical or functional obstruction of the intestines, preventing the normal digestion process (Lynch et al 2012). Obstructions may be caused by adhesions, impacted faeces, hernias, tumours, inflammation, neurological disorders or by medication effects (Lynch et al 2012). If the obstruction is at the distal end of the intestine, vomiting may occur, and the vomitus will have a faecal odour caused by bacterial overgrowth in the intestinal tract. The individual generally experiences abdominal pain, distension and vomiting, and is usually unable to pass flatus or faeces. Further manifestations of bowel obstruction may include fluid and electrolyte imbalance because of progressive dehydration and plasma loss (Lynch et al 2012). Complications

of intestinal obstruction include peritonitis, ischaemia and necrosis of the bowel (Lynch et al 2012). The aim of treatment is to alleviate pain, nausea and vomiting and to restore normal bowel function, which may require surgical intervention. Other obstructions may resolve with bowel rest, where the patient is kept nil by mouth and hydration maintained with intravenous fluids (Lynch et al 2012).

### Haemorrhoids

**Haemorrhoids** are distended veins in the anal area, and can be internal or external (Anderson 2013). Internal haemorrhoids commonly present with prolapse or painless rectal bleeding. External haemorrhoids cause bleeding and can cause acute pain if thrombosed. Haemorrhoids commonly result from increased pressure in the anal area related to constipation, straining to defecate, obesity, pregnancy and prolonged sitting or standing (Anderson 2013). The individual commonly experiences pain in, and bleeding from, the anus, particularly during defecation. Pruritus of the anal area may occur in the presence of external haemorrhoids and topical creams are available to alleviate this symptom. Surgery may be an option in severe cases (Anderson 2013).

### Anal fissure

An anal fissure is a crack in the lining of the anus and, like haemorrhoids, is associated with increased pressure in the anal area (Abramowitz et al 2012). Sudden occurrence is characterised by a tearing or burning pain during or immediately after defecation, and by the appearance of a few drops of blood. An anal fissure may heal spontaneously or it may partially heal and recur. A chronic fissure produces scar tissue, which may impede normal defecation (LeMone et al 2013).

### Rectal prolapse

Rectal prolapse is the protrusion of one or more layers of the mucous membrane of the rectum through the anus. Prolapse may be partial or complete—with displacement of the anal sphincter and rectum (Skinn & Gardiner 2013). A rectal prolapse occurs when there is a weakening of the pelvic floor, a poorly attached rectum to the sacrum or a floppy rectum or sigmoid colon (Skinn & Gardiner 2013). Risk factors for this condition include increasing age, chronic constipation and straining on defecation as well as childbirth (Skinn & Gardiner 2013). When a rectal prolapse occurs protrusion of tissue from the rectum is evident, and the individual may experience a sensation of rectal fullness, bleeding and pain due to ulceration of the exposed tissues (Jarvis & Watt 2012).

## Inflammatory and infectious disorders

Inflammatory and/or infectious disorders of the digestive system may be related to internal or external irritation or to the proliferation of pathogenic microorganisms.

### Appendicitis

Appendicitis is the acute inflammation of the vermiform appendix. The individual typically presents with acute abdominal pain starting in the mid-abdomen, later localising to the right lower quadrant (Murphy & Berman 2014). Symptoms may include fever, anorexia, nausea, vomiting and elevation of the neutrophil count (Murphy & Berman 2014). The condition commonly results from an obstruction of the lumen of the appendix, for example, by a faecal mass, or as a result of inflammation and oedema due to a viral infection. The obstruction causes inflammation, which can lead to infection, necrosis and perforation. If the appendix perforates, the contents spill into the abdominal cavity, causing peritonitis (Murphy & Berman 2014).

### Peritonitis

Peritonitis is inflammation of the peritoneum and may be associated with many conditions. Causes of peritonitis include end-stage liver disease, ruptured appendix and abdominal trauma (Cabrera & Schub 2014). The peritoneum becomes inflamed and oedematous, which generally results in decreased intestinal motility and intestinal obstruction. Peritonitis adversely affects the GI, endocrine and cardiovascular systems (Cabrera & Schub 2014). The onset of peritonitis may be acute, or slow and progressive. The inflammatory process causes accumulation of fluid in the abdominal cavity, leading to abdominal distension and rigidity, severe pain, nausea and vomiting. As a result of loss of fluid and electrolytes into the abdominal cavity, the individual displays signs of hypovolaemic shock. Other potential complications include septic shock, acute renal failure, liver failure, respiratory failure, abscess formation and abdomen compartment syndrome (Cabrera & Schub 2014). Treatment commonly includes antibiotics, analgesics, anti-emetics, surgery and supportive care such as supplemental oxygen, blood transfusions and intravenous fluids (Cabrera & Schub 2014).

### Pilonidal sinus

A pilonidal sinus occurs when a hair tunnels inwards, gathering sebaceous oils and other debris (Rice 2014). This causes a localised infected tunnel in the natal cleft (Rice 2014). A pilonidal sinus causes pain and infective symptoms and often requires a surgical incision with drainage. The condition is exacerbated by friction, warmth and moisture and is more common in young males (Rice 2014). Nursing care includes keeping the area dry and clean and ensuring the individual routinely removes hair from the area (LeMone et al 2013).

### Inflammatory bowel disease

Inflammatory bowel disease (IBD) describes a chronic autoimmune disorder of the gastrointestinal tract characterised by inflammation with active and remission periods (Bettany & Gardiner 2013). The two main conditions associated with IBD are Crohn's disease and ulcerative colitis (Bettany & Gardiner 2013). Although the precise cause of inflammatory bowel disease is unknown, factors that have been implicated include a familial tendency, infection, autoimmune reactions and psychological stress. The effect of the disease causes altered mobility and fatigue, as well as changes to perception of body image and alteration in quality of life (Bettany & Gardiner 2013).

Ulcerative colitis primarily affects the superficial mucosal layers of large areas of the colon. The inflammation associated with the disorder destroys tissue, causing ulceration and necrosis (Bettany & Gardiner 2013). Symptoms may be intermittent or continuous and include abdominal pain and diarrhoea. The faeces are generally watery and may contain blood and mucus (Bettany & Gardiner 2013). Complications of ulcerative colitis include haemorrhage and bowel obstruction (Bettany & Gardiner 2013).

Crohn's disease can affect any part of the digestive tract from the mouth to the anus but most commonly affects the small intestine and/or colon (Crohn's and Colitis Australia (CCA) 2015a). There may be healthy sections of the intestine between the diseased sections. Crohn's disease can affect all layers of the intestinal wall and can lead to complications such as strictures, abscesses, fistulae and fissures (CCA 2015a). Symptoms vary according to the site and extent of the lesions and, in acute episodes, the individual experiences abdominal pain and cramps, flatulence, diarrhoea, nausea and vomiting and pyrexia (Bettany & Gardiner 2013). The faeces may contain large quantities of blood and mucus. Chronic or prolonged episodes of inflammatory bowel disease lead to nutritional imbalances, marked weight loss and an increased risk of colon cancer (CCA 2015b; Bettany & Gardiner 2013).

## Neoplastic disorders

Neoplasms of the digestive system may be benign or malignant. Cancer may develop in the mouth, oesophagus, stomach, intestines, rectum, liver or pancreas. The manifestations of cancer of the digestive system vary according to the site.

Polyps are projections of the mucosal surface of an organ and may develop in the stomach or intestine (Islam et al 2013). Most polyps have no risk of cancer but a certain subset has malignant potential (Islam et al 2013). Polyps may be asymptomatic or they may cause diarrhoea, haemorrhage or the manifestations of intestinal obstruction (Islam et al 2013). Familial colonic polyposis is a hereditary disorder characterised by numerous polyps, and has a high association with colonic malignancy.

Colorectal cancer is the most common cancer of the digestive system and is the third most commonly diagnosed cancer worldwide (World Cancer Research Fund 2015). It can develop with few, if any, early warning symptoms. Symptoms of bowel cancer include:

- Bleeding from the anus or any sign of blood after a bowel motion
- A recent and persistent change in bowel habit; for example, looser bowel motions, severe constipation and/or needing to go to the toilet more than usual
- Unexplained tiredness (a symptom of anaemia) and weight loss
- Abdominal pain, especially of recent onset (Commonwealth of Australia 2015).

Screening tests for occult blood assist in early diagnosis of colorectal cancers, improving treatment options and chances of survival. Regular screening can also reduce death from bowel cancers by 15–25% and prevent between 300 and 500 deaths per year (Commonwealth of Australia 2015).

## Traumatic disorders

Trauma to parts of the digestive system may be related to injury or to irritation, such as the ingestion of a corrosive substance. Abdominal trauma may be localised or it may involve more than one abdominal structure. When a part of the digestive system is damaged the processes of digestion, absorption and elimination may be impaired. As a consequence, alterations in nutritional, electrolyte and fluid status occur. Depending on the type and extent of injury, the manifestations include external bruising, abdominal distension, pain, altered bowel sounds and haemorrhage, either internal and concealed, or presenting as haematemesis and/or melaena. Complications of trauma to the digestive system include haemorrhage, shock, infection, peritonitis and obstruction (Kozier et al 2014; Crisp et al 2013).

## End-of-life care

Management of constipation and incontinence in end-of-life care is a priority. Lack of appetite, inadequate intake and high opioid usage contribute to constipation and potential discomfort (Gardiner & Hilton 2014). Abdominal massage and fluid management adaptive to the individual's altered needs may assist, as well as appropriate continence aids to ensure the individual is comfortable and their dignity is maintained.

**CRITICAL THINKING EXERCISE 32.5**

Lee has end-stage dementia and is under a palliative care plan. What aspects of her bowel elimination care need considering?

## Diagnostic tests

Certain tests may be performed to assist or confirm the diagnosis of digestive system disorders.

### Digital rectal examination

A digital examination is done with a gloved finger placed into the anorectal region to identify any physical abnormalities or constipation (Gardiner & Hilton 2014). This is an invasive and uncomfortable procedure and the individual needs privacy and reassurance.

### Screening

Screening is recognised as one method in the early detection of bowel cancer (Commonwealth of Australia 2015). Individuals are now able to screen for unseen blood in their stool which may be an indicator of a disease process. Faecal occult blood test (FOBT) involves placing small samples of stool on special cards and sending them to a pathology laboratory for analysis. The results are then sent back to the individual and their designated medical officer (Cancer Council Australia 2015).

### Laboratory tests

Specimens that may be obtained from the individual for laboratory analysis include blood, faeces, gastric or peritoneal fluid, urine and samples of tissue. Laboratory tests include:

- Histology, microbiology and cytology of stools
- The blood may be tested to determine haemoglobin level, haematocrit, leucocyte count, serum electrolytes, bilirubin levels, glucose levels or pancreatic enzyme levels
- The faeces may be tested to identify bleeding disorders, biliary obstruction, infections and disorders of digestion or absorption
- Gastric fluid analysis involves examination of gastric secretions, and may be performed by examining a specimen of vomitus or by testing a sample of the gastric contents aspirated via a nasogastric tube
- Peritoneal fluid analysis assesses a sample of peritoneal fluid obtained by abdominal paracentesis. The test may be performed when bleeding or infection is suspected by a medical officer. Abdominal paracentesis involves the insertion of a trocar and cannula through the abdominal wall to aspirate a quantity of peritoneal fluid
- The urine may be tested to detect the presence of any abnormal substance (e.g. bilirubin) which may be excreted in the urine as a result of a digestive system disorder
- Biopsy: specimens of tissue may be obtained during endoscopic examinations or surgery. The specimens are examined microscopically for changes in cellular structure, to confirm diagnosis or to determine the cause of a disease (e.g. malignancy) (CCA 2015b; Kozier et al 2014; Crisp et al 2013).

### Radiological examination

Several different types of radiological investigation may be performed:

- Plain x-rays may be taken to aid in the diagnosis of abdominal masses, bowel obstruction, trauma to abdominal organs and ascites
- Computerised tomography (CT) scanning involves the direction of a narrow x-ray beam at parts of the body, from various angles. Contrast medium is often administered intravenously to enhance visualisation. A computer reconstructs the information as a three-dimensional image on a screen
- Ultrasound involves the use of soundwaves to visualise body structures. A transducer is passed over the area, such as the abdomen, and receives echoes, which are bounced off body structures. The echoes are converted into electrical impulses, which may be viewed on a screen or photographed
- Fluoroscopy (visualisation with motion) involves use of a contrast agent (e.g. barium sulfate) which can be visualised as it passes through and outlines structures in the digestive tract. Fluoroscopic examination of the digestive tract includes barium swallow, barium meal and barium enema
- Defecating proctogram is an x-ray of the rectal region during defecation. A simulated stool is an oral contrast agent, composed of barium and a liquid, starchy substance and the individual is required to pass this agent.
- **Endoscopy** is the visual examination of part of the digestive tract using a flexible fibreoptic endoscope. The endoscope also provides a channel for the introduction of instruments for the purpose of obtaining a sample of tissue for microscopic examination. The various forms of endoscopy derive their names from the part of the body being examined:
  - oesophagoscopy (the oesophagus)
  - gastroscopy (the stomach)
  - duodenoscopy (the duodenum)
  - proctoscopy (the anus and rectum)
  - sigmoidoscopy (the sigmoid colon)
  - colonoscopy (the colon) (Kozier et al 2014; Crisp et al 2013).

**CRITICAL THINKING EXERCISE 32.6**

William, 50, is admitted for a colonoscopy because of a family history of bowel cancer and because he has had intermittent presence of blood in his bowel actions. What education can you provide William with about this procedure?

## Care of the individual with a digestive system disorder

Although specific nursing actions and medical management may vary depending on the disorder, the main aims of care are to:

- Maintain standard precautions
- Monitor and maintain accurate bowel frequency and stool form scale (see Clinical Skill 32.2: Stool assessment/collection)
- Ensure accurate documentation and assessment to aid all health professionals in treatment
- Ensure hygiene needs are met; for example, that handwash or sanitisers are available following bowel action
- Maintain skin integrity and appropriate personal hygiene
- Ensure environment is clean, fresh and appropriate to age and ability of the individual
- Encourage appropriate fluids and diet
- Encourage appropriate and realistic exercise
- Ensure the individual is in partnership with the health team in care planning and support individual in accessing further information
- Investigate culturally sensitive issues specific to the lifestyle of the individual
- Maintain individual dignity and support self-image deficits through exploration of potential for altered

## CLINICAL SKILL 32.2 Stool assessment/collection

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Faecal specimen container<br>Pathology request form<br>Bedpan<br>Gloves |

| **Skill activity** | **Rationale** |
|---|---|
| Explain the procedure to the individual and ensure privacy | Reduces anxiety and embarrassment |
| Check the individual's identity band and ensure this information matches the identity on the pathology request form | Ensures the sample is obtained from the correct individual |
| Perform hand hygiene and follow infection control procedures | Prevents cross-infection |
| Provide the individual with a bedpan. Encourage the individual to void prior to providing the stool sample | Ideally the stool sample should be uncontaminated by urine although this might not always be possible |
| Visually assess the stool sample. The size, shape, colour and consistency of the stool should be observed | Changes in the size, shape, colour and consistency of the stool can be a sign of an underlying medical condition |
| The specimen must be labelled with the individual's identifying details, and the date and time the sample was collected | Unlabelled samples will not be processed by the laboratory |
| Using the scooped lid of the faecal specimen container, place a portion of the stool into the container. Place the lid on the container. | All stool samples must be placed into the faecal specimen container |
| The sample is placed the appropriate pathology bag and sent to pathology | The sample will be processed in the laboratory |
| Document and report the procedure | Appropriate care can be planned and implemented |

*(Black 2014; Burch 2014a; 2014b)*

relationships, both physical and emotional, with significant others. Consider the issues such as teasing, bullying, altered physical relationships and carer expectations and stress.

It is vital that infection control principles are adhered to when handling any bodily fluids. The Australian Commission on Safety and Quality in Health Care (ACSQHC 2012) has recognised the importance of infection control and made the reduction of harm through healthcare-associated infections an area of priority in its goals for healthcare. Nurses have a central role to play in this by using effective, evidence-based hand hygiene practices and educating individuals to do the same (ACSQHC 2012).

Specific nursing activities include implementing measures to assist elimination from the bowel, observing and collecting excreta, and care of an individual with a stoma.

## Summary

The functions of the digestive system are to ingest and digest foods so that nutrients can be absorbed into the bloodstream, and to eliminate wastes from the body. Normal functioning may be impaired as a result of alterations in swallowing, secretory function, motility, digestion, absorption or elimination. Disorders of the digestive system can be classified as those occurring from multiple causes, from inflammation or infection, as a result of neoplasms, obstruction or as a result of injury. Diagnostic tests used to assess digestive system function include laboratory

*Continued*

## Summary—cont'd

analysis of body fluids, excretions or tissues; radiological examinations; and endoscopy. Care of the individual with a digestive system disorder includes preventing and managing altered elimination, promoting comfort, maintaining skin and mucous membrane integrity and maintaining nutritional and fluid status. These tasks need to be balanced by supporting the individual through often undignified and embarrassing procedures. Maintaining their self-esteem and encouraging a team approach from all healthcare providers to ensure an optimum lifestyle for the individual is crucial for satisfactory person-centred outcomes.

### DECISION-MAKING FRAMEWORK EXERCISE 32.1

Mr Smith, an individual with a spinal cord injury, has been admitted for a surgical procedure. During his admission he reports to you that he has not had a bowel action for 4 days. Mr Smith states that he is usually unable to completely empty his rectum and requires his wife, who is his carer, to assist him in manually emptying his rectum. He asks if you could perform this procedure as he is experiencing rectal pain. You have never performed this procedure before and do not feel confident in doing so. Mr Smith reassures you that it is easy and he will talk you through the process.

Using the decision-making framework:

1. What is your response to Mr Smith?
2. What is your next action?

## Review Questions

1. What factors may impact an individual's ability to ingest food?
2. Describe the digestion process in the large intestine.
3. Consider the psychosocial impact of bowel disease on the individual and their family.
4. Describe the different types of hepatitis.
5. Describe how assessment of faeces assists in the application of laxatives.
6. Identify the factors that affect bowel elimination.
7. Outline five (5) causes for the onset of diarrhoea in an individual.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australian Council of Stoma Associations Inc. (ACSA): www.australianstoma.com.au

Bowel Cancer Australia: www.bowelcanceraustralia.org/bca/

Coeliac Australia: www.coeliac.org.au

Continence Foundation of Australia: www.continence.org.au

Crohn's and Colitis Australia: www.crohnsandcolitis.com.au

Hepatitis Australia: www.hepatitisaustralia.com

IBIS Irritable Bowel Information & Support Association of Australia Inc.: www.ibis-australia.org/

CHAPTER 33

# Nursing assessment and management of pain

*Yangama Jokwiro*

## KEY TERMS

acute pain
analgesic
chronic pain
endorphins
epidural infusion
gate control theory
pain
pain assessment tool
pain management
palliative care
patient-controlled analgesia (PCA)
substance abuse
threshold
transcutaneous electrical nerve stimulation (TENS)

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define the key terms
- Describe the physiological basis of pain perception
- Describe the factors influencing an individual's perception of, and reaction to, pain
- Describe the differences in approach to pain assessment across the lifespan
- Describe various methods of pain management, including both non-pharmacological and pharmacological approaches
- Apply appropriate principles in planning and implementing nursing actions to prevent and to alleviate an individual's pain

## CHAPTER FOCUS

**Pain** is a hugely subjective phenomenon which has been defined by the International Association for the Study of Pain (IASP) (1979) as 'an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage'. However, a timeless definition of pain that has been widely accepted and used by many nurses is that of Margo McCaffery (1968), a highly recognised pain care specialist. Her definition encompasses the idea that 'pain is what the person says it is, and exists when he [sic] says it does' (McCaffery & Pasero 1999:17). Pain is usually the chief reason individuals seek medical help. Nurses, due to their unique position as direct care workers, should be adequately equipped with cross-cultural, interdisciplinary and age-appropriate skills to assess and manage pain effectively. Thus the focus of this chapter, using a person-centred approach, is on the pathophysiology of pain, barriers to effective pain control and perception, assessment and treatment of pain.

## LIVED EXPERIENCE

I am back again in these familiar hospital corridors. I survived the accident and I am grateful to the mighty Lord for that; but this debilitating pain has left me paralysed for life. This time the pain is worse and I hope that I will be looked after by a nurse who understands what I am going through. I hope I don't meet new nurses and I have to go through my history again. The worst feeling is getting to a place of help and not getting the relief that you need.

**Danai, 44, with chronic pain syndrome post MVA**

# FUNDAMENTALS OF PAIN

Pain is a phenomenon as simple as it is complex. For instance, individuals realise that sitting down can help relieve pain but prolonged sitting can then result in more pain. The same applies to activities of daily living such as walking, dancing and playing. What is even more baffling is that doing nothing for too long or being isolated can also result in pain. Individuals master ways to balance the environmental stimuli so that they avoid pain, such as by using a reverse-cycle air-conditioner to control exposure to hot or cold weather. However, it is impossible to always avoid pain as it is part of our daily living. It is also apparent that pain is multifactorial in origin because of the various environmental factors associated with it; thus the experience and responses to pain are unpredictable. The unpredictability of the response to pain is also complicated by individual differences in age, personality, culture, previous experience, gender and race among other factors. This is why a precise clinical description of pain has eluded clinicians for decades.

Melzack and Casey published a model which describes pain in terms of three hierarchical levels: 'a sensory-discriminative component (location, intensity and quality), a motivational–affective component (depression and anxiety) and a cognitive-evaluative component (thoughts concerning the cause and significance of the pain)' (Melzack & Casey 1968). This description recognises that pain perception may not always be associated with diagnosable tissue damage and that it is hugely influenced by psychological and emotional factors. It also recognises that pain as an unpleasant experience does affect the mental status of people. Pain's sensory-discriminative component constitutes its physiological role as a protective signal, a product of evolution and a warning of actual or impending tissue damage. Avoidance of pain appears to be an instinctive reaction to harmful factors in the environment; for example, a newborn will draw away from a painful stimulus (Craft et al 2014). Throughout the life cycle, people will avoid painful stimuli or take actions to withdraw from such stimuli. The sensation of pain can also warn the individual of emotional or stress-related problems, such as a headache caused by tension or anxiety. The ability to relieve or to control pain depends on an understanding of how it occurs and how it is controlled by the brain.

Although the complex mechanisms of the physiology and psychology of pain are not understood completely, there are several theories of pain. The **gate control theory** (Melzack & Wall 1965) is the leading theory and a discussion of the other theories is beyond the scope of this chapter. The gate control theory of pain suggests that neural mechanisms in the dorsal horns of the spinal cord can act like a gate (Melzack & Wall 1965). This theory proposes that activity in the large diameter nerve fibres can close the gate and block pain impulses, resulting in a decrease or elimination of pain sensation. Therefore, according to this theory, it is possible to block pain impulses travelling to the brain by stimulating the large 'A' nerve fibres and 'closing the gate'. This theory may help to explain why cutaneous stimulation (rubbing a sore spot) or acupuncture can relieve pain, because stimulation of non-painful nerve fibres can 'confuse' messages and suppress pain signals.

It is acknowledged that pain can be inhibited along the course of transmission (Figures 33.1 and 33.2) and that endorphins play a complex role in closing the gate to pain (Bryant & Knights 2014). **Endorphins** are naturally occurring substances with opioid qualities, which combine with the same receptors as morphine and other narcotics to produce the same effect (i.e. analgesia) (Bryant & Knights

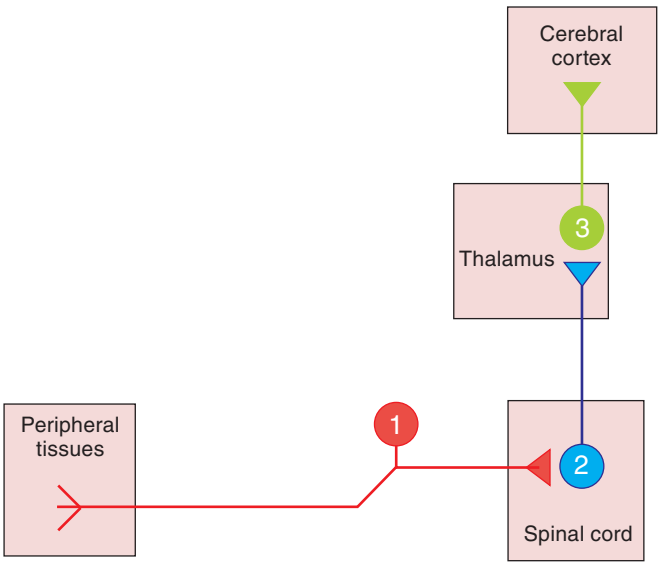


**Figure 33.1** The transmission of pain
*(Craft et al 2014)*

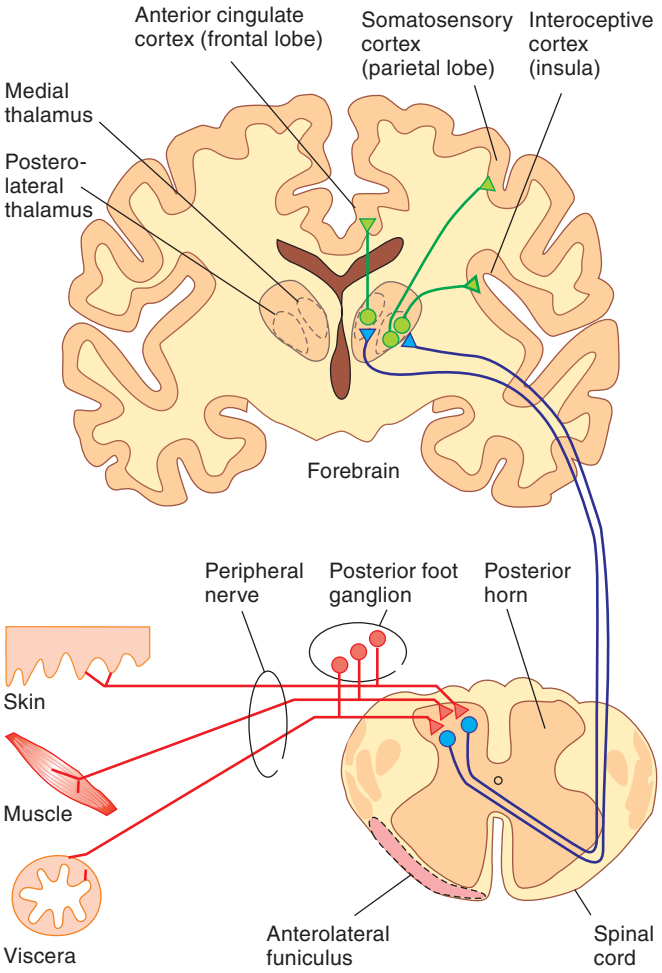


**Figure 33.2** The transmission of pain
*(Craft et al 2014)*

2014). They act as neurotransmitters that mediate the transmission of pain information. As a result of pain or stress, an impulse from the brain may trigger the release of endorphins from pain-inhibiting neurons in the dorsal horn, which block transmission of the pain impulse before it reaches the brain (Figure 33.3). Various studies have shown that plasma endorphin levels increase in states of stress, and also that acupuncture and transcutaneous electrical nerve stimulation (TENS) increase endorphin release (Amir et al 1980; Bowen et al 1987; Belvisi et al 2009; Brown et al 2015; Bryant & Knights 2014). Therefore, although incompletely understood, it is known that the body has some internal mechanisms that help to control pain and our perception of it.

**CRITICAL THINKING EXERCISE 33.1**

Explain physiologically why individuals can become aggressive when they experience pain.

## Classification of pain

In order to manage pain effectively an understanding of the classification of pain is required. The IASP taxonomy of 2014 provides a framework for classification of pain (IASP 2014). It classifies pain according to the cause or pathology involved in its generation. This results in categories such as nociceptive pain, neuropathic pain, psychogenic pain and phantom pain (Table 33.1). The other classification of pain is based on duration (Bryant & Knights 2014). The two main categories in this classification are acute and chronic pain (Table 33.2).

# PAIN MANAGEMENT ACROSS THE LIFESPAN

**Pain management** is the use of pharmacological or non-pharmacological nursing interventions to comprehensively treat discomfort and improve or restore the quality of life. Pain management involves vigilant monitoring of comfort using a multidisciplinary approach and not the mere administration of prescribed analgesics (Brown et al 2015). The major goal is to eliminate pain and improve the quality of life and function. In **palliative care** (see Chapter 38), pain management allows individuals to die with dignity.

The nurse, by virtue of spending 24 hours a day with individuals, is in a position to make the greatest impact in the diagnosis and treatment of pain. As described previously, pain is a hugely subjective experience, and therefore difficult to diagnose objectively. It is thus vital for nurses to be cognisant of the fact that pain is a lived experience, a product of the continuous conflict between the internal and external stimuli and the whole individual (IASP 2014). Therefore, the nurse has an important responsibility to observe the individual for visible evidence of pain, listen carefully to the individual's description of pain and implement measures that prevent or treat pain. In addition, the nurse has a responsibility to monitor and report the individual's response to, and the efficacy of, any prescribed pain management. From a

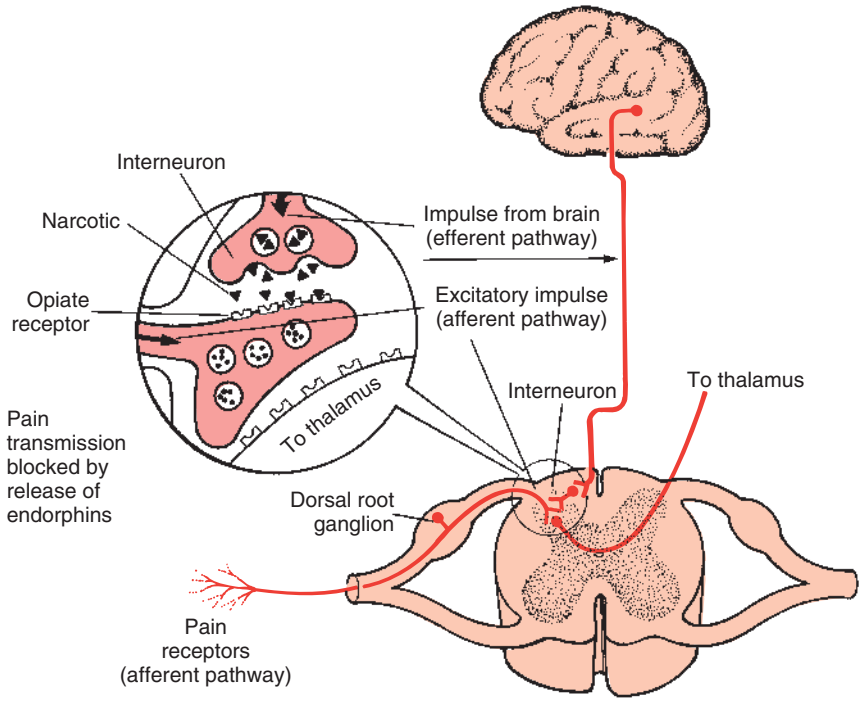


**Figure 33.3** Modulation of pain by endorphins
*(Huether & McCance 2011)*

**TABLE 33.1 | Classification of pain based on aetiology or pathology**

| Type of pain | Pathophysiology |
|---|---|
| Nociceptive | This pain is caused by stimulation of nociceptors (peripheral nerve fibres). These peripheral nerve fibres have the capability to be responsive to noxious internal or external stimuli. Nociceptive pain can be classified as *somatic* (deep or superficial) originating from the skin and musculoskeletal system and *visceral* originating from damaged organs. Nociceptive pain is caused by ischaemia, trauma, chemical irritants and extremes of temperature.<br>When pain receptors are stimulated they send electrical impulses along special pathways to the spinal cord. These pathways may be seen as being similar to a two-lane road, one lane with large diameter fibres for fast message transmission ('A' fibres), and one lane with smaller diameter fibres for slower message transmission ('C' fibres). 'A' fibres have the most insulation, and carry information that reflects throbbing and pricking types of pain. Slow pathways ('C' fibres) have less insulation, and carry impulses that represent burning pain. Pain receptors in the skin and other tissues are free nerve endings, some of which are the peripheral terminations of small diameter 'C' fibres, while others are the slightly larger diameter 'A' fibres.<br>When histamine and other naturally occurring chemical substances are released as a result of tissue damage, pain sensations travel along the nerve fibres. Regardless of the type of pain, and whether travelling slowly or quickly, pain impulses are transmitted to the dorsal root ganglia of the spinal cord, where they synapse with certain neurons in the posterior horns of the grey matter. Pain sensations are then transmitted to various areas of the brain by synapses at the thalamus, where they are perceived and interpreted (Figure 33.2) |
| Neuropathic | Pain resulting from the damage or malfunction of nerve fibres in the peripheral and/or central nervous system. The nerve fibres could be located in the periphery or central sections of the nervous system. The resulting pain is often described as burning or pins and needles |
| Psychogenic | Hugely complex pain which is not fully acknowledged or understood. This pain exists in the absence of known pathophysiology and it is associated with mental and emotional behaviours |
| Phantom | Pain sensation resulting from body parts that have been surgically removed |
| Referred | Pain which originates from visceral organs but is felt on cutaneous areas suggesting some embryonic origin. A good example is cardiac pain which is also felt in the neck and shoulders (Figure 33.4) |

*(Berman et al 2015; IASP 2014)*

**TABLE 33.2 | Classification of pain based on duration**

| Type of pain | Pathophysiology |
|---|---|
| Acute | Pain of rapid onset which varies in intensity and length of time, but is usually time limited and has a predictable management and end. It is often perceived as an incident of high severity and is often able to be precisely located and described. **Acute pain**, if mild, may require no specific intervention, and more severe acute pain can usually be managed successfully. Acute pain may result from injury or infection or occur after surgical intervention. Acute pain includes pre- and postoperative pain, post-traumatic pain, burns pain, acute pain during childbirth, pain as a result of spinal cord injury, acute headache pain, pain associated with HIV/AIDS or sickle cell crisis, pain in trigeminal neuralgia, interventional pain (diagnostic and therapeutic procedures), pancreatitis and other colic pain, pain in myocardial infarction and other major cardiac events, acute on chronic pain. When tissue damage is the cause, pain declines as the tissues heal |
| Chronic<br>—malignant<br>—non-malignant | Pain that has lasted for a period of 3 months or more in the past 6 months and is an ongoing experience that fails to resolve naturally or does not respond well to intervention. It is often no longer considered to be pain that warns of impending danger or tissue damage. **Chronic pain** is constant or intermittent and the individual often has difficulty localising it.<br>Chronic malignant pain includes pain in individuals with cancer, HIV/AIDS, motor neuron disease (MND), multiple sclerosis, end-stage organ failure, advanced chronic obstructive pulmonary disease, advanced congestive heart failure, parkinsonism.<br>Chronic non-malignant pain includes:<br>— chronic musculoskeletal pain such as spinal pain or low back pain, chronic degenerative arthritis, osteoarthritis, rheumatoid arthritis, myofascial and rheumatic pain, chronic headache, migraine pain, bone pain<br>— neuropathic pain (including nerve compression pain, post-nerve injury and post-amputation pain), diabetic neuropathy, complex regional pain syndromes (types I and II), skeletal muscle spasm pain, post-herpetic neuralgia, chronic postsurgical pain<br>— visceral pain (such as distension of hollow viscera and colic pain)<br>— chronic pain in sickle cell anaemia |

*(Berman et al 2015; IASP 2014; National Pain Summit Initiative 2010; WHO 2007)*

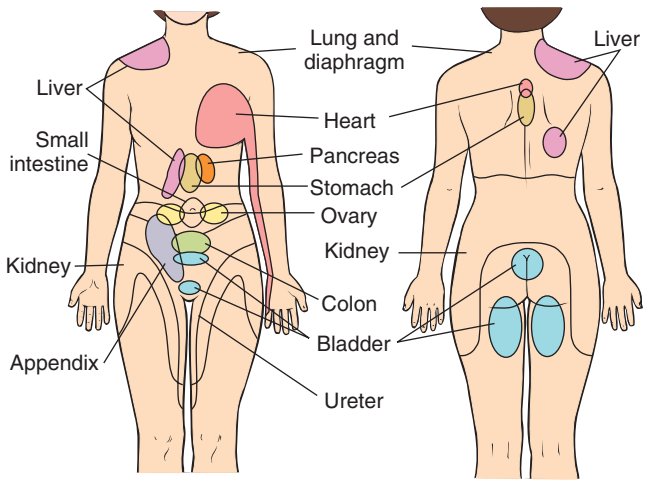


**Figure 33.4** Referred pain sites: cutaneous areas to which pain from certain viscera is referred
*(Craft et al 2014)*

medical point of view, the management of pain includes treating the underlying disease to remove or diminish the cause; treating any other symptoms such as nausea or constipation that may increase the perception of pain; and using non-pharmacological and pharmacological therapy. Specific nursing interventions described later in this chapter include minimising the stimulus that is causing or contributing to the pain, alleviating pain with supportive nursing intervention and assisting the individual self-manage pain. It must be recognised that even the simple provision of information and explanation can have a powerful effect in assisting people to feel in control of their pain-management situation (Craft et al 2014).

## Barriers to effective pain management

There are multiple barriers to adequate pain management; this places individuals at risk of under-treatment. The major problem is that pain management is dependent on a self-report. Individuals recognised to be at risk are those in the extremes of age; that is, children and the elderly. In addition, individuals with psychiatric disorders, who are cognitively impaired, have **substance abuse** problems and those suffering from chronic pain are also at risk of under-treatment of pain. It is therefore important to analyse factors that can influence the perception of pain. The perception of pain is individual and is thus different for each person. Table 33.3 outlines the factors that can influence the perception of pain across the lifespan. In addition, a person may perceive pain differently at different times. Clinical Interest Box 33.1 provides some common biases and misconceptions about pain.

## TABLE 33.3 | Factors influencing the perception of pain across the lifespan

| Factor | Rationale |
|---|---|
| Age | As infants and young children lack the ability to express themselves verbally, their pain, or the degree of pain they experience, may not be recognised or appreciated. Many misconceptions exist in relation to pain in infants, including that infants do not feel pain or are incapable of expressing pain. In addition to the physiological changes, behavioural cues, such as facial activity (including brow bulge, eye squeeze and open lips), crying behaviour and gross motor activity may indicate pain in the infant. Additionally, many children are taught from an early age that they are expected to be brave and that 'only babies cry'. As a result, a child who is experiencing pain may endeavour to hide it. Conversely, a child may invent or exaggerate pain as a method of gaining attention.<br>When older children or adolescents experience pain they may think of it in terms of how it will affect their activities and the attainment of goals. As a result of misunderstanding about their body and illness, young individuals sometimes harbour distressing fantasies about the significance of pain. Consequently, both anxiety and pain are increased.<br>The ability to tolerate pain generally seems to increase with age, and this may be partly due to expectations about what constitutes 'adult' behaviour. Many myths also exist, however, in relation to pain experienced by older adults, particularly those with cognitive impairment. This has resulted in an underestimation and under-management of pain in people with disorders such as Alzheimer's disease. Clinical Interest Box 33.2 provides more information about pain management in individuals with Alzheimer's disease. Common misconceptions include that pain is a natural consequence of growing old, that pain perception decreases with age and that, if the older adult does not report pain, they do not have pain |
| Gender | Many males have been conditioned by society to be strong and brave. Some people consider that any display of emotion by a male, such as crying, is a sign of weakness. As a result of society's expectations of acceptable behaviour, a male may internalise or suppress expressions of pain |
| Culture | Cultural values, attitudes and feelings contribute to the way people react to pain. Some people have a matter-of-fact attitude to pain, with little outward expression of their suffering, while others are more expressive and seek immediate pain relief. Most Western cultures place strong values on the ability to bear pain with silent fortitude, so that external behaviours may not reveal the intensity of pain. People from Latin cultures are permitted to display their suffering openly, such as by crying or moaning, as a socially accepted response to pain. It must also be appreciated, however, that there are enormous differences within every culture and that not every person from a specific culture will react in the same manner. Clinical Interest Box 33.3 provides an example of a cultural experience of pain |
| Emotional state | A person who is emotionally or physically exhausted often has a reduced capacity to tolerate pain. Individual resistance to, and control over, reactions to pain may be lessened. This is often a cyclical phenomenon; continual pain results in anxiety, and anxiety and fear exacerbate pain |
| Environment | There is a relationship between anxiety and pain, and environmental factors can either contribute to or reduce anxiety levels. The environment can act as an anxiety-provoking stressor; for example, if there is an atmosphere of tension or if there is a lack of privacy. Privacy allows a person uninhibited expression of pain, such as crying or moaning. The continued presence of other people, as in a shared ward, results in a sense of loss of privacy. This may be a cause of anxiety and a contributing factor in the perception of, and reaction to, pain. It is therefore important to recognise the many factors that influence pain reactions and to appreciate that each pain experience is unique and personal. Anyone caring for an individual experiencing pain should not judge the appropriateness of that person's reaction to pain, and must be sensitive to individual needs |
| Self-image | A person's self-perception can influence a reaction to pain. For example, a person who has low self-esteem may try to bear pain stoically to be regarded highly by others. Conversely, another person with a poor self-image and feelings of worthlessness may tolerate pain poorly in an attempt to gain attention and recognition. A pain episode may be interpreted by some people as being punished for something |
| Time of the day | Night, with accompanying darkness and reduced sensory input, often increases a person's sensation of pain. Fear and anxiety may be increased and, as a result, so too is the sensation of pain. The latter part of the day may also be when the person is fatigued physically and emotionally |
| Previous experience | Previous episodes of severe pain often cause great apprehension, and individuals can suffer greatly if they anticipate recurrent severe pain. Anxiety may be increased if the previous experience of severe pain was poorly managed. Previous pain experience may at times be useful as a form of comparison when assessing a subsequent pain episode. Overall, the amount of previous pain experiences a person has had may influence their current response to an episode of pain |

*(Adapted from Crisp et al 2013)*

## CLINICAL INTEREST BOX 33.1 Common biases and misconceptions about pain

The following statements are false:

- Substance abusers and alcoholics overreact to discomforts
- Individuals with minor illnesses have less pain than those with severe physical alteration
- Administering analgesics regularly will lead to drug addiction
- The amount of tissue damage in an injury can accurately indicate pain intensity
- Healthcare personnel are the best authorities on the nature of an individual's pain
- Psychogenic pain is not real
- Chronic pain is psychological
- Individuals should expect to have pain in hospital
- Individuals who cannot speak do not feel pain.

*(Crisp et al 2013)*

## CLINICAL INTEREST BOX 33.2 Pain management in individuals with Alzheimer's disease

No evidence exists that cognitively impaired older adults experience less pain or that their reports of pain are less valid than those people with intact cognitive function. It is probable that individuals with dementia and progressive deficits of cognition, particularly those in long-term care facilities, suffer significant unrelieved pain and discomfort. Assessing pain in these individuals is challenging but possible. The best approach is to accept the individual's report of pain and treat the pain as it would be treated in a person with intact cognitive function.

*(Potter et al 2013)*

## CLINICAL INTEREST BOX 33.3 A cultural experience of pain

People from different cultures respond differently to pain. In a more general sense, these responses can be described as stoic and emotive. Stoic individuals tend to bear the pain and withdraw socially as seen in some Northern European and Asian cultures. Emotive individuals express their pain verbally and want to be surrounded by close family members so they can react and validate their pain, as seen in people from Middle Eastern and Mediterranean backgrounds. A person's cultural belief of pain and their personal treatment strategy may lead them to believe, for example, that it is God's will for them to experience pain. Buddhists prefer to use meditation techniques to help relieve their pain.

*(Brown et al 2015)*

As the perception of pain is individual, some will experience pain much earlier than others. Studies have shown that all individuals have a similar sensation **threshold** but that the ways in which different people react to pain may vary tremendously and many factors may be involved (see Clinical Interest Boxes 33.2 and 33.3) (Fillingim et al 2009; Clayton et al 2009; Bryant & Knights 2014). This is demonstrated by behavioural manifestations of pain which express the individual's physiological response and the cultural factors which shape the person's perception of pain. The pain threshold is the point at which a stimulus, such as pressure, activates pain receptors and produces a sensation of pain (IASP 2014).

## Assessing pain

Pain is considered the fifth vital sign alongside classic vital signs such a blood pressure, pulse, respiration and temperature (Lynch 2001). Incomplete assessment of individuals leads to inadequate pain management which in turn interferes with the healing process. The assessment process involves obtaining both subjective and objective data (Table 33.4). The data must be comprehensive, covering both the physiological and the behavioural manifestations of pain (Clinical Interest Box 33.4) (Crisp et al 2013). Assessment begins with a comprehensive pain history and use of the PQRST or PQRSTU mnemonic (Table 33.4) is recommended (Chang & Johnson 2014; Crisp et al 2013). This includes provoking/palliative factors, quality, region and radiation, severity and temporal pattern (onset, duration and pattern). The questions must be designed to enable the individual to describe the pain in their own words. In circumstances when individuals cannot describe their pain, appropriate assessment questions and tools should be used. These circumstances could be younger children, language or cultural barrier and individuals with cognitive impairment (refer to Clinical Interest Boxes 33.2 and 33.3). A nurse should never ignore an individual's statement that they are in pain, and should remember that 'pain is what the person says it is' as described by McCaffery in 1968 (McCaffery & Pasero 1999). An individual can usually sense if the nurse does not believe that they are experiencing pain, and this can increase the sense of helplessness. As a consequence, the person may compensate by under-reporting pain or by anxiously over-reporting. Either reaction aggravates the circle of mistrust–anxiety–more pain (Crisp et al 2013). When assessing an individual's pain, the nurse should obtain sufficient and appropriate information through observation, questioning and conducting a physical examination. (See Case Study 33.1, Nursing Care Plan 33.1 and Progress Note Example 33.1.)

**CRITICAL THINKING EXERCISE 33.2**

Discuss the rationale for ensuring that pain assessment is undertaken in a non-judgmental manner.

## TABLE 33.4 | Assessing pain

### SUBJECTIVE DATA

| Domain | Assessment questions | Rationale |
|---|---|---|
| Pain history | **PQRST**<br>**Provocative**<br>What where you doing when the pain started?<br>What makes the pain worse or what relieves it?<br>What caused it?<br>**Quality**<br>What does the pain feel like?<br>**Region**<br>Where is the pain located?<br>Does the pain move and is it related to any other pain?<br>**Severity**<br>How severe is the pain?<br>**Timing**<br>When did the pain start?<br>How long has the pain been present?<br>Is pain constant or intermittent?<br>**U (You)**<br>How does the pain affect you? | Information should be obtained regarding the onset of pain; for example, whether it was sudden or gradual. The individual should also be asked if the pain increases or decreases at specific times of the day or night; that is, if there is rhythmic variation or pattern in the pain. For example, an individual who has arthritis aggravated by inactivity may experience severe joint pain on waking, but the pain may become less severe throughout the day.<br>Certain physical activities or psychological factors may precipitate pain. For example, chest pain may occur after physical exercise, or abdominal pain may occur after eating. A change of posture may aggravate or relieve pain, and factors such as anxiety or fear may also precipitate pain. It is important to establish factors that aggravate the pain as well as those that modify or bring about pain relief.<br>Quality is the way the pain is described by the person who is experiencing it, and it is important for the nurse to report and record the individual's own words. Some of the terms that may be used to describe the type and quality of pain are gripping, knife-like, burning, prickling, tingling, dull, aching, cramping, gnawing, constricting, throbbing, vice-like, crushing, stabbing and shooting.<br>An individual may be able to locate a painful area specifically by describing it or by pointing to the body area involved, such as the tip of the thumb on the left hand, or they may describe the painful area more generally; for example, all over the abdomen. Pain that radiates from its point of origin should also be noted.<br>The severity of pain is not always evident from a person's reaction, especially with a chronic pain problem, and must therefore be assessed as the individual's own perception. Several measurement tools, or pain scales (Figure 33.5), have been designed to assist an individual to describe the intensity of pain. Healthcare institutions may devise their own measurement tool, or may use a standard tool. One method of assessment is a linear scale from 1–10, on which the individual indicates the intensity of their pain, with 0–1 being no pain at all, and 10 representing severe and intense pain. A similar scale using 'smiley faces' may be used for children (Figure 33.6).<br>This type of measurement device facilitates both assessment and management of pain in many cases. However, the use of pain-scale assessment tools makes the assumptions that the individual has a past experience of pain, that they can understand the scale and verbalise, and that they are not cognitively impaired. With elderly individuals, issues such as poor memory, depression and sensory impairment may also make pain assessment difficult. The Abbey Pain Scale (Figure 33.7) is a measurement of pain in people with dementia who cannot verbalise.<br>It is important to establish how long the pain lasts; for example, whether it is continuous or intermittent |
| Medication history | What medication have you taken to treat the pain?<br>What medications are you currently taking?<br>Have you been prescribed medications in the past to treat this pain? | These questions give invaluable information which can help with diagnosing the cause of the pain. This information can also shape treatment |

*Continued*

## TABLE 33.4 | Assessing pain—cont'd

### SUBJECTIVE DATA

| Domain | Assessment questions | Rationale |
|---|---|---|
| Cognitive dimensions | Is the individual cognitively incapacitated?<br>What is the attitude of the individual?<br>What is your perception of the pain?<br>What is the meaning of the pain? | A person's self-perception can influence a reaction to pain. For example, a person who has a low self-esteem may try to bear pain stoically to be regarded highly by others. Conversely, another person with a poor self-image and feelings of worthlessness may tolerate pain poorly in an attempt to gain attention and recognition. A pain episode may be interpreted by some people as being punished for something |
| Psychological status | How is the individual coping?<br>How do you expect to cope? | A person who is emotionally or physically exhausted often has a reduced capacity to tolerate pain. Individual resistance to, and control over, reactions to pain may be lessened. This is often a cyclical phenomenon—continual pain results in anxiety, and anxiety and fear exacerbate pain |
| Social and family history | What are the social pressures?<br>How is the pain affecting the social role of the individual?<br>Does the individual have any support from the family?<br>How is the family coping? | Assessment should include whether or not the pain interferes with lifestyle or the performance of any activities of daily living; for example, does it affect the ability to eat, move freely or sleep? Are roles and relationships being affected in a significant way by the pain that is being experienced? |
| Cultural and spiritual influences | What is the cultural background?<br>What gives meaning to the individual? | Cultural values, attitudes and feelings contribute to the way people react to pain. Some people have a matter-of-fact attitude to pain, with little outward expression of their suffering, while others are more expressive and seek immediate pain relief |

### OBJECTIVE DATA

| Domain | Rationale |
|---|---|
| Vital signs | The individual's temperature, pulse, respirations and blood pressure should be measured when pain is first experienced. When acute pain occurs the autonomic response is activated, so that:<br>• Heart rate increases<br>• Blood pressure rises<br>• Breathing often becomes rapid and shallow<br>• Muscles tense<br>• Blood flow to the hands and feet is constricted, and they become cold<br>• The skin becomes pale and sweaty<br>• Nausea and vomiting may occur.<br>These physiological changes are often less observable in a person with chronic pain.<br>Over time the changes are unable to be sustained, and the individual with chronic pain may exhibit a general appearance of not being in pain. The results should be documented, and repeated measurements made to detect any alterations. Any abnormal result or significant variation should be reported immediately |
| Physical examination | The individual should be observed for signs of increased emotional tension, such as irritability, anxiety, depression, aggression, exhaustion or sleeplessness. When an individual experiences pain or a change in the nature of pain already present, the nurse should monitor and assess by making the observations as described. Clinical Interest Box 33.4 outlines some behavioural indicators of the effects of pain. A simple head-to-toe assessment is also warranted to make sure that there are no mechanical objects that may be the cause of pain such as a blocked catheter |
| Investigations | The medical officer may order further investigations which may help diagnose the source of pain |

*(Adapted from Brown et al 2015; Crisp et al 2013)*

## CLINICAL INTEREST BOX 33.4 Behavioural indicators of effects of pain

**Vocalisations**

- Sighing, groaning, moaning
- Grunting, screaming, calling out
- Aggressive/offensive speech
- Noisy breathing
- Asking for assistance

**Facial expressions**

- Frowning, sad or frightened face
- Grimacing, wincing, eye tightening
- Distorted facial expressions—brow raising/lowering, cheek raising, nose wrinkling, lip corner pulling
- Rapid blinking

**Body movement**

- Tense posture, guarded, rigid
- Fidgeting
- Pacing, rocking or repetitive movements
- Reduced or restricted movement
- Altered gait

**Social interaction**

- Aggressive or disruptive behaviour
- Socially inappropriate behaviour
- Decreased social interactions
- Withdrawn

**Changes in activities**

- Appetite change, refusing food
- Increase in rest periods
- Sleep or rest pattern changes
- Increased wandering

*(Royal College of Physicians, British Geriatrics Society, British Pain Society 2007; Edith Cowan University 2007)*

## CASE STUDY 33.1

Mrs Jones is 65 and, up until admission to hospital, has lived alone. She has had rheumatoid arthritis for the past 25 years, resulting in severely deformed hands. She is unable to walk without assistance and is no longer managing at home, despite full community services. Chronic pain is a major issue for her. Mrs Jones states that 'the pain is there most of the time but gets worse when I move suddenly'.

Describe the assessment and management of Mrs Jones' pain.

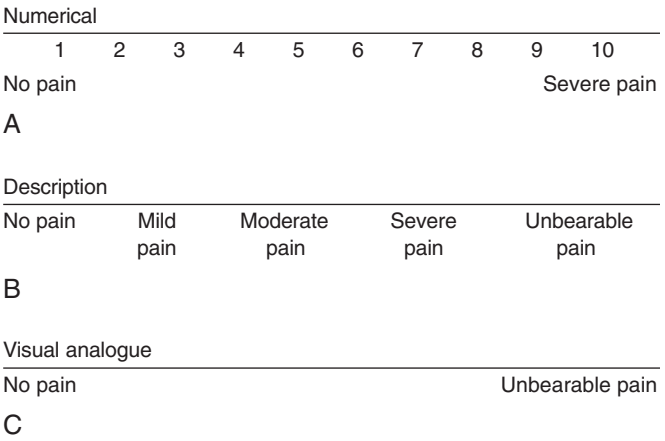


**Figure 33.5** Scales for measuring pain intensity in adults The individual identifies a point on the scale that corresponds to their perception of the severity of the pain

### Pain assessment tools

There are a variety of **pain assessment tools** used for individuals across the lifespan (Figures 33.5, 33.6 and 33.7). The aim of these tools is to standardise and objectify assessment. These tools include:

- Numeric rating scale (NRS) (Figure 33.5A)
- Categorical or verbal descriptor scale (VDS) (Figure 33.5B)
- Visual analogue scale (VAS) (Figure 33.5C)
- Faces scale (Figure 33.6)
- Abbey Pain Scale (Figure 33.7).

## NURSING INTERVENTIONS FOR AN INDIVIDUAL EXPERIENCING PAIN

The nurse has a responsibility to try to eliminate or minimise the stimulus that is causing pain. The nurse should also observe the individual who is experiencing pain, report and document their observations and implement nursing measures accordingly to alleviate pain. Continued assessment and monitoring of the individual is necessary to evaluate the effectiveness of any prescribed therapy (IASP 2014). Particular attention must be paid to individuals who cannot clearly articulate their needs or feelings, such as infants and small children and those with cognitive or communicative impairment (Crisp et al 2013). Pain management, both of non-pharmacological and pharmacological nature, must still be addressed in these situations, and responses evaluated. The nurse also plays an important role in supporting the individual's significant others, who are usually distressed by the pain experience of their loved one, particularly when the pain is chronic or is a result of terminal illness.

The importance of clear and effective communication between the nurse and the individual and significant others cannot be overemphasised. A positive relationship facilitates effective communication, which can affect the individual's response to pain and pain relief. The individual should be

## NURSING CARE PLAN 33.1

**Assessment:** Mrs Jones is 65 and, up until admission to hospital, has lived alone. She has had rheumatoid arthritis for the past 25 years, resulting in severely deformed hands. She is unable to walk without assistance and is no longer managing at home, despite full community services. Chronic pain is a major issue for her. Mrs Jones states that 'the pain is there most of the time but gets worse when I move suddenly'.
**Issue/s to be addressed:** Chronic pain, related to joint inflammation
Impaired home maintenance, related to fatigue
Activity intolerance, related to the effects of inflammation
Deficient knowledge: therapeutic regimen
**Goal/s:** Effective pain management
Minimise joint stress with ADLs
Understanding of the prescribed therapeutic regimen

| Care/Actions | Rationale |
|---|---|
| Assess thoroughly including vital signs, liver function test and renal function test | NSAIDS are nephrotoxic and hepatotoxic |
| Schedule NSAIDs at equal intervals throughout the day | Keeps the pain under control through the day |
| Give morning NSAID dose with milk and cracker biscuits approximately 30 minutes before rising | Allows individual to mobilise when they get up and giving NSAIDs with food protects stomach |
| Performing ROM exercises in shower or bathtub | Reduces joint stiffness by allowing self-lubrication |
| Apply local heat with paraffin dip or compress; use cold packs as needed | Reduces pain and increases joint mobility |
| Provide information about the Arthritis Foundation of Australia | This information is helpful for individuals to access services and support groups |
| Referral to social worker | Helps with household work |
| Provide information about the disease process and its manifestations, prescribed medications with desired and adverse effects, and the importance of balancing rest and activity | Empowers the individual |

**Evaluation**

Verbalises effective pain management strategies.
Uses assistive devices to minimise joint stress with ADLs.
Verbalises a plan to reduce responsibilities for home maintenance.
Expresses a willingness to plan rest breaks during the day.
Demonstrates understanding of the prescribed therapeutic regimen and its importance for both short- and long-term benefit.

## PROGRESS NOTE EXAMPLE 33.1

| | |
|---|---|
| 20/07/2015<br>1020 hrs | Nursing: Admitted Mrs Jones for pain management. GCS 15/15, PERLA and normal power upper and lower limbs. Nil focal neurology. Her vital signs were normal. Her liver function and renal function are within normal limits. She has been referred to social worker and occupational therapy for self-care adjustments and use of assistive devices. She has also been advised on the use of NSAIDs with the pharmacist. Nil other concerns identified.<br>***S. Stewart* (Stewart) EN** |

encouraged to express feelings openly, in an atmosphere of trust. The nurse should learn to listen actively to the individual, so that not only the verbal interactions are heard but any non-verbal cues are also detected and acted on (see Chapter 8). For example, individuals may deny pain or state that they are not experiencing much pain, but the body language and tone of voice may indicate otherwise. To promote peace of mind and to reduce anxiety, individuals should be provided with information about their illness, including expected pain and its management. Individuals should be aware that they have a right to pain relief and that various pain-relieving measures are available. It is important to prevent or reduce the cycle of pain–stress–anxiety–pain. A variety of nursing measures, some very simple, may help to minimise or alleviate pain (Table 33.5).

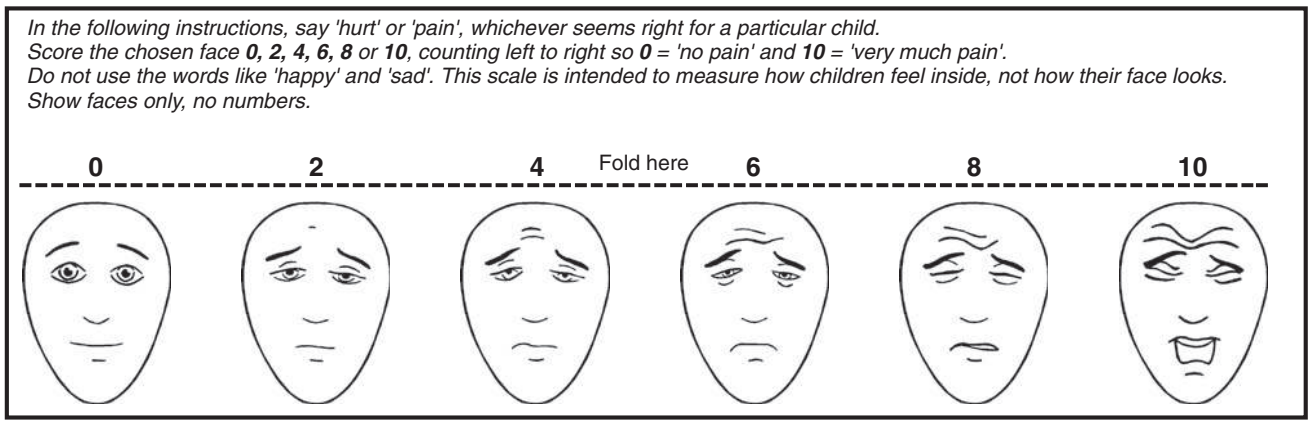


**Figure 33.6** Faces Pain Scale, Revised

*(Faces Pain Scale—Revised (FPS-R). www.iasp-pain.org/fpsr. Copyright © 2001, International Association for the Study of Pain®. Reproduced with permission)*

**CRITICAL THINKING EXERCISE 33.3**

It has been observed that pain in certain groups, especially children and the elderly, is not always well managed, and that these groups may be among the most under-treated for pain. Why do you think this may occur? What can the nurse do to improve this situation?

## Non-pharmacological therapy

Pain management and control may be achieved by a variety of supportive measures other than medication. Non-drug approaches to pain management may include the use of heat or cold, massage and psychological methods.

### Application of heat or cold

The general rule is that heat is for chronic pain while cold is for acute injuries. Heat applied to the skin causes dilation of the local blood vessels and, as a result, may improve the blood supply to an area, relax muscles and relieve spasm, promote healing and relieve pain. Cold applications may also be used to relieve swelling and pain. Cold has a numbing effect that helps to reduce pain in a body part. The use of heat and cold depends on the individual's preferences and hospital policy and if used should include education on potential risks and safe use (Brown et al 2015). Heat packs have been associated with burns, especially wheat or grain filled packs. The Therapeutic Goods Administration (TGA) advises consumers to follow manufacturer instructions and to use heat packs listed on the Australian Register of Therapeutic Goods (ARTG).

### Massage

Massage involves the manipulation of soft tissue and can increase circulation, reduce muscle tension, relax the individual and relieve pain. Cutaneous stimulation often acts to alter the individual's conscious awareness of pain. Aromatherapy and massage using essential oils may also be of benefit in some situations. Soothing touch and gentle rocking motion to promote contact, warmth and closeness may help to relax an infant in pain.

### Psychological methods

Various techniques may be used to promote general relaxation of the individual, and therefore reduce anxiety and relieve pain. Music and art may be used as a sensory distraction or as a soothing method of reducing stress (Brown et al 2015). Other methods of distraction may be helpful to lessen the individual's awareness of painful stimuli, such as encouragement of concentration on slow, deep, rhythmic breathing exercises, or even guided imagery, singing, praying or tapping (Brown et al 2015). Several other methods of non-pharmacological pain management may be prescribed or undertaken. While it is not the role of the nurse to implement these, they may form part of the overall treatment plan, so an awareness of them is required.

### Acupuncture

Acupuncture, which is a form of traditional Chinese medicine, involves the insertion of fine needles into the skin at selected points on the body. It may be used to manage both acute and chronic pain, and there are several theories about how it relieves pain. Some authorities believe that acupuncture achieves analgesia by stimulating the release of endorphins, while others believe that it stimulates the large diameter nerve fibres that effectively close the gate and block pain impulses (Amir et al 1980; Bowen et al 1987; Belvisi et al 2009; Brown et al 2015; Bryant & Knights 2014).

### Transcutaneous electrical nerve stimulation

A specific technique of peripheral nerve stimulation, **transcutaneous electrical nerve stimulation (TENS)**, involves the application of electrodes to trigger points on the skin (Figure 33.8). The electrodes are activated by a battery-powered device to produce a tingling or vibrating sensation in the painful area. The impulses block the transmission of pain impulses to the brain (Brown et al 2015; Bryant &

Place identification label here

Name: .....
DOB: .....
Room No: .....

**ABBEY PAIN SCALE**

**For measurement of pain in people with dementia who cannot verbalise**

How to use scale: While observing the resident, score questions 1 to 6.

Name of person completing the scale:.....
Date: ..... Time: ..... Designation:.....
Latest pain relief given was ..... at ..... hrs.

**Q1 Vocalisation** **Q1**
(e.g. whimpering, groaning, crying)
*Absent 0* *Mild 1* *Moderate 2* *Severe 3*

**Q2 Facial expression** **Q2**
(e.g. looking tense, frowning, grimacing, looking frightened)
*Absent 0* *Mild 1* *Moderate 2* *Severe 3*

**Q3 Change in body language** **Q3**
(e.g. fidgeting, rocking, guarding part of body, withdrawn)
*Absent 0* *Mild 1* *Moderate 2* *Severe 3*

**Q4 Behavioural change** **Q4**
(e.g. increased confusion, refusing to eat, alteration in usual patterns)
*Absent 0* *Mild 1* *Moderate 2* *Severe 3*

**Q5 Physiological change** **Q5**
(e.g. temperature, pulse or blood pressure outside normal limits, perspiring, flushing or pallor)
*Absent 0* *Mild 1* *Moderate 2* *Severe 3*

**Q6 Physical changes** **Q6**
(e.g. skin tears, pressure areas, arthritis, contractures, previous injuries)
*Absent 0* *Mild 1* *Moderate 2* *Severe 3*

---

**Add scores for 1–6 and record here** **Total Pain Score**

**Now tick the box that matches the Total Pain Score**

| 0–2 No pain | 3–7 Mild | 8–13 Moderate | 14+ Severe |
|---|---|---|---|

**Finally tick the box which matches the type of pain**

| Chronic | Acute | Acute on Chronic |
|---|---|---|

Abbey, J; Do Bellis, A; Piller, N; Esterman, A; Giles, I; Parker, D and Lowcay, B.
Funded by the JH & JD Gunn M Medical Research Foundation 1998–2002
(This document may be reproduced with this acknowledgement retained)
Taken from: www.health.gov.au/acc/reports/download/

**Figure 33.7** The Abbey Pain Scale
*(Abbey et al 2004)*

**TABLE 33.5 | Nursing measures to improve comfort**

| Nursing action | Rationale |
|---|---|
| Change of position | At times pain can result from, or be increased by, an uncomfortable posture. The individual should be assisted into a more comfortable position, with appropriate pillows arranged for support. The addition of a sheepskin underneath the back and buttocks may enhance comfort, and the bedclothes should be arranged to meet individual needs. It is important to ensure that the individual's body is in alignment, and the placement of a pillow under a painful limb may further enhance comfort. Correct positioning should ensure that there is no undue stress on incisions, and no tension applied to any tubing present (surgical drain tube or urinary catheter) |
| Meet general comfort needs | The nurse should ensure that all basic comfort needs are provided for; for example, discomfort and pain can result from a distended bladder. The individual may feel more comfortable if the face and hands are washed, hair brushed and teeth cleaned. If not contraindicated, a drink of the individual's choice should be offered. A warm drink in the evening may help to promote settling and sleep. Comfort needs for an infant in pain may include containment (swaddling) to increase feelings of security, and the pacifying effect of non-nutritive sucking |
| Gentle handling | When the individual is being assisted to move, the nurse should ensure that any movements are made gently. Pain is usually increased on movement, so individuals should be permitted and assisted to move at their own pace. As the individual moves, the nurse should ensure that painful areas are supported. An incision can be supported during movement; the individual or the nurse may place a hand over the incision to 'splint' it, or hugging a pillow may provide support on movement |
| Promote rest and sleep | Pain is very tiring, and fatigue increases reactions to pain; therefore, the nurse should ensure that the individual receives adequate and effective rest and sleep. Measures should be implemented during the day, as well as during the night, to facilitate rest; for example, the blinds may be drawn, and all care planned so that repeated interruptions and visits to the individual are avoided. Relaxation reduces anxiety, can enhance the effect of pain relief and facilitates sleep. The individual can be taught and encouraged to practise one of several relaxation techniques, as described later. If appropriate, and with consent, gentle massaging of the neck and back may relieve tension and facilitate relaxation |
| Check dressings and splints | Any dressing, bandage or splint should be checked at regular intervals and, within medical orders, changed or adjusted if necessary. A poorly positioned dressing can irritate a wound, a bandage may be too tight or an inappropriately applied or positioned splint may cause pressure and pain |
| Adapt the environment | The nurse should consider the immediate surroundings and adapt them according to individual needs. While some individuals experiencing pain may prefer to rest in a darkened room, others may prefer that their room is bright and cheerful. An individual may choose to attempt to distract themselves from their pain by watching television or listening to music, or may prefer to lie quietly. The presence of fresh flowers in the room may be a source of pleasure or irritation, and some individuals may find it comforting if there are appropriate paintings on the wall. The nurse should ensure adequate privacy and appropriate ventilation and heating, while adapting the environment to meet individual needs |
| Implement prescribed therapy | The nurse may be responsible for being with the individual during therapy, or may be involved in its implementation. Whenever therapy is prescribed, the nurse should implement measures to promote the individual's comfort and safety. The nurse should also monitor the individual to assess the efficacy of prescribed therapy, and report and document all observations |

Knights 2014). TENS may be indicated for many people, especially those with joint or bone pain. It is normally well tolerated, although skin irritation is sometimes experienced. It should not be used for individuals with cardiac pacemakers as it can interfere with pacemaker function.

## Hypnosis

Hypnotic analgesia may be achieved when a person enters a state of self-induced relaxation and concentration. During hypnosis, cognitive thinking is bypassed, allowing the individual to become more susceptible to suggestion. The individual enters a passive trance-like state, which is induced by a trained hypnotist, who may use the repetition of words and gestures. Susceptibility to hypnosis varies from person to person.

## Biofeedback

Biofeedback is a method that assists a person to become aware of, and subsequently to control, certain autonomic physiological responses, such as blood pressure, muscle

**CRITICAL THINKING EXERCISE 33.4**

Discuss the rationale/benefits for use of non-pharmacological pain management strategies for:
1. A young child
2. An adolescent
3. An older adult

**Figure 33.8** A transcutaneous electrical nerve stimulation (TENS) device
*(Brown et al 2015)*

tension and heart rate. Through concentration, and with the aid of instruments, the individual can learn to control and modify these processes, which are normally involuntary. The technique of biofeedback is more effective when accompanied by other relaxation techniques.

### Placebo therapy

Placebo therapy involves the administration of inactive substances (such as lactose pills or sterile water), and may be effective for certain people in certain situations. It is thought that placebos relieve pain or other symptoms by causing the body to release endorphins, combined with an expectation that the treatment will be effective (McCaffery & Arnstein 2006). The use of placebos involves a degree of recipient deception and poses many ethical and moral problems (McCaffery & Arnstein 2006). Its use in mainstream pain management should generally be limited.

### Pain clinics

People who experience chronic pain may be helped by attending a multidisciplinary pain clinic. Pain clinics commonly attempt to reduce use of pain medication, help individuals resume normal activities and restore a positive self-image. Management includes a thorough physical and psychological examination before a program is designed for the individual. Approaches to pain management in a pain clinic include psychological counselling, acupuncture, TENS or any of the other methods of pain relief. The individual is taught alternative ways of carrying out the activities of daily living so that associated pain is minimised.

## Pharmacological therapy

Medications prescribed by a medical officer to relieve pain may be either local or systemic, analgesic or co-analgesic. The nurse's role in relation to medication administration involves assessment and monitoring of individual responses to therapeutic treatments ordered. When medications have been prescribed, it may be within the nurse's scope of practice to administer them. Figure 33.9 is a flow chart for pharmacological management of pain.

### Nerve block

Peripheral nerve transmission of pain can be interrupted temporarily by the injection of a local anaesthetic, or permanently by injecting a sclerosing agent into the nerve root area. As the latter method can result in destruction of tissue adjacent to the injected area, other pain-relieving methods are usually preferred, with this being an option in cases when other pain-relieving methods have been unsuccessful.

### Counter-irritants

Counter-irritants, such as mentholated ointments and heat rubs, applied locally to the skin, can produce an inflammatory response, thereby relieving congestion in underlying tissues and reducing pain from the original source.

### Radiotherapy and/or chemotherapy

The pain associated with malignant disease may be relieved by radiation, which shrinks a tumour that is actively causing compression in an area. Chemotherapy (also considered as pharmacological therapy) may sometimes control pain if the tumour is sensitive to the medications used.

### Analgesic

**Analgesic** or pain-relieving medications may be mild (e.g. non-narcotics such as acetylsalicylic acid (aspirin) or paracetamol) or strong (e.g. narcotics such as morphine or oxycodone). Analgesics may be administered via a number of routes, including orally, by injection or infusion (intramuscularly, subcutaneously, intravenously or into the epidural space), or in some instances they may be applied topically (via creams or patches onto the skin) (see Chapter 24). The type, dosage and route of analgesic medications given will be prescribed by the medical officer according to the individual's needs. Good pain control, especially in postoperative and chronic pain situations, is achieved by administering appropriate amounts of the most effective medication at regular intervals, thus avoiding the experience of peaks and troughs of pain. In some cases analgesia is ordered on a 'PRN' (as required) basis, which may be appropriate for intermittent episodes of pain. Clinical Interest Box 33.5 provides a caution related to pain and the older adult.

Analgesics are frequently given intravenously for severe pain, either as a bolus dose (a concentrated dose given in a short period of time) or, preferably, as an infusion, which has the advantage of avoiding repeated injections and establishes

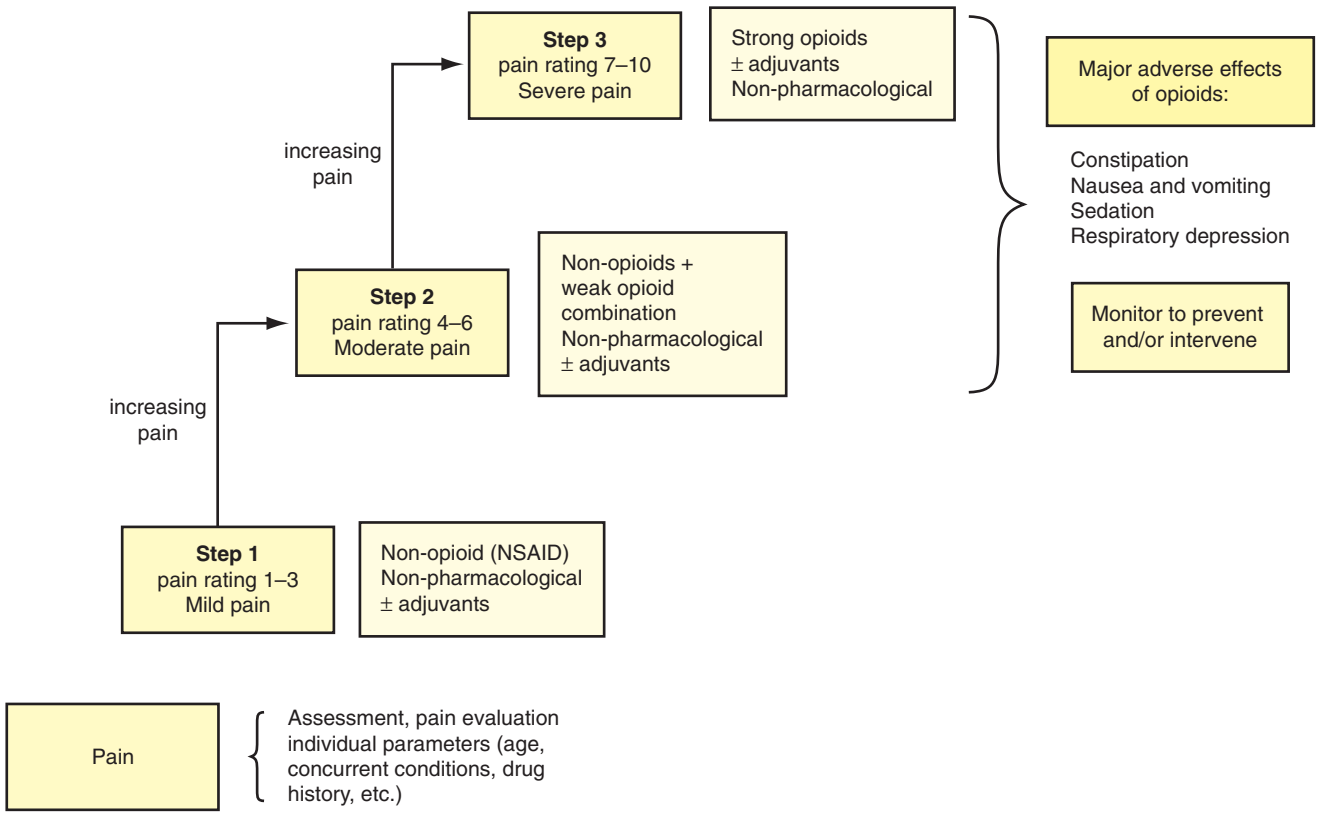


**Figure 33.9** Flow chart for pharmacological management of pain
*(Bryant & Knights 2014)*

## CLINICAL INTEREST BOX 33.5
## Pain and the older adult

Pain is a prevalent in older people and has significant debilitating outcome. This is exacerbated by the existence of multiple commodities and polypharmacy. Nursing older people requires an understanding of the pharmacokinetics and pharmacodynamics of analgesics in older people and the careful monitoring of side effects. Older people are susceptible to confusion if given higher doses of narcotics, for example.

*(Bryant & Knights 2014)*

a constant blood level of analgesic drug, thus avoiding considerable pain between doses. This can be done using an intravenous pump controlled by the individual (patient-controlled analgesia or PCA) or a programmable pump with a catheter placed in the epidural space.

**Patient-controlled analgesia (PCA)** uses intravenous opioids and a programmable pump. A dose of drug is delivered each time the individual pushes a button, within limitations set by the doctor. This allows the individual to choose how often and when to receive the medication, and often enables them to establish a greater sense of control over pain management.

**Epidural** analgesia is an alternative method of pain control that uses a fine catheter inserted into the epidural space of the spine, again connected to a programmable pump. This method of pain relief is effective in controlling pain while allowing the individual to remain alert. It is frequently used in obstetrics, postoperatively and sometimes in individuals with cancer. The primary responsibility of caring for individuals with either narcotic or epidural infusions remains with the Registered Nurse (RN). Nonetheless, response to medications and evaluation of pain control measures are within the scope of practice of all nurses. Table 33.6 outlines nursing measures for an individual with an **epidural infusion**.

**Co-analgesic** medications, while not true analgesics in the pharmacological sense, act to augment pain relief, either alone or in combination with analgesics. Examples of medications that may be used as co-analgesics are corticosteroids and non-steroidal anti-inflammatory drugs, both of which may act to decrease inflammation and oedema (Bryant & Knights 2014). The use of anti-anxiety drugs or drugs producing muscle relaxation may also be incorporated into a treatment plan. Sometimes a dose of co-analgesic medication together with an analgesic can produce greater pain relief than a higher dose of an analgesic alone. Table 33.7 outlines the nursing considerations for an individual receiving specific analgesics and Table 33.8 outlines the actions of analgesics.

## TABLE 33.6 | Nursing care for individuals with epidural infusions

| Goal | Actions |
|---|---|
| Prevent catheter displacement | Secure catheter (if not connected to implanted reservoir) carefully to outside skin |
| Maintain catheter function | Check external dressing around catheter site for dampness or discharge (leak of cerebrospinal fluid may develop)<br>Use transparent dressing to secure catheter and to aid inspection<br>Inspect catheter for breaks |
| Prevent infection | Use strict aseptic technique when caring for catheter (see Chapter 31)<br>Do not routinely change dressing over site<br>Change infusion tubing every 24 hours |
| Monitor for respiratory depression | Monitor vital signs, especially respirations, per policy<br>Use pulse oximetry and apnoea monitoring |
| Prevent undesirable complications | Assess for pruritus (itching) and nausea and vomiting<br>Administer anti-emetics as ordered |
| Maintain urinary and bowel function | Monitor intake and output<br>Assess for bladder and bowel distension<br>Assess for discomfort, frequency and urgency |

*(Crisp et al 2013)*

## TABLE 33.7 | Nursing considerations for an individual receiving analgesics

| Medication | Nursing considerations |
|---|---|
| Salicylates | Medications must be given with food as they can cause GIT bleeding<br>Individuals should also be monitored for bleeding as the medications decrease platelet aggregation |
| Paracetamol | Nurses should make sure the dosage limits are maintained as paracetamol can cause liver toxicity. Care should be taken not to overdose as there are many pharmaceutical preparations that can contain paracetamol, such as Panadeine Forte and Di-Gesic |
| NSAIDs | Medications must be given with food as they can cause GIT bleeding<br>Individuals should also be monitored for bleeding as the medications decrease platelet aggregation |
| Morphine-related products | Monitor vital signs as these medications can cause respiratory depression and hypotension<br>Nurses should also monitor bowels and encourage fluids and fibre as these medications can cause constipation |

*(Adapted from Bryant & Knights 2014)*

## TABLE 33.8 | Action of analgesics

| Drug category | Example | Site of action | Mechanism |
|---|---|---|---|
| Paracetamol | Paracetamol | Damaged cells | Decrease production of prostaglandins from cell responding to inflammation |
| Non-steroidal anti-inflammatory drugs (NSAIDs) | Aspirin<br>Ibuprofen<br>Indomethacin<br>Piroxicam<br>Ketorolac<br>Celecoxib | Damaged cells | Decrease production of prostaglandins from cell responding to inflammation |

**TABLE 33.8 | Action of analgesics—cont'd**

| Drug category | Example | Site of action | Mechanism |
|---|---|---|---|
| Narcotics | Codeine<br>Pethidine<br>Tramadol<br>Oxycodone<br>Morphine<br>Fentanyl | Brain | Bind to natural endorphin stimulant receptor in the brain. This depresses pain perception and can cause profound euphoria |
| Anaesthetics | Lignocaine<br>Ketamine | Brain and peripheral nerve fibres | Block perception and transmission pain |
| Antidepressants | Amitriptyline<br>Venlafaxine<br>Fluoxetine | Brain | Pain is associated with depression |
| Anticonvulsants | Carbamazepine<br>Gabapentin<br>Pregabalin | Brain | Block/modulate transmission of pain |
| Antiemetic | Metoclopramide<br>Ondansetron | Mainly brain but metoclopramide is also a prokinetic | Acute pain is associated with nausea and narcotics can also cause nausea and vomiting |

*(Adapted from Bryant & Knights 2014)*

## Summary

Pain, which is often a protective signal of actual or impending tissue damage, can be both an unpleasant physical sensation and an emotional experience. Each episode of pain is unique and subjective and it is important for the nurse to appreciate that 'pain is what the individual says it is'. Pain may be mild or severe, acute or chronic, physical or psychological.

Pain receptors transmit impulses along nerve fibres to the brain, where the impulses are perceived and interpreted. The body has some internal mechanisms that may be activated to help control pain and its perception, such as the gate control mechanism and the endorphin system.

The perception of pain varies with the individual; therefore, some people will experience pain much sooner and more intensely than others. Many factors influence an individual's reaction to pain, including age, gender, culture, and emotional state, history of pain, self-image, the time of day and the environment. Although each individual's behavioural reaction to pain is different, the physiological responses to acute pain are the same.

The nurse has a responsibility to assess an individual's pain in terms of site, time it occurs, duration, precipitating factors, type, intensity, associated signs and symptoms, body posture, vital signs and emotional manifestations.

The management of pain includes non-pharmacological and pharmacological therapy, and depends on each individual's individual needs. The nurse has a responsibility to eliminate or reduce painful stimuli and to plan and implement supportive nursing measures to help alleviate pain or to assist the individual to manage their pain.

### DECISION-MAKING FRAMEWORK EXERCISE 33.1

You are an Enrolled Nurse who has just commenced working in the Greenslopes Hospice. You have been asked to assist Craig with his breakfast. You notice that Craig has medications sitting on his tray in a cup. Craig tells you they are his pain-relief tablets and he likes to take them with his breakfast. He cannot take them on his own and asks you to assist him in taking them.

What action should you take? Use the decision-making framework to assist your decision utilising the following headings:

1. Identify individual need/benefit
2. Reflect on scope of practice and nursing practice standards
3. Consider context of practice/organisational support
4. Select appropriate, competent person to perform the activity

## Review Questions

1. What is pain?
2. What are the different types of pain?
3. Explain why individuals can feel pain in limbs that have been removed.
4. List potential nursing issues that could affect someone with chronic pain.
5. What are the nursing considerations for someone receiving a narcotic medication?
6. What is the difference between Panadol and aspirin? Explain the side effects of NSAIDs.
7. Why do we feel pain?
8. Explain why rubbing/massage can relieve pain.
9. If Individuals experience psychogenic pain should we dismiss it as attention seeking?
10. What would be the general psychosocial impact of chronic pain on a middle-aged individual?
11. How do age, culture or background and gender affect the individual's perception of pain?
12. What is the pain threshold?
13. How different would the perception of pain be in an individual who already suffers from chronic pain?
14. What is the appropriate assessment tool that could be used to assess:
    a. Children in pain
    b. Adult individuals who do not speak English
    c. An individual with dementia

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australian Pain Management Association: www.painmanagement.org.au/

Chronic Pain Australia: www.chronicpainaustralia.org.au/

International Association for the Study of Pain: www.iasp-pain.org//AM/Template.cfm?Section=Home

Pain assessment tools: www.caresearch.com.au/caresearch/ClinicalPractice/Physical/Pain/AssessmentTools/tabid/748/Default.aspx

*Pain* (Journal of the International Association for the Study of Pain): www.elsevier.com/wps/find/journaldescription.cws_home/506083/description#description

The Australian Pain Society: www.apsoc.org.au/

CHAPTER
34

# Nursing assessment and management of sensory health

*Jodie Hughson*

## KEY TERMS

ageusia
anosmia
cacogeusia
chemoreceptors
convergence
diplopia
dysgeusia
hyperopia
hypogeusia
hyposmia
myopia
nystagmus
otalgia
parosmia
presbycusis
presbyopia
proprioception
refraction
tinnitus

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define key terms
- Describe the position and structure of each sense organ
- Describe the physiology of taste, smell, sight and hearing
- Describe the factors affecting sensory functions in the sense organs
- Describe the major manifestations of disorders of the eye and ear
- Describe diagnostic tests that may be used to assess eye and ear function
- Plan and implement nursing care for the person with altered sensory function

## CHAPTER FOCUS

The sensory abilities of taste, smell, touch, sight and hearing enable the person to 'sense' changes in their external and internal environments. This is an essential requirement for maintaining homeostasis so we can interact with the world around us (Crisp et al 2013). Perception of stimuli has its origin in the five special sense organs, which are adapted to receive specific stimuli: tongue (taste); nose (smell); skin (touch); eyes (sight); and ears (hearing and maintenance of balance). Receptors in the sensory organs pick up stimuli from the environment and transmit information to the brain via pathways in the nervous system. In the brain the information is processed and interpreted (Patton & Thibodeau 2014). A person's senses are essential for growth, development and survival. A person can initiate protective reflexes only if they can see or sense a change or danger. Sensory stimuli give meaning to events in the environment. Alterations in sensory function may lead to dysfunctions of sight, hearing, smell, taste, balance or coordination.

As the eyes and ears are the two major structures by which an individual receives information about the external environment, this chapter focuses on the care of these two organs. The eye is the means by which light is reflected from objects and travels to the retina so that an image is formed. Nerve endings in the retina transmit electrical impulses along the optic nerve to the brain for interpretation. The ear is the means by which soundwaves are collected and amplified. Nerve endings in the inner ear transmit electrical impulses along the auditory pathways to the brain for interpretation. The auditory system is also responsible for maintenance of balance (Patton & Thibodeau 2014).

## LIVED EXPERIENCE

I had a stroke at age 62 years and it has left me legally blind. I used to go to the car races every weekend but I can't do that anymore. When it first happened I felt like I had lost my independence and everything I used to love to do, but I have learnt to adjust and have found other interests and ways to maintain my independence. I wish I had lost any other sense but my sight, but now I listen to the car races and the football and I am enjoying these things again.

**Syd, 68 years old**

## CLASSIFICATION OF SENSE ORGANS

Sense organs can be classified as special and general sense organs. Special sense organs such as the eye and the ear are characterised as being large and complex organs, or having localised groups of special receptors for specific and specialised detection of stimuli. The general sense organs are for detecting stimuli such as pain and touch. They have microscopic receptors and are distributed throughout the entire body (see Table 34.1). An example of a general sense organ is the skin (Patton & Thibodeau 2014). Receptors in general sense organs are scattered over almost the entire body. The skin over different parts of the body will respond differently because of the differing numbers of touch receptors. Touch receptors are distributed closely together over the fingertips and far apart across the back and torso. Stimulation of some receptors will lead to the sensation of vibration, while others give the sensation of pressure, pain (pain receptors) or temperature (thermoreceptors).

Many general receptors are present in deep tissue; there are stretch receptors in your stomach that signal when it is full. There are important chemoreceptors in the aorta that detect changes in blood pH and carbon dioxide levels (Crisp et al 2013).

## ALTERED SENSES

People become accustomed to certain sensory stimuli and when these change, the individual may experience discomfort. Factors that contribute to alterations in behaviour are as follows.

### Sensory deprivation

Sensory deprivation is thought of as a decrease or lack of meaningful stimuli. Because of reduced stimulation, a person becomes more acutely aware of the remaining stimuli and often perceives these in a distorted manner. The individual often experiences alterations in perception, cognition and emotion.

### Sensory overload

Sensory overload generally occurs when a person is unable to process or manage the amount or intensity of sensory stimuli. Factors that can contribute to sensory overload are:

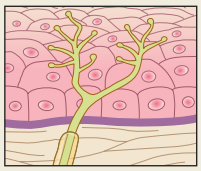
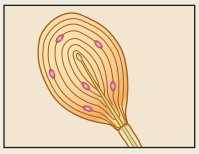
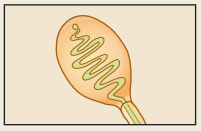
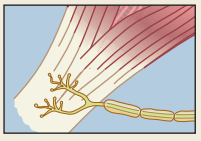
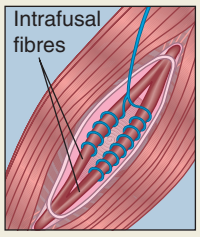
- Pain, dyspnoea and anxiety
- A noisy healthcare setting, intrusive diagnostic studies, contact with many strangers
- Nervous system disturbances, certain medication.

Sensory overload can prevent the brain from ignoring or responding to specific stimuli. Some signs of sensory overload can include feelings of fatigue, irritability, anxiety, disorientation, reduced cognitive function and inability to concentrate (Patton & Thibodeau 2014).

### Sensory deficits

A sensory deficit is impaired reception, perception, or both, of one or more of the senses. Impaired hearing and sight are sensory deficits. When only one sense is affected, other senses

## TABLE 34.1 | General sense organs

| Type | Main locations | General senses |
|---|---|---|
| **Free nerve endings** | | |
| (Naked nerve ending; several types exist)  | Skin and mucosa (epithelial layers) | Pain, discriminative touch, tickle and temperature |
| **Encapsulated nerve endings** | | |
| Bulboid (Krause) corpuscle | Skin (dermal layer), subcutaneous tissue, mucosa of lips and eyelids, and external genitals | Touch and possibly cold |
| Lamellar (Pacini) corpuscle  | Subcutaneous, submucous and subserous tissues; around joints; in mammary glands; and external genitals of both sexes | Pressure and high-frequency vibration |
| Tactile (Meissner) corpuscle  | Skin (in papillae of dermis) and fingertips and lips (numerous) | Fine touch and low-frequency vibration |
| Bulbous (Ruffini) corpuscle | Skin (dermal layer) and subcutaneous tissue of fingers | Touch and pressure |
| Golgi tendon receptor  | Near junction of tendons and muscles | **Proprioception** (sense of muscle tension) |
| Muscle spindle   | Skeletal muscles | Proprioception (sense of muscle length) |

*(Patton & Thibodeau 2014)*

may become more acute to compensate for the loss. However, sudden loss of eyesight can result in disorientation. When there is a gradual loss of sensory function, people often develop behaviours to compensate for the loss; for example, a person with gradual hearing loss in the right ear may unconsciously turn the left ear towards the speaker. Persons with sensory deficits are at risk of both sensory deprivation and sensory overload (Berman et al 2015).

## FACTORS AFFECTING SENSORY FUNCTION

A range of factors affect the amount and quality of sensory stimulation, including a person's developmental stage, culture, level of stress, medications, illness and lifestyle. These are outlined in Clinical Interest Boxes 34.1 and 34.2.

### CLINICAL INTEREST BOX 34.1 Factors that influence sensory function

**Age**

- Infants are unable to discriminate sensory stimuli. Nerve pathways are immature
- Visual changes during adulthood include presbyopia (inability to focus on near objects) and the need for glasses for reading (usually occurring from age 40–50)
- Hearing changes, which begin at age 30, include decreased hearing acuity, speech intelligibility, pitch discrimination and hearing threshold. Tinnitus often accompanies a hearing loss as a side effect of drugs. Older adults hear low-pitched sounds the best but have difficulty hearing conversation over background noise
- Older adults have reduced visual fields, increased glare sensitivity, impaired night vision and reduced accommodation, depth perception and colour discrimination
- Older adults have difficulty discriminating the consonants (*f, s, th, ch*). Speech sounds are garbled and there is a delayed reception and reaction to speech
- Gustatory and olfactory changes include a decrease in the number of taste buds in later years and reduction of olfactory nerve fibres by age 50. Reduced taste discrimination and reduced sensitivity to odours are common
- Proprioceptive changes after age 60 include increased difficulty with balance, spatial orientation and coordination
- Older adults experience tactile changes, including declining sensitivity to pain, pressure and temperature

**Medications**

- Some antibiotics (e.g. streptomycin, gentamicin) are ototoxic and can permanently damage the auditory nerve; chloramphenicol can irritate the optic nerve. Narcotic analgesics, sedatives and antidepressant medications can alter the perception of stimuli

**Environment**

- Excessive environmental stimuli (e.g. equipment noise and staff conversation in an intensive care unit) can result in sensory overload, marked by confusion, disorientation and the inability to make decisions. Restricted environmental stimulation (e.g. with protective isolation) can lead to sensory deprivation. Poor-quality environmental stimuli (e.g. reduced lighting, narrow walkways, background noise) can worsen sensory impairment

**Comfort level**

- Pain and fatigue alter the way a person perceives and reacts to stimuli

**Pre-existing illness**

- Peripheral vascular disease can cause reduced sensation in the extremities and impaired cognition. Chronic diabetes mellitus can lead to reduced vision, blindness or peripheral neuropathy. Strokes often produce loss of speech. Some neurological disorders impair motor function and sensory reception

**Smoking**

- Chronic tobacco use can cause the taste buds to atrophy, lessening the perception of flavours

**Noise levels**

- Constant exposure to high noise levels (e.g. on a construction job site) can cause hearing loss

**Endotracheal intubation**

- Temporary loss of speech results from insertion of an endotracheal tube through the mouth or nose into the trachea

*(Crisp et al 2013)*

## CLINICAL INTEREST BOX 34.2 Cultural considerations affecting sensory function

An individual's culture often determines the amount of stimulation that a person considers normal. The normal amount of stimulation associated with ethnic origin, religious affiliation and income level also affects the amount of stimulation an individual desires and believes to be meaningful.

It is important for nurses to be sensitive to what stimulation is culturally acceptable to each individual; for example, in some cultures touching is comforting, whereas in others it is offensive.

*(LeMone et al 2014)*

## ASSESSING SENSORY FUNCTION

Nursing assessment of sensory perceptual functioning includes:

- Nursing history: a guide to assessing a person's sensory perceptual functioning
- Mental status, including level of consciousness, orientation, memory and attention span
- Physical examination: the person's specific visual and hearing abilities; perception of heat, cold, light touch and pain in the limbs; and awareness of the position of body parts
- The person's environment: assess for quantity, quality and type of stimuli
- Social support network: the degree of isolation a person feels is significantly influenced by the quality and quantity of support from family and friends (Berman et al 2015).

Clinical Interest Box 34.3 provides further detail.

## CLINICAL INTEREST BOX 34.3 Interview to assess a person's sensory perceptual functioning

### Visual

- How would you rate your vision (excellent, good, fair or poor)?
- Do you wear glasses or contact lenses?
- Describe any recent changes in your vision.
- Do you have any difficulty seeing near or far objects?
- Do you have any difficulty seeing at night?
- Have you ever experienced blurred vision, double vision, spots moving in front of your eyes, blind spots, light sensitivity, flashing lights or halos around objects?
- When did you last visit an eye doctor?

### Auditory

- How would you rate your hearing (excellent, good, fair or poor)?
- Do you wear a hearing aid?
- Describe any recent changes in your hearing.
- Can you locate the direction of sounds and distinguish various voices?
- Do you experience any dizziness or vertigo?
- Do you experience any ringing, buzzing, humming or crackling noises or fullness in the ears?

### Gustatory

- Have you experienced any changes in taste (e.g. difficulty in differentiating sweet, sour, salty and bitter tastes)?
- Do you enjoy the taste of foods as you did previously?

### Olfactory

- Have you experienced any changes in your sense of smell?
- Do things (foods, flowers, perfumes, etc) smell the same as previously?
- Can you distinguish foods by their odours and tell when something is burning?
- Have you experienced any changes in appetite? (Changes in appetite may be related to an impaired sense of smell.)

### Tactile

- Are you experiencing any pain or discomfort?
- Have you experienced any decrease in your ability to perceive heat, cold or pain in your limbs?
- Do you have any numbness or tingling in your extremities?

### Kinaesthetic

- Have you noticed any difficulty in perceiving the position of parts of your body?

*(Berman et al 2015)*

**CRITICAL THINKING EXERCISE 34.1**

Pain and anxiety are two factors that contribute to sensory overload. Identify four (4) different nursing interventions that you could implement to help alleviate these contributing factors. Why do you think these will help?

# SPECIAL SENSE ORGANS

## The taste receptors

The chemical receptors (**chemoreceptors**) that generate the nervous impulses that result in the sense of taste are called the taste buds. Taste buds are scattered in the oral cavity, with most concentrated over the surface of the tongue and a few found on the soft palate and the inner surface of the cheeks. These chemoreceptors respond to substances present in food and generate nerve impulses that are transmitted to the brain for interpretation. The upper surface of the tongue is covered with small projections (papillae), some of which contain a taste bud. Each taste bud consists of sensory and supporting cells situated in the epithelium and opening into the surface through a small gustatory pore.

Between the cells of the taste bud lie the endings of afferent nerve fibres derived from several cranial nerves. Taste buds on the anterior two-thirds of the tongue connect with fibres of the facial (seventh cranial) nerve. Taste buds on the posterior one-third of the tongue are associated with the fibres of the glossopharyngeal (ninth cranial) nerve, while pharyngeal taste buds send impulses to the brain via the vagus (tenth cranial) nerve (Marieb 2015).

These taste buds can differentiate sweet, salty, sour and bitter stimuli. The tip of the tongue is the most sensitive to sweet and salty substances; the edges of the tongue are most sensitive to bitter substances. Substances must be in solution (saliva) so that they can reach every opening in a taste bud and stimulate the nerve ending. Molecules pass into solution on the surface of the tongue and combine with the surface membranes of the receptor cells. Transmitter substances are released, which evoke action potentials on the sensory nerve fibres. Fibres from the seventh, ninth and tenth cranial nerves carry the taste impulses via the brainstem to an area of the cerebral cortex where the taste is experienced (Patton & Thibodeau 2014).

The sense of taste is intricately linked with the sense of smell, and the sense of taste depends on stimulation of the olfactory receptors (see Figure 34.1). Both senses have a protective function; for example, in detecting substances that may be harmful. Interruption of the transmission of taste stimuli to the brain may cause taste abnormalities. Taste abnormalities may result from trauma, infection, vitamin or mineral deficiencies, neurological or oral disorders and the effects of drugs. Because tastes are most accurately perceived in a fluid medium, mouth dryness may interfere with taste. Alterations in taste may include **ageusia** (a complete loss of taste), **hypogeusia** (a partial loss of taste), **dysgeusia** (a distorted sense of taste) and **cacogeusia** (an unpleasant taste) (Daroff et al 2012).

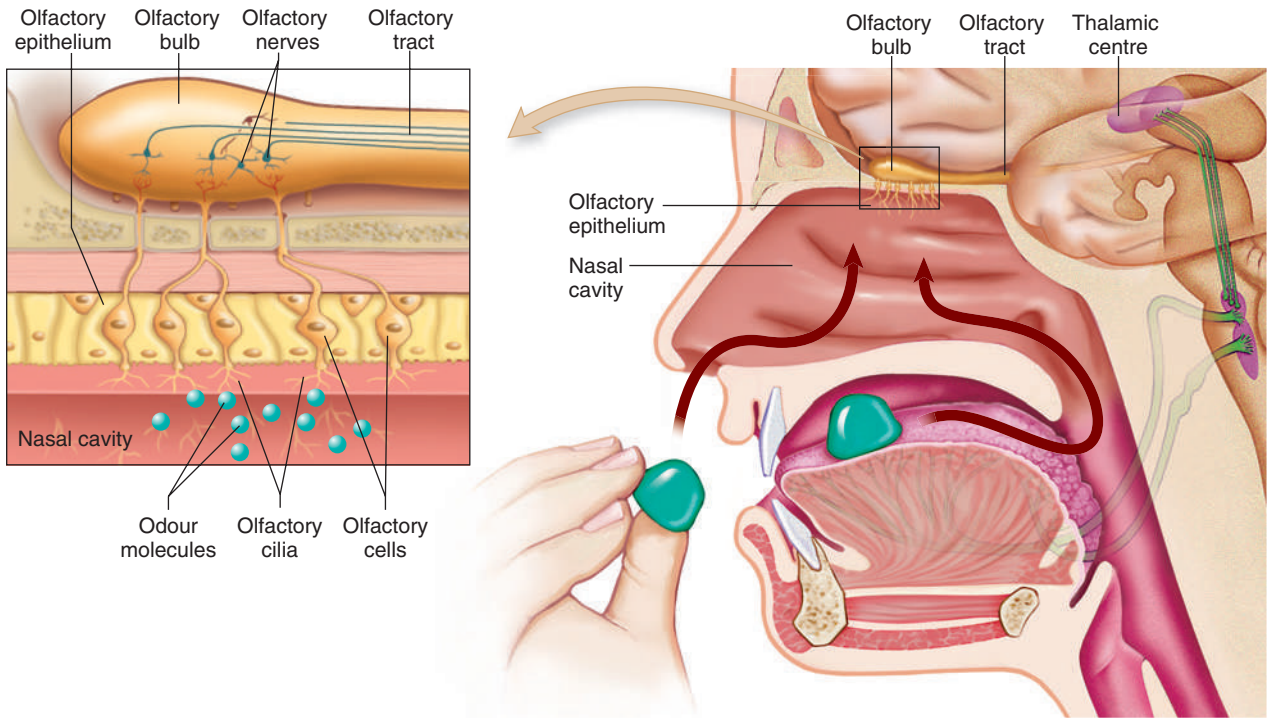



**Figure 34.1** Olfactory structures
*(Patton & Thibodeau 2014)*

## The smell receptors

The chemoreceptors responsible for the sense of smell are located in a small area of epithelial tissue in the upper part of the nasal cavity (Figure 34.2). These chemoreceptors are known as the olfactory receptors. They respond to airborne chemicals and generate impulses that are transmitted to the brain for interpretation. These receptors adapt quickly when exposed to an unchanging stimulus, which means that the person can become accustomed to an odour when constantly exposed to it.

Permanent alterations in the sense usually result when the olfactory neuroepithelium or part of the olfactory nerve is destroyed. Permanent or temporary loss can occur from inhaling irritants such as acid fumes that paralyse nasal cilia. Conditions such as ageing, Parkinson's disease and Alzheimer's disease may alter the sense of smell. Alterations in smell include **anosmia** (a total loss of sense of smell), **hyposmia** (an impaired sense of smell) and **parosmia** (an abnormal sense of smell) (Patton & Thibodeau 2014).

There is a close relationship between the sense of smell and the sense of taste, and therefore they are not always distinguishable. The sensations of smell and taste play an important part in stimulating the secretions of digestive juices (Berman et al 2015).

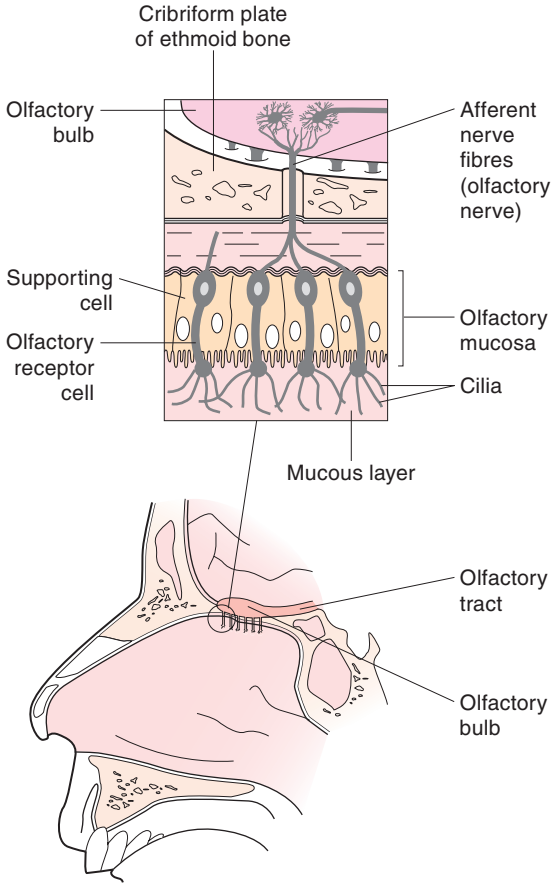



**Figure 34.2** The location and structure of the olfactory receptors in the nose

The nurse plays an important role in promoting the sense of taste and stimulating the sense of smell when caring for a person with altered sensory function. Health education regarding good oral hygiene practices will enhance taste perception. Discuss with the person which foods are the most taste appealing. If taste perception is improved, food intake and appetite will also improve. Taste perception is increased when food is seasoned. The person's sense of smell can be stimulated by pleasant aromas such as flowers, perfumes and food.

# THE EYE

## Structure of the eye

The eye is a spherical structure (Figure 34.3) about 2.5 cm in diameter, consisting of three principal layers (Patton & Thibodeau 2014).

### The outer layer

The outer fibrous layer consists of the sclera and the cornea, which is a transparent structure continuous with the sclera. About five-sixths of the outer surface is made up of a tough white opaque fibrous layer (sclera), while the cornea comprises the anterior one-sixth. Both the sclera and the cornea consist of layers of collagen fibres. In the cornea the fibres are regular in size and arrangement, which accounts for its transparency. The cornea functions as a refracting and protective layer through which light rays pass en route to the brain (Levin et al 2011).

### The middle layer

The middle pigmented vascular layer is composed of three structures: the choroid, the iris and the ciliary body. The choroid is a layer of tissue that lies between the sclera and the retina. It is composed largely of blood vessels, and contains highly pigmented cells that absorb light and prevent it from being reflected within the eyeball.

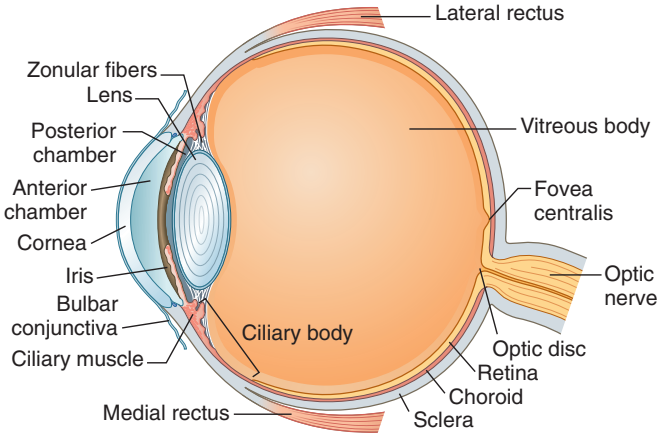



**Figure 34.3** The eye cut in horizontal section

*Ophthalmic Assistant, The Ninth Edition © 2013, Elsevier Inc. All rights reserved*

The iris is a pigmented circular membrane between the cornea and the lens, and gives the eye its colour. Sphincter and dilator muscles within the iris regulate the central aperture (the pupil). By either dilation or constriction of the pupil, the amount of light entering the eye is regulated. The pupil appears black because light rays entering the eye are absorbed by the choroid and are not reflected.

The ciliary body is a thickened area of the choroid, lying anterior to the choroid, extending to the root of the iris. A circular array of fibres stretches from the ciliary body to the lens to hold it in place. The ciliary body controls focusing of the lens and contains glands that secrete aqueous humour (Bruce 2011).

## The innermost layer

The innermost layer is a thin structure called the retina. The retina lines the inner wall of the posterior portion of the eyeball and is comprised of a number of layers. The two main layers are the pigmented layer (the outermost layer of the retina, lying next to the choroid, and whose cells contain melanin) and the rod and cone layer, which lies next to the pigmented layer and is highly sensitive to light.

Rods and cones (specialised nerve endings) are distributed as a tightly packed mass throughout the retina, except at a point where the ganglionic fibres converge to form the optic nerve. This area, which is about 1.5 mm in diameter, is termed the optic disc. Since it possesses no photosensitive cells it is also known as the 'blind spot'. The prime function of rods and cones is to absorb light. Rods can be stimulated by dim light and allow perception of shapes and movement in dim light. Rods also provide far peripheral vision. Cones are specialised for fine visual discrimination of colour perception. There are three types of cones: one type responds mostly to blue light, another to red light and the third type responds to green light (Patton & Thibodeau 2014).

In the centre of the retina is an oval yellowish area, the macula lutea, and in the centre of the macula lutea is a small depression, the fovea centralis. The photosensitive cells in the centre of the retina are more exposed to light than the rest of the retina; therefore, visual acuity is at its highest here (Levin et al 2011).

## Extraocular structure—accessory structures

Extraocular, or accessory, structures of the eye are portions of the eye outside the eyeball. These structures consist of the eyebrows, eyelids, eyelashes and lacrimal apparatus. The eyeball is anchored into position by several structures, including the extraocular muscles, the conjunctiva and the eyelids. The eyeball is surrounded and protected by a bony orbit, the eyebrow ridge and some fatty tissue. The eyeball is lubricated by the lacrimal glands.

The extraocular muscles bring about rotational movements of the eyeball. The muscles arise from the orbit and consist of four rectus muscles, which are attached to the sclera, and two oblique muscles. The oblique muscles are arranged so that for part of their length they lie around the circumference of the eyeball. The eyebrows and eyelashes are short coarse hairs that shade the eyes and protect the eyes from dust and sweat. The eyelids consist of connective tissue covered by skin and lined with mucous membrane. The lining is reflected over the eyeballs, and is called the conjunctiva. The eyelids protect the eye from foreign bodies and excessive light, as well as distributing tears by blinking (Patton & Thibodeau 2014).

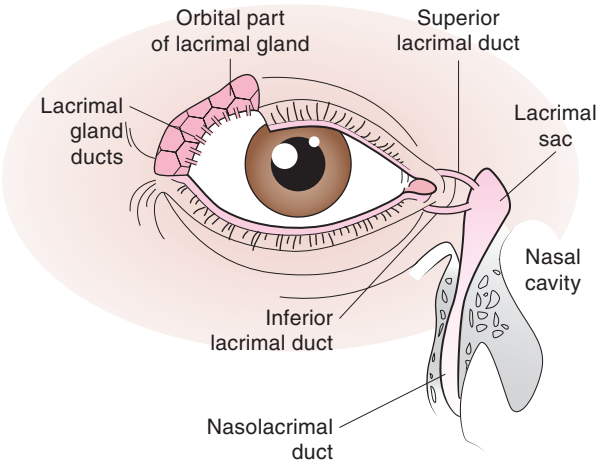



**Figure 34.4** The lacrimal apparatus of the eye

The lacrimal apparatus consists of the lacrimal gland, which is situated over the eye at the upper outer corner and secretes tears, which constantly wash over the conjunctiva (Figure 34.4). Tears leave the gland via several small ducts, and pass over the front of the eye eventually draining into the lacrimal sac, which is the expanded end of the nasolacrimal duct. Tears are secreted on to the anterior surface of the eyeball and are spread over it by the blinking movements of the eyelids. An antimicrobial substance in tears protects the eyes against microorganisms. Excess tears drain down the nasal cavity. The lacrimal glands are stimulated in response to chemical and mechanical irritants, thus producing tears to wash away irritants. Tears may also be produced as a result of emotion such as sadness or happiness (Hendry et al 2012).

## The refractive media

The refractive media are the transparent parts of the eye, and have the ability to bend light rays at the surfaces of two transparent media. The refractive media are the cornea, the lens, the aqueous humour and the vitreous humour. The cornea functions as a refracting and protective layer through which light rays pass en route to the brain (Levin et al 2011).

The lens is a transparent, biconvex encapsulated structure suspended from the ciliary body posterior to the iris. The lens is an elastic structure and this allows its shape to change when the eye is focused. The function of the lens is to refract (bend) light rays and to focus them on the retina.

Aqueous humour is a clear watery fluid that fills the cavities around the lens. These cavities are called the anterior and posterior chambers. Aqueous humour is derived from the plasma in the capillaries of the ciliary body, and passes into the posterior chamber. It then passes forwards through the

pupil to the anterior chamber, where it is absorbed into the ciliary veins. The rate of secretion and re-absorption is balanced so that intraocular pressure is regulated. Aqueous humour serves as a refractory medium and provides nutrients to the lens and cornea (Hendry et al 2012).

Vitreous humour is a clear jelly-like substance that fills the intraocular space from the posterior lens to the retina. Because it does not regenerate, any significant loss of vitreous humour—for example, as a result of injury to the eye—may distort other ocular structures. Vitreous humour helps to maintain the shape of the eyeball, helps keep the retina in position and helps with the refraction of light rays (Marieb 2015).

## The physiology of sight

Light travels from its source to various objects, where it undergoes reflection. This reflected light can then travel towards the eye, where it passes through the cornea, aqueous humour, the lens and the vitreous humour, before forming an image on the retina. Nerve endings in the retina transmit electrical impulses along the optic nerve to the brain. A coordinated process of refraction, accommodation, regulation of pupil size and convergence makes normal binocular vision possible (Patton & Thibodeau 2014).

### Refraction

**Refraction**, or bending of light rays, occurs as the light waves pass through the cornea, aqueous humour, the lens and the vitreous humour. At the lens the light is bent so that it converges at a single point on the retina (Hendry et al 2012).

### Accommodation

Accommodation is the process whereby the curvature of the lens is altered so that the eye is able to focus light from objects at different distances. As an object moves closer to the eye the curvature of the lens increases so that the image remains in focus on the retina (Crisp et al 2013).

### Regulation of pupil size

The diameter of the pupil influences image formation, and the muscles of the iris respond to changes in light intensity. An increase in light intensity initiates constriction of the pupil, whereas a decrease in light intensity causes dilation of the pupil. Adjustment of pupil size therefore regulates the amount of light entering the eyes. Too much light may damage the retina, and too little fails to stimulate it (Patton & Thibodeau 2014).

### Convergence

**Convergence** is the medial movements of the two eyeballs so that they are both directed towards the object being viewed. Convergence allows light rays to fall and stimulate two identical spots on the retinas, resulting in the perception of a single image.

After an image has been formed on the retina by the processes of refraction, accommodation, regulation of pupil size and convergence, light impulses are converted into nerve impulses by the rods and cones. The light breaks down the photosensitive chemical in either rods or cones, which stimulates electrical impulses to the brain for interpretation.

Nerve impulses travel from the retina along the optic nerve. The optic nerve emerges from the back of the eyeball and passes to the optic chiasma, an area at the base of the brain.

The fibres then form the left and right optic tracts, which continue to the visual areas of the brain in the occipital lobes. Here, further processing occurs so that the image is given meaning (Trattler et al 2012).

# DISORDERS OF THE EYE

Healthy vision requires three processes:

1. Formation of an image on the retina (refraction)
2. Stimulation of rods and cones
3. Conduction of nerve impulses to the brain.

Normal eye function can be altered by a malfunction of any of these processes. Some of the pathophysiological causes of disruption of eye function can be congenital, degenerative, infectious, neoplastic or traumatic. The effects may be mild and temporary, severe or permanent. Disorders of vision include alterations in visual acuity, ocular movement, accommodation, refraction and colour vision (Berman et al 2015).

## Refraction disorders

Focusing a clear image on the retina is essential for good vision. In the normal eye, light rays enter the eye and are focused into a clear, upside-down image on the retina. The brain rights the image in our conscious perception but cannot correct an image that is not sharply focused. If the eyeballs are elongated, the image focuses in front of the retina, giving the retina a fuzzy image; this is known as **myopia** or nearsightedness. This can be corrected by refractive eye surgery or by using contact lenses or glasses. If our eyeballs are shorter than normal, the image focuses behind the retina, also producing a fuzzy image; this condition is known as hypermetropia, **hyperopia** or farsightedness. (See Figure 34.5.) This can also be corrected by eye surgery or glasses (The Fred Hollows Foundation 2015).

As we age we develop an inability to focus the lens properly; this is known as **presbyopia**, and is the reason most people once they pass through middle age require reading glasses. The lens becomes firm and loses its elasticity; the ageing lens loses its ability to focus light rays and near objects appear blurred. People may also state that they are experiencing 'halos' which are coloured rings encircling bright lights, caused by alteration in the ocular media. Small moving spots or flecks seen before the eyes are commonly called floaters, and may be due to the ageing process as the vitreous material degenerates. Floaters may also be caused by retinal laceration, diabetic neuropathy or hypertension. Visual changes also include double vision, or **diplopia**. Photophobia may be caused by inflammation of the cornea or the iris and ciliary bodies. An irregular, uneven curvature of the cornea or lens,

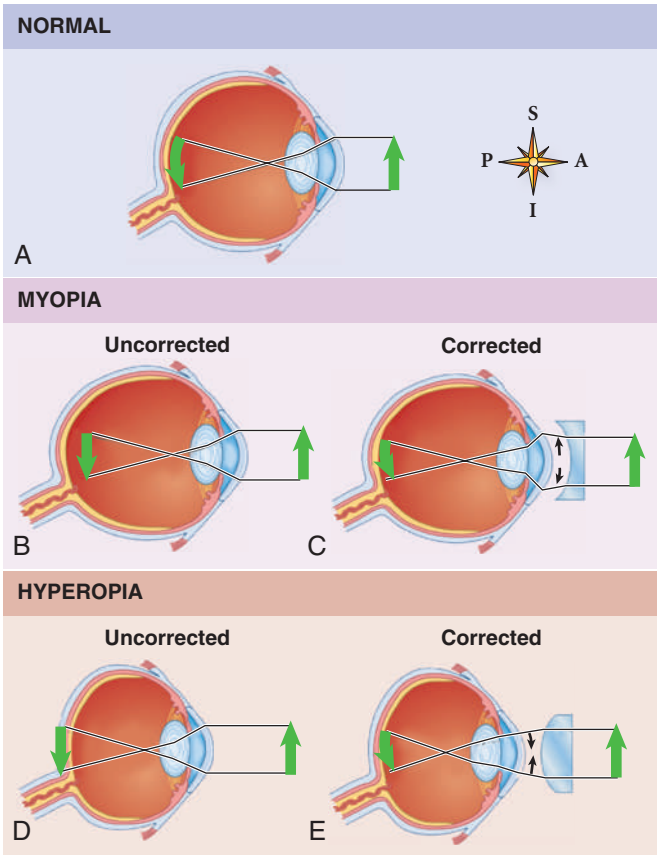



**Figure 34.5** Structure & function of the body
*By Kevin T. Patton, Gary A. Thibodeau. (2016, 15th edition)*

astigmatism, can also be corrected by glasses (Patton & Thibodeau 2014).

### Cataracts

There are three classifications of cataracts: congenital, traumatic and age-related. By definition a cataract is a clouding of the lens in the eye. Cataracts generally develop bilaterally, with each progressing independently, with the exception of congenital and traumatic cataracts. Causes include the ageing process, inflammation, malignancy, metabolic factors, toxins, heredity and trauma. Manifestations generally begin with a decrease in visual acuity. The person complains of not being able to see clearly. They may also complain of blurred vision, glare and a decrease in colour perception. As the cataract progresses, the pupil appears milky white. Surgical removal of the cataract from the lens is indicated when activities of daily living are affected (Trattler et al 2012).

See Nursing Care Plan 34.1 and associated Progress Note Example 34.1 for an individual admitted for cataract surgery.

## Infectious disorders

Infections of the eye and its associated structures also have the potential to impair vision, sometimes permanently.

### Stye

A hordeolum (stye) is a localised staphylococcal infection of a sebaceous gland of the eyelid. This gland is the base of a hair follicle or eyelash. Manifestations include localised inflammation, swelling and pain (Trattler et al 2012).

### Blepharitis

Blepharitis is inflammation of the eyelid margins. It may be caused by bacterial infection or an allergic reaction to smoke, dust or chemical. Seborrhoea, a disorder of the sebaceous gland, may also cause blepharitis. Manifestations include itching, burning, redness of the eyelid margins, chronic conjunctivitis and yellow purulent discharge crusts on the lashes (Trattler et al 2012).

### Conjunctivitis

Conjunctivitis is the inflammation of the conjunctiva and may be caused by excessive exposure to wind, sun, heat, cold, allergens or chemicals, or by bacterial, viral or fungal infection. Manifestations include itching, burning, excessive tearing and pain. Allergic conjunctivitis may cause considerable swelling (Trattler et al 2012).

### Trachoma

Trachoma is a chronic form of keratoconjunctivitis that causes permanent damage to the cornea which, if untreated, can result in blindness. The condition results from infection by *Chlamydia trachomatis* and is associated with poor personal and community hygiene and lack of available clean water. There is a high incidence of trachoma in Australian Indigenous people. Manifestations, which may not become apparent for years, are similar to those for severe conjunctivitis. There is corneal inflammation and scarring, due to the eyelids turning inwards, which causes the lashes to rub against the cornea. Severe corneal scarring may result in blindness (The Fred Hollows Foundation 2015).

### Keratitis

Keratitis is inflammation of the cornea and is frequently caused by trauma or infection. It usually affects only one eye, and frequently presents as a secondary infection to an upper respiratory tract infection involving cold sores (herpes simplex infection). Manifestations include opacity of the cornea, irritation, excessive tearing, blurred vision, redness and photophobia (Trattler et al 2012).

### Orbital cellulitis

Orbital cellulitis is an acute infection of the orbital tissues and eyelids that does not involve the eyeball. The condition is generally secondary to infection of nearby structures. If orbital cellulitis is not treated, the infection may spread to the sinuses and meninges. Manifestations include unilateral eyelid oedema, inflammation of the orbital tissues and eyelids, pain, impaired eye movement and purulent discharge from indurated areas (Tabbara et al 2015).

## NURSING CARE PLAN 34.1

**Assessment:** Mrs Tan has been admitted for cataract extraction and intraocular lens replacement
**Issue/s to be addressed:** Health education regarding the upcoming procedure
Poor vision
Discharge planning
**Goal/s:** Mrs Tan verbalises understanding of upcoming surgery and expected outcomes
Mrs Tan has daily needs assisted as required
Mrs Tan is given appropriate postoperative care
Mrs Tan understands the importance of going home to a supportive environment; family/support persons are informed

| Care/actions | Rationale |
|---|---|
| Provide preoperative health education to ensure the individual understands the procedure. Ensure this is culturally appropriate and offer verbal and written instructions in language of choice. If required obtain assistance from interpreter service | Mrs Tan will feel less anxious and more prepared for surgery if all aspects of the surgery are explained in the best mode for her |
| Offer Mrs Tan assistance with daily activities including hygiene and nutrition. Ensure layout of room is explained, ensure call bell is accessible and any excess furniture or belongings are removed. Provide any nutritional aids or support such as explaining what food is where on the plate and bright-coloured utensils | Due to cataracts Mrs Tan has poor vision and being in an unfamiliar environment will require some assistance with activities of daily living. Keeping environment clutter free and explaining the layout will minimise the risk of injury. Maintaining nutrition while in hospital will aid in recovery |
| Postoperative observations as per surgeon's instructions. Perform eye care as per surgeon's instructions. Mobilise as soon as able | Post-anaesthetic observations and mobilisation are required to ensure there are no adverse side effects |
| Provide Mrs Tan and her carers with culturally appropriate information on what to expect post discharge. Have transport arranged for her on discharge and ensure she has support at home for the initial postoperative period | Being prepared for discharge prevents risks of re-admission as Mrs Tan understands what to expect once she is at home. Ensuring transport will ensure Mrs Tan's safety and to expedite discharge |

**Evaluation**

Mrs Tan and her family/carers verbalise a thorough understanding of the procedure and she appears and purports to be relaxed and comfortable.
Mrs Tan is able to perform all her required daily activities while in hospital and expresses her satisfaction.
Mrs Tan recovers from surgery as per expected outcome without any complications.
Mrs Tan and her family verbalise their understanding of what to expect on discharge and provide details of transport mode home.

## PROGRESS NOTE EXAMPLE 34.1

21/10/2015
0700 hrs

Nursing: Mrs Tan has been admitted for removal of cataracts and insertion of intraocular lens. She is visually impaired. She requires assistance with her daily activities and meals. She has been seen by the surgeon—refer to notes. She has expressed some nervousness about her operation. A thorough explanation of the procedure has been provided to her and her family. To assist in her adjustment staff need to spend time explaining their activities to Mrs Tan before they are carried out.

***J. Hughson*** **(Hughson) EN**

## Disorders of the retina

Damage to the retina impairs vision because even a well-focused image cannot be perceived if some or all of the light receptors do not function properly; for example, in retinal detachment when part of the retina falls away from the tissue supporting it. The condition can result from normal ageing, eye tumours or a sudden blow to the head. Common warning signs are:

- Sudden appearance of floating spots
- Odd 'flashes of light' that appear when the eye moves.

If left untreated the retina may detach completely and can cause total blindness (Patton & Thibodeau 2014).

### Diabetic retinopathy

Diabetes mellitus may cause a condition known as diabetic retinopathy which causes small haemorrhages in retinal blood

vessels to disrupt the oxygen supply to the photoreceptors. The eye responds by building new, but abnormal, vessels that block vision and which may cause detachment of the retina (Trattler et al 2012). See Clinical Interest Box 34.4 for more information on diabetic retinopathy.

## Glaucoma

Another common condition that can damage the retina is glaucoma. This is excessive intraocular pressure caused by abnormal accumulation of aqueous humour. As fluid pressure against the retina increases, blood flow to the retina slows. The reduced blood flow causes degeneration of the retina and thus a loss of vision. There are various forms of glaucoma: primary open-angle, primary closed-angle, secondary, congenital and absolute. Generally speaking, glaucoma progresses slowly and may or may not be symptomatic. It rarely affects persons under 40 years of age. The condition may be caused by over-production of aqueous humour or obstruction to the outflow of aqueous humour, both of which result in accumulation of fluid and a rise in intraocular pressure. Manifestations of primary open-angle glaucoma are gradual and progressive; the person is unable to perceive changes in colour and experiences blurred vision and persistent aching eyes. Manifestations of primary closed-angle glaucoma occur suddenly. The person experiences intense pain, loss of vision, nausea and vomiting. The affected eye appears red, and the pupil is fixed, dilated and unresponsive (Hendry et al 2012).

The manifestations of secondary glaucoma are similar to those of the primary form depending on the cause. Congenital glaucoma is a rare disorder generally associated with other abnormalities, and manifests as a large-diameter cornea. Absolute glaucoma is the end result of any uncontrolled glaucoma resulting in blindness (Trattler et al 2012).

Clinical Interest Box 34.5 provides information on glaucoma prevention and preservation of sight.

## Degenerative diseases of the retina

Macular degeneration is the most common cause of untreatable blindness in developed countries. It is becoming more common throughout the world as the average age of the population increases. Macular degeneration is caused by degenerative changes in the central part of the retina. The exact cause of the degeneration is unknown, but the risk of developing this condition increases with age after reaching 50 years. Other risk factors are cigarette smoking and a family history of the disorder.

Manifestations include loss of central vision, and activities that require fine detailed vision becoming impossible. The disease usually develops slowly and painlessly, and both eyes are generally affected. Vision may be improved in some cases by laser surgery. In extreme cases, it can cause legal blindness; however, most people usually retain good peripheral vision (The Fred Hollows Foundation 2015).

## CLINICAL INTEREST BOX 34.4 Diabetic retinopathy

Diabetes is becoming more common throughout the world, particularly in the developing world, where lifestyle and diet are rapidly changing.

As diabetes becomes more prevalent around the world the number of people with diabetic retinopathy is also becoming more common and has the potential to become a leading cause of blindness.

### What is diabetic retinopathy?

Diabetic retinopathy is a condition in which the retina is damaged by sustained and poor control of high blood sugar levels due to diabetes. It can cause reduced vision and blindness, particularly in its later stages.

### What causes diabetic retinopathy?

Diabetic retinopathy is damage to the tiniest blood vessels of the retina, the capillaries, by the high and abnormally varying levels of blood sugar associated with diabetes. The site of damage is mainly the lining or endothelial cells of these vessels. These cells are necessary for the normal functioning of the capillaries including actual blood flow.

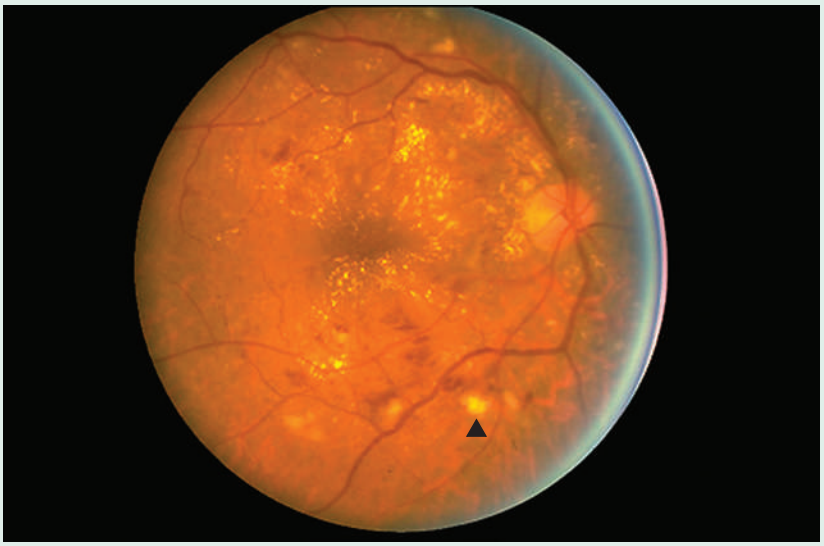
This damage causes three basic problems:

1. Leakage from the capillaries. The accumulation of fluid, protein, fat and whole blood from leaking, damaged capillaries in the retina disturbs the retina's delicate organisation and complex functions. This leakage is prone to occur at the macula, the part of the retina that is most critical for sharp vision.
2. Poor blood circulation. Because of damage to endothelial cells, the capillaries can fail to deliver oxygen and nutrients to the retina and also fail to remove toxic waste products. This causes reduced function or failure of parts of the retina, affecting vision.
3. Growth of abnormal new vessels in the retina. The lack of oxygen and perhaps some other metabolic features of diabetic retinopathy can stimulate new blood vessels to grow on or out from the surface of the retina. These often cause serious problems because they can bleed, sometimes massively, and they promote the formation of scar tissue which can stretch or distort the retina. In advanced cases, this process can pull the retina off the internal surface of the eye (traction retinal detachment). If this occurs, the affected eye will almost always lose all useful vision.

*Continued*

## CLINICAL INTEREST BOX 34.4 Diabetic retinopathy—cont'd

Most people who have diabetic retinopathy start with mild signs as described above, but may progress to the more severe stages.



Diabetic retinopathy, funduscopy. Note the extensive hard exudates (▲), typical of the 'background retinopathy' of diabetes mellitus.

*Robbins and Cotran Atlas of Pathology, Third Edition. Copyright © 2015, 2010, 2006 by Saunders, an imprint of Elsevier Inc.*

### Symptoms of diabetic retinopathy

Often in mild diabetic retinopathy a person will have no symptoms. Once the disease becomes more advanced they may experience:

- Blurred vision
- Floaters
- Sudden catastrophic loss of vision in one or both eyes.

### Contributing factors

#### Length of disease

The longer the person has diabetes, the more likely it is that they will develop diabetic retinopathy. Once it is present it tends to worsen as time passes. It is rare to see much diabetic retinopathy in people who have had diabetes for less than 5 years but it does happen at times. Diabetes can remain undiagnosed for a period of time; therefore, people can have diabetes longer than they realise and it is possible for diabetic retinopathy to be present at the time of diagnosis of diabetes.

#### Blood glucose levels

The poorer the control of blood sugar levels, the more likely it is that diabetic retinopathy will develop and the more likely it is that it will worsen.

#### Other vascular risk factors

Control of blood lipids (e.g. cholesterol) and blood pressure are also very important in the delay of onset of diabetic retinopathy. Lifestyle choices play a big part in the control of these factors. Healthy eating, weight control and exercise should be encouraged, along with quitting smoking and reducing or ceasing alcohol intake.

### Prevention and slowing progression

Diabetics should have regular eye examinations from time of diagnosis. This is the single most important measure in the prevention of blindness from diabetes.

### Treatment

Treatment of diabetic retinopathy should begin as soon as possible, before significant symptoms are evident and before the disease has progressed too far. This represents one of the great challenges in the care of diabetic retinopathy in both developed and developing countries.

#### Laser treatment

The current treatment for most people is laser. Laser treatment is usually applied through a special contact lens in an outpatient setting and the individual can go home after having it. The treatment is not usually painful. The affected areas

## CLINICAL INTEREST BOX 34.4 Diabetic retinopathy—cont'd

of the retina are treated with tiny laser burns, particularly where there is significant leakage of fluid, especially at or near the macula, or where there are areas of ischaemia.

The aim of treatment is to help prevent further leakage, to promote reabsorption of fluid from the retina and reduce the stimulus to new vessel growth. Where there is severe ischaemia or when new blood vessels are already present, treatment aims to cause the new vessels to regress and prevent any further vessels from developing.

Often treatment is required to be repeated a number of times. In advanced diabetic retinopathy laser treatments may fail to improve sight significantly and disease progression may continue, often leading to blindness in both eyes.

### Surgical interventions

Surgical interventions may be indicated in very advanced cases of diabetic retinopathy where there has been severe bleeding in the eye, scar formation or retinal detachment. However, this intervention is usually only undertaken when all other treatments have failed to stop progression of the disease.

### Other treatment

There are new and emerging forms of treatment including injecting drugs into the eye to reduce swelling in the retina and suppress new vessel growth. These are similar drugs to those used in the treatment of some forms of macular degeneration but at present are too costly for routine use in some countries.

*(Batterbury et al 2009; Tarr et al 2013)*

## CLINICAL INTEREST BOX 34.5 Glaucoma prevention and preservation of sight

Routine eye screenings are recommended for early detection of glaucoma. Although it cannot at this time be predicted, prevented or cured, in most cases glaucoma can be controlled and vision preserved by early diagnosis. The person needs to be aware that certain prescription and over-the-counter medications can cause increased intraocular pressure and should not be taken without consulting their doctor. The person who has experienced an episode of acute angle-closure glaucoma is taught about the risks, warning signs and management of future attacks. Persons need to understand the importance of lifetime therapy and periodic eye examinations with intraocular measurement in controlling the disease and preventing blindness. The nurse should assess the person's compliance with routine health screening.

*(Hendry et al 2012)*

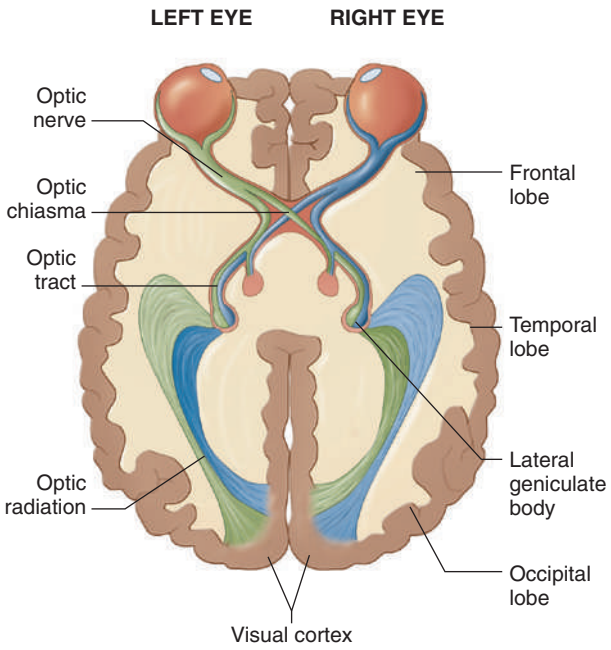



**Figure 34.6** The optic (visual) pathway

*(Thibodeau & Patton 2010)*

Degeneration of the retina can cause difficulty in seeing at night or in dim light. This condition, nyctalopia or night blindness, can be caused by a deficiency in vitamin A. Vitamin A is needed to make photo pigment in rod cells. Photo pigment is a light-sensitive chemical that triggers stimulation of the visual nerve pathway. A lack of vitamin A may result in a lack of photo pigment in rods, a condition that impairs dim-light vision (Patton & Thibodeau 2014).

## Disorders of the visual pathway

Damage or degeneration in the optic nerve, the brain or any part of the visual pathway can impair vision (see Figure 34.6). This can include damage from stroke, multiple sclerosis or trauma among others. Damage to the visual pathway does not always result in total loss of vision; depending on where the damage has occurred only part of the visual field may be affected (Patton & Thibodeau 2014).

# OTHER DISORDERS OF THE EYE

## Congenital disorders

### Strabismus

Strabismus is a condition of eye deviation in which the eyes fail to look in the same direction at the same time. The eyes may have uncoordinated appearance and the person may experience diplopia. Congenital strabismus is an anomaly in which there is a defect in the position and fusion ability of the two eyes. The condition is usually easily observed and, in addition to crossed eyes, the person may squint, tilt the head or close one eye to improve vision (Batterbury et al 2009).

### Ptosis

Ptosis, drooping of the upper eyelid, may be unilateral or bilateral. Congenital ptosis results from the failure of the levator muscle in the upper eyelid to develop. Manifestations are usually very obvious; the lid appears smooth and flat, and the person may tilt the head back to compensate if the lid droops over the pupil (Batterbury et al 2009).

## Neoplastic disorders

Benign or malignant tumours may arise in the tissues surrounding the eye, but neoplasms of the eyeball are rare (Batterbury et al 2009).

### Choroidal melanoma

A choroidal melanoma is a malignant tumour of the middle of the eyeball. The major symptom is visual distortion. There is generally no pain unless glaucoma develops (Trattler et al 2012).

### Retinoblastoma

Retinoblastoma is a congenital hereditary neoplasm that develops from retinal germ cells. It is the most common malignancy of the eye in childhood. Manifestations include diminished vision, strabismus, retinal detachment and an abnormal papillary reflex. The tumour grows rapidly and may invade the brain and metastasise to distant sites (Batterbury et al 2009).

## Traumatic disorders

### Abrasions

Abrasions are superficial scratches on the eyelid, conjunctiva or cornea. Corneal abrasions may be caused by foreign bodies or over-wearing of contact lenses. Manifestations include excessive tearing, pain, a sensation of something in the eye and photophobia.

### Lacerations

Lacerations may involve the eyelids or the eyeball. Lacerations of the eyeball may lead to intraocular infection, cataract formation of loss of vision. Manifestations of a lacerated eyeball include severe pain and shock.

### Contusions

Contusions of the eyeball involve a bruising injury in which intraocular damage occurs. The injury may result in bleeding into the anterior chamber (hyphema) or into the vitreous of surrounding tissues. Contusions generally result from a severe blow to the eye, such as from a fist, golf or squash ball. Manifestations include impaired vision, pain, bruising of the tissues surrounding the eye and blood in the anterior chamber.

### Foreign bodies

Foreign bodies may enter the conjunctiva or cornea, or they may penetrate and perforate the eyeball. Examples of foreign bodies that gain entry include eyelashes, dirt and small particles of metal, dust and glass. Manifestations include irritation, pain, excessive tearing and photophobia.

### Burns

Burns to the eye may result from exposure to a chemical, radiant energy or high temperatures. The extent of damage to the eye depends on the duration of exposure and the causative agent. Manifestations include extreme pain, excessive tearing, photophobia, inflammation or destruction of tissue and visual impairment (Batterbury et al 2009).

## Health promotion and education

The nurse is in a key position to educate individuals and their families about the ways by which eyesight can be protected and preserved in children. For adults, screening of visual function is imperative to detect problems early. Regular eye examinations are important, especially for persons with a family history of eye disorders and for persons who are more vulnerable to ocular complications such as diabetes mellitus. Recommended screening guidelines are structured on the basis of age. People under 40 years of age should have periodic eye checks as required. Those aged 40–64 should have a complete eye examination every 2 years, and those aged 65 years and over should have a complete eye examination every year. Examination of the eyes is also recommended if a person experiences any disturbances of vision, pain, sudden appearance of floaters, photophobia, purulent discharge, trauma to the eye or pupil irregularities. Prevention of eye infection includes washing the hands before touching the eyes, and not sharing eye make-up, eye drops or ointment (Crisp et al 2013).

Education is particularly important for persons involved in high-risk occupations and activities. Education should focus on strategies for prevention and first aid measures. Teach people what immediate care to give to prevent permanent loss of sight, such as immediately flushing the eye with copious amounts of water if a chemical splash occurs. Prevention of injury includes wearing eye protection when working with chemicals or when the eyes may be exposed to dust,

wood, metal or glass fragments. Protective eye wear should also be worn during recreational or sporting activities in which sticks or balls may contact the eye, such as squash. Excessive exposure to strong sunlight or sunlamps should be avoided, as these may damage the eyes. A common form of cataract, which can result from frequent exposure to intense sunlight, can largely be prevented if sun hats and good quality sunglasses are worn.

Prevention of eye fatigue includes using adequate illumination when reading or writing, resting the eyes often during prolonged use and reducing screen glare when using a visual display unit such as a computer screen. The nurse should inform the person and family of the importance of follow-up treatment and stress the importance of complying with prescribed activity restriction to prevent further eye damage, and of safe and careful application and correct storage of prescribed eye drops or ointments (Vision Australia 2015).

See Clinical Interest Box 34.6 for information on childhood screening.

**CRITICAL THINKING EXERCISE 34.2**

David Michaels is a 50-year-old man with hypertension. On his admission his blood pressure was 185/105 and he revealed that he had been seeing black spot floaters and flashing lights at times. He also was complaining of blurred vision. What health education would you provide to him on discharge?

**CLINICAL INTEREST BOX 34.6**
**Childhood preventative screening**

The most common visual problem during childhood is refractive error, such as nearsightedness. In early childhood parents may be alerted to a visual problem by reduced eye contact from their infant or the infant's failure to react to light. Recommended screening guidelines are usually structured on the basis of age, and preventative screening occurs in pre-school-age children (ages 4–5 years), where the nurse's role is one of detection and referral.

At school entry (age around 5 years):

- Examine eyes and observe for fixation, following, nystagmus, strabismus
- Test visual acuity
- Test hearing; perform otoscopy on children failing audiometry to determine appropriate action
- Address parental concerns regarding vision and hearing.

For more information visit Department of Education and Early Childhood Development: www.education.vic.gov.au/edulibrary/public/stuman/wellbeing/hwsfdp.pdf

## Diagnostic tests

Tests used to diagnose eye disorders may be classified as subjective, objective or special procedures. Subjective tests require oral responses from the person that must be interpreted by the examiner. Objective tests are those in which the examiner obtains precise measurements or directly visualises the interior of the eyes.

## Subjective eye tests

A visual acuity test evaluates the person's ability to distinguish the form and detail of an object. Visual acuity is measured by the use of a Snellen chart. The person is required to read letters on this chart from a distance of 6 metres. Generally, the smaller the symbol the person can identify the sharper their visual acuity.

Colour vision tests evaluate the person's ability to recognise differences in colour. The most common colour vision tests use plates made up of patterns of dots of primary colours, superimposed on backgrounds of randomly mixed colours. A person with normal colour vision can identify the patterns.

Accommodation tests evaluate the ability of the eyes to adjust to the curvature of the lenses. The examiner may perform this test by questioning the person concerning their visual acuity, while placing trial lenses before their eyes. Alternatively the test can be performed using an ophthalmoscope.

Visual field tests evaluate the functions of the retina, optic nerve and optic pathways. The person's peripheral and central visual fields are assessed when the examiner moves an object from outside the field into the field, on a radial line, until the person states that they can see the object. Tangent screen examinations detect visual field loss. In this examination, a screen is used and test objects from 1–50 mm in size are placed on the screen. Each eye is individually tested for visualisation of the objects.

## Objective eye tests

Intraocular pressure is assessed using a tonometer. A topical anaesthetic is instilled and the examiner places the tonometer on the apex of the cornea to determine pressure in the eye. An alternative method involves the use of an 'air-puff' tonometer that does not contact the eye. Tonometry serves as a valuable screening test for early detection of glaucoma.

Ophthalmoscopic examination involves the use of an ophthalmoscope to view the interior structures of the eye. The ophthalmoscope examines the fundus, or interior aspect, of the eye, allowing magnified examination of the optic disc, retinal vessels, macula and retina.

Slit-lamp examination allows the examiner to visualise in detail the anterior segment of the eye. Before the examination, dilating eye drops (mydriatics) may be instilled. The person sits with their chin on a rest and their forehead against a bar attached to the lamp. Slit-lamp examination helps determine corneal abrasions, dermatitis and cataracts.

Fluorescein staining is a technique in which staining the eye's surface with dye provides a better view of the anterior portion of the eye. The test is generally performed when the

conjunctival or corneal abrasions are suspected. Surface defects absorb more dye than normal areas.

### Special procedures for assessing the eye

Fluorescein angiography involves rapid-sequence photographs of the fundus after intravenous injection of a contrast medium. Fluorescein angiography records the appearance of blood vessels inside the eye.

A culture to determine the microorganism causing ocular infection may be obtained by passing a sterile swab over the conjunctival surface.

Computerised tomography (CT) of the orbit may be used to detect abnormalities such as intraocular foreign bodies or retinoblastoma. Contrast dye is injected and the eyeball scanned.

Ocular ultrasonography involves the transmission of high-frequency sound waves through the eye, and measurement of their reflection forms the ocular structures.

Ultrasonography can identify abnormalities that are undetectable through ophthalmoscopy, and may be used to locate intraocular foreign bodies.

## Care of the person with an eye disorder

While the general care of the person with a disorder of the eye is directed towards helping them to meet their needs, the three main aspects of care are:

1. Maintaining a safe environment
2. Education
3. Providing local eye care.

### Maintaining a safe environment

Any visual impairment or loss renders the individual susceptible to injury; therefore, the nurse has a responsibility to protect them from environmental hazards. These hazards may include such things as low levels of lighting, poor colour contrast or badly positioned furniture. The nurse should describe the layout of the room to the individual. If the individual is ambulant, the nurse should encourage them to locate the various pieces of furniture so that they become familiar with their position in the room. Leave furniture and personal belongings in the same position in the room. Ensure that any doors are either fully closed or open, as a visually impaired person can easily by injured if a door is left ajar.

Nurses can foster independence in the hospitalised visually impaired person by encouraging self-sufficiency in completing activities of daily living, and improving self-esteem as the person attempts and masters activities.

### Education

Education involves assisting the individual to adjust to a visual impairment. The nurse should initially describe to the individual with the alteration to visual function what has occurred. The person who is experiencing visual loss that is either temporary or permanent needs assistance to adjust to the physical and psychosocial implications. Care of the person includes encouraging them to express reactions and feelings to their visual loss. The visually impaired person may lose the ability to observe body language and the reading and writing components of communication. It is important for the individual to be able to interact with people who they encounter. Communication methods may also be taught to family members and significant others.

### Key aspects related to assisting the visually impaired person

- Encourage as much self-care as possible. The person who is experiencing recent visual impairment may need assistance until they adjust to their condition. A person who has been visually impaired for some time will probably have developed considerable self-reliance. The nurse should always consult the person when uncertain whether assistance is required.
- Address the person by name and identify yourself, visitors or others in the room. This avoids frightening the person and assists them in knowing who is in the room. It is also important to knock before entering and to inform them when you are about to leave the room.
- Speak to the person in the same manner as you would a fully sighted person. The nurse must suppress the urge to speak more loudly than usual, which people often do when conversing with a visually impaired person. There is no need to exclude words such as 'look' and 'see' from normal conversation.
- Any visual aids that the person uses should be kept in close proximity (Table 34.2). The person should have easy accessibility to the call bell if required.
- Encourage the person to maintain an interest in the outside environment through listening to the radio or television and discussing newspaper items.
- Provide full descriptions of people, places and things.
- Provide items that can compensate for diminished vision, such as bright non-glare lighting, large-print books, talking books, telephones with enlarged buttons and a clock with numbers and hands that can be felt.
- At mealtimes it may be necessary for the nurse to describe the position of foods on the plate (such as, peas are at 9 o'clock, potatoes at 12 o'clock, pumpkin at 3 o'clock and chicken at 6 o'clock).
- It is of particular importance to thoroughly explain any procedure or treatment before it is started. Whenever possible, if it will not affect sterility, the person should be allowed to feel any items used during a procedure.
- Provide contrasting colours; for example, non-white crockery and brightly coloured telephones, handles, borders or edges allow familiar objects to become more visible. Coloured tape, paint or nail polish can be used to colour-code appliance dials.
- Painting the edge of stairs with bright paint can help the person distinguish the edge of the step more clearly.
- Inform the person when they are approaching stairs or steps, remembering to let them know whether they are up or down.

**TABLE 34.2 | Aids for the visually impaired**

| Aid | Description |
|---|---|
| Magnifiers | Hand-held or standing magnifiers can be used to enlarge print, or for fine detail |
| Enlarged print | Large-print books, magazines and newspapers may be borrowed from the local library |
| Talking books | Tapes of books may be available on loan from agencies for the blind or from public libraries |
| Telephone aids | Special dials are available for telephones in both large print and braille |
| Braille | The braille system of writing and printing uses tangible points or dots, which the individual feels and 'reads' with the fingertips |
| Optical-to-tactile converters | Consist of devices that convert vision into tactile sensation, by reproducing the outline of a letter on a tactile screen |
| Canes | A variety of canes is available (e.g. a white or collapsible cane) which helps the individual to locate obstacles in the environment. Laser canes also locate objects and can identify changes in the region from as far away as 6 metres |
| Guide dogs | Trained dogs allow greater mobility and independence for the visually impaired person. The individual holds a U-shaped handle, which is attached to a harness on the dog. Communication between the two takes place through the movements of the harness. When a guide dog is working (i.e. when it is in harness) other people should not approach or pat the dog without the handler's permission, as the dog may become distracted |

*(Vision Australia 2015)*

- When walking with the person, the nurse should walk slightly ahead and let the person take their elbow. This technique ensures that the person senses the direction they are walking towards. The nurse should encourage the use of handrails while ambulating and warn the person of any hazards as they are approached.
- Cultural aspects of care should always be taken into account when caring for a person who has impaired vision.
- On discharge, review specific hazards in the home with the person and family. Assessment must be made of both indoor and outdoor living arrangements. The person's living quarters should not be altered after they have become familiar with placement of furniture.
- Inform the person and family that progress will be slow and that they will need to seek support from outside agencies. Encourage families to explore community resources available to persons with partial or total loss of vision, and the rehabilitation programs available to them. Some of these include: Association for the Blind; state and territory guide dog associations and Seeing Eye Dogs Australia; Australian Braille Authority; Vision Australia; Blind Welfare Australia; and Blind Citizens Australia. All coordinate services for the blind and visually impaired.

## Local eye care

Various nursing procedures involving the eye should be performed in accordance with the policies of the healthcare institution. General principles that should be followed in all ophthalmic procedures include:

- Explain what you are going to do
- Ensure that the person is sitting or lying with their head well supported
- Ensure that there is adequate lighting; lights should never be allowed to shine directly into the person's eyes
- Wash hands thoroughly before and after the procedure and wear disposable gloves to prevent cross-infection
- Use gentle unhurried movements and refrain from exerting any pressure on the eye
- Avoid all sudden movements
- Avoid touching the cornea with the fingers or equipment, to prevent corneal damage
- Use aseptic technique. When only one eye is infected or inflamed, the unaffected eye must receive attention first to prevent cross-infection
- Ensure that if an eye pad is to be applied, the eyelid is closed firmly to avoid corneal abrasion.

See Clinical Skill 34.1.

## Application of eye pads

A light eye pad may be applied to prevent further injury after trauma to the eye or to avoid eye damage after administration of a local anaesthetic. Before the eye pad is applied the individual is asked to close their eyelid firmly. The pad should be applied so that the eyelid cannot be opened. Pressure should not be applied, unless a medical officer has prescribed it. The

## CLINICAL SKILL 34.1 Application of eye pad

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile eye pad<br>Disposable gloves<br>Tape |

| **Skill activity** | **Rationale** |
|---|---|
| Validate the medical order in the individual's healthcare record | Ensures correct procedure is about to take place |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Ensure that the person is sitting or lying with their head well supported and there is adequate lighting | The person is relaxed and comfortable and therefore less likely to move during procedure and cause corneal damage |
| Place the equipment in a convenient location near the bedside<br>Raise the bed to the appropriate working position based on your height | Ensures all equipment is at individual's bedside to maximise efficiency<br>Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |
| Perform hand hygiene<br>Don appropriate PPE as per infection control protocols | Prevents cross-infection and contamination |
| Before the eye pad is applied the person is asked to close their eyelid firmly | Ensures the eye is not directly in contact with the eye pad and prevents corneal damage |
| Use gentle unhurried movements and avoid all sudden movements | Prevents person from moving or flinching to prevent corneal damage |
| The pad should be applied so that the eyelid cannot be opened. Check medical orders as sometimes double padding is required | Ensures the eye is not directly in contact with the eye pad and prevents corneal damage |
| Pressure should not be applied, unless prescribed by a medical officer | Pressure can damage the eye |
| The eye pad is secured into position using hypoallergenic tape<br>Place the tape diagonally from forehead to cheek | Prevents exposure of the eye<br>Placing tape at an angle reduces the risk of pressure on the eye |
| Clean and dispose of waste equipment appropriately<br>Remove gloves. Perform hand hygiene | Prevents cross-infection |
| Lower the bed and assist the individual to reassume a comfortable position<br>Ask the individual to report any complications during and post procedure if able. Explain that their range of vision and depth perception may be altered | Promotes rest and relaxation, monitors for adverse effects<br>Provides anticipatory guidance so that they take more care when ambulating or feeding themselves |
| Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer | Provides relevant information to other members of the healthcare team<br>Allows for the planning and implementation of care |

*(Australian Commission on Safety and Quality in Health Care (ACSQHC) 2012; 2015; Batterbury et al 2009; Berman et al 2015; Tollefson et al 2016)*

eye pad is secured into position using hypoallergenic tape, placing the tape diagonally from forehead to cheek.

## Eye irrigation

Irrigation is a technique performed to flush secretions, chemicals or foreign bodies from the conjunctival sac. Chemical injuries to the eye require flushing of the conjunctival sac with copious amounts of solution. It may be necessary to cleanse the eyelids before irrigation; for example, if there is excessive discharge or crusting. A suggested technique for eye irrigation is outlined in Clinical Skill 34.2.

## Eye prostheses

Two types of eye prosthesis are contact lenses and artificial eyes.

*Contact lenses*: a contact lens is a small plastic disc that is positioned on the cornea and held in place by surface tension. A person who has a refractive error, for example astigmatism,

### CLINICAL SKILL 34.2 Eye irrigation

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Dressing pack or sterile gauze and kidney dish or other receptacle<br>Sterile eye irrigating solution<br>Gloves<br>Towel or absorbent mat |
| **Skill activity** | **Rationale** |
| Validate the medical order in the individual's healthcare record | Ensures correct procedure is about to take place |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Assist the person into a recumbent position, with the head tilted towards the affected side | Prevents the solution running either over the cheek into the other eye or out of the affected eye and down the side of the nose |
| Place the equipment in a convenient location near the bedside<br>Raise the bed to the appropriate working position based on your height | Ensures all equipment is at individual's bedside to maximise efficiency<br>Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |
| Perform hand hygiene<br>Don appropriate PPE as per infection control protocols | Prevents cross-infection and contamination |
| Place a towel under the head on the affected side and across the neck. Place a kidney dish against the person's cheek and ask the individual to hold it in position | Prevents solution from flowing down the neck |
| Pour irrigating solution into the sterile receptacle or open the container of eye wash. Gently hold the eyelid open with one hand | A person will instinctively try to close the eye |
| Hold the fluid container 2.5 cm away from the eye | If the fluid container is held too high, fluid will flow at increased pressure, causing discomfort and possible damage to the eye |

*Continued*

| CLINICAL SKILL 34.2 Eye irrigation—cont'd | |
|---|---|
| Pour a little solution over the cheek first | Accustoms the person to the feel of the solution and prevents person moving during procedure |
| Direct the flow of solution from the nasal corner outwards | Because the head is tilted, the stream of irrigating solution will flow over the eyeball and prevent contamination of the other eye |
| Avoid directing the stream forcefully onto the eyeball, and avoid touching the eye's structures | Prevents discomfort and damage to the eye |
| Ask the person to look up and down and to either side while irrigating | Ensures that the whole area is washed |
| When the eye has been thoroughly irrigated, ask the person to close the eyes, and use a new gauze swab to dry the lids | Promotes comfort |
| Clean and dispose of waste equipment appropriately<br>Remove gloves. Perform hand hygiene | Prevents cross-infection |
| Lower the bed and assist the individual to reassume a comfortable position<br>Ask the individual to report any complications during and post procedure if able | Promotes rest and relaxation, monitors for adverse effects<br>Provides anticipatory guidance so that they take more care when ambulating or feeding themselves |
| Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer | Provides relevant information to other members of the healthcare team<br>Allows for the planning and implementation of care |
| *(ACSQHC 2012; 2015; Batterbury et al 2009; Berman et al 2015; Tollefson et al 2016)* | |

may wear contact lenses in place of glasses. A variety of lenses are available including hard, soft, gas permeable, extended wear, daily wear, coloured and disposable. It is important to know that all lenses require care and must be removed periodically to prevent corneal damage and eye infection. Education is required regarding proper lens care; for example, daily wear lenses should be removed overnight for cleaning and disinfection. Only the recommended solutions should be used for cleaning, soaking and storing lenses. Wetting lenses with contact lens solution before insertion minimises discomfort. The hands should be washed and dried before insertion or removing lenses (Crisp et al 2013).

*Artificial eyes*: an artificial eye may be inserted after surgical removal of an eye. Persons with artificial eyes have had enucleation of an entire eyeball. An artificial eye may be removed from the socket, cleaned and replaced. Alternatively, the prosthesis may remain in the socket permanently. Most persons prefer to care for their own eyes but there may be times when assistance from the nurse is required. When a prosthesis is removed from the socket it is placed in warm normal saline for cleansing (Crisp et al 2013).

## Eye surgery

*Laser eye surgery* is commonly performed to correct refractive errors such as myopia, hyperopia and astigmatism. A laser is used to permanently change the shape of the cornea, and in most cases the need to use corrective lenses is reduced or eliminated. Several surgical procedures are now available:

- Laser in situ keratomileusis (LASIK)
- Photorefractive keratectomy (PRK)
- Laser epithelial keratomileusis (LASEK)
- Laser thermokeratoplasty (LTK) (Batterbury et al 2009).

These procedures reshape the cornea using laser technology to remove a thin layer of epithelial cells or to shrink and reshape the cornea. Candidates for laser vision-correction should be in good health and must have adequate corneal thickness to ensure that the risk of perforation does not occur.

Following surgery, persons may experience a temporary loss of contrast sharpness (images do not appear crisp as with corrective lenses), over- or under-correction of visual acuity, dry eyes or temporarily decreased night vision with halos, glare and starbursts (LeMone et al 2014).

*Corneal transplant*: once the cornea has become scarred and opaque, no treatment can restore clarity. The first successful corneal transplant was performed in 1906. Corneas are harvested from cadavers of uninfected adults who were under the age of 65 and who die as a result of acute trauma or illness. Corneal transplantation is usually an elective procedure, although emergency transplantation may be required in the case of perforation of the cornea (Brown et al 2015; LeMone et al 2014).

# THE EAR

The ear is specially adapted as the organ of hearing but it is also concerned with the sense of position, balance and equilibrium. Hearing is a special sense that allows individuals to experience the world in which we live by providing a pathway for sounds to reach the brain. Hearing is a complex mechanism in which the ears receive sound waves and convert them into nerve impulses. The nerve impulses are transmitted by the acoustic nerve to the brain where they are interpreted. The externally visible portion of each ear is located on the lateral surface of the head on each side. The remaining parts of each ear are embedded in the bone of the skull (Marieb 2015).

## Structure of the ears

Each ear can be divided into three areas: the external, the middle and the inner ear (Figure 34.7).

### The external ear

The external ear consists of the auricle (pinna) and the external auditory canal. The auricle consists of a piece of elastic cartilage with a number of associated ligaments and muscles, and has a small amount of adipose tissue in the earlobe. The skin of the auricle is covered with fine hairs and is continuous with the skin lining the external auditory canal. The external auditory canal is an S-shaped canal about 2.5 cm long. It extends from the auricle to the tympanic membrane (eardrum). The skin lining the canal contains glands that produce cerumen (wax) that protects the lining from damage and keeps dust particles away from the eardrum. The tympanic membrane lies between the external ear and the middle ear. It is a semi-transparent sheet consisting of three layers. The outermost layer consists of hairless skin, the middle layer is connective tissue and the innermost layer is continuous with the mucous membrane lining of the ear (Ballachanda 2013).

### The middle ear

The middle ear, or tympanic cavity, is a small chamber within the temporal bone. Three small bones, or ossicles, lying in the middle ear transmit sound from the tympanic membrane to the oval window. Because of their shapes, the bones are named the malleus (the mallet), the incus (the anvil) and the stapes (the stirrup). The malleus is attached to the tympanic membrane; the stapes is attached to the oval window; and the incus articulates with the other two ossicles. The three ossicles are attached to the wall of the middle ear by ligaments. The auditory tube (or eustachian tube) connects the middle ear with air from the nasopharynx. It is about 3–6 cm long and is lined with mucous membrane. Normally the tube is flattened and closed at the pharyngeal orifice, but swallowing or yawning opens it briefly (Patton & Thibodeau 2014).

### The inner ear

The inner ear (Figure 34.8) consists of a bony cavity within the temporal bone known as the osseous labyrinth. It is lined with periosteum and filled with a fluid called perilymph. The three divisions of the osseous labyrinth are the cochlea, the vestibule and the semicircular canals. The cochlea is a spiralling bony cavity, which resembles the shell of a snail. It houses the organ of Corti, the receptor organ of hearing. The vestibule lies between the cochlea and the semicircular canals. It contains structures responsible for maintaining equilibrium during movement of the head. The semicircular canals consist of three canals (in each ear), arranged at right angles to each

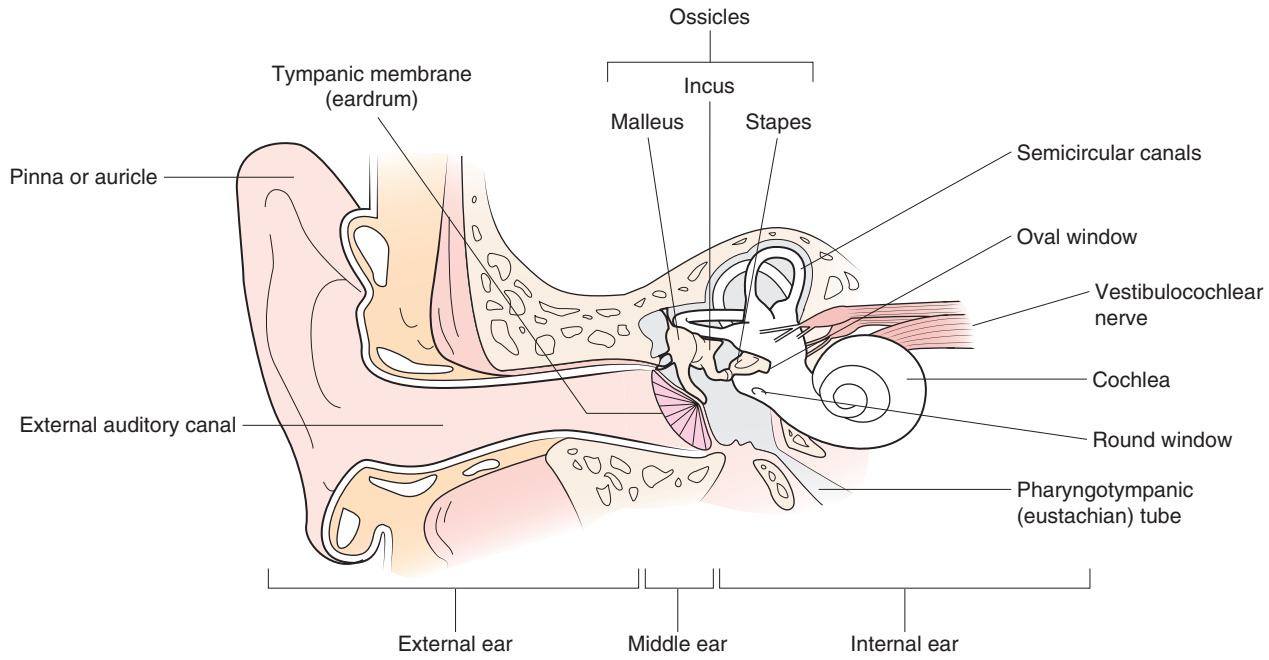



**Figure 34.7** The ear

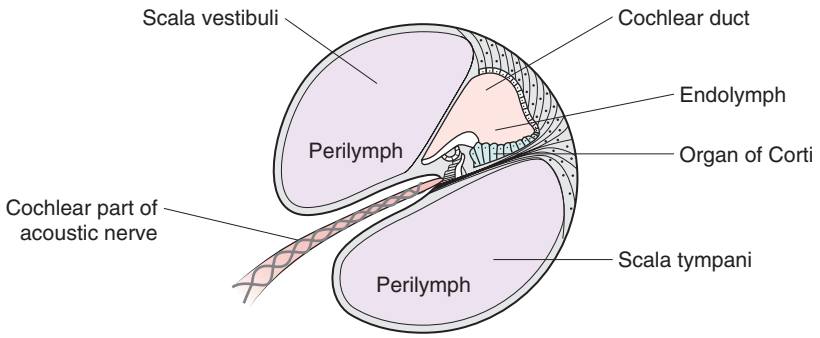



**Figure 34.8** A section of membranous cochlea showing the organ of Corti

other. They are filled with endolymph (the fluid inside the membranous labyrinth at the ear) and contain specialised nerve endings that are stimulated by the movement of the endolymph. The semicircular canals assist the body to adjust to changes of direction. The movement of fluid in this area can cause the person to experience a feeling of dizziness.

The membranous labyrinth is a membrane consisting of three layers, and lies within the osseous labyrinth. In the areas where it is not attached to the osseous labyrinth it is surrounded by perilymph. The fluid contained within the membranous labyrinth is known as endolymph. Part of the membranous labyrinth is concerned with hearing and part is concerned with the position of the head in space (Marieb 2015).

## The physiology of hearing

Hearing is a sense that enables sound to be perceived. Sound waves are collected and directed by the auricle into the external auditory canal, where they pass through and cause the tympanic membrane to vibrate. They then pass through the middle ear by vibration of the ossicles, and into the internal ear. From the internal ear sound waves are transmitted to the brain, via the acoustic nerve, for interpretation. Perception of sound involves interpretation of pitch and intensity. The entire process of hearing involves the following steps:

- Movement of air molecules causes a sound wave to form
- The sound wave travels through the air to the auricle, which directs it into the external auditory canal
- The sound wave enters the auditory canal and comes in contact with the tympanic membrane, causing it to vibrate
- The vibrations are transferred to the ossicles, which begin to vibrate, and the sound wave is transmitted across the middle-ear cavity to the oval window and into the fluid-filled internal ear
- The sound waves set the cochlear fluids into motion. The receptor cells are stimulated, and the sound waves are transmitted along the acoustic nerve to the temporal lobe of the brain for interpretation (Patton & Thibodeau 2014).

Two qualities of sound, pitch and intensity, are important in the interpretation of sound. Pitch is related to the frequency of the sound wave. A high-frequency sound stimulates the neurons supplying the cells near the base of the cochlea. Low-frequency sounds stimulate neurons nearer the apex of the cochlea. Intensity is related to the loudness of sound and is measured in decibels (dB). A loud sound causes the nerve endings to be stimulated at a greater rate than does a softer sound. The intensity of normal conversational speech is about 60 dB, and a decibel level of 160 can cause bursting of the tympanic membrane.

## Maintenance of equilibrium (balance)

Two structures within the internal ear, the semicircular canals and the vestibule, work together to help the individual maintain balance and equilibrium. Components of the semicircular canals alert the brain to rotational movement, and components of the vestibule alert the brain to gravitational movement. Movement of fluid in the canals gives a constant flow of information about body position and the speed and direction of any body movement. This information is used to coordinate movements and to maintain balance (Hendry et al 2012).

## Pathophysiology of the ear

Normal function of the ear can be altered by a variety of pathophysiological factors including those that are congenital, degenerative, infectious, obstructive, neoplastic or traumatic (Marieb 2015).

### Congenital factors

Congenital alteration, which may be either hereditary or acquired, include structural malformations that can lead to hearing loss or deafness, disorders resulting from maternal infection during pregnancy or trauma incurred during pregnancy or delivery or before maturity. Congenital disorders may be caused by a genetic defect or may result from prenatal trauma or toxicity. Some of the disorders affect the cosmetic appearance only, while others result in varying degrees of hearing loss. Congenital disorders include partial or total absence of the external ear (auricle), protruding ears, fused or absent ossicles and malformation of the cochlea (Patton & Thibodeau 2014).

## Degenerative factors

Degenerative changes in the bones and joints of the ossicles can result in conductive hearing loss, while narrowing of blood vessels to the inner ear can result in tinnitus, vertigo or hearing loss. Gradual sensorineural hearing loss can result from a decrease in the number of hair cells and nerve fibres in the auditory system as a consequence of the ageing process. **Presbycusis** is a slowly progressive bilateral hearing loss resulting from physiological changes of ageing. It results from a loss of hair cells in the organ of Corti and causes sensorineural hearing loss, usually of high-frequency tones. Manifestations include gradual progressive hearing loss, which may be accompanied by tinnitus and dizziness, depression or irritability (Brown et al 2015).

## Infectious factors

Microorganisms can cause external, middle or inner ear infections, all of which result in pain and varying degrees of conductive hearing loss. Otitis externa, which may be acute or chronic, is inflammation of the external ear canal and auricle; the most common causative organism is *Streptococcus pyogenes* although *Proteus vulgaris*, *Staphylococcus aureus*, *Candida albicans* and *Aspergillus niger* may be responsible for infection. Predisposing factors include swimming in contaminated water, abrasion of the ear canal from inserting sharp or small objects to clean the ear, exposure to irritants and constant use of earphones or ear plugs. Manifestations include otalgia which is exacerbated on chewing or opening the mouth, lymphadenopathy, pyrexia, regional cellulitis, offensive smelling discharge, pruritus and partial hearing loss.

Otitis media, which may be acute or chronic, is inflammation of the middle ear. Causative organisms include *Haemophilus influenzae*, pneumococci and beta-haemolytic streptococci. Predisposing factors include the wider, shorter and more horizontal pharyngotympanic tube in infants and children; anatomical abnormalities such as cleft palate; and respiratory tract infection. Manifestations include severe otalgia, pyrexia, hearing loss, dizziness, nausea and vomiting. If the tympanic membrane ruptures, there is often purulent discharge from the ear canal (Hendry et al 2012).

## Obstructive factors

Obstruction of the auditory system, which may result in conductive or sensorineural hearing loss, includes impacted cerumen, foreign bodies, oedema and neoplasms. An obstruction can impede the passage of sound waves causing an imbalance of pressure on either side of the tympanic membrane or it may disrupt the transmission of sound to the inner ear.

## Neoplastic factors

Neoplasms, which may be benign or malignant, can affect the external middle or inner ear. The effects of a neoplasm include pain, discharge, vertigo, tinnitus and hearing loss. An acoustic neuroma is a benign tumour arising from the eighth cranial nerve and occurring within the internal auditory canal. As the tumour grows the cochlear branch of the eighth cranial nerve becomes involved. Manifestations include tinnitus followed by an increasing high-frequency hearing loss. As the tumour increases in size, symptoms of other cranial nerve involvement occur, such as trigeminal pain and loss of taste in part of the tongue. Nystagmus and ataxia may occur (Brown et al 2015; LeMone et al 2014).

## Traumatic factors

Trauma to the external ear includes bruising, lacerations and frostbite. Trauma to the head can result in fractures of the temporal bone, dislocation of the ossicles, rupture of the tympanic membrane and damage to the auditory nerve. Trauma can lead to vertigo, tinnitus, nystagmus, pain, bleeding and hearing loss. Hearing loss can also result from sudden exposure to a loud explosive sound or from continued exposure to loud noise.

Abrasion: because of its vulnerable position, the external ear may sustain abrasion of the canal, burns or contusions of the pinna. Foreign bodies may be inserted into the canal and become lodged, or insects may fly into the ear, causing irritation.

Perforated eardrum: a perforated tympanic membrane may be caused by a variety of factors, such as the introduction of a sharp object to clean the canal, unskilled irrigation of the auditory canal, middle ear infection, trauma to the head or sudden exposure to loud noise. Most traumatic perforations heal spontaneously, but a perforated tympanic membrane results in scarring and renders the person susceptible to chronic ear infections and hearing loss. Manifestations include sudden severe pain inside the ear, loss of hearing, tinnitus and bleeding.

Barotrauma: barotrauma is injury caused by changes of air pressure to the wall of the pharyngotympanic tube and mucous membrane of the middle ear. It is caused by failure of the pharyngotympanic tube to open sufficiently, resulting in unequal pressure between the middle ear and the atmospheric pressure. It may occur during take off or landing in planes, or during deep-sea diving. Manifestations include severe pain, decreased hearing, tinnitus and vertigo.

Noise-induced hearing loss: this condition develops gradually as a result of continued exposure to environmental or industrial noise. Acoustic trauma is sudden hearing loss from brief exposure to a high-intensity sound at close range, such as gunshots. Manifestations of noise trauma include hearing loss, tinnitus and a feeling of fullness within the ear.

Ototoxicity: ototoxicity is a toxic reaction to medications or chemicals that can damage the auditory and/or vestibular system. Auditory damage may be permanent, whereas vestibular damage may be reversed after the drug therapy is discontinued. A variety of substances may result in ototoxic reactions, including diuretics, alcohol, lead, carbon monoxide, aspirin and antibiotics. Manifestations include bilateral hearing loss, tinnitus, vertigo and ataxia (Brown et al 2015).

## Major symptoms of ear disorders

The major manifestations of ear disorders are pain, discharge, tinnitus, vertigo, nystagmus and hearing loss. Table 34.3 is a representation of these manifestations.

### CRITICAL THINKING EXERCISE 34.3

A mother and 4-year-old child present at the clinic. The child has a temperature of 38°C, is crying and pulling at its left ear. The mother tells you the child has been like this all night. While at the clinic the child vomits and a purulent discharge emerges from the ear. What might these symptoms suggest is happening? What nursing management strategies would you suggest?

### Disorders of multiple causes

Otosclerosis is a disorder in which the spongy temporal bone becomes a dense sclerotic mass, eventually immobilising the stapedial footplate and causing a conductive hearing loss. Although no definite cause has been identified, heredity is a significant factor. Females have a higher incidence of the disorder than males. Manifestations are slowly progressive and include bilateral conductive hearing loss and mild tinnitus (Patton & Thibodeau 2014).

Ménière's disease is a disorder of the inner ear that results from over-production or decreased absorption of endolymph. The resulting dilation of the membranous labyrinth can progress to herniation and rupture. Manifestations are exacerbation and remissions of three symptoms: vertigo, tinnitus and sensorineural hearing loss. During an acute episode the person may experience nausea and vomiting, sweating, giddiness, nystagmus and ataxia (Marieb 2015).

### CRITICAL THINKING EXERCISE 34.4

Rebecca, a 42-year-old woman with Ménière's disease, is experiencing an increasing frequency of attacks of vertigo and tinnitus. Rebecca and her husband are booked on a holiday to England soon and are worried that she may not be able to fly. What do you think is probably happening to Rebecca? What may be some of the reasons for the increase in frequency of symptoms? What home management strategies would you suggest for Rebecca?

**TABLE 34.3 | Major manifestations of ear disorders**

| | |
|---|---|
| Pain | Earache (**otalgia**) is a common manifestation of many ear disorders. Middle ear pain associated with otitis media is often described as deep seated and throbbing, whereas the pain associated with otitis externa is often described as tenderness of the pinna only. Ear pain can also result from referred pain via various cranial or cervical nerves as occurs with tonsillitis |
| Discharge | Discharge form the ear, also known as otorrhoea, is generally associated with infections of the middle ear (otitis media). Purulent or haemopurulent discharge may drain from the middle ear through a perforation in the tympanic membrane. Otitis externa can sometimes produce a prolific discharge but is less likely than with otitis media |
| Hearing loss | Hearing loss is a common manifestation in ear disorders. There are two types of hearing loss:<br>Conductive—caused by blockage or damage in the outer ear, middle ear or both. Some of the causes of a conductive hearing loss include ear infections, otosclerosis, otitis media, barotrauma, damage to tympanic membrane or blockage of the ear canal by wax or foreign objects.<br>Sensorineural (perceptive or nerve)—caused by damage to, or a malfunction of, the cochlea (the sensory part) or the nerve (the neural part). It can be hereditary or genetic; it can also be caused by the ageing process, excessive noise exposure, diseases such as meningitis or Ménière's disease and viruses such as mumps or measles.<br>Some hearing loss is caused by a mixture of both above types, known as mixed hearing loss |
| Tinnitus | The term '**tinnitus**' is used to describe a noise in the inner ear when there is no actual external noise. The word 'tinnitus' means 'tinkling or ringing like a bell', and is of Latin origin; usually pronounced tinn-i-tus, the 'i' as in 'sit'.<br>It can be constant or intermittent, and may be described as ringing, buzzing, hissing or roaring noises. There are many possible causes of tinnitus, including trauma, obstruction, inflammation and malignancies. However, little research has been done in this area and there is no known cure |
| Vertigo | Vertigo is a sensation of spinning. People describe it as feeling as though their head is spinning or the room is going around. Causes can include trauma, malignancies, Ménière's disease and obstruction |
| Nystagmus | **Nystagmus** is the involuntary, rhythmic movement of the eyes. Movement may be horizontal, vertical, rotary or mixed. Nystagmus can be a sign of disorders of the inner ear but can also be present in some neurological disorders. Nystagmus can also be induced by introducing cold or warm water into the external auditory canal |

*(Crisp et al 2013; Brown et al 2015)*

## CASE STUDY 34.1

Georgia Murdoch is a 45-year-old mother of three who runs her own accounting business from home. She has been admitted with complaints of feeling that she is spinning or falling and has ringing and a feeling of fullness in her left ear. These symptoms have been getting worse over the past 2 weeks, and now she has difficulty getting up from a sitting position, and is worried about driving with her children in the car.

1. What do you think is happening to Georgia?
2. What are some of the nursing care considerations you need to take into account when caring for Georgia?

## Health promotion

Health promotion focuses on identifying persons with potential ear disorders (see Case Study 34.1). Persistent episodes of dizziness, ringing in the ears, balance problems or loss of hearing should be reported to a healthcare provider. The nurse is in a key position to educate persons about the ways in which hearing can be protected and preserved:

- Regular hearing examinations are important for the early detection of hearing problems, especially for children, whose ability to learn can be impaired by hearing defects
- Regular screening is also important for the person over age 65 because the ageing process is commonly accompanied by degenerative ear changes. Recommended preventative screening should be carried out for all ages as required
- Prevention of trauma to the ears includes education, such as the importance of never putting small or sharp objects into ears
- Excessive cleaning of the ear canal is contraindicated, as it removes the cerumen, which has a protective function
- Protection of the ears from contamination by water when swimming or diving is particularly important if the person has experienced ear infections
- Infections that could involve the ear (e.g. upper respiratory tract infections require adequate treatment)
- Protection of the ears from damage by noise: prolonged exposure to noise levels greater than 85–90 dB causes cochlear damage. People working in areas of high noise levels are required to wear protective devices such as earplugs or earmuffs. Exposure to loud volume from live music, audio equipment and headphones should be avoided
- Nurse assessment of the person's compliance with routine health screening
- Monitoring for vertigo, nystagmus, nausea, vomiting and hearing loss
- Instructing the person not to get up without assistance during episodes of vertigo due to increased falls risk
- Education to avoid sudden head movements or position changes
- Discussion of the effect of unilateral hearing loss on the ability to identify the direction of sounds (Crisp et al 2013).

## Diagnostic tests

Tests used to assist in the diagnosis of ear disorders assess auditory and vestibular function.

### Auditory tests

Otoscopic examination is the direct visualisation of the external auditory canal and the tympanic membrane through an otoscope (auroscope). Otoscopy is performed to detect foreign bodies or cerumen in the external canal, or to detect external and middle ear pathology. Tuning forks detect hearing loss and provide information as to the type of loss:

- The Weber test determines whether the individual lateralises the tone of the tuning fork to one ear
- The Rinne's test evaluates air and bone conduction in both ears
- The Schwabach test compares the individual's bone conduction response with that of the examiner, who is assumed to have normal hearing (LeMone et al 2014).

*Audiometry*: pure tone audiometry is the testing of each ear separately for air conduction via earphones, and for bone conduction via a vibrator placed on the mastoid bone. The faintest point at which the individual hears the tone is called the hearing threshold level. Comparison of air and bone thresholds can suggest a conductive, sensorineural or mixed-type hearing loss.

Speech audiometry tests the person's ability to understand and discriminate sounds. Two-syllable words are presented through earphones to measure how loud speech must be before it is heard.

Speech discrimination testing measures the person's ability to distinguish phonetic elements of speech and thus understand what is heard. The examiner presents one-syllable words through the ear phones.

Impedance audiometry evaluates middle ear function by measuring the flow of sound energy into the ear, and the resistance to that flow. The objective is to determine the resistance (impedance) of flexibility (compliance) of the tympanic membrane (Patton & Thibodeau 2014).

### Vestibular tests

*Electronystagmography* (ENG) evaluates vestibular function by measuring the effect of the semicircular canals on the ocular muscles. Electrodes are positioned at precise points on the face and eye, with movements in response to specific stimuli recorded on a graph.

*Caloric tests* compare the nystagmus produced by warm and cold stimulation in each ear. Each ear is irrigated with water to stimulate mild vertigo and nystagmus. No response indicates that the labyrinth is non-functional.

Other tests used to diagnose ear disorders include cultures of secretions to detect the source of an infection, and radiological examination of the temporal bone.

## Care of a person with an ear disorder

While the general care of the person with a disorder of the ear is directed towards helping them to meet their needs, the three main aspects of care are:

1. Maintaining a safe environment
2. Education
3. Providing any prescribed local ear care (Brown et al 2015; LeMone et al 2014).

### Maintaining a safe environment

Any hearing impairment renders the person susceptible to accidents and injury. Any environment can heighten or reduce sensory stimulation. The nurse must assess the person's environment in the healthcare setting as well as assisting the person and the family to identify hazards in the home environment, and recommend appropriate adaptations. Persons with vestibular disorders are at risk of losing their balance and falling. It is important to ensure that bathrooms have a non-skid surface in the shower and bath, grab bars are installed and that the nurse provides the family with education regarding supervision of the person when ambulant, to minimise the risk of falls (Crisp et al 2013).

### Education

The person who is experiencing hearing loss that is either temporary or permanent needs assistance to adjust to the physical and psychosocial implications. Communication is a key component of assisting the person with impaired hearing. Initially the person may withdraw by avoiding communication or socialisation with others to cope with the hearing loss. This can lead to social isolation and low self-esteem. The nurse should encourage the person to discuss feelings of fear and frustration with their family members (LeMone et al 2014).

Clinical Interest Box 34.7 provides an overview of hearing aid care and education.

### Key aspects related to assisting the hearing-impaired person

- Reduce background noise; attract the person's attention before speaking.
- Stand directly in front of the person or, if in a group setting, arrange semicircular seating. This enables the person to see facial expressions, body gestures and to read lips. Vision becomes a primary sense for the person who is hearing impaired. The nurse should avoid covering the mouth while speaking.
- Communication can be improved by employing non-verbal cues to help convey the meaning of your conversation; for example, facial expressions, hand gestures, pointing and writing.
- Allow the person time to insert, or adjust, any hearing aid before you speak.
- Speak clearly and more slowly than usual but avoid exaggerated movements or shouting. Shouting distorts sound and is painful to the wearer of a hearing aid.
- Rephrase your words if the person has not understood. It may be helpful to write out the message if you remain uncertain whether the person has understood.
- Encourage the hearing-impaired person who has a speech disorder to communicate verbally. If you do not understand their communication, do not pretend to

## CLINICAL INTEREST BOX 34.7 Hearing aid care

A hearing aid helps capture, amplify and funnel sound waves to the auditory nerve in a person with sensorineural hearing loss. Hearing aids are delicate and must be protected from heat, moisture and breakage. The manufacturer's guidelines for instructions specific to the person's hearing aid should be read by the person and/or family members. The aid is turned on to be certain it is working, then the ear mould is gently inserted into the ear canal. Once the mould has been inserted, the individual adjusts the volume. The tube, if fitted, is placed over the ear and attached to the battery device. Key aspects related to care of aids include:

- Ensuring that the ear mould and tubing are not blocked by wax or moisture. The hearing aid may be wiped with a soft tissue to remove any oils or waxes
- Keeping the aid dry and away from high temperatures (e.g. direct sunlight)
- Removing the aid before the person showers or washes their hair
- Switching off the aid when it is not in use
- Checking the battery and replacing it when necessary. Ensure that the battery is inserted correctly
- Checking that the hearing aid is switched on when in use and that the volume is adjusted
- Investigating the cause of any 'whistling', which can result in embarrassment and annoyance. Causes of whistling include a poorly fitting ear mould, ear mould incorrectly positioned, cracked or broken tubing and the volume turned up too high
- Notifying the audiologist or hearing-aid specialist if the aid is malfunctioning.

Research has resulted in the development of an implantable device to improve hearing—the cochlear implant. A cochlear implant is an electronic device that is surgically implanted. The device picks up environmental sounds and converts them to electrical impulses, which are relayed to an implant receiver. Direct electrical stimulation to the nerve fibres of cranial nerve VIII sometimes enables profoundly deaf persons to hear some sounds.

**TABLE 34.4 | Aids available to hearing-impaired persons**

| Aid | Description |
|---|---|
| Hearing aid | Device that receives speech and environmental sounds through a microphone, and amplifies sound. Various styles including those worn in the ear canal, behind the ear, on the arm of spectacles, and in the form of a transmitter that is attached to the clothing (body aid). Some styles may be used with an induction coil for use with television, telephone and radio |
| Modified telephone | Telephone fitted with volume control and induction coil |
| Radio and television | Used in conjunction with headphones, induction coils, infra-red and FM transmitters |
| Telephone typewriter | Device fitted to a telephone whereby a caller's message is typed and translated into a written message, which is either displayed on a screen or printout |
| Captioning devices | Added to a television set, these devices display captions or subtitles at the bottom of the screen. Not all television programs are coded for this service |
| Hearing dog | Dog trained to respond to specific sounds (e.g. door bell, telephone, a baby's cry) and to alert the hearing-impaired person to the source of the sound |

*www.deafness.org.au*

have done so. The person should be encouraged to repeat the sentence or to use other words or gestures to get the message across.

- Use items that are available from organisations such as the Deafness Foundation (www.deafness.org.au). Such organisations provide packaged kits to healthcare institutions, designed to assist hearing-impaired persons and staff. The kit generally includes adhesive stickers, discs, cards and information sheets.
- Other assistive devices may be required, such as sound lamps in which the light responds to sounds and telephones and alarm clocks with enhanced noise or flashing lights.
- Cultural aspects of care should always be taken into account when caring for the person who has impaired hearing.
- On discharge the nurse should encourage the person and their family to explore community resources available to people with partial or total loss of hearing, and rehabilitation programs that provide assistance in performing the activities of daily living (Crisp et al 2013).
- Table 34.4 provides examples of aids for hearing-impaired persons.

## Local ear care

Various nursing procedures involving the ear should be performed in accordance with the policies of the healthcare facility. The general principles should include:

- Explain the procedure to the person
- Ensure the person is sitting or lying with their head well supported
- Ensure adequate lighting
- Wash hands thoroughly before and after the procedure to prevent cross-infection
- Warm solutions and ear drops to body temperature, as hot or cold temperatures stimulate the inner ear, causing vertigo and sometimes nausea and vomiting (Berman et al 2015).

## Instillation of ear drops

Ear drops that may be prescribed include those that combat infection and those that soften wax. Ear drops are instilled only when they have been prescribed by a medical officer, and the nurse must follow the regulations and policies regarding the administration of medications. Key aspects regarding the use of otic medications are the same as those for using ophthalmic medications (see Chapter 24).

### DECISION-MAKING FRAMEWORK EXERCISE 34.1

Katie is an Enrolled Nurse working in an acute medical ward. The RN allocates her a patient who is prescribed ear drops four times a day. Katie is unsure if she is able to administer the ear drops. What steps must she work through to decide if she can administer the ear drops?

## Summary

The sense organs are those that contain receptors that pick up a stimulus from the environment and transmit impulses to the brain for interpretation. These unique organs are the tongue, eye, ear, nose and skin. With these organs taste, smell, touch, sight and sound are experienced.

The tongue contains taste buds that allow individuals to differentiate from sweet, salty and bitter tastes when substances are in solution. The information is transmitted to the brain via nerve impulses to be interpreted. The sensations of taste, sight and smell are closely related, and play an important part in stimulating appetite and the secretion of gastric juices.

One of the functions of the skin is the perception of touch, making it an organ of sensation. The sensation of touch allows individuals to be aware of pressure, heat, cold and pain—necessary to protect individuals from harm as well as to feel pleasure. The impulses that travel to the brain for interpretation enable individuals to distinguish if the intensity of the sensation is harmful.

Sight is the result of light rays reaching the retina in the eyes and the image being transmitted to the brain for interpretation of that image. This process requires several components that allow the right amount of light into the eye, the retina to be exposed to the light rays and the inner workings of the eye to be able to ensure the image is in focus and true to colour.

The ears enable individuals to hear sounds and interpret them into meaningful communication. The sense of hearing is closely linked with our ability to speak.

Sound waves enter the outer ear and travel to the tympanic membrane where nerve endings carry the resulting vibrations to the brain for interpretation. With the complex mechanisms required for hearing, individuals can interpret intensity of sound and pitch. Structures within the ear help to maintain balance.

The sense organs enable the individual to react and respond to their environment. Caring for a person with impaired sensory function requires the nurse to maintain a safe environment for the person to interact in and to be sensitive to the particular sensory loss being experienced.

## Review Questions

1. What does the term ageusia mean?
2. What are the three (3) structures of the middle layer of the eye?
3. What is the other term for myopia?
4. What are the three (3) classifications of cataracts?
5. What is the most common cause of blindness in developed countries?
6. What is Ménière's disease?
7. What is presbycusis?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Recommended Reading

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## Online Resources

Australian Commission on Safety and Quality in Healthcare www.safetyandquality.gov.au Australian

Australian Health Practitioner Regulation Agency: www.ahpra.gov.au

Australian Nursing and Midwifery Accreditation Council: www.anmac.org.au

Australian Nursing Federation: www.anf.org.au

Better Hearing Australia: http://betterhearing.org.au

Deafness Foundation: http://www.deafness.org.au

Department of Education and Early Childhood Development: www.education.vic.gov.au/edulibrary/public/stuman/wellbeing/hwsfdp.pdf

Joanna Briggs Institute: www.joannabriggs.edu.au

The Fred Hollows Foundation http://www.hollows.org.au/eye-health

Vision Australia Foundation: www.visionaustralia.org.au

http://www.visionaustralia.org/eye-health/tips-for-looking-after-your-eyes

http://www.aihw.gov.au/eye-health-facts/

CHAPTER 35

# Nursing assessment and management of neurological health

*Anne MacLeod*

## KEY TERMS

absence seizure
aneurysm
aphasia
apraxia
ataxia
aura
cephalalgia
cerebrovascular accident (stroke)
chorea
decerebrate
decorticate
dysphasia
generalised seizure
hemiparesis
hemiplegia
hydrocephalus
neuralgia
neuritis
paraplegia
quadriplegia
spina bifida
status epilepticus
transient ischaemic attack (TIA)

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define the key terms
- Describe the structure of the nervous system
- Describe the position of each part of the nervous system
- Describe the functions of the nervous system
- State the pathophysiological influences and effects associated with disorders of the nervous system
- Describe the major manifestations of nervous system disorders
- Briefly describe the specific disorders of the nervous system outlined in this chapter
- Apply principles of neurological assessment
- Demonstrate accurate documentation of a neurological assessment
- Discuss the nursing management of an acute neurological presentation
- State the diagnostic tests that may be used to assess nervous system function
- Assist in planning and implementing nursing care for the individual with a nervous system disorder

## CHAPTER FOCUS

The nervous system is responsible for the coordination of all other systems. It provides a network for communication within the body, and between the body and its environment. The brain is informed of events occurring both within and outside the body by nerve impulses that originate at a large number of sensory receptors. The receptors, which may be nerve endings, single specialised cells or a group of cells forming a sense organ, convert the energy of a stimulus into impulses that pass to specific areas of the brain. An understanding of this complex and dynamic system underpins many aspects of individual care, as almost all medical conditions can affect the human nervous system in some way.

The workings of the human brain, and indeed the entire nervous system, have both fascinated and mystified scientists for centuries. The knowledge that has been uncovered has enabled healthcare professionals to make more accurate assessments of individuals, allowing implementation of safer and more effective treatments. While application of this knowledge has significantly improved the expected outcomes for many individuals affected by disorders of the nervous system, there is still much research to be carried out to fully explain the workings of this intricate system.

This chapter focuses on the function and structure of the neurological system, pathophysiological influences and effects of disorders of the nervous system, neurological assessment and the care of an individual with a nervous system disorder.

## LIVED EXPERIENCE

Since my marriage a year ago I had recently noticed my wedding ring was getting tight. I also found my shoes pinched me and I bought a larger size. I had had occasional headaches, but these started to increase in frequency and intensity. I also thought I might need to get eyeglasses as my vision seemed to be getting worse. It wasn't until we were showing friends our wedding photos when my husband said I looked a bit different to the photos. Looking in the mirror we could see subtle differences—my chin seemed bigger or longer, my nose looked a bit more prominent, and my forehead had developed a mild furrow across it. I decided to see my GP who sent me for a scan. It showed a pituitary tumour. Apparently this explained some of my symptoms. I was referred to an endocrinologist and a neurosurgeon. I was told some of my symptoms (acromegaly) might improve after surgery and we traced around my hand as a baseline. The GP ordered visual field tests. I went into hospital the day of the surgery and had fiducials (little greenish lifesaver-looking things) stuck to my head. I was taught to wipe my nose, not blow it post op, and to turn any sneeze into a cough by opening my mouth at the time. Apparently this is to protect the graft stuck up my nose. The operation was due to be done through my nostril. When I awoke I had a nasal bolster under my nose (to catch the drips), an IV and a urinary catheter and a lumbar drain in my back to drain small amounts of spinal fluid. The lumbar drain was removed later that day and the IDC was removed the next morning. The nurses asked me to keep a record of anything I had to drink, and I used a bottle for measuring urine. I didn't have issues but some people will pass a lot of urine post op. Two days after surgery they removed the packs from my nostril (they looked like tampons). I was discharged after 4 days. My hand is back to normal size! I haven't noticed any other changes. I see the endocrinologist as a follow up, and also the neurosurgeon in 6 weeks. I will not get glasses until I have another visual field test (my peripheral vision was diminished on my left side). I was lucky to catch this tumour before it caused more vision problems or hormone problems.

**Tanya, age 26**

# THE FUNCTION AND STRUCTURE OF THE NEUROLOGICAL SYSTEM

## Nervous tissue

### Neurons

Neurons 'nerve cells' (Figure 35.1) are the primary components of the nervous system. Functioning alone, or as units, neurons detect internal and external changes and initiate body responses needed to maintain homeostasis. Each neuron is composed of a cell body, with projections forming dendrites, and one long axon. The dendrites are short-branched fibres, which receive impulses and conduct them towards the cell body of a neuron. The axon, which may vary in length from miniscule to over a metre, conducts impulses away from the cell body of a neuron. A single neuron may have many dendrites. Each axon has a covering called a neurilemma, and most have a fatty sheath, the myelin sheath. The myelin sheath protects and insulates the axon and increases the transmission rate of nervous impulses. Neurons are supported by many types of cells that support, insulate and protect, called neuroglia or 'nerve glue'.

### Neuroglia

The neuroglia include many types of cells that support and protect the neurons. They play a role in regulating neuronal activity, and in providing neurons with nutrients. Neuroglia differ from neurons in that they are not capable of transmitting nerve impulses and never lose their ability to divide. The neuroglia in the central nervous system (CNS) are comprised of five types of cells: astrocytes, cells with small cell bodies

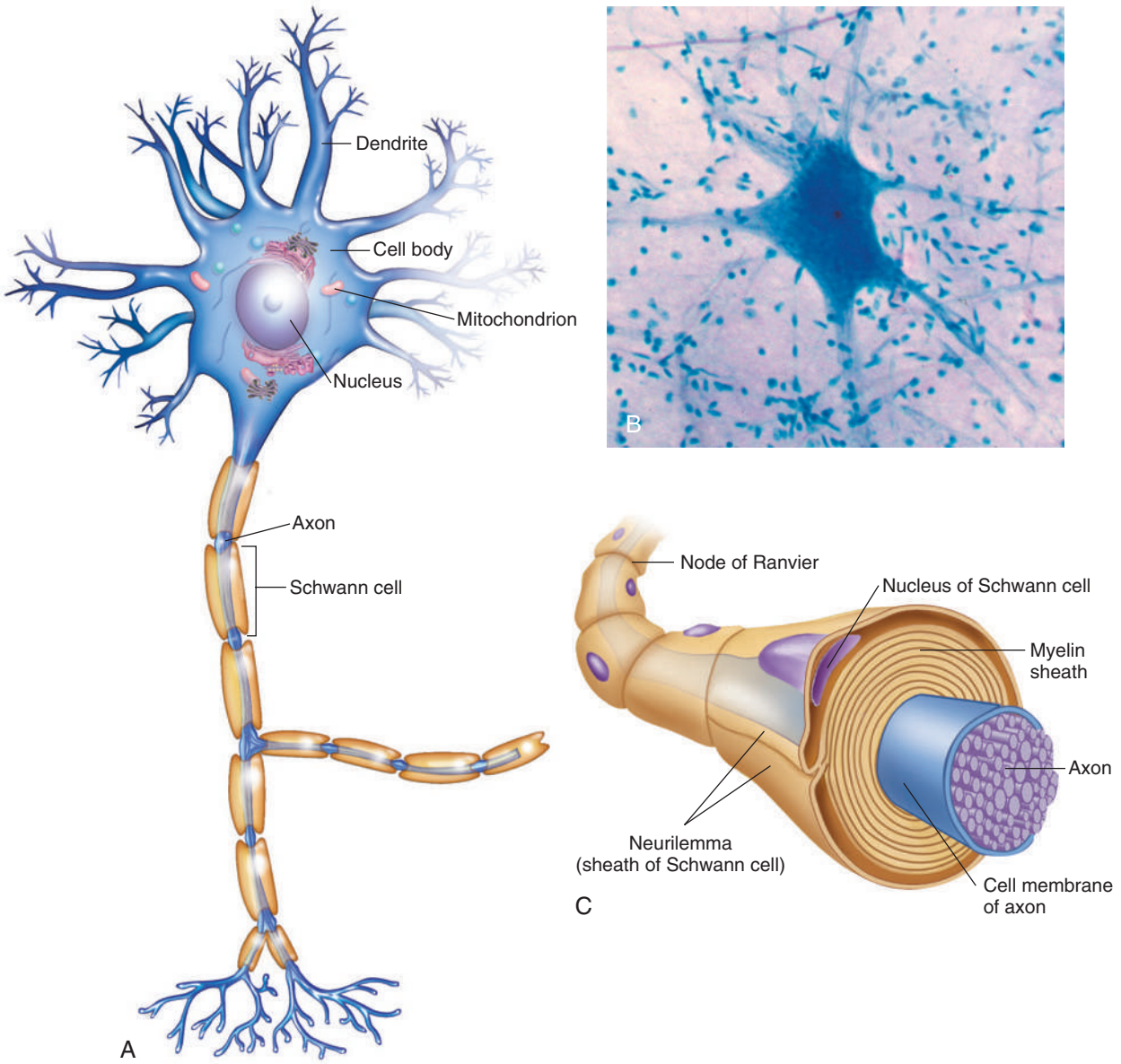


**Figure 35.1** A typical neuron A: Diagram of a typical neuron showing dendrites, a cell body and an axon B: Photomicrograph of a neuron C: Segment of a myelinated axon

*(Thibodeau & Patton 2012)*

and processes like dendrites, which protect the neurons from harmful substances that may be in the blood by forming a living barrier between the capillary blood supply and the neurons; oligodendrocytes in the CNS, which have few processes and produce the myelin sheath around the processes of the neurons; microglia which are phagocytes that dispose of debris; ependymal cells which line the cavities of the brain and spinal cord; and Schwann and satellite cells within the PNS. The Schwann cells protect, nourish and form myelin and the satellite cells protect and cushion.

## Functions of neurons

Neurons have two major functional properties: irritability and conductivity. Irritability is the ability to respond to a stimulus and convert it into a nerve impulse. Conductivity is the ability to transmit the impulse to other neurons, muscles or glands. An impulse is a complex electrical and chemical signal transmitted along a nerve pathway in response to a stimulus. The speed of transmission varies with the size of the nerve fibre, and may be as much as 120 metres per second.

A synapse is the space between the terminal axon of one neuron and the dendrites of another. By means of a chemical substance (neurotransmitter) released by the axons, impulses are transmitted through this space from one neuron to another. Examples of neurotransmitters are acetylcholine and noradrenaline. Many different types of stimuli (electrical, mechanical or chemical) can excite neurons so that they become active and generate an impulse. Most neurons are excited by the neurotransmitters released by other neurons, but other stimuli can excite neurons. For example, sound excites some of the neuronal receptors of the ear, and pressure excites some cutaneous receptors of the skin. Receptors, or sensory nerve terminals, act as transducers, converting the energy of a stimulus into impulses that pass to the brain.

The nervous system can be divided into two primary divisions: the central nervous system, consisting of the brain and spinal cord; and the peripheral nervous system, consisting of nerves that connect the central nervous system with the body tissues (Patton et al 2012; Thibodeau & Patton 2012).

## The central nervous system

The central nervous system is composed of nervous tissue, which is commonly described as grey and white matter. Examination of a section of the brain reveals that it is grey on the outside and white on the inside. Microscopic examination reveals that the grey matter is composed of neuron cell bodies responsible for processing information and white matter which is made up of myelinated fibres which allows communication to and from grey matter areas, and between the grey matter and the other parts of the body.

### The brain

The brain is a large organ weighing about 1.4 kg in the adult, held in position within the skull by membranes called the meninges. In most parts of the brain the outer portion, or cortex, consists of grey matter, while white matter forms the inner portion. The grey matter is convoluted to provide a greater surface area. The brain is divided into the:

- Cerebrum, comprising the left and right cerebral hemispheres
- Diencephalon, comprising the left and right thalamus and hypothalamus
- Brainstem, comprising the midbrain, pons and medulla oblongata—the stalk-like section that connects the brain to the spinal cord
- Cerebellum (Thibodeau & Patton 2012).

### The cerebrum

The cerebrum (Figure 35.2) is the largest part of the brain, filling the vault of the cranium from front to back. It is divided by fissures into the left and right hemispheres, and each hemisphere is further divided by fissures into four main lobes and the insula lobe. The insula lobe lies medial to the lateral sulcus and is thought to be involved in sensory and motor visceral functions as well as taste perception. The four main lobes are:

1. The frontal lobe, responsible for voluntary motor function, motivation, aggression, personality, sense of smell and mood
2. The parietal lobe, which receives and evaluates sensory information
3. The temporal lobe, which receives input for smell and hearing and has an important role in memory
4. The occipital lobe, responsible for reception and integration of visual input.

The left hemisphere of the brain controls the right side of the body and the right hemisphere controls the left side of the body. The hemispheres are connected by the corpus callosum which allows the cerebral hemispheres to communicate with each other.

The cerebrum is divided into several areas, some of which are sensory and some of which are motor areas. The sensory areas of each hemisphere receive and interpret sensations from the opposite side of the body, including touch, temperature, pain, pressure and an awareness of the position of the body in its environment. The motor areas of each hemisphere control all voluntary movement on the opposite side of the body. The centres of special sense are located in the various lobes, including the centres for hearing, speech, smell, taste and sight (Figure 35.3).

The functions of the cerebrum are therefore to receive and interpret impulses from the sensory organs, to initiate and control the movements of skeletal muscles and to perform the higher levels of mental activity such as thinking, reasoning, intelligence, learning and memory (Thibodeau & Patton 2012).

### The diencephalon

The diencephalon consists of three major structures: the thalamus, the hypothalamus and the pineal gland. It is located between the midbrain and cerebrum. The thalami are two oval masses of grey matter that form the lateral walls of the third ventricle. Each thalamus is subdivided into a number of nuclei. Most sensory pathways (except smell) synapse here, serving as the major relay station for sensory impulses. The thalamus plays an important role in the control of somatic motor activity and influences mood and strong emotions.

The hypothalamus lies beneath the thalamus and the pituitary gland is closely connected to it. The hypothalamus controls all the activities of the autonomic nervous system, which is described later in this chapter. The hypothalamus is important in controlling the endocrine system, as it regulates pituitary gland function.

The pineal gland is located posterior to the thalamus, receives sensory information about the strength of light seen by the eyes and varies the secretion of the hormone melatonin (Thibodeau & Patton 2012; Patton et al 2012).

### The brainstem

*The midbrain*. The midbrain is a short narrow segment connecting the cerebrum with the pons. It is composed primarily

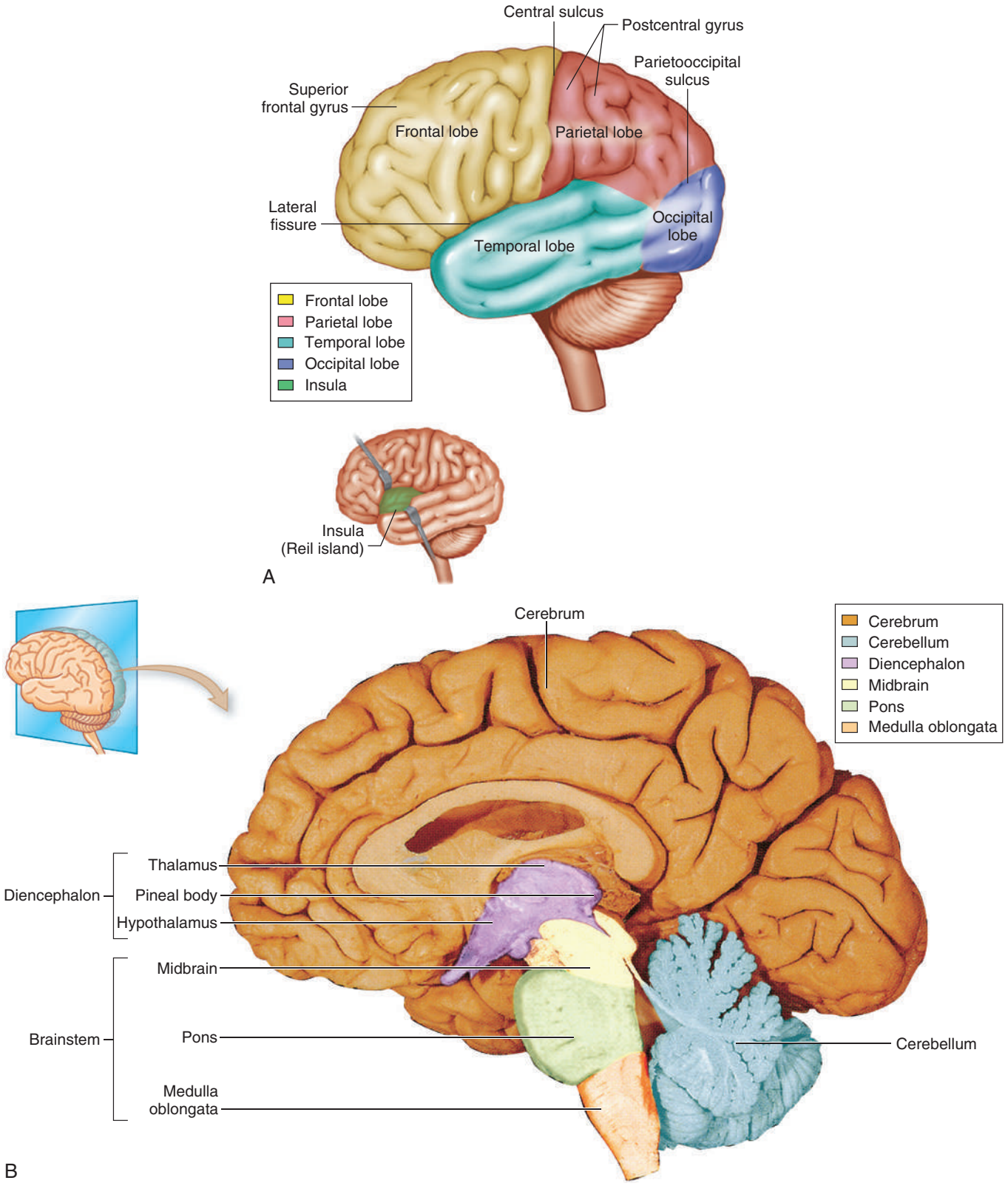


**Figure 35.2** A: Left hemisphere of cerebrum, lateral surface B: Divisions of the brain *(Thibodeau & Patton 2012)*

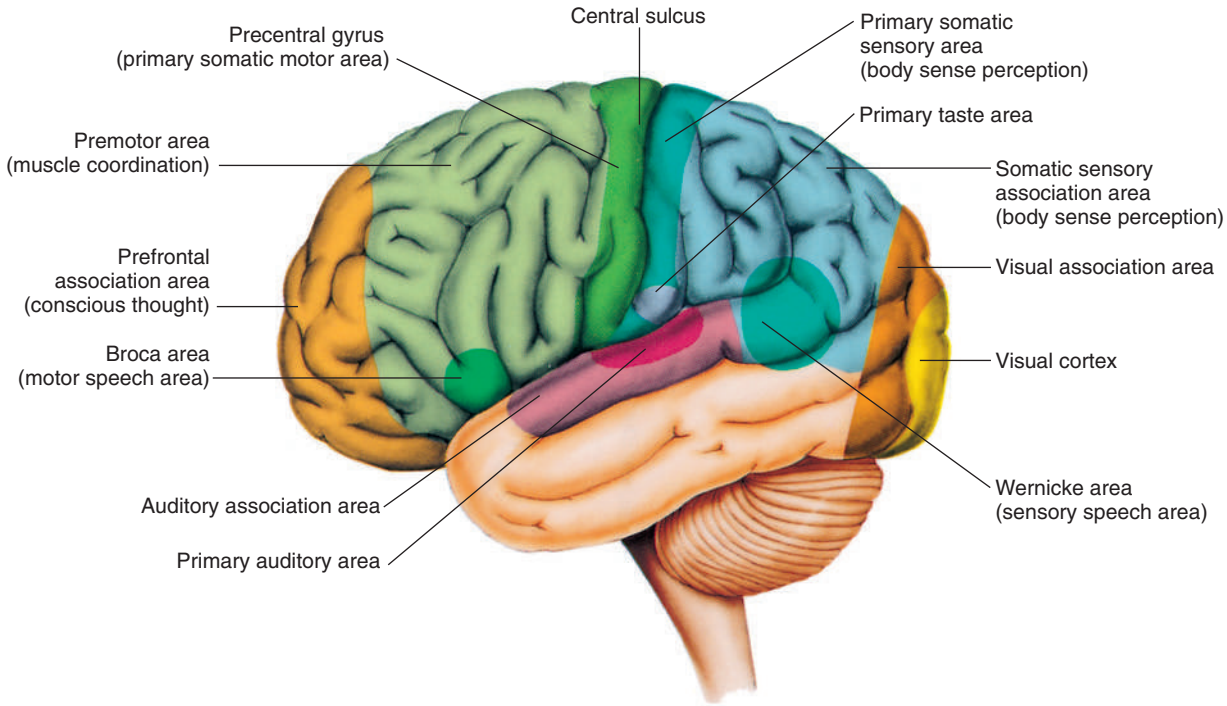


**Figure 35.3** Functional regions of the cerebral cortex
*(Patton et al 2012)*

of ascending and descending fibre tracts. Its functions are to provide a pathway for impulses passing between the cerebrum and spinal cord, and to receive stimuli that initiate eye and postural movements.

*The pons* lies just above the medulla oblongata. It contains two respiratory centres: the pneumotaxic centre and the apneustic centre. Its functions are to act as a relay station from the cerebrum to the cerebellum, and to modify the activity of the medullary respiratory centres through the pneumotaxic and apneustic centres.

*The medulla oblongata*. The medulla oblongata lies between the pons and the spinal cord. It provides the link between the brain and the spinal cord and contains the cardiac, respiratory, vasomotor and reflex centres. Its functions are:

- To provide a pathway where nerve fibres to and from the brain cross over to the opposite side
- To control heartbeat (through the cardiac centre)
- To control ventilation (through the respiratory centre)
- To control constriction and dilation of blood vessels (through the vasomotor centre)
- To initiate the reflex actions of swallowing, vomiting, coughing and sneezing (through the reflex centres).

## The cerebellum

The cerebellum lies behind the pons and medulla and below the occipital lobes of the cerebrum. Like the cerebrum, the cerebellum is divided into two hemispheres that have shallow convolutions in their surface of grey matter. Its functions are coordination of muscular activity and regulation of muscle tone, and maintenance of balance and posture.

## Blood supply to the brain

The carotid and the vertebral arteries supply blood to the brain. These arteries branch and join up again, forming a circle of arteries at the base of the brain called the circle of Willis. From here smaller cerebral arteries branch off to supply each region of the brain. Blood returns from the brain via the jugular veins to the superior vena cava.

The blood–brain barrier is a barrier that prevents or delays the entry of certain substances into brain tissue. The relatively low permeability of the capillaries supplying the brain means that some substances are either completely or partially prevented from gaining access to brain tissue. The blood–brain barrier thus acts as a protective mechanism, preventing substances such as bilirubin, which could disrupt brain function, from crossing the barrier. Water, oxygen, carbon dioxide and glucose cross the blood–brain barrier easily (Patton et al 2012).

## The spinal cord

The spinal cord is a cylindrical structure that lies within a canal inside the vertebral column. It extends from an opening on the underside of the skull (the foramen magnum) to the level of the first or second lumbar vertebra. Below this level the vertebral canal is occupied by nerves from the lumbar and

sacral segments of the cord; conus medullaris, the most distal bulbous part of the spinal cord which continues as the filum terminale: these constitute the cauda equina ('horse's tail'). The spinal cord, which is about 46 cm in length, consists of nervous tissue, with the white matter on the outside and the grey matter arranged roughly in an 'H' formation in the centre (Figures 35.4 and 35.5). The two anterior projections of grey matter are called the anterior horns, and the posterior projections are called the posterior horns. Sensory nerve fibres enter the posterior horns, and motor nerve fibres leave the anterior horns.

Leaving the spinal cord at intervals throughout its length are 31 pairs of spinal nerves. The functions of the spinal cord are:

- To receive sensory impulses from the tissues and convey them to the sensory areas of the brain via ascending (afferent) pathways
- To convey motor impulses from the brain to various parts of the body via descending (efferent) pathways
- To provide a pathway through which reflex actions take place.

A reflex action, or arc, is an automatic motor response to a sensory stimulus without conscious involvement (Figure 35.6). Most reflex actions are protective in nature and take place more quickly than voluntary actions. The structures involved in a reflex action are:

- A sensory organ (e.g. the skin) to receive the stimulus
- A sensory (afferent) nerve fibre to carry the impulse to the posterior horn of the spinal cord
- An association neuron in the spinal cord to receive the impulse and transmit it directly to the anterior horn
- A motor (efferent) neuron in the anterior horn to receive the impulse and transmit it to the motor organ
- A motor organ (e.g. a muscle) to receive and respond to the stimulus.

An example of a reflex action is when the hand comes into contact with a very hot object. The skin on the hand receives the stimulus of heat, and an impulse travels from the sensory nerve endings in the skin to the posterior horn of the spinal cord. From there, the impulse is transmitted to the anterior horn, then passed along the motor nerves to the muscles of the shoulder, arm and hand. As a result, the hand is pulled rapidly away from the source of heat before the brain has even processed the information (Patton et al 2012; Thibodeau & Patton 2012).

### The meninges

The meninges are the three membranes that cover the brain and the spinal cord. The individual membranes are:

1. The dura mater (meaning 'hard mother') is the tough outermost layer. It consists of two layers of fibrous connective tissue, with one layer forming the periosteum covering the inner surface of the skull bones, and the other layer covering the brain and spinal cord
2. The arachnoid mater (meaning 'mother like a spider's web') is the middle layer. The name refers to the fact that it is so thin that, when viewed under a microscope, it resembles a spider's web
3. The pia mater (meaning 'gentle mother') is the delicate innermost layer. It adheres closely to the surface of the brain and spinal cord, dipping down into the convolutions and fissures. The pia mater is richly supplied with blood vessels that carry blood to the brain and spinal cord.

The subarachnoid space is the space between the arachnoid mater and pia mater, filled with cerebrospinal fluid in circulation. The functions of the meninges are to form a protective covering against physical injury around the brain and spinal cord, and to help secure the brain to the cranial vault (Thibodeau & Patton 2012; Patton et al 2012).

### Cerebrospinal fluid

Cerebrospinal fluid (CSF) is a clear watery fluid with a composition similar to plasma. It contains substances including water, glucose, sodium, chloride, potassium, protein and waste products such as urea. The CSF is formed from the blood and is produced by a combination of filtration and active secretory processes by the choroid plexus in the ventricles of the brain. CSF circulates in the subarachnoid space surrounding the brain and spinal cord. The total volume of the CSF is about 140 mL. The fluid is formed continuously in the ventricles at a rate of about 500 mL/day, and is reabsorbed into the blood at about the same rate. The functions of CSF are to:

- Form a protective cushion around the brain and spinal cord
- Maintain normal pressure around the brain and spinal cord
- Provide a medium for the exchange of nutrients and waste products between the bloodstream and the nervous tissue (Patton et al 2012).

## The peripheral nervous system

The peripheral nervous system (PNS) consists of the 12 pairs of cranial nerves, and 31 pairs of spinal nerves that leave the spinal cord. The peripheral nerves may be sensory, motor or mixed. Sensory (afferent) nerves carry impulses to the brain and spinal cord. Motor (efferent) nerves carry impulses from the brain and spinal cord to the muscles, organs and tissues. Mixed nerves are composed of both sensory and motor fibres and transmit impulses in both directions. The motor peripheral nervous system has two functional divisions:

- The somatic nervous system, which allows us to consciously, or voluntarily, control our skeletal muscles. This division is often called the voluntary motor system but it also includes involuntary reflexes
- The autonomic nervous system, which regulates events that are automatic, or involuntary, such as the activity of smooth and cardiac muscle and glands. The autonomic nervous system itself has two parts: the sympathetic and parasympathetic nervous systems (described further below) (Marieb 2015; Patton et al 2012).

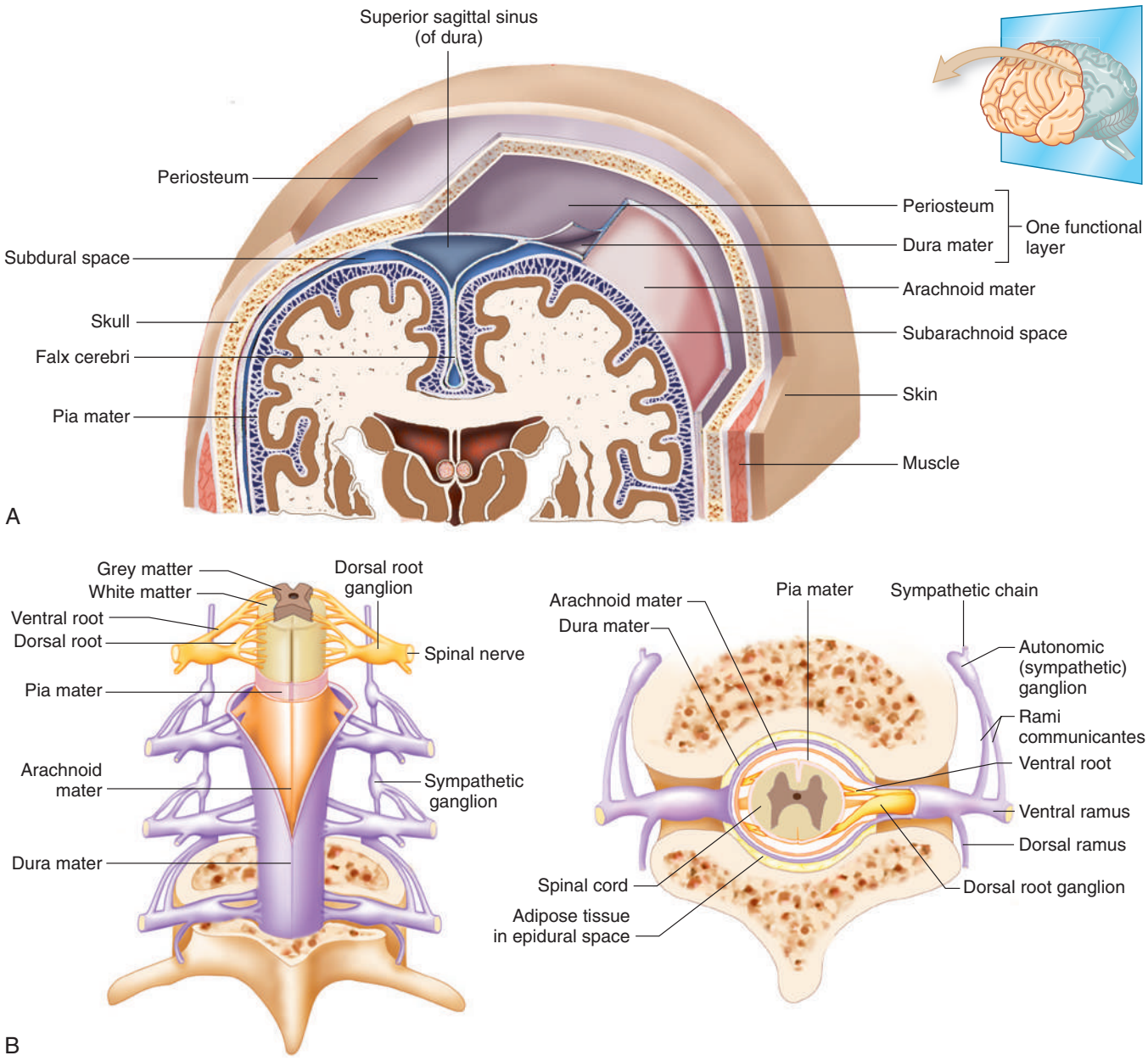


**Figure 35.4** A: Coverings of the brain B: Coverings of the spinal cord *(Patton et al 2012)*

## The cranial nerves

Twelve pairs of cranial nerves (CN) leave the brainstem. The numbers (Roman numerals are the convention), names and functions of the cranial nerves are:

I. Olfactory nerve: sensory—the nerve of smell
II. Optic nerve: sensory—the nerve of sight
III. Oculomotor nerve: motor—supplies the muscle of the eye
IV. Trochlear nerve: motor—supplies one of the eye muscles
V. Trigeminal nerve: mixed—sensory fibres receive stimuli from most of the skin of the head and face, the membranes of the nose and mouth, the orbits, the upper and lower jaws and teeth; motor fibres supply the muscles of mastication
VI. Abducent nerve: motor—supplies one of the eye muscles
VII. Facial nerve: mixed—sensory fibres convey the sensation of taste from the anterior portion of the tongue; motor fibres supply the muscles of facial expressions

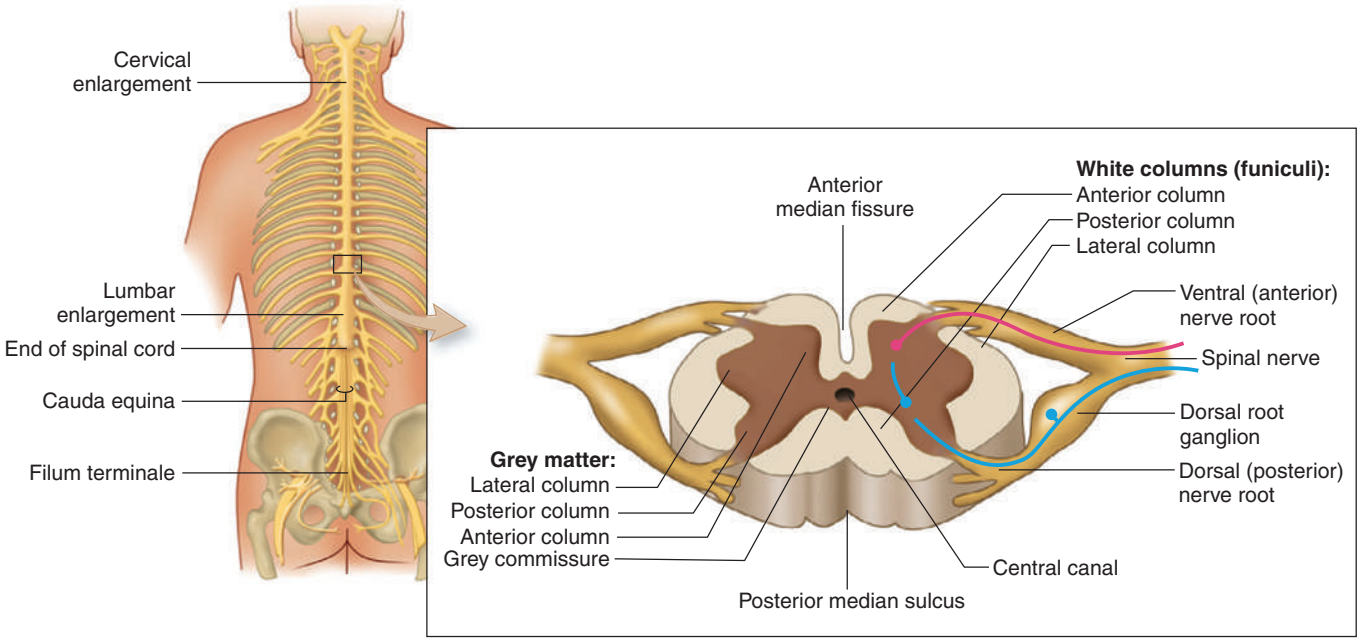


**Figure 35.5** Spinal cord
*(Patton et al 2012)*

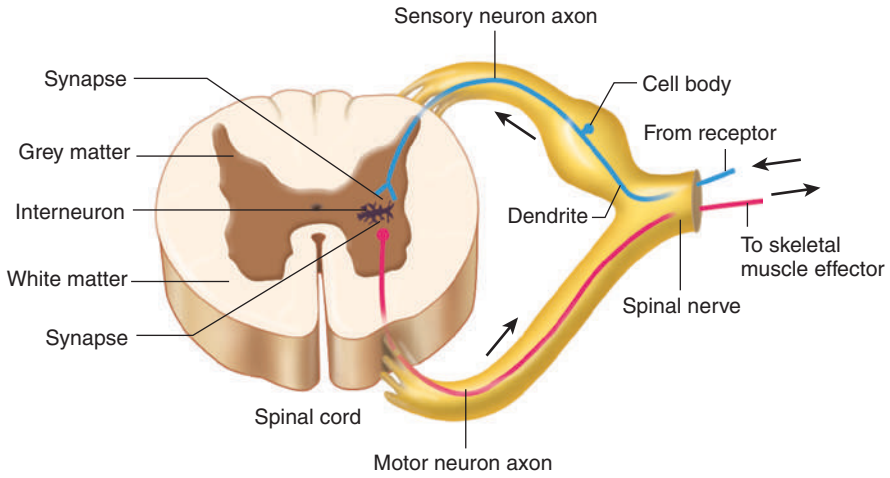


**Figure 35.6** A reflex arc
*(Patton et al 2012)*

VIII. Auditory nerve: sensory—the nerve of hearing and balance
IX. Glossopharyngeal nerve: mixed—sensory fibres convey taste sensations from the posterior part of the tongue; motor fibres supply the pharynx
X. Vagus nerve: mixed—controls secretion and movement of the internal organs (e.g. oesophagus, larynx, trachea, heart, stomach, intestines, pancreas, spleen, kidneys and blood vessels)
XI. Accessory nerve: motor—supplies the muscles of the neck, and also the pharynx and larynx
XII. Hypoglossal nerve: motor—supplies the tongue muscles (Marieb 2015; Patton et al 2012).

## The spinal nerves

The spinal nerves project out of the vertebral canal, one pair emerging below each vertebra, and one pair emerging between the cranium and the first cervical vertebra. The spinal nerves

are mixed nerves, containing both sensory and motor fibres. They allow for sensation and movement in peripheral parts of the body not supplied by the cranial nerves, such as skin, muscles, bones and joints of the trunk and limbs. The spinal nerves are arranged in groups according to their region of origin in the cord. There are:

- Eight pairs of cervical nerves (C1–C8)
- Twelve pairs of thoracic nerves (T1–T12)
- Five pairs of lumbar nerves (L1–L5)
- Five pairs of sacral nerves (S1–S5)
- One pair of coccygeal nerves.

In some regions the nerves divide immediately after leaving the cord. These then branch and unite with each other to form what is called a plexus (meaning braid). The major plexuses are:

- The cervical plexus, which supplies the muscles of the neck and shoulders, and also gives rise to the phrenic nerves that supply the diaphragm
- The brachial plexus, which gives rise to the radial, median and ulna nerves, which supply the arm
- The lumbar plexus, which gives rise to the femoral nerve, which supplies the thigh muscles
- The sacral plexus, from which the sciatic nerve arises.

The sciatic nerve is the largest nerve in the body, running over the hip posteriorly down the back of the thigh to the knee where it divides into the peroneal nerve and tibial nerve (Marieb 2015; Patton et al 2012).

## The autonomic nervous system

The autonomic nervous system is the division of the peripheral nervous system concerned with involuntary activity of the body. It supplies nerves to all the structures in the body that are not under conscious control. The autonomic nervous system consists of two divisions: the sympathetic and the parasympathetic nervous systems.

### The sympathetic nervous system

The sympathetic nervous system arises from grey matter in the spinal cord from T1 through to L2. Sympathetic nerves then synapse in a chain of ganglia that lies on either side of the vertebral column, before reaching organs or tissues. A ganglion (plural ganglia) is a knot-like mass of cell bodies. Plexuses are formed by fibres from these ganglia; for example, the solar plexus lying behind the stomach and supplying the abdominal organs, and the cardiac plexus supplying the heart and lungs (Marieb 2015).

### The parasympathetic nervous system

The parasympathetic nervous system consists of cranial nerves III, VII, IX and X and nerves that emerge from the sacral region of the spinal cord. The vagus nerve (cranial nerve X) is the largest autonomic nerve.

***Vasovagal syncope*** When the vagus nerve is overstimulated the body's blood vessels dilate causing the heart rate to slow and lowering the BP, which may cause sweating and a loss of consciousness. There are many causes for vasovagal syncope, including nausea, gastrointestinal cramping, straining during a bowel movement, the sight of blood, standing for too long or emotional or physical stressors that over-stimulate the vagus nerve (Mayo Clinic 2015).

### Functions of the autonomic nervous system

The functions of the autonomic nervous system are to control the movements of internal organs and the secretions of glands. The system provides dual control: the activity of an organ is stimulated by one set of nerves, and inhibited by the other set of nerves. This dual control achieves smooth rhythmic action of involuntary muscles and internal organs, maintaining a balance between activity and rest.

The sympathetic nerves are called adrenergic nerve fibres and release the neurotransmitter noradrenaline. These nerves can be affected by strong emotions such as anger, fear or excitement, and have a stimulating effect on most organs. The effect resembles that produced by adrenaline, a hormone secreted by the adrenal glands. This effect is called the 'fright, fight or flight' effect, in which the body responds to a fright either by preparing to fight or by running away. The response of the body includes:

- Dilation of the pupils of the eyes
- Increased force and rate of heartbeat, increasing circulation
- Increased blood pressure and constriction of arterioles in the skin and abdominal organs to divert blood to all skeletal muscles, heart, lungs and brain
- Dilation of the bronchi to allow more oxygen to enter
- Slowing of digestion so that the digestive organs can receive a reduced blood supply, enabling blood to be diverted to vital structures
- Increased production of sweat by sweat glands
- A rise in blood sugar level, as the liver is stimulated to release more glucose for increased energy needs.

The parasympathetic nerves are called cholinergic fibres and release the neurotransmitter acetylcholine. These nerves tend to slow down body processes, so that the end result of the antagonistic action of each division of the autonomic nervous system is a balance between acceleration and retardation. After the 'fright' or stressful situation is over, the parasympathetic nervous system returns things to normal. The digestive organs receive more blood, the glands increase their secretions, the heartbeat is decreased and the blood pressure falls. The effects of sympathetic and parasympathetic stimulation on various body organs are compared in Table 35.1 (Marieb 2015; LeMone et al 2014; Patton et al 2012).

# PATHOPHYSIOLOGICAL INFLUENCES AND EFFECTS OF DISORDERS OF THE NERVOUS SYSTEM

The pathophysiological changes that can disrupt normal function of part or all of the nervous system can be due to congenital or developmental disorders, infectious or inflammatory conditions, trauma, neoplasia, degenerative conditions and metabolic or endocrine disorders. Any pathophysiological

**TABLE 35.1 | Effects of sympathetic and parasympathetic stimulation**

| Organ | Sympathetic stimulation | Parasympathetic stimulation |
|---|---|---|
| Heart | Increases rate/strength of heartbeat<br>Dilates coronary arteries to increase blood supply to the heart muscle | Decreases rate/strength of heartbeat<br>Constricts coronary arteries to decrease supply of blood to the heart muscle |
| Bronchi | Dilates bronchi, allowing more air to enter the lungs | Constricts bronchi, limiting air intake |
| Digestive system | Decreases activity of the system and constricts digestive system sphincters<br>Inhibits production of saliva | Increases peristalsis and relaxes sphincters<br>Stimulates production of saliva |
| Urinary bladder | Relaxes bladder wall. Contracts internal sphincter muscle | Contracts bladder wall. Relaxes internal sphincter muscle |
| Eye | Dilates the pupil. Retracts the eyelids | Constricts the pupil. Closes the eyelids |
| Skin | Stimulates perspiration<br>Stimulates smooth muscles attached to hair follicles, producing 'goose bumps' | No effect on sweat glands<br>No effect on muscles/hair follicles |

*(Marieb 2015; Thibodeau & Patton 2012; Patton et al 2012)*

change is capable of causing various types and degrees of dysfunction.

## Aetiology of nervous system disorders

### Congenital disorders

The central nervous system of the developing fetus is very vulnerable to damage. Factors that may cause nervous system damage include the passage of microorganisms and drugs across the placental barrier into the fetal circulation. Other factors that may cause nervous system defects and result in physical and intellectual deterioration include chromosomal abnormalities, metabolic disorders, cranial malformations and structural abnormalities. The central nervous system may also be damaged during the birth process; for example, by cerebral anoxia or cerebral haemorrhage (National Institute of Neurological Disorders and Stroke ndb).

### Inflammatory and infectious conditions

Bacterial or viral infective processes affecting the central nervous system may result in the destruction of nervous tissue through the action of toxins released by the living microorganisms and from the material released from dead microorganisms, which stimulates the inflammatory process. Infection and inflammation of nervous tissue may result in altered behaviour, altered consciousness and sensory or motor deficits. Brain and spinal cord infections can cause dangerous inflammation with a wide range of symptoms, including raised temperature, headache, seizures, change in individual behaviour or confusion, brain damage, stroke or even death. Infection of the meninges is called meningitis and inflammation of the brain is called encephalitis. Myelitis refers to inflammation of the spinal cord. When both the brain and the spinal cord are involved, the condition is called encephalomyelitis (National Institute of Neurological Disorders and Stroke nde).

### Trauma

Trauma to the nervous system may result from elements within the system or from external forces. Trauma occurring from elements within the nervous system includes: bleeding from an **aneurysm** or ruptured intracranial vessel; transient interruption of the cerebral blood flow, causing ischaemia; and occlusion of a cerebral blood vessel by a thrombus or embolus. The most common causative factors in these conditions are hypertension and atherosclerosis.

Trauma from external forces may be caused by a direct or an indirect injury. A direct acceleration brain injury occurs when the head is struck by a moving object, and a direct deceleration injury occurs when the head in motion strikes a stationary object. In an indirect brain injury, the traumatic force is transmitted to the head through an impact to another part of the body, such as the neck or buttocks.

In open head trauma, a penetrating injury damages the integrity of the skull and/or meninges and brain. Infection may occur, as the injury allows the entry of microorganisms. A closed head injury is non-penetrating, with generally no disruption to the integrity of the cerebral meninges. Closed head injuries can result in jarring, bruising or tearing of brain tissue, which can cause haemorrhage, cranial nerve damage and cerebral oedema. An important event in closed head injury is known as coup and contrecoup. The coup injury is cerebral bruising resulting from impact to the skull, and contrecoup refers to the rebound effect of the injury, the movement of the brain opposite to the site of impact.

The nervous system response to trauma, which may cause more damage than the actual injury, results in oedema, bleeding and increased intracranial pressure. These factors destroy nervous tissue by compression or restriction of the circulation.

The spinal cord may be damaged as a result of a crushing or penetrating injury, dislocation of the spinal column, prolapsed intravertebral discs or neoplasia. In addition to tearing of, and pressure on, the spinal cord tissues, damage may be caused by haemorrhage, oedema or disruption of the blood supply to the spinal cord.

Damage to the peripheral nerves may result in loss of sensory and/or motor function (LeMone et al 2014).

### Neoplasia

Tumours of the nervous system, which may be either benign or malignant, cause symptoms related to pressure, destruction of nervous tissue, oedema and disruption of the blood supply. The neurological manifestations of a tumour affecting the nervous system depend on the location of the tumour and on its rate of growth. Examples of neoplasia include astrocytomas which arise from astrocytes and gliomas which arise from glial cells.

### Degenerative conditions

The causes of degenerative disorders of the nervous system are varied and involve atrophy of neurons and nerve fibres. The course of a degenerative disorder is generally gradual and progressive over many years. The effects of degenerative disorders include: progressive muscular atrophy; impaired speech, chewing, swallowing and breathing; deterioration of intellectual capacity; impaired motor function; and dementia. Examples of degenerative conditions include Parkinson's disease, motor neuron disease and Alzheimer's.

### Metabolic and endocrine disorders

Nervous system dysfunction may result from the effects of certain metabolic and endocrine disorders. Some nutritional deficiencies may affect nerve cells, resulting in their damage or death. For example, degeneration of the posterior and lateral columns of the spinal cord may occur from the vitamin B12 deficiency of pernicious anaemia. Disorders of cortical function, leading to confusion or coma, may result from a deficiency of thiamine (vitamin B1).

Specific endocrine disorders such as hypothyroidism result in decreased metabolic rate, and hypothermia can develop. If the body temperature falls below 30°C, unconsciousness will result. Myxoedema coma (hypothyroid state) is characterised by exaggeration of the signs and symptoms of hypothyroidism, with neurological impairment leading to loss of consciousness (LeMone et al 2014).

## Major manifestations of nervous system disorders

The manifestations of a nervous system disorder will vary depending on the type and severity of the disorder.

### Headaches (cephalalgia)

Headaches, or **cephalalgia**, are common in a variety of disorders and situations ranging from functional disturbances of blood vessels to tension and stress. In neurological disorders, headaches are one of the most common symptoms. Headaches can result from compression, traction, displacement or inflammation of the cranial periosteum, the dura mater, cerebral arteries or branches of the cranial nerves. Headaches may also occur as a result of tension within extracranial structures such as muscles, air sinuses and blood vessels. Headaches are commonly classified as vascular, tension or traction–inflammatory.

*Vascular headaches* include migraine, cluster headaches, hypertension headaches and headaches resulting from temporal arteritis. Although the mechanisms of migraine are not completely understood, migraine appears to result from an inherited predisposition and seems to be precipitated by trigger factors such as stress, abrupt falls in oestrogen levels, low blood glucose levels and dietary intake. One theory is that migraine results from spasm of intracranial blood vessels and dilation of extracranial blood vessels. The classic characteristics of migraine headache include throbbing and a tendency for the attacks to be unilateral. Some attacks are preceded by a variety of visual disturbances, such as loss of half of the visual field or flashing lights across the visual fields. Some individuals experience vertigo, nausea and vomiting.

Cluster headaches are a rapid succession of attacks over several days, followed by remission. Previously thought to be caused by histamine sensitisation, cluster headaches are now considered to have a vascular cause. Headaches associated with severe hypertension may be intense and similar to those caused by intracranial lesions. Temporal arteritis causes severe, throbbing headaches in the region of the temporal artery and is sometimes accompanied by visual loss.

*Tension headaches* are caused by prolonged contraction (tension) of the neck, head or facial muscles. Tension headaches are frequently associated with psychological factors such as anxiety or depression. The pain tends to be bilateral and, unlike vascular headaches, is not throbbing in character.

*Traction–inflammatory headaches*: headaches of this type are related to increased intracranial pressure, which causes irritation of, and traction on, blood vessels and the dura mater within the skull. Inflammation of the meninges (meningitis) can also result in severe headache. Headaches of intracranial origin related to increased intracranial pressure vary from mild to excruciating depending on the location and cause, such as a tumour, lesion or cerebral oedema (Brown et al 2015; National Institute of Neurological Disorders and Stroke ndd).

### Sensory changes

Sensory changes, which can result from disorders of the brain, spinal cord or peripheral nerves, include alterations in the sense of touch, pain, temperature sensitivity and the loss of a

sense of position. The loss of these sensations may be partial or complete. Common sensory disturbances include neuritis and neuralgia. **Neuritis**, characterised by pain and tenderness along the path of a nerve, can progress to complete loss of sensory and motor function. **Neuralgia** is characterised by severe stabbing pain, and can be caused by a variety of disorders affecting the nervous system. Other sensory changes that may accompany nervous system disorders include a loss of taste or smell, visual changes and hearing loss (LeMone et al 2014).

### Motor changes

Alterations in motor function include localised or generalised weakness, with difficulty in moving normally. Muscle tone may be abnormally increased or decreased. A pronounced increase in tone is referred to as rigidity. Spasticity of muscles is an increased resistance to passive stretch, with rapid flexion of a joint. Abnormal movements include:

- Twitching: localised spasmodic contraction of a single muscle group
- Tremor: rhythmic quivering movements resulting from involuntary alternating contraction and relaxation of opposing groups of muscles
- Myoclonus: spasm of a muscle or a group of muscles
- Dystonia: intense irregular muscle spasms
- Athetosis: slow, writhing involuntary movements of the extremities
- **Chorea**: involuntary, purposeless, rapid jerky movements
- Dyskinesia: involuntary twitching of the limbs or facial muscles.

Symptoms of **ataxia**, a condition characterised by impaired ability to coordinate movement, may be caused by a lesion in the spinal cord or cerebellum. Dizziness or vertigo, when the individual is unable to maintain normal balance in a standing or seated position, may also be related to a disorder of the nervous system. Unusual gait or stance may result from motor or sensory deficits caused by a disorder of the nervous system, such as Parkinson's disease. Paralysis, a symptom of motor disturbances, can occur in varying degrees with many nervous system disorders. Upper motor neuron lesions, in which the reflex area remains intact, generally cause spastic paralysis. Flaccid paralysis generally occurs in lower motor neuron lesions, which disrupt the reflex area (LeMone et al 2014).

### Reflex changes

Reflex changes can provide evidence of damage to the nervous system. The absences of normal reflexes, or the presence of abnormal reflexes, generally indicate nervous system dysfunction. Reflexes are classed as either superficial (cutaneous) or deep tendon (muscle stretch). Superficial reflexes are elicited when a stimulus is applied to the skin surface or to mucous membrane. Deep tendon reflexes are elicited when a stimulus is applied to a tendon, bone or joint (Patton et al 2012).

### Altered awareness, personality or level of consciousness

A neurological disorder that results in altered brain structure may cause impairment of a person's cognitive functions. They may experience difficulty in being able to think, remember, reason or understand. The person may also be confused in that orientation to time, place and person is impaired. Signs of reduced alertness or responsiveness may also be shown. Brain damage, for example as a result of a head injury, can cause a confused state characterised by fluctuating disorientation and incoherence.

Cerebral impairment may also cause mood changes and/or inappropriate emotional responses. Diffuse brain damage such as that caused by a large cerebral infarction may result in emotional instability or lability (a tendency to show alternating states of happiness and sadness that seem to be inappropriate). The person may also show signs of emotional flatness or apathy, demonstrated by a reactive absence of emotions. Alternatively, the individual may become euphoric.

Damage to the brain can also result in altered states of consciousness, ranging from drowsiness and difficulty in being aroused by normal stimuli, to coma. More information on assessment of level of consciousness is provided later in this chapter (Brown et al 2015).

### Seizures

Seizures, which are paroxysmal events associated with sudden abnormal discharges of electrical energy in the neurons of the brain, may be secondary to central nervous system disease. Seizure disorders are described later in this chapter.

## ASSESSING NEUROLOGICAL STATUS

Assessment is of prime importance in the care of an individual with a neurological disorder. The nurse must recognise changes that indicate a change in condition, as changes can occur rapidly and dramatically or develop over a period of days or weeks.

### Intracranial pressure

Intracranial pressure (ICP) is the pressure exerted by the CSF within the ventricles of the brain. However, it is more accurate to think in terms of intracranial 'pressures' rather than a single pressure, as the rigid skull is filled with brain tissue, intravascular blood and CSF. If any one of these three components increases in volume without a reciprocal change in volume of the other two, intracranial pressure will rise. Increased intracranial pressure affects the cerebral perfusion pressure, causing hypoxia, ischaemia, irreversible neurological damage and even death. Unless increased intracranial pressure is treated, the outcome will be herniation of a portion of the cerebrum through the tentorium, with pressure being exerted on the brainstem. The brainstem will then herniate through the foramen magnum, the only opening in the closed cranial vault.

Common causes of increased intracranial pressure include: space-occupying masses such as tumours, haematomas, abscesses or cerebral oedema; conditions that increase cerebral blood volume; and conditions that increase CSF. It is very important to identify early signs of increased intracranial pressure so that actions can be implemented to prevent or minimise irreversible brain damage. The manifestations of increased intracranial pressure include:

- Early signs and symptoms: deterioration in the level of consciousness (confusion, restlessness, lethargy), pupillary dysfunction, motor weakness such as **hemiparesis** and possible headaches
- Later signs and symptoms: continued deterioration in the level of consciousness (coma), possible vomiting, hemiplegia, decortication, decerebration, increasing systolic blood pressure, bradycardia and decreasing or irregular ventilations (Crisp et al 2013).

## Neurological assessment

Neurological assessment includes checking the level of consciousness, the pupils, motor function, sensory function and the vital signs. The frequency with which assessment is performed and documented depends on the individual's condition and on the healthcare institution's policy (see Clinical Skill 35.1).

### Level of consciousness

The level of consciousness is a most important factor in neurological assessment, providing valid information about changes in neurological status. Change can occur slowly over the course of many days, or it can occur rapidly in a few minutes or hours. The rapidity of change is an indicator of the severity of the neurological problem. The individual's level of consciousness is evaluated by providing stimuli and observing the response. Sound and pain are the major stimuli used. Speaking to the individual is the most common method of applying an auditory stimulus, while painful stimuli are reserved for the individual with obviously decreased levels of consciousness. When spoken to, a fully conscious individual should reply with an appropriate verbal response. A person with a decreased level of consciousness may respond in a puzzled way or may not respond at all, showing no response even when someone speaks directly into their ear (Crisp et al 2013; Agency for Clinical Innovation 2013; Rebeiro et al 2013).

### Painful tactile stimuli

Painful tactile stimuli may be necessary to arouse the semicomatose individual. Painful stimuli can be provided by exerting firm digital pressure on the nail beds, the Achilles tendon or the gastrocnemius muscle. Response to painful stimuli can be classified into:

- Purposeful, when the individual winces, pushes the assessor away or withdraws the affected body part
- Non-purposeful, when the individual moves the stimulated body part only slightly, or when the application of painful stimuli causes an extensor response (a contraction of muscles) only
- Unresponsive: when the individual shows no sign of reacting to painful stimuli.

The Glasgow Coma Scale (GCS) (Table 35.2) was originally designed to assess the level of consciousness in people with head injuries but is now used in a variety of settings. It has gained increasing acceptance as an accurate and effective means of evaluating levels of consciousness. Using the GCS, a score of 15 reflects a fully alert, well-oriented person, while a score of 8 or less is considered to indicate coma. The lowest possible score of 3 is indicative of brain death. The GCS is standardised worldwide (Agency for Clinical Innovation 2013; Rebeiro et al 2013).

### Evaluation of the pupils

Evaluating the pupils provides vital information about the brain and raised intracranial pressure. The findings in one pupil are compared with the findings in the other, and the differences between the two pupils are documented. The pupils are assessed for size, shape and reaction to light. Normally the pupils are equal in size (average diameter of 3.5 mm), round and they constrict briskly when light is shone into the eye. A pupil gauge may be used to estimate the size of each pupil. Abnormal responses of a pupil to light may be described as sluggish, non-reactive or fixed. Generally, any change in a pupil's size, shape or reaction is indicative of an intracranial change.

### Assessment of motor function

Assessment of motor function usually focuses on the arms and legs, and the identification of significant changes is important for denoting improvement, stabilisation or deterioration in the individual's condition. The techniques used to evaluate motor function depend on the individual's level of consciousness. In the conscious individual, the assessment can be made by observing motor responses to directions; for example, by asking the individual to squeeze the assessor's hands. If the individual is unconscious or is unable to provide accurate responses, the assessor must rely on observational skills to evaluate motor function.

### Assessment of sensory function

Assessment of sensory function is described earlier in this chapter.

### Assessment of the vital signs

Assessing the vital signs (see also Chapter 20) provides data concerning vital functions of the body. The individual's temperature, pulse, ventilations and blood pressure are monitored and documented at a frequency that depends on their condition. Data from neurological assessments are documented according to the healthcare institution's policy. Many institutions use a special neurological assessment chart. If clinical deterioration is recognised the response to be implemented is in accordance with the health service organisation

*Text continued on page 1011*

## CLINICAL SKILL 35.1 Performing a neurological assessment

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sphygmomanometer, BP cuff, stethoscope<br>Thermometer<br>Watch with a second hand<br>Penlight and pupil gauge<br>Neurological observations sheet (must include Glasgow Coma Scale (GCS)) |
| **Skill activity** | **Rationale** |
| Determine the need for neurological assessment and validate the medical orders in the individual's record | Ensures correct procedure is about to take place<br>Physical signs and symptoms such as confusion, drowsiness and limb weakness may indicate alterations in neurological function |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Critically think through the assessment data and problem solving—provide privacy, comfort measures, pain relief, neurological history (e.g. stroke, seizure, paralysis, confusion) | Evaluate each aspect and its relationship to other data to help identify specific problems and modifications of the procedure that may be needed for the individual |
| Place the equipment in a convenient location near the bedside<br>Raise the bed to the appropriate working position based on your height<br>Position the individual | Ensures all equipment is at individual's bedside to maximise efficiency<br>Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |
| Perform hand hygiene<br>Don appropriate PPE as per infection control protocols | Prevents cross-infection and contamination |
| **Eyes opening (E)**<br>Assess arousal or wakefulness:<br>• Assess for eye opening by observing the individual as you approach him/her—if he/she opens eyes spontaneously (spontaneous, score 4)<br>• If the individual's eyes remain closed speak in a clear strong voice by calling the individual by name to elicit a response. If eyes open (to speech, score 3)<br>• If there is no response to speech exert a painful stimulus (e.g. trapezium squeeze/supra-orbital pressure or sternal rub—used as a last measure)<br>• If eyes open (to pain, score 2)<br>• If there is no eye opening following the application of painful stimulus (none, score 1)<br>• Record (C) if the eye is closed due to trauma or swelling<br>Note: Record the best response only in this chart section | Altered level of consciousness is a key indicator to brain function<br>The GCS assesses the individual's level of consciousness<br>A fully conscious individual responds to questions spontaneously<br>As level of consciousness decreases individual may show irritability, a shortened attention span or an unwillingness to cooperate<br>Watch the individual for any response<br>If no response is gained the individual is spoken to at first quietly then more loudly<br>Response is opening the eyes<br>If there is no auditory response gentle touch is used then use a central painful stimulus<br>If the individual has periorbital oedema due to trauma or surgery a 'c' for closed can be documented next to 'None' (1) column |

## CLINICAL SKILL 35.1 Performing a neurological assessment—cont'd

| | |
|---|---|
| **Assess verbal response (V)**<br>Examine appropriateness of speech and awareness:<br>• Obtain the individual's attention and allow time for the individual to respond<br>• Ask questions to assess orientation to person, place and time (e.g. ask the individual to tell you their full name, what the month or year is, and where they are). If correct answers are elicited to all 3 questions (orientated, score 5)<br>• If the individual talks but is confused to either of the above three questions (confused, score 4)<br>• Record as 'X' if culturally and linguistically diverse<br>• If the individual uses words or phrases that make little or no sense (inappropriate words, score 3)<br>• If the individual makes unintelligible sounds, moaning or groaning (incomprehensible sounds, score 2)<br>• If the individual makes no attempt to speak and no sounds are made, in response to the painful stimulus (none, score 1)<br>• Record as 'T' if unable to speak due to tracheostomy or ETT<br>Note: Record the best response only in this chart section | When spoken to, a fully conscious individual should reply with an appropriate verbal response. A person with a decreased level of consciousness may respond in a puzzled way or may not respond at all, showing no response even when someone speaks directly into their ear<br>The individual who is able to respond is asked a series of simple questions (e.g. identify themself, what month, season or year it is)<br>Impaired hearing may affect response<br>If the individual is not orientated to person, place or time, ascertain their best verbal response<br>Scores on the GCS are confused, inappropriate words, incomprehensible sounds and no response |
| **Assess best motor response (M)**<br>Assess overall awareness and ability to respond to external stimuli by recording best arm response:<br>• Ask the individual to perform a simple motor task (e.g. 'raise your arm' or 'squeeze and let go of my hands'). If the individual follows the command even weakly (obeys commands score 6)<br>• If the individual does not respond to verbal commands apply a central painful stimulus (e.g. trapezium squeeze/ supra-orbital pressure or sternal rub—used as a last measure) to determine the best arm response<br>• If the individual demonstrates purposeful movement to locate and remove the source of painful stimulus by bringing the hand up to at least nipple line it is recorded as localising (localise to pain, score 5)<br>• If the individual's hand or body moves away from the source of pain it is recorded as withdraws (withdraws, score 4)<br>• The individual may respond by flexing an arm demonstrating abnormal posturing (decorticate) (flexion to pain, score 3)<br>• The individual may respond by extending an elbow and internally rotating wrist (decerebrate posturing). This response is recorded as abnormal extension (extension to pain, score 2)<br>• If there is no response to the painful stimulus (none, score 1)<br>Note: Record the best response only in this chart section | Assessment of motor function usually focuses on the arms and legs, and the identification of significant changes is important for denoting improvement, stabilisation or deterioration in the individual's condition. As neurological function deteriorates motor responses are reduced<br>If eyes are closed due to trauma and the individual is aphasic, motor response indicates the level of consciousness<br>If nil response to verbal command, progress to use painful stimulus<br>Record the best movement response<br>Be careful not to misinterpret a grasp reflex. If you ask the individual to squeeze your hands, also ask them to release your hands as stimulation of pain can stimulate a grasp reflex in the severely head injured person<br>An individual with serious neurological impairment exhibits abnormal posturing in response to pain<br>Compare the right and left sides and upper and lower extremities |
| GCS is out of 15 and recorded on neurological observation chart<br>Overall score or change in score determines need to report to Registered Nurse and medical officer. Refer to facility/organisation policy regarding clinical review/ rapid response criteria | The GCS allows the evaluation of an individual's neurological status<br>The higher the score the more normal the level of neurological functioning |

*Continued*

## CLINICAL SKILL 35.1 Performing a neurological assessment—cont'd

| | |
|---|---|
| **Assess pupillary activity**<br>• Note the size (mm), shape and equality of both the pupils in normal lighting<br>• Shine a pen torch light, moving from the outer aspect of the eye to the pupil. Observe the reaction of the pupil<br>• Test each eye separately and record reaction:<br>Yes '+'<br>No '–'<br>Closed 'C'<br>Sluggish 'SL'<br>Pupillary response should be brisk constriction to light<br>Pupils are assessed for equality (are both pupils the same size?)<br>Report to Registered Nurse and medical officer if pupils become unequal or if one becomes more sluggish than the other | Evaluating the pupils provides vital information about the brain and raised intracranial pressure<br>Pupil size (1–8 mm) is determined using the pupil gauge before the light reflex is used<br>Pupil shape is determined as round, oval or drawn to indicate abnormality<br>Pupil reactivity to light is assessed by bringing the penlight from the lateral side of the individual's head towards the nose. Observe for pupil constriction (direct response) and repeat with the other eye<br>Document a lack of consensual reaction (opposite pupil fails to constrict when light is shone in eye) in healthcare record<br>Do not confuse a prosthetic eye with a fixed pupil. There will be no response from a blind eye.<br>If pupils are not the same size 'unequal' differences are noted between the right and left sections of the chart |
| **Assess limb strength**<br>Testing limb strength gives an indication of the part of the brain that is affected as opposed to testing LOC<br>Bilateral upper limb muscle strength:<br>• Instruct individual to move arms, lift limb against gravity, move limb against your resistance<br>• Ask the individual to squeeze both the assessor's hands followed by asking the individual to:<br>> pull your hands towards them against resistance<br>> ask the individual to push your hands away against resistance (normal power)<br>• Active movement of body part against gravity with some resistance (mild weakness)<br>• Active movement of body part against gravity (severe weakness)<br>• Active movement of body part when effect of gravity is removed (spastic flexion)<br>• Only a trace or flicker of movement is seen or felt in the muscle (extension)<br>• No detectable muscle contraction (no response)<br>Bilateral lower limb muscle strength<br>• Instruct individual to move legs laterally on bed; lift limb against gravity; move limb against your resistance<br>Note: Record the response for each limb separately in this section of the chart as per upper limb muscle assessment:<br>• (normal power)<br>• (mild weakness)<br>• (severe weakness)<br>• (extension)<br>• (no response) | Assessment of limb strength usually focuses on the arms and legs, and the identification of significant changes is important for denoting improvement, stabilisation or deterioration in the individual's condition. The techniques used to evaluate limb strength depend on the individual's level of consciousness<br>Each extremity is assessed unless contraindicated<br>The individual is given clear commands such as 'squeeze my hands' 'push against my hands'. Compare both sides. Record right (R) and left (L) separately if there is a difference between the two sides<br>Response is recorded as normal, mild weakness, severe weakness, flexion, extension or no response |

| CLINICAL SKILL 35.1 Performing a neurological assessment—cont'd | |
|---|---|
| **Assess vital signs**<br>Initially vital signs are monitored every 15 minutes until stable then hourly or as per organisational/facility guidelines | Vital sign changes are late changes in brain deterioration<br>A drop in level of consciousness is the earliest sign of neurological deterioration<br>Change in vital signs can indicate a worsening neurological condition, and therefore vital signs are always recorded at the same time as other neurological observations<br>Change in vital signs may also provide clues as to other medical problems in an unconscious individual who cannot tell staff what symptoms they are experiencing<br>Vital sign changes associated with raised intracranial pressure:<br>• Bradycardia<br>• Tachycardia (very late sign)<br>• Hypertension (typically, an elevated systolic blood pressure combined with a widening pulse pressure)<br>• Irregular respirations |
| Clean and dispose of waste equipment appropriately<br>Remove gloves. Perform hand hygiene | Prevents cross-infection |
| Lower the bed and assist the individual to reassume a comfortable position<br>Ask the individual to report any complications during and post procedure if able | Promotes rest and relaxation, monitors for adverse effects |
| Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer<br>Report to medical officer immediately or initiate a clinical review/rapid response (depending on facility policy) if the GCS drops by 1–2 points (depending on facility/organisation policy) | Provides relevant information to other members of the healthcare team<br>Allows for the planning and implementation of care<br>The information gathered is documented on the GCS or neurological observation chart depending on which is used within the facility/organisation, where there are designated places for each of the observations<br>Any change in the individual's level of consciousness should be recorded in the individual's healthcare record<br>Documentation increases the communication between healthcare professionals and complies with legal requirements for reporting change |
| *(Agency for Clinical Innovation 2013; ACSQHC 2012; 2015; Berman et al 2015; Crisp & Taylor 2013; Dempsey et al 2014; LeMone et al 2014; NSW Health 2013; Rebeiro et al 2013)* | |

policy and procedures (Australian Commission on Safety and Quality in Health Care (ACSQHC) 2012).

## DIAGNOSTIC TESTS

Specific tests may be performed for diagnostic purposes or to aid in evaluation of an individual's condition.

### The neurological examination

The purpose of the neurological examination is to determine the presence or absence of disease in the nervous system by assessing cerebral, cranial nerve, motor, sensory and reflex function. Evaluation of cerebral function is performed by assessing the individual's general behaviour and cognitive functions, such as orientation to time and place, concentration, memory, vocabulary and abstract reasoning. Evaluation of the cranial nerves involves assessing:

- The olfactory nerve: the sense of smell is tested by obstructing one nostril while testing the other. A variety of substances is placed near the unobstructed nostril and the individual is asked to identify the odour of each
- The optic nerve: each eye is tested to assess visual acuity and visual fields. The fundus of each eye is assessed by ophthalmoscopic examination
- The oculomotor, trochlear and abducens nerves: these three nerves are generally tested together, as they supply the various muscles that rotate the eyeball. The ophthalmoscope is used during the assessment; the pupils are observed for size, shape and equality, and

**TABLE 35.2 | Levels of Consciousness: Glasgow Coma Scale**

| Faculty measured | Response | Score |
|---|---|---|
| Eye opening | Spontaneous | 4 |
| | To verbal command | 3 |
| | To pain | 2 |
| | No response | 1 |
| Motor response | To verbal command | 6 |
| | To localised pain | 5 |
| | Flexes and withdraws | 4 |
| | Flexes abnormally | 3 |
| | Extends abnormally | 2 |
| | No response | 1 |
| Verbal response | Oriented, converses | 5 |
| | Disoriented, converses | 4 |
| | Uses inappropriate words | 3 |
| | Makes incomprehensible sounds | 2 |
| | No response | 1 |

*(Berman et al 2015)*

movement of the eyes is evaluated by requesting the individual to follow a finger through the six cardinal areas of vision

- The trigeminal nerve: the sensory component of this nerve is tested with the individual's eyes closed. Test tubes of warm and cold water are brought into contact with the skin of the face to check temperature perception. Touching the face with a wisp of cotton checks perception of light touch. Pain perception is evaluated either by applying pressure or by touching areas of the face with the point of a pin. The motor component of the trigeminal nerve is evaluated by asking the individual to clench and unclench the teeth, and by observing their ability to open the mouth against resistance. The corneal reflex is assessed by lightly stroking the cornea with a wisp of cotton. If the corneal reflex is intact, the individual will automatically blink
- The facial nerve: the sensory component of this nerve is assessed by placing sweet, salty, sour and bitter substances on various areas of the tongue, and asking the individual to identify each taste. The motor component of the facial nerve is assessed by requesting the individual to perform specific facial movements such as smiling, closing the eyes, pursing the lips and wrinkling the forehead
- The acoustic nerve: generally, unless the individual has a history of vertigo, only the hearing branch of this nerve is assessed. A series of hearing tests is performed, and hearing in both ears is compared. For a more precise assessment of hearing acuity, a tuning fork is used
- The glossopharyngeal and vagus nerves: these nerves are usually tested together, as they are closely related both anatomically and functionally. A series of tests is performed to assess the gag and swallowing reflexes
- The spinal accessory nerve: this nerve is tested by evaluating the strength of the trapezius and sternocleidomastoid muscles; for example, by requesting the individual to shrug the shoulders against resistance and by asking them to turn their head to one side and push their chin against the assessor's hand
- The hypoglossal nerve: the strength and movement of the tongue muscles are evaluated by testing the individual's ability to protrude the tongue, and also by requesting them to push their tongue against a tongue depressor (Thibodeau & Patton 2012; Brown et al 2015).

**PROGRESS NOTE EXAMPLE 35.1**

| | |
|---|---|
| 23/03/2015 1500 hrs | Nursing: L3–4, L4–5 posterior lumbar interbody fusion on 21 March. Neuro: Mr Brown alert and orientated ×3, full power in left limbs, full power in right arm, mild weakness in right leg (pre-existing), cranial nerves II–XII intact, proprioception intact, normal sensation. Vitals: afebrile, Temp, pulse, resp rate, saturations and BP within SAGO chart limits. Pain score 6/10 this morning—given 5 mg Endone at 0830 with good effect. Pain score at 1000 was 3/10 on movement. Intake: Tolerating full ward diet and some free fluids. IV fluids discontinued this morning when IV antibiotics ceased. Output: IDC removed at 1000. For trial of void. Has not passed urine yet but no palpable bladder. Needs bladder scan at 1800. Bowels not opened yesterday or today. Will offer aperients this evening. Minimal drainage in Varivac drain—can be removed today. General: Needs assistance of one to get out of bed. Walked to shower with standby supervision. Showered self with minimal assistance to dry back and legs. Cleaned teeth. Pressure points intact. Wound dressing removed. Wound is clean and dry, no redness. Wound has been glued with Dermabond. Mr Brown taken for a walk by physio. TEDs in situ with non-slip socks. Family in attendance at time and shown how to help Mr Brown roll on to side to get out of bed. In better spirits today now he has visitors, and also having had a walk and a shower. To mobilise with supervision today. Mr Brown will be discharged in 3 days if bowels opened and mobilising safely.<br>***B. Hughes* (Hughes) EN** |

### Evaluation of motor function

Evaluating motor function involves assessing the individual's gait, posture, muscle strength and tone, balance and coordination. The assessor observes for abnormalities and compares the findings on both sides of the body for asymmetry.

### Evaluation of sensory function

Evaluating sensory function involves assessing the individual's ability to perceive various sensations with their eyes closed. Assessment includes testing of sensitivity to touch, pain, temperature, testing of joint motion and position and assessment of discriminative function and vibratory sensation.

### Evaluation of reflexes

Evaluation of reflexes involves testing the two types of reflex to assess the integrity of the motor and sensory systems.

***The superficial reflexes*** These include the upper abdominal, lower abdominal, gluteal and plantar reflexes. The abdominal and gluteal reflexes are evaluated by applying a stimulus to the skin surface; for example, stroking with a finger or pointed object and observing for muscle contraction. The plantar reflex is evaluated by stroking the sole of the foot, with one continuous movement from the heel to the toes. Normally, the big toe curls downwards in response to this stimulus. An abnormal response, Babinski's sign, when there is dorsiflexion of the big toe and fanning of the other toes, indicates upper motor neuron disease.

***The deep tendon reflexes*** These include the biceps, triceps, quadriceps and Achilles tendons. Deep tendon reflexes are elicited by using a percussion hammer and observing the response, as follows:

- The biceps reflex is tested with the arm partially flexed at the elbow and the palm down. When the hammer is applied to the biceps tendon, the elbow should flex
- The triceps reflex is tested with the arm partially flexed at the elbow and the palm directed towards the body. When the hammer is applied to the triceps tendon, the elbow should extend
- The quadriceps reflex is tested with the knee flexed. When the patellar tendon is struck with the hammer, the knee should extend
- The Achilles reflex is tested with the knee flexed. When the Achilles tendon is struck with the hammer, the foot should plantar flex (Brown et al 2015).

### Neurovascular assessment

Neurovascular assessment includes skin assessment (colour, temperature, oedema), palpation and assessment of pulses, sensation, motor function and pain.

Extremities should be palpated for swelling and assessed for pain, an appropriate colour, warmth, symmetry in shape and size, and capillary refill should be less than 2 seconds (immediate). Pulses should be strong and equal. For lower limbs, popliteal, posterior tibial and dorsalis pedis pulses should all be present and assessed for strength and equal amplitude. Assessment findings are used to support a diagnosis and determine or modify nursing care interventions (Berman et al 2015; Crisp et al 2013; LeMone et al 2014; The Royal Children's Hospital Melbourne 2015; The Sydney Children's Hospitals Network 2014).

See Clinical Skill 35.2.

## Radiographic examination

### X-ray

Plain x-ray films of the skull may be performed to detect fractures, to aid in the diagnosis of pituitary tumours or to detect congenital abnormalities. X-ray films of the spine may be performed to detect trauma to the vertebral column or to aid in the diagnosis of conditions that cause motor or sensory impairment.

### Computerised tomography scan

Computerised tomography (CT) is commonly used to diagnose intracranial and spinal cord lesions. It is usually non-invasive but a contrast dye is sometimes administered to visualise blood vessels or to define lesions. The individual lies on an x-ray table, with the head immobilised and face uncovered. The head is moved into the scanner, and a moveable frame revolves around it while x-ray films are taken. If a contrast agent is used the individual may feel warm and experience a transient headache, a salty taste and nausea.

### Myelogram

A myelogram involves fluoroscopy and radiography to evaluate the spinal cord and vertebral column after injection of a contrast medium via lumbar puncture into the subarachnoid space. The individual is positioned to allow the medium to flow through the subarachnoid space. A series of x-ray films are taken, after which the contrast medium may be either withdrawn or allowed to remain in the CSF. Water-soluble agents are allowed to remain, as they will eventually be excreted by the kidneys.

### Angiography

Cerebral angiography involves injecting a radio-opaque contrast medium into an artery for radiological visualisation of the intracranial and extracranial blood vessels. Common injection sites are the carotid or femoral arteries, with x-ray films taken at various intervals after injection of the medium. Cerebral angiography may be performed using either local or general anaesthetic. Digital subtraction angiography is a computer-assisted radiographic procedure for visualising extracranial and intracranial vessels and involves injection of a contrast medium through a catheter into the superior vena cava. Cerebral vessels are visualised on a screen, and pictures taken. Cerebral angiogram is used to diagnose aneurysms, arteriovenous malformations, thrombosis, vasospasm, tumours and haematomas.

### Magnetic resonance imaging (MRI)

An MRI is a non-invasive procedure in which the individual is placed in a strong magnetic field and is subjected to precise

computer-programmed bursts of radio pulse waves. The sharpness and detail of the images produced assist diagnosis by providing identification of abnormalities and can detect neurological disorders with structural changes; for example, stroke, tumour, infection and seizures. MRI is contraindicated in individuals with pacemakers, metallic aneurysm clips and some metallic prostheses.

### Magnetic resonance angiography (MRA)

MRA is used to detect vascular lesions by reconstructing vessels with blood flow. Contrast may be used.

### Positron emission tomography (PET) scanning

PET scanning is a non-invasive nuclear imaging technique used to detect biochemical and physiological abnormalities. The individual is injected with a nuclide that reacts with electrons and produces gamma-ray photons. A scanner detects the gamma rays and codes this data into a computer. Radioisotopes evaluate cellular metabolism, and may show a typical pattern for Alzheimer's disease, and can be used to differentiate tumour reoccurrence from radiation necrosis. The computer then reconstructs cross-sectional images of the tissues being examined.

### Single-photon emission computed tomography (SPECT)

A SPECT scan is similar to a PET scan and can be used to diagnose strokes, brain tumours and seizure disorders.

### Carotid duplex study

Identifies carotid artery disease by using sound waves produced by blood flow to produce an image.

## Electroencephalography (EEG)

An electroencephalogram (EEG) is a recording of the electrical activity of the brain (brainwaves). Surface electrodes are attached to the scalp with a paste and transmit the brain's electrical impulses to a machine that records them as brainwaves on strips of paper. Brainwaves are recorded while the individual is at rest, after hyperventilation, with photic stimulation, after a sensory stimulus and during sleep (see Clinical Interest Box 35.1) (Patton et al 2012).

## Evoked potentials

Evoked potentials are used to measure nerve conduction and diagnose and evaluate neuromuscular disease and nerve damage.

## CLINICAL SKILL 35.2 Neurovascular assessment

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Neurovascular assessment chart |
| **Skill activity** | **Rationale** |
| Validate the medical order in the individual's record | Ensures correct procedure is about to take place |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Critically think through the assessment data and problem solving (e.g. provide privacy, comfort measures, pain relief) | Evaluate each aspect and its relationship to other data to help identify specific problems and modifications of the procedure that may be needed for the individual |
| Place the equipment in a convenient location near the bedside<br>Raise the bed to the appropriate working position based on your height<br>Position the individual | Ensures all equipment is at individual's bedside to maximise efficiency<br>Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |

## CLINICAL SKILL 35.2 Neurovascular assessment—cont'd

| | |
|---|---|
| Perform hand hygiene<br>Don appropriate PPE as per infection control protocols | Prevents cross-infection and contamination |
| **Assess the limb distal to the surgery/injury**<br>Compare affected limb with unaffected limb assessing both limbs for (document affected limb only):<br>• Colour<br>> Visually check colour, document as pink, pale/white or cyanotic, dusky, cyanotic, mottle or purple/black<br>• Temperature<br>> Check temperature with superficial touch, document as warm, cool or hot<br>• Pulses<br>> Palpate for presence of peripheral pulses distal to injury<br>> Document pulses as strong, weak, absent<br>• Sensation<br>> Touch and assess visual limb surfaces for presence and type of sensation. Document as normal, decreased sensation, loss of sensation, numbness, tingling or pins and needles<br>• Motor function<br>> Active movement or passive movement<br>• Pain<br>> Assess pain on movement of limb (document pain score 0 (no pain), 10 (worst pain))<br>• Swelling and ooze<br>> Visually check for swelling and ooze<br>> Document swelling as nil, small, moderate | Obtains a baseline prior to surgery<br>Assesses the vasculature and nerve supply to a traumatised limb<br>Monitors limb status so that permanent damage or complications are avoided by identifying indicators of problems early and intervening<br>Limb assessed as normal if limb pink in colour, warm to touch, capillary refill of 1–2 seconds, swelling full, strong pulse, normal sensation<br>Limb assessed as inadequate arterial supply if pale/white or cyanotic in colour, cool to touch, capillary refill >2 seconds, swelling hollow or prune like<br>Limb assessed as inadequate venous return if limb dusky, cyanotic, mottled or purple/black in colour, hot to touch, immediate capillary refill, swelling distended or tense, tissues feel hard<br>Capillary refill assessment is evaluated by pressing firmly down on the nail bed of fingers or toes for 5 seconds. The nail bed will blanch and the colour should return within 2 seconds once pressure is released<br>If pulses are not palpable due to plaster casts, assess closely above parameters<br>Individuals may report changes in sensation if neurovascular compromise is present or may be a result of a nerve block or epidural (this should be documented on the neurovascular chart)<br>Individual assessed as having active movement if able to voluntarily extend and flex an extremity or digit<br>Individual assessed as having passive movement if assessor is able to extend and flex an extremity or digit<br>If pulse is not present, document and notify medical officer, observe colour, capillary refill and temperature.<br>Immediately report to medical team if there is any deterioration in neurovascular assessment |
| Clean and dispose waste/equipment appropriately<br>Remove gloves. Perform hand hygiene | Prevents cross-infection |
| Lower the bed and assist the individual to reassume a comfortable position.<br>Ask the individual to report any complications during and post procedure if able | Promotes rest and relaxation, monitors for adverse effects |
| Report and document all relevant information correctly in the healthcare record<br>Communicate abnormal findings to the Registered Nurse/medical officer | Provides relevant information to other members of the healthcare team<br>Allows for the planning and implementation of care<br>Information gathered is documented on the neurovascular assessment chart at a frequency as determined by medical officer and facility/organisation policy<br>Any change in the individual's neurovascular assessment should be recorded in the individual's progress notes and medical staff must be informed<br>Documentation increases the communication between healthcare professionals and complies with legal requirements for reporting change |

*(Berman et al 2015; Crisp & Taylor 2013; Dempsey et al 2014; LeMone et al 2014)*

## CLINICAL INTEREST BOX 35.1 Care of the individual undergoing an EEG

### Individual preparation

Explain the procedure to the individual, emphasising the importance of cooperation

Withhold fluids, foods and medications (as prescribed) that may stimulate or depress brainwaves. These include anticonvulsants, tranquillisers, depressants and caffeine-containing foods (e.g. coffee, tea, colas and chocolate). Medications are usually withheld for 24–48 hours before the test

Help the individual to wash their hair before the test

### Individual and family teaching

The test takes about an hour

The test is painless and will be performed while the individual sits in a comfortable chair or lies on a stretcher

The electrodes are applied to the scalp with a thick paste

During the test the individual will first be asked to breathe in and out deeply for a few minutes, then to close their eyes while a light is flashed on them and, finally, to lie quietly with eyes closed

After the test, the nurse will help the individual wash the paste out of their hair

*(LeMone et al 2014)*

## Electromyogram (EMG)

EMG is used to diagnose neuromuscular diseases by inserting needle electrodes into the muscle to be examined. Recordings measure the electrical activity of skeletal muscles at rest and during contraction.

## Lumbar puncture (LP)

A lumbar puncture may be performed to obtain a sample of CSF for either diagnostic or therapeutic purposes. The diagnostic indications include:

- Measurement of CSF pressure
- Examination of CSF for the presence of blood or microorganisms
- Injection of air, oxygen or radio-opaque material to visualise parts of the central nervous system radiologically
- Evaluation for signs of blockage of CSF flow.

Therapeutic indications include introduction of spinal anaesthesia for surgery, and intrathecal injection of medications.

For the procedure the individual assumes a lateral position, with their back curled and their knees flexed as close to their chest as possible. The head should be bent forwards so that the chin touches their chest (Figure 35.7). After preparation of the site, the medical officer inserts a spinal needle with a stylus (a fine probe) between L3 and L4 or L4 and L5 into the subarachnoid space and fluid is aspirated. If the lumbar puncture is being performed for diagnostic purposes, a manometer may be attached to the needle to measure CSF pressure. Samples of CSF are then collected for visual and laboratory examination. When the procedure is completed, the needle is withdrawn and an adhesive dressing applied over the puncture site (Thibodeau & Patton 2012).

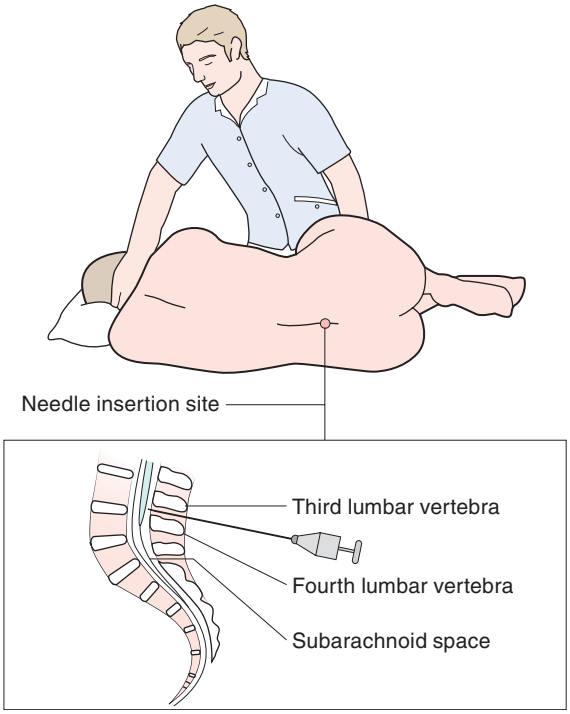


**Figure 35.7** Lumbar puncture, showing the position of the individual and the insertion site

## Further investigations

### Nerve conduction studies

These studies involve application of an electrical stimulus to peripheral nerves and measurement of their response by means of an oscilloscope (Brown et al 2015; Marieb 2015; Berman et al 2015).

# SPECIFIC DISORDERS OF THE NERVOUS SYSTEM

Disorders of the nervous system may be congenital or genetic, due to multiple causes, degenerative, infectious or inflammatory, immunological, neoplastic, obstructive or traumatic.

## Congenital disorders

Structural congenital abnormalities include anencephaly, spinal cord defects and hydrocephalus.

### Anencephaly

Anencephaly is the failure of normal development of the brain (cerebral hemispheres and cerebellum) and scalp. The

precise cause is unknown, and babies with the disorder do not live.

### Spinal cord defects

These include spina bifida, meningocele and myelomeningocele. These conditions are the result of incomplete closure of the neural tube during the first 3 months of embryonic development. Causes are thought to include maternal exposure to viruses, radiation and other environmental factors.

In severe forms, **spina bifida** involves incomplete closure of one or more of the vertebrae, causing protrusion of the spinal contents in an external sac. In spina bifida with meningocele, the sac contains meninges and CSF. In spina bifida with myelomeningocele the sac contains meninges, CSF and a portion of the spinal cord or nerve roots. Manifestations of congenital spinal cord defects vary and include a depression, dimple or tuft of hair on the skin over the spinal defect. The more severe defects cause neurological dysfunction such as paralysis of the legs, bowel and bladder incontinence and hydrocephalus (Better Health Channel 2015).

### Hydrocephalus

**Hydrocephalus** is an excessive accumulation of CSF within the ventricles of the brain. It may result from an obstruction in CSF flow or from faulty absorption of CSF. The condition can also occur as a result of cerebral injury or disease. In infants, the obvious manifestation of hydrocephalus is abnormal enlargement of the head. Other characteristics include distended scalp veins, thin and fragile scalp skin, downward displacement of the eyes, a shrill high-pitched cry, irritability and abnormal muscle tone of the legs.

A treatment for hydrocephalus is the insertion of a shunt which allows excess cerebrospinal fluid to drain to another area of the body. Typical shunt types are: a ventriculoperitoneal (VP) shunt, which moves fluid from the ventricles of the brain to the abdominal cavity; a ventriculoatrial (VA) shunt, which moves fluid from the ventricles of the brain to a chamber of the heart; and a lumboperitoneal (LP) shunt, which moves fluid from the lower back to the abdominal cavity. Each shunt has a valve attached. The two most common valves are fixed pressure valves, which are regulated by a predetermined pressure setting, and adjustable pressure valves, which can be adjusted non-invasively by a special magnetic tool (Medtronic 2015).

## Genetic disorders

Hereditary genetic defects include muscular dystrophy, Huntington's chorea and neurofibromatosis.

### Muscular dystrophy

Muscular dystrophy is a group of congenital disorders characterised by progressive wasting and weakness of muscles. There are many different forms and sources of muscular dystrophy, with all of the conditions causing muscle weakness which has a profound effect on the individual's life. Each neuromuscular condition has a characteristic pattern of muscle weakness. It may affect only the muscles around the eyes, throat or legs; however, the severest form may affect all the muscles of the body including the heart. There is no specific treatment. Duchenne's muscular dystrophy is the most common type. It begins to manifest between the ages of 3 and 5 years and is the most severe form. Initially it affects the leg and pelvic muscles but there is progressive involvement of all voluntary muscles. Later in the disease, progressive weakening of cardiac and respiratory muscles results in heart or respiratory failure. Early manifestations of Duchenne's muscular dystrophy include a waddling gait, lordosis (increased curvature of the lumbar spine) and marked difficulty rising from a supine to a standing position. As the disease progresses, facial, oropharyngeal and respiratory muscles become involved (Muscular Dystrophy Foundation 2014; Muscular Dystrophy Australia 2015).

### Huntington's chorea

Huntington's chorea is a disorder in which degeneration of the cerebral cortex and basal ganglia causes chronic progressive choreiform movements and mental deterioration. Onset is generally in early middle age, and the individual gradually develops progressively severe choreiform movements and dementia. The movements usually begin slowly, with facial grimacing and jerking arm actions. Over time, the movements become frequent, erratic and violent, affecting the trunk and lower limbs and making speech, swallowing, walking and other basic tasks more difficult. Dementia may be mild at first but eventually severely disrupts the person as the intellectual and emotional symptoms become more advanced (Huntington's NSW 2015).

### Neurofibromatosis

Neurofibromatosis can affect anyone and is one of the most common congenital abnormalities. The condition is usually classified according to which parts of the nervous system are affected. There are three types of neurofibromas: type 1 (NF 1), type 2 (NF 2) and Schwannomatosis. All are characterised by the growth of benign tumours which can grow anywhere there are nerve cells. In NF 1, multiple cutaneous and subcutaneous nodules of varying size occur. Subcutaneous nodules may attach to the peripheral portion of the nerve, causing pain or pressure and, rarely, sensory loss in the distribution of the affected nerve. Neuromas, which are an overgrowth of subcutaneous tissue, may reach enormous sizes and commonly affect the face, scalp, neck and chest. Neurological symptoms may appear if the tumours cause pressure on the brain or spinal cord as occurs in NF 2 (Neurofibromatosis Australia nd).

## Disorders of multiple cause

### Cerebral palsy

Cerebral palsy comprises a group of neuromotor disorders resulting from prenatal, perinatal or postnatal cerebral hypoxia

or damage. The incidence of cerebral palsy is highest in premature infants or in infants who have experienced a difficult birth resulting in cerebral damage. Causative factors include: chromosomal abnormalities; prenatal factors such as maternal infections, exposure to harmful chemicals or malnutrition; perinatal factors such as premature birth or instrumental delivery causing cerebral anoxia; and postnatal factors such as trauma, infection or malnutrition causing cerebral damage.

The manifestations of cerebral palsy range from mild muscle incoordination to severe spasticity. The spastic form of the disorder is characterised by rapid alternating muscle contraction and relaxation, muscle weakness and underdevelopment and muscle contraction in response to manipulation. The athetoid form of cerebral palsy is characterised by grimacing, writhing and jerking involuntary movements, which become more severe during stress. Ataxic cerebral palsy is characterised by disturbed balance, incoordination, muscle weakness and tremor. In addition to the range of motor deficits, the individual may experience sensory deficits such as speech, visual or hearing impairment. Intellectual disability accompanies cerebral palsy in about 40% of cases (Cerebral Palsy Australia 2015; Cerebral Palsy Alliance 2015).

## Cerebral aneurysm

A cerebral aneurysm is an abnormality (weak spot) of the wall of a cerebral artery that results in a localised dilation. As the aneurysm becomes larger the wall of the artery becomes weaker and can rupture. If the aneurysm ruptures, blood enters the subarachnoid space or cerebral tissue. Causative factors include congenital defects in the arterial walls, sclerotic changes in blood vessels, hypertension and cerebral trauma. Manifestations of a cerebral aneurysm do not generally appear until the aneurysm ruptures. The most common symptom of rupture is the sudden onset of a severe headache, which may be accompanied by nausea and vomiting, motor deficits, visual disturbances and loss of consciousness. A cerebral aneurysm may be detected before it ruptures if the individual shows signs of oculomotor nerve compression, eyelid ptosis and a pupil that is sluggish or non-reactive (Stroke Foundation 2015a).

## Transient ischaemic attacks

**Transient ischaemic attacks** (TIAs) result in a loss of function to a particular part of the body due to a sudden lack of blood flow to a part of the brain. The attacks, which may last from seconds to hours, are generally considered to be warning signs of an impending thrombotic cerebrovascular accident (stroke). The characteristics of a TIA, which may be caused by micro-emboli or arteriole spasm, are various symptoms of neurological dysfunction followed by a return of normal function. Symptoms include visual disturbances, double or blurred vision, short-term blindness, speech disturbances, slurred or thick speech, swallowing difficulty, staggering or uncoordinated gait, unilateral weakness or numbness, facial numbness or weakness, vertigo and loss of balance, nausea and vomiting. The difference between a TIA and an ischaemic stroke is that the symptoms of a TIA will completely disappear within 24 hours (Brain Foundation 2015).

## Trigeminal neuralgia

Trigeminal neuralgia is a painful disorder of one or more branches of the trigeminal nerve that produces paroxysmal attacks of excruciating facial pain. While the cause is often unknown, the disorder may be associated with other neurological conditions such as aneurysms, cerebral tumours or multiple sclerosis. The individual experiences excruciating burning pain, which generally occurs suddenly in response to a stimulus, such as a draught of cold air, drinking hot or cold fluids, brushing the teeth or speaking or laughing. The frequency of attacks varies from many times a day to several times a month or year.

## Intellectual disability

Intellectual disability is a syndrome of incomplete intellectual development associated with impaired learning and social adjustment. The causes include:

- Prenatal factors such as metabolic disorders, chromosomal abnormalities, cranial malformation, maternal infections, malnutrition or anoxia
- Perinatal factors such as prematurity, anoxia or intracranial haemorrhage
- Postnatal factors such as cerebral injury, central nervous system infections, anoxia, neoplasms, degenerative diseases, cerebral haemorrhage, nutritional deficiencies and emotional deprivation.

Manifestations include poor motor development, impaired concepts of space and time, learning difficulties, inappropriate behaviour and difficulty with social interactions.

## Peripheral neuritis

Peripheral neuritis (polyneuritis) is the degeneration of peripheral nerves, resulting in muscle weakness and atrophy, sensory loss and decreased or absent tendon reflexes. Causes include chronic intoxication (alcohol, arsenic, lead), metabolic and inflammatory disorders (diabetes mellitus, rheumatoid arthritis), nutrient deficiencies (thiamine) and infectious diseases (meningitis or Guillain–Barré syndrome). Manifestations usually develop slowly, beginning with leg pains and numbness or tingling in the feet and hands. As the disease progresses the individual experiences flaccid paralysis, muscle wasting, pain of varying intensity and loss of reflexes in the legs and arms. Footdrop, ataxic gait and inability to walk will eventually occur.

## Guillain–Barré syndrome

Guillain–Barré Syndrome (GBS) is an acute inflammatory disorder which causes the body's immune system to attack part of the peripheral nervous system, causing what is known as an autoimmune disorder. It is characterised by rapid and progressive neuromuscular paralysis with the first symptoms including decreased function, varying degrees of weakness or tingling sensation, and decreased reflexes distally in the lower

limbs which often spreads proximally to include the upper body. In some cases these symptoms can increase until the muscles are almost totally paralysed, resulting in a life-threatening situation requiring mechanical ventilation due to respiratory dysfunction.

The National Institute of Neurological Disorders and Stroke (ndc) states that most individuals will have good recovery from Guillain–Barré syndrome (GBS), although some may continue to have some residual weakness after 3 years.

While there is no known cause of GBS most individuals who are diagnosed with this condition have a 1–3 week previous history of upper respiratory or gastrointestinal viral infection. Occasionally, surgery may also trigger the syndrome. The disease progression may occur over the course of hours or days, or it may take up to 3 to 4 weeks. It is confirmed with a lumbar puncture, electromyography and nerve conduction studies.

In GBS the antiganglioside antibodies attack Schwann cells of the myelin sheath, causing demyelination of the peripheral nerves, which in turn halts nerve conduction. There is no known cure for GBS; however, plasmapheresis (also known as plasma exchange) and high-dose immunoglobulin therapy may be used to treat the complications of the disease. Plasmapheresis causes the Schwann cells to re-myelinate, which in turn reduces the severity and duration of the Guillain–Barré episode and in most cases individuals can expect a full recovery.

When caring for the individual with GBS the nurse should assess airway and breathing, refer to speech pathology, maintain the individual as nil by mouth until otherwise ordered, ensure adequate analgesia, perform pressure area care and take steps to reassure the individual (National Institute of Neurological Disorders and Stroke ndc).

***What is the prognosis?*** Guillain–Barré syndrome can be a devastating disorder because of its sudden and unexpected onset. Most people reach the stage of greatest weakness within the first 2 weeks after symptoms appear, and by the third week of the illness 90% of all individuals are at their weakest. The recovery period may be as little as a few weeks or as long as a few years. About 30% of those with Guillain–Barré still have a residual weakness after 3 years. About 3% may suffer a relapse of muscle weakness and tingling sensations many years after the initial attack (National Institute of Neurological Disorders and Stroke ndc).

### Bell's palsy

Bell's palsy is a disorder of the seventh cranial nerve that produces unilateral facial weakness or paralysis. An inflammatory reaction occurs in or around cranial nerve VII, resulting in nerve compression and the onset of flaccid facial paralysis. Factors responsible for the inflammatory reaction include infection, prolonged exposure to cold temperature and local trauma. The seventh cranial nerve can also be affected by other conditions such as a cerebral tumour, meningitis or a middle-ear infection. Manifestations are unilateral facial weakness, which is sometimes associated with pain around the angle of the jaw or behind the ear. On the affected side the mouth droops and the individual is unable to wrinkle the forehead, close the eyelid or smile. There may be excessive watering from the affected eye and drooling of saliva from the affected side of the mouth (National Institute of Neurological Disorders and Stroke nda; Brown et al 2015).

## Seizure disorders

Seizure disorders may be primary and idiopathic, or secondary and symptomatic of a central nervous system disorder. The most common type of seizure disorder is epilepsy. **Seizures** may be focal (partial) or **generalised**. Focal seizures generally affect a specific body part, and the symptoms of an attack depend on the location of the cerebral focus. For example, the focal motor seizure occurs from a lesion in the motor cortex. Typically it causes stiffening or jerking in one extremity that is accompanied by numbness or tingling.

**Absence seizures** only last a few seconds. They generally begin with a brief change in the level of consciousness, which is indicated by a blank stare, eyelid fluttering or head nodding or a pause in conversation. The individual generally retains posture and returns to pre-seizure activity without difficulty. This type of epilepsy usually occurs in childhood and may continue into early adolescence. Some partial seizures may progress to become **generalised seizures**. These are termed secondary generalised seizures.

Although seizures may result from a nervous system disorder, they may be caused by many other factors and are often idiopathic. The common classification of seizures is given in Table 35.3.

The most common generalised seizure is referred to as a tonic–clonic. This type of seizure usually consists of three phases:

1. Aura. The aura (which is not always experienced) is a warning of an impending seizure. An **aura** is a sensation (e.g. a specific taste or smell) experienced by the individual immediately before a seizure. The seizure commonly begins with a loud cry, which is caused by air being forced out through the vocal cords that are in spasm
2. Tonic–clonic phase. The individual then loses consciousness and may fall. The muscles become rigid, then alternate between episodes of muscle spasm and relaxation (tonus and clonus), resulting in jerky spasmodic body movements. Tongue biting, incontinence of urine, laboured breathing, apnoea and cyanosis may occur
3. Post-convulsive phase. The seizure generally stops within 2–5 minutes, when abnormal electrical conduction in the brain ceases. The individual regains consciousness but may be dazed and confused or fall asleep. Automatisms are more commonly associated with complex partial seizures.

**TABLE 35.3 | Common classification of seizures**

| | |
|---|---|
| Focal (partial) seizures | About 60% of people with epilepsy have focal (partial) seizures. These seizures can often be subtle or unusual, and may go unnoticed or be mistaken for anything from intoxication to daydreaming. Seizure activity starts in one area of the brain and may spread to other regions of the brain.<br>Types of focal (partial) seizures are:<br>• Focal seizure—awareness retained (formerly simple partial seizures)<br>• Focal dyscognitive seizures—awareness altered (formerly complex partial seizures)<br>• Focal seizures evolving to a bilateral convulsive seizure (formerly secondarily generalised tonic–clonic*) |
| Generalised seizures | Generalised seizures are the result of abnormal activity in both hemispheres of the brain simultaneously. Because of this, consciousness is lost at the onset of the seizure. There are many types of generalised seizures:<br>• Absence<br>> Typical<br>> Atypical absence<br>> Absence with special features<br>– Myoclonic absence<br>– Eyelid myoclonia<br>• Tonic–clonic<br>• Clonic<br>• Tonic<br>• Atonic<br>• Myoclonic<br>> Myoclonic atonic<br>> Myoclonic tonic |
| Unknown | This a grouping of seizures that cannot be diagnosed as either focal or generalised seizures and are thus grouped as unknown.<br>• Epileptic spasm<br>• Other |

*Note: Sometimes a seizure starts as a focal (partial) seizure and then becomes a generalised seizure—almost always a tonic–clonic seizure.
Most people will only have one or two seizure type(s), which may vary in severity. A person with severe epilepsy or significant damage to the brain may experience several different seizure types.
*(LeMone et al 2014; Berman et al 2015; Epilepsy Action Australia nd; Epilepsy Foundation 2015)*

**Status epilepticus** is a condition in which the individual experiences continuous seizures without regaining consciousness in between. It is generally accompanied by respiratory distress.

Table 35.4 provides an assessment and rationale for a nursing assessment before, during and after a seizure (LeMone et al 2011). Clinical Interest Box 35.2 provides an outline of teaching for home care of individuals in relation to seizures (LeMone et al 2014; Berman et al 2015; Epilepsy Action Australia nd; Epilepsy Foundation 2015).

## Degenerative disorders

### Parkinson's disease

Parkinson's disease is a degenerative process of nerve cells in the basal ganglia and substantia nigra. The substantia nigra is an area in the basal ganglia considered necessary for motor control. Although the precise cause of the disorder is unknown, research has demonstrated that a dopamine deficiency prevents affected brain cells from functioning normally. Dopamine is a neurotransmitter that plays a role in the transmission of nerve impulses between synapses. Factors implicated in the development of Parkinson's disease include cerebral atherosclerosis and long-term therapy with drugs such as haloperidol and phenothiazine (Parkinson's Australia 2015; Thibodeau & Patton 2012). Manifestations of Parkinson's disease are related to disturbances of movement: tremor, muscle rigidity and dyskinesia. The most common initial symptom is tremor; for example, 'pill-rolling' movements of the fingers, and to-and-fro head tremors. Tremors are aggravated by fatigue and stress, and decrease when the individual performs a purposeful activity or is asleep. The person experiences difficulty in initiating voluntary movement and loss of posture control, so that walking is with the body bent forwards. The gait consists of short shuffling steps that are slowly initiated. Facial expression becomes mask-like, and the voice is commonly high-pitched and monotone. The person's intelligence is not affected.

## TABLE 35.4 | Nursing assessments before, during and after a seizure

| Assessment | Rationale |
|---|---|
| What was the client's level of consciousness? If consciousness was lost, at what point? | Indicates area of brain involved and type of seizure. |
| What was the client doing just before the attack? | May suggest precipitating factors. |
| In what part of the body did the seizure start? | May indicate the site of seizure activity in the brain tissue; for example, if jerking movements were first observed in right hand, the seizure focus may be in left motor cortex. |
| Was there an epileptic cry? | Usually indicates the tonic stage of a generalised tonic–clonic seizure. |
| Were any automatisms such as eyelid fluttering, chewing, lip smacking or swallowing observed? | Often seen in complex, partial and absence seizures. |
| How long did movements last? Did the location or character change (tonic to clonic)? Did movements involve both sides of the body or just one? | Indicates areas in which focal activity originated. |
| Did the head and/or eyes turn to one side and, if so, which side? | Helps localise the focus of the seizure. During the seizure, the head and eyes typically will turn away from the side of the epileptogenic focus. |
| Were there changes in pupillary reactions? | Indicates involvement of the autonomic nervous system. |
| If the client fell, was the head hit? | Skull x-ray studies may be needed to rule out subdural haematoma or fracture. |
| Was there foaming or frothing from the mouth? | Usually indicates a tonic–clonic seizure. |

*(LeMone et al 2011)*

## CLINICAL INTEREST BOX 35.2 Health education for home care of individuals affected by generalised seizures

Teaching must be planned around a systematic assessment of the needs of both the individual and their significant others. Significant others need to be included so that they can learn seizure management, care and observations. The importance of safety and maintenance of a patent airway should be stressed. The following recommendations assist the individual and significant others to adjust:

- Correct misconceptions, fears and myths about epilepsy
- Encourage both the individual and their significant others to express their feelings
- Provide the name and location of community and national resources; for example, the Epilepsy Foundation of Victoria (www.epinet.org.au). Facilitate socialisation with others facing the same issues
- Stress the importance of follow-up care and keeping medical appointments
- Refer the individual to employment or vocational counselling as needed
- Review any state and local laws that apply to people with seizure disorders. Usually a driver's licence can be reinstated after a 2-year seizure-free period and a letter from a medical officer
- Stress the importance of wearing a medical alert bracelet and carrying a medical alert card at all times
- Emphasise the importance of aura identification and plan action to take
- Emphasise the importance of taking anticonvulsant medication as prescribed, even when seizures no longer occur
- Avoid physical and emotional stress
- Help individuals develop a positive focus on life
- In general, alcohol should be avoided and caffeine limited
- Discuss factors that may trigger a seizure (fatigue, abrupt stopping of medication, flashing video games)

*(LeMone et al 2014)*

### CRITICAL THINKING EXERCISE 35.1

Mrs T, 55, has recently been diagnosed with early-stage Parkinson's disease. Mr T is quite concerned about the progression of the disease—whether Mrs T can be left alone for several hours at a time while Mr T goes to work and what medications she will be required to take. How would you respond to his concerns? How can they find more information about Parkinson's disease?

### CRITICAL THINKING EXERCISE 35.2

An individual arrives for surgery for implantation of a deep brain stimulator. On examination you notice he has a mask-like face, pill-rolling movements in his hands when at rest, a shuffling gait and bradykinesia. What condition do you think he has? What is important about his medication management? What is 'on and off' in relation to this individual?

### Amyotrophic lateral sclerosis

Amyotrophic lateral sclerosis, which is the most common form of motor neuron disease (MND), is a progressive degenerative condition that is generally fatal within 3–10 years after onset. The disease affects the upper and lower motor neurons of the central nervous system, resulting in progressive muscular atrophy, progressive bulbar palsy and upper motor neuron deficits. While the cause is unknown, the disease is thought to result from viral, metabolic, toxic, infectious and immunological factors. Manifestations include skeletal muscle weakness and atrophy and impaired speech, chewing, swallowing and breathing. The cause of death is commonly respiratory muscle weakness and bulbar palsy causing respiratory failure (LeMone et al 2014; MND Australia 2013a; 2013b).

### Alzheimer's disease

Alzheimer's disease is a progressive degenerative disorder that causes cerebral atrophy and dementia. Although the precise cause is unknown, several theories propose that the disorder may result from a genetic factor, immunological dysfunction, a toxin or a virus. People with Alzheimer's disease have low levels of acetylcholine in their brain which is an important neurotransmitter for memory.

Alzheimer's disease, which affects an estimated 343 000 Australians, is characterised by memory loss and the eventual inability to self-care. Some medications to alleviate the symptoms have been developed, but presently there is no known treatment for the disease (Alzheimer's Australia nda; ndb).

Manifestations of the disease generally occur in three stages:

1. Memory loss, decline in judgment and logic, disorientation, global aphasia, irritability, mood swings and agitation
2. Neglect of hygiene, inability to carry out deliberate voluntary movements (**apraxia**), inability to recognise the nature or use of objects (agnosia), repetition of a motor or verbal action (perseveration) and seizures
3. Marked dementia, unresponsiveness, aphasia and apraxia.

Delirium is a common mental disorder affecting older adults. The acute condition is often misdiagnosed as a form of dementia and the underlying cause is therefore missed. The characteristics of delirium are listed in Clinical Interest Box 35.3. A history of the individual's behaviour before delirium developed is essential in early recognition of the condition (LeMone et al 2014).

### CLINICAL INTEREST BOX 35.3 Clinical criteria for delirium

- Delirium is an acute disturbance of consciousness that is accompanied by a change in cognition. It cannot be accounted for by a pre-existing or evolving dementia. Delirium develops over a short period of time, usually hours to days, and tends to fluctuate during the course of the day. It is usually a direct physiological consequence of a general medical condition.
- There is reduced clarity of awareness of the environment
- Ability to focus, sustain or shift attention is impaired
- Person is easily distracted by irrelevant stimuli
- There is an accompanying change in cognition (memory impairment, disorientation or language disturbance)
- Recent memory is most commonly affected
- Disorientation is usually shown, with a person disoriented to time or place
- Language disturbance may involve impaired ability to name objects or ability to write; speech may be rambling
- Perceptual disturbances may include misinterpretations, illusions or hallucinations

*(Crisp et al 2013; Australian Government Department of Health and Ageing 2011)*

## Immunological disorders

### Multiple sclerosis

Multiple sclerosis is a disorder characterised by progressive demyelination of nerve fibres in the spinal cord and brain. Patches of demyelination throughout the central nervous system result in varied neurological dysfunction. The cause is unknown, but the disease is thought to result from viral or immunological factors. Manifestations vary depending on the areas of the central nervous system that are affected. Some individuals experience mild exacerbations, with long remission periods, while others have frequent relapses, with increasing residual deficits. The most common initial symptoms are

## CLINICAL INTEREST BOX 35.4 Health education checklist—the individual with multiple sclerosis

In formulating a teaching plan it is important that the individual's significant others are included. The following aspects may be considered:

- Facilitate access to the Multiple Sclerosis Society of Australia (www.msaustralia.org.au)
- Ensure that the individual understands the clinical course of multiple sclerosis. Dispel any myths
- Identify strategies to manage symptoms such as dysphagia or altered cognitive responses
- Plan strategies for preventing complications such as pressure ulcers or depression
- Identify coping strategies
- Identify strategies for minimising fatigue
- Explain how to prevent injury
- Discuss ways to adapt to sexual dysfunction
- Develop strategies to control bowel and bladder function
- Explain benefits of continued physical activity and exercise
- Identify ways to minimise immobility and spasticity
- Describe the medication regimen and possible adverse effects.

fatigue, motor weakness and visual disturbances. Other characteristic changes include numbness and tingling sensations, intention tremor, gait ataxia, paralysis, urinary disturbances and emotional lability. Clinical Interest Box 35.4 provides a teaching plan for the individual as well as their significant others (Brown et al 2015; Multiple Sclerosis Society of Australia 2015; Thibodeau & Patton 2012).

### Myasthenia gravis

Myasthenia gravis is a chronic neuromuscular disorder that affects voluntary muscles and is characterised by fluctuating muscle weakness that is exacerbated by exercise. The disease is considered to be autoimmune in origin, resulting in an acetylcholine-receptor deficiency. The thymus gland is also thought to be involved in the disease because the gland is abnormal and remains active after puberty in individuals with myasthenia gravis.

Manifestations include progressive weakness of certain voluntary muscles, with some improvement in muscle function after rest. The eye muscles are most commonly affected, with drooping of the eyelids (ptosis) and double vision (diplopia). Other affected muscles include those involved with facial expression, speech, chewing and swallowing. The individual may experience problems with saliva, nasal regurgitation and choking. The shoulder and neck muscles may be affected so that the head tends to fall forwards. Weakened respiratory muscles make breathing difficult and predispose the person to respiratory tract infections (LeMone et al 2014: National Institute of Neurological Disorders and Stroke ndf).

## Infectious and inflammatory conditions

### Meningitis

Meningitis is inflammation of the meninges and can be caused by viruses, bacteria or fungi. The inflammation may involve one or all three layers of the meninges. Meningitis often begins when the causative organism enters the subarachnoid space, then the infection spreads because of the open communication over the brain's convexity. The accumulation of exudate from the inflammatory process over the convexities or in the ventricles can obstruct the flow of CSF. Aseptic meningitis is thought to occur from meningeal irritation resulting from encephalitis, leukaemia, lymphoma or the presence of blood in the subarachnoid space. The major manifestations of meningitis are severe headaches, pyrexia, irritability, neck rigidity, photophobia and pain in the back and limbs. Other manifestations are alterations in mental status, altered levels of consciousness and restlessness. Vomiting may occur, and cranial nerve involvement causes visual disturbances, pupil abnormalities, strabismus and vertigo. There may be generalised seizures due to cerebral oedema (Patton et al 2012).

### Encephalitis

Encephalitis is inflammation of the brain tissue caused by viruses, bacteria, fungi or protozoans. Endemic encephalitis begins in a non-human host or reservoir from which the virus is transmitted to humans, for example, through mosquito bites. After the pathogen gains access to the central nervous system via the bloodstream or along nerves, the white matter and meninges develop non-suppurative inflammation, and diffuse cerebral oedema results. Initial manifestations are headaches, pyrexia, vomiting, malaise and muscular aches and pains. These are often followed by alterations in the level of consciousness, confusion, motor and sensory deficits, hyperirritability and meningeal signs (National Institute of Neurological Disorders and Stroke nde).

### Brain abscess

A brain abscess is a collection of pus, usually occurring in the temporal lobes or the cerebellum. A brain abscess is accompanied by cerebral oedema and congestion. Most brain abscesses develop secondary to a primary source of infection such as mastoiditis or otitis media; or they may develop from a septic focus in the respiratory tract or, less often, from a pelvic or cardiac source. A small percentage result from a penetrating head wound such as a gunshot injury.

Manifestations include headache, pyrexia, vomiting, alterations in the level of consciousness, and local or generalised seizures. Other features differ according to the site of the abscess and include motor, sensory and speech disturbances (Brown et al 2015).

### Myelitis

Myelitis is the term that applies to a group of infective and non-infective processes that affect the spinal cord. Myelitis can be due to viruses, occur secondary to meningeal inflammation or be of unknown aetiology. The most common viral

diseases causing myelitis are poliomyelitis and herpes zoster. Manifestations include a sudden onset of motor paresis, accompanied by other neurological deficits such as loss of sensory and sphincter functions.

### Herpes zoster

Herpes zoster is a viral disorder that causes inflammation of the posterior root ganglia. The condition develops from reactivation of the varicella virus, the virus responsible for chickenpox. There is also evidence of a relationship between herpes zoster and certain systemic infections, neoplasms and immunosuppressive therapy. Manifestations include mild to severe neuralgic pain in the affected nerve root distribution. The pain, which may be burning, tingling, dull or sharp, may occur with or be followed by skin reddening and eruption of vesicles. The vesicles become pustules and develop a crust within 1–2 weeks. If infection or ulceration accompanies the vesicles, permanent scarring may result.

Occasionally, herpes zoster involves the cranial nerves, especially the trigeminal or oculomotor nerve. Trigeminal involvement causes eye pain and, possibly, corneal damage and impaired vision. Oculomotor involvement may result in conjunctivitis or ptosis. Rarely, herpes zoster leads to generalised central nervous system infection. Post-herpetic neuralgia can persist for months or years, and the skin may remain hypersensitive to touch (LeMone et al 2014).

### Poliomyelitis

Poliomyelitis is an acute infectious disease caused by one of the three poliomyelitis viruses, which generally enter the body through the mouth or nose, multiply in the bloodstream and travel to the central nervous system. The viruses are then spread along neural pathways and destroy cells in the anterior horns of the spinal cord. The brainstem may also be damaged. The incidence of acute anterior poliomyelitis has decreased dramatically in the western world since the introduction of vaccination in 1955.

The virus may cause only a minor illness, or there may be signs and symptoms of viral meningitis and paralysis. The extent of paralysis depends on the location of the affected neurons. The initial manifestations of paralytic poliomyelitis include pyrexia, headaches, vomiting, irritability and pains in the neck, back, arms and legs. About 5–7 days after onset, the individual experiences weakness of various muscles, paraesthesia, hypersensitivity to touch and resistance to neck flexion. If the disease affects the brainstem, the muscles involved in swallowing, chewing and ventilation are affected (LeMone et al 2014).

## Neoplastic and obstructive disorders

Tumours of the nervous system may be benign or malignant, and primary or metastatic. Tumours may arise in the brain tissue, the meninges, the skull, in the peripheral and cranial nerves or in the spinal cord. Brain tissue (cerebral) tumours include astrocytomas and glioblastomas. Meningiomas usually arise from the arachnoid layer of the meninges and do not invade the brain. Skull tumours, which are rare, may be either osteomas (benign) or sarcomas (malignant). Peripheral and cranial nerve tumours include acoustic neuromas, schwannomas and neuroblastomas. Spinal cord tumours may be either extradural or intradural.

Manifestations of nervous system tumours are related to invasion or compression of surrounding neural structures. Brain tumours may produce symptoms as a consequence of increased intracranial pressure; for example, from cerebral oedema. The neurological manifestations of a brain tumour depend on the location of the tumour and its rate of growth. The clinical features associated with a brain tumour include headaches, vomiting, papilloedema (swelling of the optic disc and distension of the retinal vessels), personality or behavioural changes, seizures, visual or hearing defects, dizziness, ataxia and hemiparesis. Manifestations of spinal cord tumours are related to spinal cord compression and include pain, paraplegia or quadriplegia, which may be slowly progressive or acute (Brown et al 2015; Cancer Council Australia 2015).

**CRITICAL THINKING EXERCISE 35.3**

Mrs Smith is transferred to your care a couple of days postoperatively after resection of an occipital tumour and occipital lobectomy. What symptoms may she have? What difficulties may she face for the immediate post op period? What assessments will she need? What discharge information will she need?

## Traumatic disorders

Despite being well protected by bone, meninges and CSF, the brain and spinal cord are frequently injured. Serious cerebral or spinal cord damage can result from a variety of factors such as motor vehicle accidents, sports accidents and penetrating injuries such as gunshot wounds. Acquired brain injury (ABI) or cerebral injury may be classified as concussion, contusion, laceration, haematomas and tentorial herniation. Traumatic brain injury (TBI) is a type of acquired brain injury caused by a blow to the head or contrecoup injury, usually with some loss of consciousness. As a result the brain may be torn, stretched, penetrated, bruised or become swollen (Brain Injury Australia 2015). See Case Study 35.1.

### Concussion

Concussion results from a blow to the head and is characterised by a loss of consciousness for less than 5 minutes and memory loss of events preceding and following the injury. Other features include headaches, confusion, dizziness, visual disturbances, vomiting and irritability.

### Contusion

Contusion is bruising of the brain that disrupts normal nerve function in the bruised area and which may be associated with haemorrhage or oedema. Manifestations include drowsiness, confusion, behavioural changes, loss of consciousness, hemiparesis, unequal pupil response and decorticate

## CASE STUDY 35.1

Gary is a 45-year-old male. He presented to the emergency department after a fall from a first-floor window last night. He had been out drinking at a work function and had forgotten his house keys. His wife called an ambulance this morning as Gary was very agitated and appeared to have a weakness in his left arm and leg. She also noticed some blood loss on the pillow from a gash on Gary's head.

1. How will you assess and manage Gary?
2. How specifically will you ask the questions to establish a Glasgow Coma Scale score for Gary?
3. What clinical risks does Gary present?

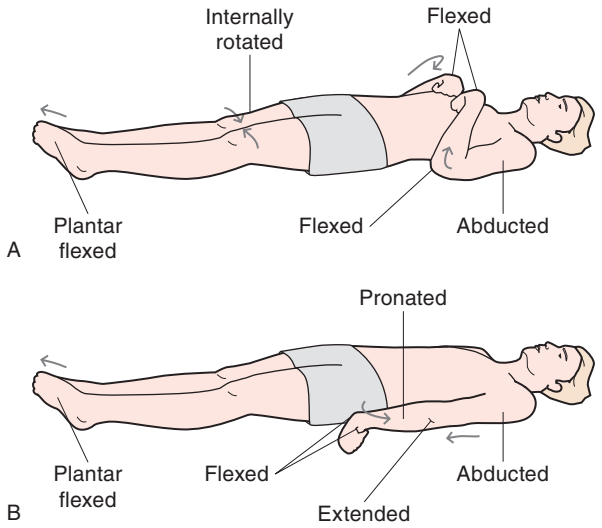


**Figure 35.8** Decorticate and decerebrate posturing A: Decorticate rigidity B: Decerebrate rigidity *(LeMone et al 2014)*

or decerebrate posturing. With **decorticate** posturing the individual demonstrates hyperflexion of the upper extremities and hyperextension of the lower extremities (Figure 35.8A). With **decerebrate** posturing, both the upper and the lower extremities are hyperextended (Figure 35.8B).

The Westmead Post-traumatic Amnesia Scale (WPTAS) is used to measure the period of post-traumatic amnesia following a closed head injury caused by either oedema or haemorrhage. The scale consists of seven orientation questions and five memory items which are designed to objectively measure the period of post-traumatic amnesia (PTA). An individual is said to be out of PTA if a perfect score is obtained for all questions 3 days in a row. Once the duration of PTA is determined the severity of injury can be classified according to the time the individual was in PTA (Department of Psychology, Macquarie University nd; Scope 2015; Synapse Reconnecting Lives 2015).

## CRITICAL THINKING EXERCISE 35.4

A 23-year-old man has been brought into the emergency department after a fall from a ladder. It was reported by his friend that he was unconscious for about 10 minutes. On presentation to ED he is alert and orientated. What type of injury is he most likely to have sustained? What discharge instructions would you give this individual's family? How would you modify these instructions if this individual lives alone?

### Laceration

Laceration is tearing of the brain tissue, followed by intracerebral bleeding. Manifestations include prolonged unconsciousness, immediate neurological deficits and deterioration of the individual's condition.

### Haematomas

Haematomas are collections of coagulated blood and, in the brain, may be epidural, subdural or intracerebral. An epidural haematoma results from haemorrhage in the epidural space between the skull and the dura mater. A subdural haematoma results from an accumulation of blood in the subdural space, between the arachnoid and dura mater. An intracerebral haematoma is a collection of blood within the brain tissue.

Manifestations of cerebral haematomas vary according to the location and whether the haematoma develops rapidly or slowly. Typically an epidural haematoma causes immediate loss of consciousness, followed by a lucid interval that eventually gives way to a rapidly progressive decrease in the level of consciousness. Accompanying features include hemiparesis, severe headaches, unilateral pupil dilation and signs of increased intracranial pressure (decreasing pulse and ventilation rate, increasing systolic blood pressure). Manifestations of a subdural haematoma may not occur until days after the injury. Common features include headaches, drowsiness, confusion, slow responses and seizures. Pupillary changes and motor deficits commonly occur. Manifestations of intracerebral haematoma include neck rigidity, photophobia, nausea and vomiting, dizziness, decreased ventilation rate and seizures (LeMone at al 2014).

### Cerebral herniation

Increased pressure in the cranial cavity can cause damage to the brain through hypoxia, ischaemia and infarction. Unrelieved or untreated raised pressure results in cerebral herniation. When pressure builds up in one area of the brain, brain tissue will begin to move into an area of lower pressure.

Tentorial herniation occurs when part of the temporal lobe herniates through the tentorial hiatus. Typical signs of this form of herniation are pupil dilation and hemiplegia.

Tonsillar herniation or 'coning' occurs when part of the cerebellum and/or brainstem herniates through the foramen magnum. Typical signs of this type of herniation are neck rigidity, dysfunction of the cardiac and respiratory drive and abnormal posturing. Irreversible brain damage and death can occur rapidly (LeMone et al 2014).

### CRITICAL THINKING EXERCISE 35.5

Mr P is a 42-year-old police constable. He has been troubled by recurrent atrial fibrillation, and treated with an anticoagulant. Mr P was on a ladder cleaning the gutters of his house when he fell and hit his head. Although shaken, he felt well after a short rest. However, over the next few days, Mrs P began noticing several behavioural changes in her husband. He seemed vague and forgetful at times. Finally, when she found him urinating in the sink, Mrs P sought medical assistance. An MRI showed a subdural haematoma. Mr P was booked in for evacuation of the clot via burr holes. Following surgery Mr P was alert and orientated. Before surgery, the nurse taking care of Mr P made the following nursing diagnoses:

- Risk for injury related to confusion secondary to increased intracranial haemorrhage
- Self-care deficit: bathing/hygiene related to decreased level of consciousness
- Sleep pattern disturbance related to frequent assessments and loss of sleep.

Describe the nursing interventions, with rationales, that may be planned in response to the issues identified above.

### Spinal cord damage

Spinal cord damage may occur from traumatic injuries as a result of motor vehicle or sports accidents, gunshot or stab wounds or falls from high places. Fractures and dislocations can occur anywhere along the spinal column and, if the spinal cord is injured, may result in temporary or permanent damage.

### Peripheral nerve damage

Peripheral nerve damage can result from pressure, compression, constriction or traction on a nerve, or as a consequence of skeletal fractures, lacerations or penetrating wounds. Nerve damage can also result from an injection of a toxic or metabolic substance into the nerve. The peripheral nerves most commonly injured are the radial, axillary and ulnar nerves and the brachial plexus. Manifestations include loss of motor function, loss of sensation and muscle atrophy. Depending on which nerve is damaged, there may be foot drop, wrist drop, limited range of motion or paralysis.

## CARE OF THE INDIVIDUAL WITH A NERVOUS SYSTEM DISORDER

Although specific nursing actions and medical management vary depending on the disorder, the main aims of care are to:

- Promote a clear airway
- Maintain fluid and nutritional status
- Prevent and manage alterations in elimination
- Promote effective communication
- Promote safety
- Promote mobility
- Prevent complications of immobility
- Provide psychological support
- Assess neurological status
- Provide a suitable environment
- Provide pre- and post-diagnostic test care
- Promote rehabilitation and independence.

Each individual presents specific nursing problems for which an individualised nursing care plan must be developed, implemented and evaluated.

### Promoting a clear airway

Disorders of the nervous system may affect the individual's ability to breathe normally, to cough effectively or to prevent the tongue from obstructing the airway. Altered levels of consciousness, decreased motor function or disrupted cranial nerve function may impair the individual's ability to maintain a clear airway. To ensure a patent airway the individual's nose, mouth and respiratory tract must be clear, allowing adequate oxygen and carbon dioxide exchange.

With a conscious individual:

- The individual should be assisted into a position that will promote effective breathing. A sitting or upright position provides better lung expansion, which improves breathing and lessens the risk of respiratory tract infection
- The individual is instructed to take deep breaths hourly and to cough and expectorate mucus frequently. Chest physiotherapy (e.g. percussion) may be necessary to help mobilise secretions
- If the individual's ability to chew and swallow is impaired, care must be taken when food, fluids or oral medications are being consumed
- Suction equipment should be readily available if the individual is at risk of choking or unable to expectorate secretions effectively
- Active or passive range-of-motion (ROM) exercises and 2–4-hourly position changes help to mobilise respiratory tract secretions
- An adequate fluid input is provided to keep respiratory tract secretions moist.

With an unconscious individual:

- The individual should be nursed in a lateral recumbent position to promote drainage of secretions and to prevent the tongue from obstructing the airway. Positioning on alternate sides 2-hourly should be carried out to prevent pooling of secretions in the lungs
- Oronasopharyngeal suction should be performed to keep the upper airway free of accumulated secretions. Mouth and nasal care should be performed 2–4-hourly for the same purpose (information on oronasopharyngeal suctioning is provided in Chapter 25)
- Chest percussion and postural drainage may be prescribed to help remove retained secretions, particularly if the cough reflex is impaired
- The individual may require mechanical assistance for adequate ventilation. A tracheostomy or endotracheal tube may be inserted and mechanical ventilation

provided (information on tracheostomy care and mechanical ventilation is provided in Chapter 25)
- Eye care is essential for the unconscious individual. If the individual's corneal reflex is absent, keep the eyes moist with artificial tears and protect the eye with a protective shield. These should be ordered by a medical officer.

## Maintaining nutritional and fluid status

An individual with a neurological disorder may have deficits that interfere with an adequate intake of food and fluid, such as:
- Altered level of consciousness
- Altered mental status
- Diminished or absent swallowing or gag reflex
- Inability to feed themself; for example, if there is paralysis of the arm(s)
- Fear of choking
- Paralysis of the muscles of mastication and/or the tongue
- Loss of appetite due to altered sensory function; for example, sight, smell, taste.

Information on assisting the individual to meet nutritional and fluid needs is provided in Chapters 26 and 30. Specific nursing activities to assist the individual with a nervous system disorder include:
- Providing appropriate devices to facilitate the cutting and eating of food
- Ensuring that suction equipment is readily available should it be needed; for example, if the individual's swallowing or gag reflexes are impaired
- Assisting the individual who is unable to feed themself
- Placing the food into the unaffected side of the mouth if the individual has any facial weakness. If able to feed themself the individual should be advised to feed in this manner
- Preparing food for the individual who has motor deficits; for example, cutting meat, spreading butter, pouring fluids
- Redirecting the individual's attention to eating if they become distracted or are unable to concentrate at mealtimes
- Assisting with the care of the individual who is being provided with nutrition and fluids by alternative methods; for example, tube feeding or total parenteral nutrition
- Keeping a record of fluid input and output if the individual has difficulty in feeding themself or swallowing, or if they are receiving dehydrating medications or intravenous solutions to reduce or prevent increased intracranial pressure.

## Preventing and managing alterations in elimination

Many disorders affecting the nervous system can result in constipation, retention of urine or incontinence. Factors that contribute to altered patterns of elimination include loss of sphincter control, diminished awareness of the need to empty the bladder or bowel, altered levels of consciousness and impaired mental status, with resulting incontinence (LeMone et al 2014). (Information on the prevention and management of constipation, retention of urine and incontinence is provided in Chapters 31 and 32.)

## Promoting effective communication

Disorders of the nervous system may affect the ability of individuals to express themselves verbally or non-verbally, and the ability to understand the spoken or written word. (General information on communication can be found in Chapter 8.) The ability to communicate may be impaired by factors that include:
- Damage to the speech centres in the brain
- Damage to the temporal lobes, which hinders the perception and interpretation of stimuli
- Damage to the cranial nerves responsible for movement of the lips, tongue, pharynx and larynx
- Limited motor function that hinders non-verbal communication actions (e.g. facial expressions and gestures)
- Visual or hearing deficits
- Altered levels of consciousness or mental status.

The two major terms used to describe communication deficits are **dysphasia** (difficulty in communicating), and **aphasia** (loss of the ability to communicate) (Brown et al 2015; Berman et al 2015).

### Aphasia

Aphasia is subdivided into three major classifications.
1. Expressive aphasia (Broca's aphasia): inability to express oneself verbally or in writing. The degree of difficulty can range from mild hesitancy in flow of speech to limitation of expression to 'yes' and 'no'. The ability to understand the spoken and written word remains intact
2. Receptive aphasia (Wernicke's aphasia): inability to understand the spoken word. Although the individual hears the sounds of speech, comprehension of speech is impaired. The individual can speak but makes many errors when using words and is often unaware of the imperfect messages. The ability to comprehend the written word is also impaired
3. Global aphasia: a combination of both expressive and receptive aphasia. The individual neither understands what they hear or read, nor can they convey their thoughts in speech or writing.

The loss or impairment of the ability to communicate is devastating and frustrating to the individual and to their significant others, often resulting in fear and depression. Although the speech therapist will be the key person in the treatment of an individual with a communication problem, the nurse must be aware of prescribed therapy so that it can be continued when the speech therapist is not with the individual. The nurse should assume a calm, reassuring and supportive manner that conveys a sense of acceptance of the

**TABLE 35.5 | Assisting the aphasic individual**

| Expressive aphasia | Receptive aphasia |
|---|---|
| Stimulate conversation and ask open-ended questions | Speak slowly and distinctly, using a common vocabulary and simple sentences |
| Allow the individual time to find the words to express themself | Stand within the individual's line of vision, so that lip movements can be observed |
| Be supportive and accepting as the individual deals with the frustration of finding the right words | Use simple gestures as an added cue |
| Accept self-expression (e.g. pointing or gestures) | Repeat or rephrase any instructions if they are not understood |
| Provide charts or books with pictures of common objects so that the individual can point when they cannot say the word | Speak in a normal voice |
| Reassure the individual that speech skills can be relearned, given time | Divide any tasks into small units, working with the individual to accomplish the task |
| Give praise for achievements and progress | Use pointing and touch to express ideas<br>Eliminate background distractions<br>Give praise for achievements and progress |

*(Brown et al 2015).*

individual's behaviour. Table 35.5 provides guidelines that can be used when working with an individual with aphasia.

Communication with the unconscious individual is very important because, although the individual appears to be completely unaware of their environment, it is impossible to determine their awareness of any stimulus. Many individuals have recovered from unconsciousness and given accurate details of events or conversations that took place in their presence while they were unconscious. Therefore the nurse should assume that some stimuli will penetrate the complexities of unconsciousness. Stimuli can be provided by talking to the individual, by touch and by playing a radio or CDs. The individual should be told what the nurse will be doing—orient the individual to time, place and person and describe the surroundings. Coma arousal is a technique whereby the unconscious individual is continuously exposed to a variety of stimuli, such as sounds, touch and smells in an attempt to increase the level of consciousness (Berman et al 2015; Crisp et al 2013).

## Promoting safety

The individual with a nervous system disorder is often susceptible to injury because of factors such as impaired consciousness or awareness, reduced mobility, impaired motor and sensory functions and reflexes. The individual is most at risk of skin breakdown, physical injuries or infection.

## Maintaining skin integrity

The nurse should assess the individual for potential skin problems and implement nursing measures in accordance with the National Safety and Quality Health Service Standard 'Preventing and managing pressure injuries'. This Standard describes the systems and strategies that prevent individuals from developing pressure injuries and the best practice management if a pressure injury occurs (ACSQHC 2012). Nursing measures to prevent skin breakdown from pressure, extremes of temperature and physical trauma is as follows:

- The skin is kept clean and dried to prevent irritation and possible breakdown. Very dry skin should be lubricated with a suitable oil or cream to prevent cracking and breakdown
- A protective cream or lotion may be applied to the genital area and buttocks if the individual is incontinent. Wet or soiled linen must be replaced immediately
- The individual's position is changed every 2–4 hours to protect the skin from irritation and prolonged pressure. Pressure-relieving aids may be used
- The skin is assessed every 2 hours for colour, temperature, dryness and the signs of impaired circulation. Any signs of skin breakdown are reported immediately so that appropriate actions can be implemented to prevent further deterioration
- Precautions must be taken to avoid injury to the skin by hot, cold, sharp or rough objects. The individual is always moved correctly and gently to avoid damage to the skin (Berman et al 2015).

## Preventing physical injuries

An individual who has impaired motor, sensory or intellectual function must be protected from accidents and injuries in accordance with the National Safety and Quality Health Service Standard 'Preventing falls and harm from falls'. This Standard describes the methods and strategies to reduce the incidence of individual falls and the best practice management if a fall should occur (ACSQHC 2012). Protective strategies include:

- Maintaining the bed in a low position when not providing direct care at the bedside
- Using alarms that are triggered when the individual attempts unsafe activities (e.g. standing from chair unaccompanied)

- Accompanying the individual when ambulating if they are unsteady or disoriented
- Providing walking aids and handrails as a means of support and to promote greater safety
- Providing an uncluttered environment and adequate lighting
- Placing the individual's requirements, including the call bell, within reach
- Supervising individuals who are at risk of falling while performing the activities of daily living.

## Preventing infection

An individual with a nervous system disorder that impairs mobility, motor function or level of consciousness is prone to infection. When a person is ill, the body's natural defence mechanisms are stressed and therefore less able than usual to resist the invasion of pathogenic microorganisms. The two most common types of infection that may occur are urinary tract infection due to urinary stasis or catheterisation, and respiratory tract infection resulting from inadequate lung expansion, pooling of secretions in the lungs, the presence of an artificial airway or mechanical ventilation.

The National Safety and Quality Health Service Standard 'Preventing and controlling healthcare associated infections', describes the systems and strategies to prevent individuals within the healthcare system acquiring infections such as a urinary tract infections (ACSQHC 2012). Strategies to prevent a urinary tract infection include ensuring that:

- The individual receives an adequate fluid input
- Whenever possible, an external urinary drainage device or intermittent catheterisation is used rather than an indwelling catheter
- If an indwelling catheter is unavoidable, measures to prevent cross-infection are implemented. These measures include maintaining a sterile closed drainage system, performing meatal and perineal care, maintaining dependent drainage, maintaining strict aseptic care and using correct handwashing technique, which is the most effective way of preventing cross-infection. (Further information on maintaining an indwelling catheter is provided in Chapter 31.)

Measures to prevent a respiratory tract infection include ensuring that:

- When possible, the individual is nursed in a sitting or upright position to promote maximal lung expansion
- The individual performs 4-hourly deep breathing and coughing exercises
- If necessary, suction is used to remove oral and nasopharyngeal secretions
- Aseptic techniques are implemented when caring for an artificial airway.

## Promoting mobility and preventing the complications of immobility

Many nervous system disorders impair physical mobility through motor deficits, cerebellar dysfunction, alterations in sensory perception and changes in conscious or mental status. Prolonged lack of physical exercise and movement can lead to many complications, including pulmonary stasis, urinary stasis, venous stasis, decubitus ulcers, constipation and contractures. Impaired mobility varies from reductions in range of motion, or unsteady gait, to total immobility. Maintaining muscle tone and preventing orthopaedic disabilities are of prime importance when caring for an individual with impaired mobility.

To prevent functional loss:

- Active or passive range-of-motion exercises should be performed every 4 hours
- The individual should be repositioned every 2 hours to maintain correct body alignment. Weak or paralysed body parts must be carefully positioned to prevent deformity. Limb splints are often used to maintain joints in normal anatomical position. These must be checked regularly to detect any areas of pressure
- Specific exercises, such as lifting hand weights, may be prescribed to strengthen a weakened limb
- As soon as the individual's condition permits, balancing and sitting exercises are implemented. If the individual has been immobile for a prolonged period it is necessary to progress slowly to prevent orthostatic hypotension
- Once the individual is able to balance and sit, transfer activities are started; for example, from bed to chair
- When the individual is able to stand and balance in an upright position, ambulation is started
- For the individual who is unable to ambulate, wheelchair mobility may be achieved.

The individual's age, severity of illness, other neurological deficits, chronic conditions or complications contribute to progress. The individual's attitude and motivation are also important factors in regaining mobility. Frequent assessment provides evaluation of the individual's needs so that rehabilitation can progress towards the greatest level of independence. More information on preventing the complications of immobility is provided in Chapter 28.

## Providing psychological support

Many individuals who have a nervous system disorder will suffer neurological deficits resulting in loss of independence, mobility, sensory function or speech. As a result, the individual's body image and self-concept may be greatly altered and they may experience emotional lability, depression, anxiety, frustration or hostility. The individual may undergo personality changes, which may be functional or organic in origin. They may require a lengthy period to regain what were once automatically performed skills involved in the activities of daily living, or they may have to come to terms with the realisation that some skills may never be regained. The emotional shock to an individual who experiences paralysis can be devastating. The nurse has an important role in providing emotional and psychological support for the individual and their significant others. Some of the key aspects related to supporting the individual are as follows:

- During the period of dependence, it is important that dignity is preserved. Sensitivity is needed when dealing with any problems associated with loss of control (e.g. incontinence or loss of social restraint)
- Positive feedback should be provided for accomplishments no matter how minor they may appear
- Adequate information about the disease process and its management should be provided, and the individual should be encouraged to participate in decision making regarding care
- Individual needs should be anticipated to decrease frustration. As much self-care as practicable should be allowed, as a return to independence is the ultimate goal of care. The individual's significant others should be allowed to be involved in care, if they so wish
- The individual and their significant others should be encouraged to express their feelings and anxieties. If the individual is experiencing a communication problem, appropriate methods of communicating should be developed. Time, patience and understanding are necessary to allow them to come to terms with the effects and implications of the disease
- The individual should be encouraged to participate in activities of interest that will help to promote a feeling of self-worth. The occupational therapist and physiotherapist generally assist the individual to find activities that interest them and that will also provide exercise for weak or paralysed muscles.

### Providing a suitable environment

The immediate physical environment should be adapted to meet the individual's specific needs. Items should be arranged to promote safety; for example, adequate lighting, the call bell within easy reach and the bed adjusted to a suitable height. If the person is experiencing sensory deprivation (a lack of sensory input from the environment), the nurse can provide multisensory stimuli. Sensory input can be provided by talking to the person, playing a radio or recordings of the voices of the individual's significant others, by touch and by reality orientation. Reality orientation is a process of making the individual aware of their environment, for example, the date, time, people, place and objects.

Conversely, the individual may experience sensory overload, particularly if critically ill and the condition requires the use of equipment such as mechanical ventilation or a cardiac monitor, or if they are receiving the constant stimuli of nursing care. Sensory overload occurs when sustained multisensory experiences are perceived as confusing or irritating by the individual. The manifestations of sensory overload are confusion, disorientation, restlessness, agitation, panic and possible hallucinations. Every effort should be made to control and moderate the intensity of stimuli; for example, reducing tactile and environmental stimuli.

When the individual is to be discharged from hospital, the physical home environment should be evaluated and the delivery of any necessary equipment arranged so that the activities of daily living can be accomplished and independence maintained. The physiotherapist and occupational therapist arrange for the home use of ambulatory equipment and identify special needs and alterations in the individual's environment that could be beneficial to support their independence.

### Providing diagnostic test care

Preparation of the individual for, and care after, diagnostic tests is part of the nurse's role (see Chapter 19). The nurse must refer to the healthcare institution's policy manual for information about preparation of the individual for specific diagnostic tests. Preparation includes a general explanation of the procedure to reinforce the information provided to the individual by the medical officer. Other preparation may include dietary or fluid restrictions, administration of prescribed medications, assisting the individual into a specific position, skin preparation and measurement of baseline vital and neurological signs.

Post-procedural care may include assessing vital and neurological signs, measuring and recording fluid input and output, administering prescribed medications and assessing the individual for signs and symptoms such as headaches, back pain, neck rigidity, nausea or vomiting, elevated temperature or voiding difficulty.

### Promoting rehabilitation and independence

Rehabilitation is an integral part of care and is a dynamic process in which the individual is assisted to achieve optimal potential. Throughout the individual's illness, all care is directed towards the maintenance of optimal function and prevention of complications to promote as much independence as possible. Rehabilitation of an individual with a nervous system disorder includes helping with relearning the activities of daily living, management of neuromuscular and impaired perception and communication deficits, bladder and bowel retraining and educating the individual and their significant others in preparation for discharge from hospital (Brown et al 2015). (Information on rehabilitation is provided in Chapter 40.)

## CARE OF THE UNCONSCIOUS INDIVIDUAL

Consciousness is defined as a state of awareness of self and the surroundings. Consciousness implies an ability to perceive sensory stimuli and to respond appropriately to them. Unconsciousness is defined as an abnormal state in which the individual is unresponsive to sensory stimuli. There are degrees of unconsciousness that vary in length and severity, ranging from a brief episode of unconsciousness in the form of fainting to a prolonged and deep coma.

### Causes of impaired consciousness

Impaired consciousness arises from widespread damage to both cerebral hemispheres or from disruption of the reticular

activating system in the upper brainstem. Loss of consciousness may result from a cerebral tumour, abscess, haemorrhage, haematoma, laceration, bruising or ischaemia, or from metabolic processes that depress or interrupt the function of both cerebral hemispheres; for example, hypoxia, hypoglycaemia or toxic agents.

### Outcome of unconsciousness

The ultimate outcome of unconsciousness varies from full recovery of brain function, through a wide range of disabilities, to irreversible coma and death. The development of sophisticated monitoring techniques and life-support systems has increased the survival rate for comatose individuals with severe brain damage. A small percentage of individuals emerge from deep coma to a state of wakefulness without awareness, never regaining any recognisable mental function.

Irreversible coma or persistent vegetative state is used to describe a chronic condition occurring after severe cerebral damage. It is characterised by intact autonomic functions, generally intact reflexes, presence of a sleep–wakefulness cycle, spontaneous eye opening to verbal stimuli, no localising motor responses to verbal stimuli and no intact cognitive functions or awareness of self or of the environment (LeMone et al 2014).

### Brain death

Brain death is a state of irreversible brain damage characterised by absence of cognitive functions and awareness of self and the environment, inability to maintain vital functions and the absence of isoelectric activity on EEG. In brain death (or brainstem death) the higher cortical functions cease, consciousness and awareness are lost, as is voluntary control of movement and all brainstem function. Some functions are not completely dependent on the integrity of the brainstem; for example, heart rate continues, though this is usually for a limited time as the individual requires ventilatory support. If brainstem function can be shown to have ceased, then there is no prospect of recovery. The basic criteria for diagnosing brain death usually include:

- No pupillary response
- No corneal response
- No vestibulo-ocular reflex
- No motor response in cranial nerve distribution
- No gag or tracheal response
- No respiratory response to hypercapnia
- Apnoea
- Irreversible coma
- Absence of brainstem reflexes
- Isoelectric electroencephalogram (ECG)
- No spontaneous movements.

Before considering a brain death diagnosis there is a need to exclude that brain dysfunction is the result of structural or metabolic disease, rather than the result of depressant drugs, alcohol, poisoning or hypothermia (Australian Government Organ and Tissue Authority 2014; LeMone et al 2014).

Brain death is a controversial legal, ethical and medical dilemma, but it is considered ethical and legal to terminate life support in individuals diagnosed as brain dead.

## Management of an unconscious individual

When an individual is unconscious a high standard of care must be provided, with the objectives of maintaining and restoring body function and preventing complications. Medical management involves establishing a patent airway and providing adequate ventilation, controlling intracranial pressure and establishing the cause of unconsciousness and, if possible, reversing it. Nursing care of the unconscious individual requires the following practices.

### Maintaining a patent airway

With the absence of cough and swallowing reflexes, secretions accumulate in the posterior pharynx and upper trachea. An oral artificial airway may be sufficient to maintain patency, or tracheostomy or endotracheal intubation and mechanical ventilation may be necessary. To prevent airway obstruction:

- The individual is positioned on alternate sides every 2–4 hours to prevent secretions accumulating in the airways on one side. The neck should be maintained in a neutral position
- Dentures and partial plates are removed
- Nasal and oral care is provided to keep the upper airway free of accumulated secretions and debris
- Oronasopharyngeal suction equipment may be necessary to aspirate secretions
- Chest percussion and postural drainage may be prescribed to assist in the removal of tenacious secretions.

### Monitoring neurological function

The individual's neurological signs are monitored at intervals determined by their condition. The results are documented and compared with previous assessments. Information on assessment of neurological function is provided earlier in this chapter.

### Positioning

The individual is generally nursed in a lateral position with a small pillow placed under the head and neck to maintain the head in a neutral position. The upper arm is positioned on a pillow to maintain the shoulder in alignment, and the upper leg is supported on a pillow to maintain alignment of the hip. The individual's position is changed so that they lie on alternate sides every 2–4 hours. If hemiplegia is present the individual may be positioned on the affected side for brief periods, but care must be taken to prevent injury to soft tissue and nerves, oedema or disruption of the blood supply. Because vasomotor tone is decreased in the affected areas, such adverse effects can develop rapidly from improper positioning. If the correct position is maintained, secretions are able to drain from the individual's mouth, the tongue is less likely to obstruct the airway and postural deformities can be prevented.

### Meeting hygiene needs

*Care of the skin* involves keeping it clean and dry and protected from damage. Areas of the skin, particularly over the

bony prominences, should be assessed regularly for the signs of impaired blood circulation and irritation that contribute to the formation of decubitus ulcers. Dry skin may be lubricated with a suitable cream or lotion to prevent cracking and breakdown, and a water-repellent substance may be used to protect the skin against excreta or perspiration. The male should receive a facial shave as part of his daily hygiene care; the individual's nails are kept short and clean; and the hair is brushed, combed and washed as necessary.

*Care of the mouth* involves cleansing all areas at 2–4-hourly intervals to prevent a build-up of plaque, development of caries and development of a focus of infection. To prevent aspiration of fluid while oral hygiene is being performed, the individual's head is turned to one side and suction equipment made available throughout the procedure. The lips are lubricated with a suitable water-based substance.

*Care of the nose* involves cleansing the nostrils to keep them free of dried mucus. Cottonwool-tipped applicators and saline solution may be used to remove mucus and dried crusts, and a thin coating of cream may be applied to the rim of the nostrils.

*Care of the eyes* involves swabbing the eyes with moistened cotton wool to remove secretions, the instillation of artificial tears (or antibiotic eye drops if prescribed) and protecting the eyes from corneal abrasions. If the eyelids do not close fully, the use of eye shields or pads may be necessary to protect the corneas. (See Chapter 34 for more information on care of the eye.)

## Meeting nutritional and fluid needs

The nutritional and fluid needs of the individual must be regularly assessed and met to maintain body function, support tissue repair and combat infection. The dietitian prescribes a nutritional program based on consideration of the individual's energy needs, requirements for tissue repair, loss of fluid and basic life functions. Methods of administering nutritional and fluid support to the unconscious individual include total parenteral nutrition, and enteral feedings administered via a nasogastric, nasojejunal or gastrostomy tube. Parenteral nutrition is only used if there is a long-term gut absorption problem, as the aim is to normalise gut function as soon as possible. Fluid input may be restricted to a specific amount of fluid in a 24-hour period. The purpose of fluid restriction is to control increased intracranial pressure by keeping the individual slightly under-hydrated. As fluid input is correlated with output, an accurate input and output record must be maintained. (See Chapter 30 for more information on nutrition.)

## Meeting elimination needs

Because an unconscious individual is incontinent, an external urinary drainage appliance or an indwelling catheter (IDC) may be used to manage urinary drainage. Both methods are used to keep the skin dry, as urinary incontinence can quickly lead to skin breakdown. Urinary drainage devices also enable accurate calculation of urinary output. Long-term IDC is avoided whenever possible due to risk of infection. Frequent checks and meticulous skin care is preferable. (Information on care of the individual with a urinary drainage device is provided in Chapter 31.)

Constipation and faecal impaction are common complications in an unconscious individual because immobility and lack of a normal diet inhibit peristalsis. A program is established whereby aperients and rectal suppositories are administered to promote regular bowel evacuation. The frequency of bowel actions and the amount and nature of the faeces are documented (see Chapter 32).

### CLINICAL INTEREST BOX 35.5 Altered consciousness and taking temperature

Temperature should never be taken orally in individuals with altered conscious state. For an oral temperature reading to be taken safely and accurately, the individual must be able to close their lips completely and understand the importance of not biting the thermometer. Measure temperature via the tympanic or axillary routes; of these, tympanic is more accurate and therefore preferred.

## Promoting safety

Providing and maintaining a safe environment is of prime importance because an unconscious individual is unable to perceive or react to safety hazards. Clinical Interest Box 35.5 suggests alternative routes for measuring temperature when an individual is in a state of altered consciousness.

## Preventing complications

Because the unconscious individual is not mobile, they are at risk of developing any of the complications associated with immobility (muscle contractures, decubitus ulcers or venous, pulmonary or urinary stasis). (Information on preventing these complications is provided in Chapter 28.)

## Providing sensory stimulation

The extent to which an unconscious individual may be aware of what is happening to and around them cannot usually be determined; the nurse should therefore assume that the brain is receiving some sensory input. When the duration of coma extends into weeks or months, it may seem meaningless to keep explaining each activity to an individual who gives no sign of comprehension. However, on regaining consciousness some individuals have been able to describe accurately events that happened to and around them while they were unconscious. Although they were unable to communicate their feelings they were able to discriminate between the gentle caring manner of some people and the inattentive ways of others. Some individuals have reported that they longed for someone to talk to them rather than about them.

The nurse should therefore act as though the individual is conscious and demonstrate respect for them as a person.

All activities should be explained to them, privacy during procedures should be ensured and they should be treated with dignity. Family members and friends should be encouraged to talk to and touch the unconscious individual. They should be encouraged to perform certain activities for the individual, such as combing the hair or applying skin lotion. Other sensory stimuli can be provided by playing a radio or music, or by placing perfumed flowers in the room.

Recovery from unconsciousness is a gradual process that tends to vary with each individual. Rehabilitation after a prolonged period of unconsciousness includes protecting the individual from orthostatic hypotension. When able to tolerate a vertical position, an ambulation program is developed, unless neurological deficits make it infeasible (Crisp et al 2013; Berman et al 2015; LeMone et al 2014). (Information on rehabilitation nursing is provided in Chapter 40.)

### Management of the individual with impaired motor function

Disturbance of motor function is common among individuals who experience disorders of the brain, spinal cord or peripheral nerves, such as cerebral haemorrhage, spinal cord injury or peripheral neuritis. While this chapter addresses the care of an individual who has experienced a stroke or a spinal cord injury, the principles of care can be applied to individuals who experience impaired motor function from other causes. Some terms relating to impaired motor function are:

- Paresis: incomplete paralysis or muscle weakness
- Paralysis: loss or impairment of the ability to move part(s) of the body. Paralysis may be complete or incomplete, spastic or flaccid, symmetric or asymmetric, temporary or permanent
- **Hemiplegia**: unilateral paralysis, or paralysis of one side of the body. Because nerves cross in the pyramidal tract before descending to the spinal cord, damage to one side of the brain causes hemiplegia on the opposite side of the body
- **Paraplegia**: paralysis of the lower limbs and, sometimes, paralysis of the lower trunk and sphincters. Paralysis may be complete or incomplete, spastic or flaccid, temporary or permanent
- **Quadriplegia** (tetraplegia): paralysis of the arms and legs and of the body below the level of injury to the spinal cord (Brown et al 2015).

## Stroke

A stroke, also known as a **cerebrovascular accident (stroke)** or brain attack, is one of the leading causes of death in the western world, and each year many thousands of individuals survive a stroke but are left with permanent disabilities. A stroke is a sudden impairment of cerebral circulation, which causes cerebral infarction. The two types of stroke are ischaemic and haemorrhagic. In an ischaemic stoke, cerebral blood flow is suddenly impaired by a thrombus or embolus. In a haemorrhagic stroke, the rupture of a cerebral blood vessel causes bleeding into the subarachnoid space or brain tissue.

Manifestations of a stroke vary depending on the artery involved, and consequently the area of brain it supplies, and the severity of damage to cerebral tissue.

Table 35.6 lists the clinical features resulting from specific cerebral artery occlusion or rupture. If the stroke occurs in the left hemisphere, it produces symptoms on the right side of the body. If it occurs in the right hemisphere, the left side of the body is affected.

A thrombotic stroke, the most common type, is associated with atherosclerosis, which causes narrowing of the lumen of arteries. A thrombus forms in one of the cerebral arteries, occluding the vessel and resulting in cerebral ischaemia. An embolic stroke occurs when an embolus, which may be part of a thrombus, fat or other substance, is carried to the brain and occludes a cerebral blood vessel. A haemorrhagic stroke, which is often associated with hypertension, occurs when a cerebral blood vessel ruptures, spilling blood into the brain tissue. Rupture of an artery may result from a degenerative change in the arterial wall, or from an anatomical defect such as an aneurysm (Brain Foundation 2015; Stroke Foundation 2015a; 2015b). See Case Study 35.2.

### Risk factors

Educational programs have been developed to inform the general public about stroke and prevention. Many factors have been identified as predisposing a person to a stroke and, by increasing public awareness, those at risk can seek medical

### CASE STUDY 35.2

Mr Ken Nyugen is a 56-year-old male who has been admitted to the acute medical ward with an ischaemic stroke. He initially presented by ambulance after being found slumped in a chair at home by his daughter. On initial presentation to the emergency department the following assessment data was obtained:

GCS 11/15 (E4 V2 M5)
PEARL 4
RR 20
BP 210/100
HR 50 regular (12 lead ECG RBBB—old)
$SpO_2$ 92% RA—coarse crackles right lower lobe
T 37.5
Right hemiplegia
Aphasia
Dysphagia
Incontinence

1. Detail how you would perform your physical assessment of the individual.
2. What risk factors does Mr Nguyen have in relation to his stroke and how do the risk factors contribute to stroke?
3. What are some indications of dysphagia?
4. What is your management plan for Mr Nguyen? What medical interventions will be required?

## TABLE 35.6 | Manifestations of cerebrovascular accidents according to vessel involved

| Vessel | Manifestations |
|---|---|
| Middle cerebral artery (MCA) | Hemiparesis or hemiplegia (contralateral to lesion)<br>Aphasia (if left hemisphere lesion)<br>Sensory impairment (same side as hemiplegia)<br>Homonymous hemianopia<br>Deterioration in conscious level from confusion to coma<br>Headaches<br>Inability to turn eyes towards the affected side<br>Denial or lack of recognition of a paralysed extremity (if right hemisphere lesion)<br>Possible Cheyne–Stokes breathing |
| Anterior cerebral artery (ACA) | Hemiparesis or hemiplegia of leg and foot (contralateral to lesion)<br>Paresis of the arm on the side of hemiplegia<br>Gait dysfunction<br>Expressive aphasia<br>Mental status impairments:<br>• Confusion<br>• Perseveration<br>• Apathy<br>• Amnesia<br>• Short attention span<br>• Slowness<br>Deviation of eyes and head towards the affected side<br>Urinary incontinence |
| Posterior cerebral artery (PCA) | Peripheral signs:<br>• Homonymous hemianopia<br>• Memory deficits<br>• Dyslexia<br>• Several visual defects<br>• Perseveration<br>Central signs:<br>• Hemiplegia or hemiparesis<br>• Pupillary dysfunction<br>• Intention tremor<br>• Diffuse sensory loss<br>• Nystagmus |
| Internal carotid artery (ICA) (may show any or all of the signs associated with middle cerebral artery and anterior cerebral artery disease) | Hemiparesis with facial asymmetry (contralateral to lesion)<br>Paraesthesia on same side as hemiparesis<br>Hemianopia<br>Repeated attacks of visual blurring or blindness in the ipsilateral eye<br>Dysphasia (intermittent) if dominant hemisphere involved |
| Posterior inferior cerebellar artery (PICA) | Dysphagia<br>Dysarthria<br>Loss of sensation on ipsilateral side of the face<br>Loss of sensation on contralateral side of the body<br>Horizontal nystagmus<br>Ataxia<br>Vertigo<br>Nausea and vomiting<br>Ipsilateral Horner's syndrome (miotic pupils, ptosis and facial anhidrosis (inadequate perspiration))<br>Paralysis of larynx and soft palate |
| Anterior inferior cerebellar artery (AICA) | Horizontal nystagmus<br>Sensory impairment<br>Deafness and tinnitus<br>Nausea and vomiting<br>Facial paralysis<br>Horner's syndrome<br>Ataxia |
| Vertebral–basilar system (may show any of the signs of the PCA, PICA or AICA occlusion) | • Dysarthria<br>• Dysphagia<br>• Vertigo<br>• Nausea<br>• Syncope<br>• Memory loss, disorientation<br>• Ataxic gait<br>• Double vision<br>• Tinnitus<br>• Nystagmus<br>• Facial paresis<br>• Drop attacks |

*(Brown et al 2015; American Nurse Today 2015)*

advice to have any pre-existing conditions managed, thus reducing the risk of stroke. Risk factors include:

- A history of transient ischaemic attacks (TIAs)
- Atherosclerosis
- Hypertension
- Family history of stroke
- Heart disease
- Diabetes mellitus
- Smoking

Alcohol

- Sedentary work with little exercise
- Obesity
- Elevated cholesterol and triglyceride levels (Brain Foundation 2015).

### Manifestations of a stroke

In all cases of stroke, areas of the brain are deprived of an adequate oxygen supply. If the blood supply is impaired for an extended period, the involved cerebral tissue may become necrotic, resulting in permanent neurological deficits. In instances of ischaemia, temporary neurological impairment may result. The particular type and degree of neurological deficits depend on the area of the brain involved (see Table 35.6). Table 35.7 lists a comparison of manifestations associated with right- and left-sided hemiplegia.

## Care of the individual who has had a stroke

Medical management involves control of cerebral oedema and subsequent increased intracranial pressure, surgical intervention if indicated and drug therapy; for example, thrombolytic medication such as tissue plasminogen activator (TPA) may be given to individuals experiencing a non-haemorrhagic stroke. Nursing care of the individual involves:

- Managing the acute phase
- Meeting basic needs
- Preventing complications
- Providing psychological support
- Promoting rehabilitation.

**TABLE 35.7 | Manifestations of stroke**

| Left-sided stroke | Right-sided stroke |
|---|---|
| Right-sided hemiplegia (left stroke) | Left-sided hemiplegia (right stroke) |
| Aphasia—expressive, receptive or global | Spatial–perceptual deficits |
| Intellectual impairment | Tends to be distractible; impulsive behaviour |
| Slow behaviour | Appears to be unaware of deficits; poor judgment |
| Defects in right visual fields | Defects in left visual fields |

*(Brown et al 2015)*

### Care during the acute phase

The acute phase begins when the individual is admitted, and continues until their condition is stable. Nursing care is directed towards maintaining a patent airway and monitoring vital and neurological signs.

*Maintaining a patent airway*. This involves positioning the individual on their side, administering oxygen as prescribed and suctioning secretions from the airway. Care must be taken when performing oronasopharyngeal suction, as suction applied for longer than 15 seconds at a time may increase intracranial pressure.

*Recording fluid input and output*. This information should be kept to monitor kidney function and to evaluate fluid and electrolyte balance.

*Vital and neurological signs*. These signs should be assessed frequently, for example every 15–30 minutes, to detect changes in the individual's condition. Information on neurological assessment is provided earlier in this chapter. If the individual is unconscious, the principles of care described previously should be incorporated.

### Care after the acute phase

Detailed information about the nursing measures necessary to meet the individual's basic needs for hygiene, safety, elimination, nutrition and fluids, psychological support, mobility and rehabilitation are provided elsewhere in this text. Clinical Interest Box 35.6 provides some suggestions that can facilitate self-care after stroke.

The main aims of care for an individual who has experienced a stroke are to:

- Assist in meeting hygiene needs
- Monitor vital and neurological signs
- Maintain muscle tone and prevent contractures
- Prevent skin breakdown
- Prevent venous stasis (thrombus and embolus formation)
- Prevent and manage alterations in elimination (e.g. incontinence, retention of urine, constipation)
- Maintain nutritional and fluid status
- Establish an adequate means of communication
- Promote reorientation of a confused individual
- Enhance self-concept and body image
- Institute a rehabilitation program aimed at achieving an optimal level of independence (Stroke Recovery Association NSW 2014a; Brown et al 2015).

### Rehabilitation

Rehabilitation of the individual begins on admission to hospital and continues for as long as necessary including after discharge home. In some healthcare institutions the individual may be transferred to a rehabilitation unit after the acute phase of their illness. The focus of rehabilitation is directed at helping the individual to relearn lost skills and to become as independent as possible. The individual and their significant others are made aware of the plan and goals of the rehabilitative phase, and their active participation is encouraged. Recovery from a stroke is a slow process; therefore the

## CLINICAL INTEREST BOX 35.6 Devices to facilitate self-care after stroke

The following list identifies useful items that may assist neurologically impaired individuals to perform self-care more easily and safely after a stroke or other disorders.

**Eating devices**

- Plate guards to prevent food from being pushed off plate
- Wide grip utensils to accommodate weak grasp
- Non-skid mats to stabilise plates

**Mobility aids**

- Canes, walkers, wheelchairs
- Transfer devices such as slide boards and belts

**Bathing and grooming devices**

- Shower and bath chairs
- Electric razors with head at 90 degrees to handle
- Grab bars, non-skid mats, hand-held shower heads
- Long-handled bath sponge

**Dressing aids**

- Velcro closures
- Elastic shoe laces
- Long-handled shoe horn

**Toileting aids**

- Raised toilet seat
- Grab bars next to toilet

*(Independent Living Centre NSW 2015)*

nurse must provide support and positive feedback so that the individual does not become discouraged. Rehabilitation of the individual includes:

- Encouraging participation in their own care as much as possible
- Teaching them to perform the activities of daily living with regard to ways of compensating for any disabilities
- Teaching and assisting with performance of transfer activities (e.g. bed to chair)
- Assisting in the regaining of any lost communication skills
- Encouraging expression of feelings, to decrease anxiety and to allow for correction of any misunderstood information
- Developing a bladder and bowel retraining program (if necessary) (Stroke Recovery Association NSW 2014c).

More information on rehabilitation nursing is provided in Chapter 40.

### Planning for discharge

Discharge planning is directed at facilitating the transition from the healthcare institution to the home environment. Discharge planning involves assessing the individual and the family, identifying specific needs, planning to implement ways of meeting those needs and evaluating the discharge process and the results. After the individual is discharged home, they and the family must have contact with support services, such as the district nurse, whom they can rely on for continued help and support (Stroke Foundation 2015a; 2015b; Stroke Recovery Association NSW 2014b).

## Spinal cord injury

Injuries involving the spinal cord result most often from motor vehicle accidents, falls, sporting and industrial accidents and firearm or stab wounds. Injuries to the vertebral column and spinal cord result from forces applied directly or indirectly to the head, neck or trunk. Apart from direct tearing of the spinal cord, the main damage is caused by haemorrhage, oedema and disruption of the blood supply to the cord. Additional compression can result if bony fragments or disc material press on the spinal cord.

Manifestations of spinal cord damage depend on the degree and site of the injury. Complete spinal cord transection causes a total loss of motor and sensory function below the level of injury. With cervical cord transection there is paralysis of all four extremities (quadriplegia/tetraplegia). There are varying degrees of arm and ventilatory paralysis, depending on the injury level. With thoracic cord transection, down to the level of the second lumbar vertebra, there is paralysis of the lower extremities (paraplegia). There is often some loss of intercostal muscle function and loss of bladder and bowel function. With transection in the region of lumbar vertebrae there is loss of a combination of sensory, motor, bowel and bladder function.

Complete cord transection results in immediate flaccid paralysis, loss of sensation and loss of reflexes below the level of injury. As paralysis subsides, reflexes usually return and flaccidity changes to involuntary spastic movements. Recovery of any motor or sensory function is rare when there has been complete paralysis of these functions for several days. With incomplete spinal cord injuries, degrees of motor and sensory deficit below the level of damage vary. The individual may experience temporary paralysis, with function returning when any oedema subsides (Spinal Cord Injuries Australia nd; LeMone et al 2014).

Damage to the spinal cord and nerve roots results from:

- Compression by displaced bone or ligaments, extruded disc or haematoma formation
- Excessive stretching, crushing, shearing or severance of neural tissue
- Swelling in response to bruising or compression
- Impaired capillary circulation and venous return.

There are four possible vectors (forces) that can be applied to the spinal column to cause injury:

1. Flexion: excessive flexion (hyperflexion) tends to produce compression of the vertebral bodies, with disruption of the posterior ligaments and the intervertebral discs. Hyperflexion injuries are caused by hyperflexion of the head and neck, as in sudden deceleration of a vehicle

2. Extension: excessive extension (hyperextension) usually causes fractures of the posterior elements of the vertebral column and disruption of the anterior ligaments. Hyperextension injuries are caused by hyperextension of the head and neck, as may occur in a rear-end vehicular accident
3. Rotation (lateral flexion): excessive rotation is most likely to produce rupture of the ligaments, fracture and fracture dislocation of the vertebral facets. Rotational injuries are caused by extreme lateral flexion or rotation of the head and neck
4. Compression: compression can result in fractures of the vertebral body and arch, and rupture of the supporting ligaments. Compression injuries are caused by vertical pressure as occurs when a person falls from a height and lands on their feet or buttocks (Spinal Hub 2015a).

### Classification of spinal cord injuries

Spinal cord injuries can be classified by the type of injury and by syndromes:

- Concussion: severe shaking of the spinal cord that causes temporary loss of function lasting about 24–48 hours
- Contusion: bruising of the spinal cord, which includes bleeding into the cord
- Laceration: an actual tear in the spinal cord
- Transection: severing of the cord—may be complete or incomplete
- Haemorrhage: bleeding into or around the cord. Escaped blood is an irritant to the delicate tissue
- Anterior cord syndrome: due to injury of the anterior part of the spinal cord and associated with flexion injuries and fracture dislocations of the vertebrae. Manifestations include loss of pain and temperature sensation and motor function below the level of the injury. The sensations of light touch, position and vibration remain intact
- Posterior cord syndrome: a rare syndrome in which the senses of position and vibration are involved
- Central cord syndrome: due to injury and/or oedema to the central cord in the cervical region (e.g. as a result of hyperextension injuries). Manifestations include a greater loss of motor function in the upper limbs (rather than the lower), bladder dysfunction and varying degrees of sensory impairment
- Brown-Séquard syndrome: results from open penetrating wounds that produce transverse hemisection of the cord. Manifestations include loss of pain and temperature sensation on the side opposite the injury, and loss of motor function, light touch, position and vibratory sensation on the side of the injury (Brown et al 2015).

### Manifestations of spinal cord injury

Generally, the degree of damage to the spinal cord at any level is described as incomplete or complete transection. Incomplete transection of the cord produces loss or impairment of sensation and motor function that reflects the specific nerve tracts that have been damaged. Complete transection of the cord results in permanent loss of voluntary movement, sensation, reflex and autonomic function below the level of injury.

### Spinal shock

Spinal shock is an immediate response to an acute spinal cord injury and is the temporary suppression of reflexes controlled by the segments below the level of injury. After a period that may vary from hours to months, the spinal neurons gradually regain their excitability. Subsequent return of some function results from decompression of the cord as oedema resolves (Spinal Hub 2015b; Brown et al 2015).

### Functional loss from spinal cord injury

The different functions and dysfunctions associated with spinal cord injuries at specific levels are listed in Table 35.8. The effects of spinal cord injury on sexual response vary depending on the level and degree of injury. Sexual function is controlled by spinal levels S2, S3 and S4. Knowledge of the physiology of alterations in sexual response after spinal cord injury is incomplete, and significant individual differences exist. People with complete loss of sensation in the genitalia may still experience orgasm in response to sensations produced by stimulation of other areas of the body in which sensation is intact. Sexual pleasure can also be increased by psychological stimuli, such as memory, sight, sound and odour. Physical stimulation of the genitalia may produce reflex erection of the penis and vaginal lubrication, even though there is no sensory awareness of stimulation (LeMone et al 2014).

## Care of the individual with spinal cord injury

Management of the individual at the scene of the accident is critical to the ultimate neurological outcome. The basic objectives of first aid management at the scene are to:

- Prevent death from asphyxia
- Prevent further spinal cord damage from torsion, flexion or extension of the unstable spine
- Transport the individual rapidly and safely to an appropriate facility
- Subsequent management of the individual involves emergency department care, early management, post-acute and long-term management.

### Initial management

On arrival of the individual in the accident and emergency department, the medical officer assesses the individual, and x-rays are taken to determine the extent of the injuries. The medical officer develops a plan of care that may include immediate surgery or a non-surgical approach with traction and immobilisation and insertion of a nasogastric tube, indwelling urinary catheter and intravenous infusion. Generally, glucocorticoid steroids are prescribed to reduce cord swelling.

**TABLE 35.8 | Spinal cord injury—functional loss**

| Level of injury | Motor function | Sensory function | Bladder/bowel function | Ventilatory function |
|---|---|---|---|---|
| C1–C4 | Loss of all function from the neck down | Loss of sensation from the neck down | No bladder or bowel control | Loss of independent ventilatory function |
| C5 | Loss of all function below the upper shoulders | Loss of sensation below the clavicles | No bladder or bowel control | Phrenic nerve is intact but the intercostal muscles are non-functional |
| C6 | Loss of all function below the upper arms | Loss of sensation below the clavicles, but some arm and thumb sensation | No bladder or bowel control | Phrenic nerve is intact but the intercostal muscles are non-functional |
| C7 | Incomplete quadriplegia. Loss of motor control to parts of the arms and hands | Loss of sensation below the clavicles but some arm and hand sensation | No bladder or bowel control | Phrenic nerve is intact but the intercostal muscles are non-functional |
| C8 | Incomplete quadriplegia Loss of motor control to parts of the arms and hands | Loss of sensation below the chest and part of the hands | No bladder or bowel control | Phrenic nerve is intact but the intercostal muscles are non-functional |
| T1–T6 | Loss of function below the mid-chest | Loss of sensation from the mid-chest down | No bladder or bowel control | Independent phrenic nerve function; some intercostal muscle impairment |
| T6–T12 | Loss of function below the waist | Loss of sensation below the waist | No bladder or bowel control | No interference to ventilatory function |
| L1–L2 | Loss of most control of the pelvis and legs | Loss of sensation to the lower abdomen and legs | No bladder or bowel control | No interference to ventilatory function |
| L3–L4 | Loss of control of part of the lower legs and feet | Loss of sensation to part of the lower legs and feet | No bladder or bowel control | No interference to ventilatory function |
| L5–S5 | Loss of control of parts of the hips, knees, ankles and feet | Loss of sensation to parts of the lower limbs and perineum | May or may not be loss of bladder and/or bowel control | No interference to ventilatory function |

*(eMedicine Health 2015; Brown et al 2015)*

### Early management

After initial assessment and stabilisation of the individual, they are admitted to the intensive care or spinal unit. An individual with less severe injuries may be admitted to a general ward. Medical management will depend on the type of spinal cord injury and any associated injuries. Treatment may be surgical, non-surgical or a combination of both approaches. Surgical management may take the form of decompression laminectomy, fusion of vertebrae, open or closed reduction of fractures or dislocations or the insertion of rods. Non-surgical management involves immobilisation of the spine (Figure 35.9) using skeletal tongs with traction, halo traction, a cervical collar or a device designed to maintain thoracic or lumbar alignment, such as a fibreglass body jacket.

## Nursing care of the individual with a spinal cord injury

Nursing management will vary according to the individual's injury and whether a surgical or non-surgical approach is selected. However, the major aspects of care are directed towards maintaining respiratory function, immobilisation and alignment of the spine, preventing complications, meeting basic needs, providing psychological support and rehabilitation.

### Respiratory care

An individual with a spinal cord injury can develop varying degrees of respiratory difficulty, depending on the level of spinal injury. The individual will require a plan of care

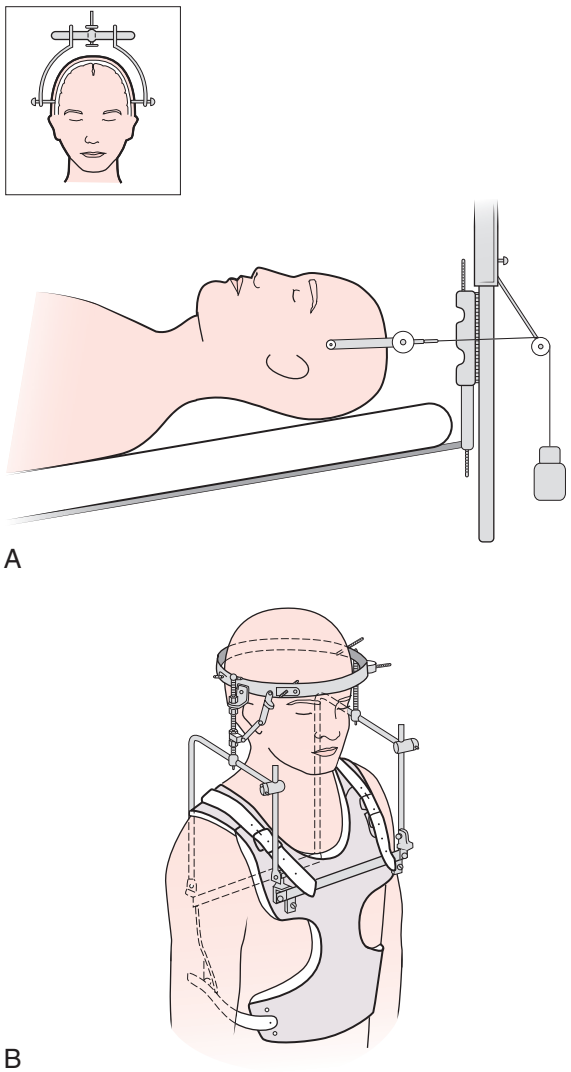

**Figure 35.9** Immobilisation of the spine

A: Cervical traction with tongs. The inset shows the position of the tongs on the bone structure of the skull B: Halo traction and vest

directed at preventing pulmonary complications. Intubation and mechanical ventilation will be required if there is impairment of respiratory muscle function. The program of care includes:

- Regular assessment for indications of inadequate ventilation
- Chest physiotherapy at least every 4 hours
- Maintenance of a patent airway
- Use of an incentive spirometer to promote lung expansion.

## Immobilisation and alignment of the spine

After alignment of the spine has been achieved, immobilisation serves to maintain alignment and promotes healing at the site of injury. For most thoracic, lumbar or sacral injuries the individual remains confined to bed, with the back positioned and supported to achieve hyperextension of the spine at the site of injury. A bed with a firm mattress and steel base and correctly positioned pillows are necessary to maintain the prescribed posture.

## Skeletal traction

When the injury involves dislocation or fracture-dislocation of the cervical or high thoracic spine, skeletal traction is commonly used to accomplish alignment and immobilisation (see Figure 35.9). Skeletal traction may be achieved by means of cervical tongs, such as Crutchfield tongs, or by the halo device. The halo device may also be incorporated with the use of a body vest or jacket to stabilise the spine, thereby allowing the individual to be ambulatory. When skeletal traction is used, the individual may be nursed on a firm mattress and fracture board, or on a special bed such as a Stryker frame.

After skeletal traction has been established, pain is decreased and the individual's comfort is enhanced. Turning can be carried out using a special technique (as described in Chapter 23) to allow for skin care and a change of position. Management of the individual in cervical skeletal traction includes:

- Checking the traction equipment every 2–4 hours to ensure safety and integrity of the treatment
- Inspecting, cleansing and dressing the pin sites according to the institution's policy (e.g. every 4–8 hours)
- Changing the individual's position every 2 hours to prevent the complications of immobility. The 'log-rolling' technique or the Stryker frame is used to turn the individual to maintain the vertebral column in neutral position
- Using various devices (e.g. pillows, a foot board, a cervical roll) to maintain good body alignment. When the individual lies supine, the arms and legs are positioned in extension with support to maintain the feet in dorsiflexion. The hands are placed in a functional position and a cervical roll is used to maintain hyperextension of the neck. When the individual is in a lateral position, the arms and legs are positioned in extension, and pillows are placed to support this position (LeMone et al 2014).

## Preventing complications

Because prolonged immobility can lead to various complications, specific preventive measures must be implemented. (Information on preventing the complications associated with immobility is provided in Chapter 28.)

## Meeting basic needs

Individuals with impaired motor and sensory function require assistance to meet their needs for hygiene, safety, elimination, nutrition and fluids, temperature regulation and pain relief (NSW Agency for Clinical Innovation 2013a). (Information on assisting individuals to meet these basic needs is provided in other chapters.)

## Providing psychological support

A severe spinal cord injury has a devastating affect on the individual and their significant others, and they will experience

a range of emotional responses, from the time of injury and through the rehabilitation process. The individual will have to adapt to the loss of motor function and sensory deprivation, both of which severely threaten self-concept and body image. It is important that the nurse is aware of the impact that the injury has on the individual's emotional and psychological equilibrium. The nurse must be sensitive to the emotional and psychological response of the individual to the injury, and be supportive as they deal with the impact of the injury. The nurse can help to support the individual by:

- Establishing a climate of trust
- Accepting behaviour, without being judgmental
- Encouraging expression of feelings
- Listening empathetically and attentively
- Allowing the individual to make decisions and maintain control
- Providing information as necessary
- Supporting a positive self-concept and self-esteem
- Informing the individual that it will take time to adjust to the disability (NSW Agency for Clinical Innovation 2013b; LeMone et al 2014).

See Nursing Care Plan 35.1.

## Promoting rehabilitation

In most instances of spinal cord injury the individual will require long-term rehabilitation. Rehabilitation after spinal cord injury is a lifelong process of learning to live with a disability. The individual and family together with the healthcare team members contribute to the development of the rehabilitative plans. (Information on rehabilitation is provided in Chapter 40.)

### CRITICAL THINKING EXERCISE 35.6

An 18-year-old male has been admitted to the neuro rehabilitation ward after complete transection of his spinal cord at C7 level following a motor bike accident. What motor and sensory function would you expect the individual to have? The individual says he is looking forward to learning to use special equipment. Do you think his emotional response is appropriate? How would you respond? What elimination issues may emerge? How would you deal with these?

## NURSING CARE PLAN 35.1

**Assessment:** Mr W, 72, had a posterior lumbar interbody fusion L3–4, L4–5 2 days ago following a fall down the stairs. Pt is alert and orientated, full power in both upper limbs and left leg; however, mild weakness in right leg and normal sensation. Mr W has a pain score of 6/10 in his surgical site, worse on mobility. He is mobilising to the bathroom with assistance of one. When not mobilising he is resting in bed.
**Issue/s to be addressed:** Immobility related to lumbar fusion
**Goal/s:** Mr W will remain free of complications of immobility

| Care/Actions | Rationale |
|---|---|
| Positioning | |
| Teach and encourage how to sit on the side of the bed independently | Encourages independence during transfer and positioning. Maintains alignment during position change |
| Physiotherapy and exercise program | Assists to strengthen muscles used to transfer and mobilise |
| Provide pain relief prior to mobilising | Reduces pain on transfer and mobilisation |
| Provide education regarding transfer, mobilisation and safety to decrease falls risk | Decreased falls risk and anxiety |
| Skin integrity | |
| Ensure the skin is checked for non-blanching redness, oedema, localised heat and integrity after repositioning | Monitors for pressure injuries<br>Documents skin integrity each shift |
| Reduce risk of pressure injury related to immobility | |
| Ensure moisture is removed from the skin caused by urinary and faecal incontinence | Reduces risk of impaired skin integrity related to incontinence |
| Circulatory care | |
| Ensure graduated compression stockings or intermittent pneumatic compression (SCDs) are used until fully mobile | To facilitate venous return from the lower extremities and prevent venous stasis and venous thrombosis |
| Assess both lower extremities for skin colour, temperature, skin condition, oedema and Homans' sign (pain in calf with passive dorsiflexion of the foot) | To reduce peripheral oedema |

## NURSING CARE PLAN 35.1—CONT'D

| Care/Actions | Rationale |
|---|---|
| Encourage leg exercises while awake | |
| Assist to sit on the side of the bed before transferring to chair | Reduces orthostatic hypotension |
| Administer anticoagulant | Prophylaxis to assist in prevention of venous thromboembolism (VTE) |

**Evaluation**

Skin integrity observed and documented each shift.
Mr W able to mobilise with minimal assistance of one.
Pain relief offered prior to mobilisation.
Calves assessed each shift.

*(LeMone et al 2014; Berman et al 2015)*

## Summary

The nervous system is a complex system, responsible for communication within the body and between the body and its environment. It is divided into two primary divisions: the central nervous system and the peripheral nervous system.

Nervous tissue is commonly described as grey and white matter. The grey matter is composed of cells and the white matter is made up of fibres. Neurons are the primary components of nervous tissue, which are bound together by neuroglia. Neurons have two functional properties, irritability and conductivity. This means that neurons are able to respond to a stimulus, convert it into an impulse and transmit the impulse to other neurons, muscles or glands. Impulses are transmitted through spaces, called synapses, between neurons.

The central nervous system consists of the brain and the spinal cord. The brain is a large organ composed of the cerebrum, diencephalon, brainstem and cerebellum. Each part of the brain has specific functions. The spinal cord lies within a canal inside the vertebral column, extending from the base of the skull to the first or second lumbar vertebra. The spinal cord receives sensory impulses, conveys motor impulses and is the centre through which reflex actions take place. The meninges are three membranes that cover the brain and spinal cord to protect them against physical injury. Cerebrospinal fluid is a clear watery fluid produced in the ventricles of the brain, which circulates in the subarachnoid space surrounding the brain and spinal cord. It protects the brain and spinal cord and provides a medium for the exchange of nutrients and waste products.

The peripheral nervous system consists of 12 pairs of cranial nerves and 31 pairs of spinal nerves. The nerves of the peripheral nervous system may be: sensory, carrying impulses to the brain and spinal cord; motor, carrying impulses away from the brain and spinal cord; or mixed. The motor nervous system is divided into somatic and autonomic nervous system divisions. The autonomic nervous system division is composed of the sympathetic nervous system and the parasympathetic nervous system. It is the section of the peripheral nervous system concerned with the involuntary activity of the body. Sympathetic nerves have a stimulating effect on most organs, while parasympathetic nerves tend to slow down body processes.

Normal function of the nervous system may be impaired as a result of congenital disorders, inflammatory or infectious conditions, trauma, neoplasia, degenerative conditions or metabolic and endocrine disorders. The major manifestations of nervous system disorders are headaches, sensory changes, motor changes, reflex changes, altered states of awareness or consciousness and seizures. Disorders of the nervous system can be classified as those occurring from congenital or hereditary defects, from multiple causes, degenerative disorders, immunological disorders, infectious or inflammatory conditions, neoplastic or obstructive disorders and trauma.

Diagnostic tests used to assess nervous system function include the neurological examination, radiographic examination, magnetic resonance imaging and electroencephalography. Care of the individual with a nervous system disorder includes promoting a clear airway, maintaining fluid and nutritional status, preventing and managing alterations in elimination, promoting effective communication, promoting safety, promoting mobility, preventing the complications of immobility, providing psychological support, assessing neurological status, providing a suitable environment and promoting rehabilitation.

## DECISION-MAKING FRAMEWORK EXERCISE 35.1

Jenna is a student Enrolled Nurse on an acute neurological unit where she is caring for Mr H, a 62-year-old male.

Mr H had a stroke 10 days ago. He is opening his eyes to verbal command; however, he remains drowsy with inappropriate words his best verbal response.

Mr H has had a nasogastric tube inserted for administration of medications and enteral feeds.

The previous shift reported that Mr H's NG had been reinserted after he pulled it out and suggested that Mr H be restrained to prevent the nasogastric tube being removed again.

Jenna has been informed by the RN supervising her to tie Mr H's hands to the bed rail to prevent the tube being removed. Jenna is aware that this would be a form of restraint.

Using the decision-making framework answer the following questions:

1. What should Jenna consider when making this decision?
2. What is the hospital policy regarding the restraint of an individual?
3. Have alternatives to restraining Mr H been considered?
4. Have any potential risks of restraining Mr H been considered?
5. Does Jenna have the required level of education to restrain Mr H?
6. Should the medical officer caring for MR H be informed?

## Review Questions

1. What is anosmia? What is the impact on the individual? What are the only tastes you can sense on your tongue? Why is education prior to discharge important?
2. An individual arrives on your ward diagnosed with a left fronto-temporal brain tumour. What deficit may he have? What can you do as his nurse to help him?
3. An individual who was in an accident 30 minutes ago reports she is unable to move her legs. Do you tell her about rehab? Do you caution her about seatbelt use? Do you say she has spinal swelling? Do you say initial swelling may make the assessment inaccurate and re-assessment will be done when the swelling has resolved?
4. The family of an individual with a ruptured aneurysm says she was seen by her doctor a few months ago and was given a clean bill of health. They worry that their GP missed something. What can you tell them to reassure them, about the nature of aneurysms? The individuals's sister also had an aneurysm last year. What should the family be advised to do?
5. An 18-year-old man has been admitted for a cranioplasty, following recent MVA resulting in head trauma, raised ICP and craniectomy. He is confused and impulsive. What specific care is needed for this individual in relation to positioning in bed and mobilising? What can be done about impulsiveness, climbing out of bed, etc?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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# Nursing assessment and management of endocrine health

*John P Elias*

CHAPTER 36

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define key terms
- Describe the locations and basic anatomy of each endocrine gland and the factors which control hormone synthesis and release from them
- Define and explain the actions of the hormones secreted by each endocrine gland
- Identify and describe the disorders associated with each endocrine gland
- Discuss the pathophysiological influences associated with endocrine gland and hormone disorders
- Explain the effects, signs or symptoms of endocrine disorders
- Understand the rationale behind the diagnostic tests that may be used when assessing endocrine function
- Assist in the planning and implementation of nursing care for the individual with an endocrine disorder

## KEY TERMS

acromegaly
Addison's disease
adrenal glands
Cushing's syndrome
diabetes insipidus
diabetes mellitus (type 1)
diabetes mellitus (type 2)
dwarfism
dysfunction
gigantism
glucose
goitre
Graves' disease
homeostasis
hormone
hyperglycaemia
hypersecretion
hypoglycaemia
hyposecretion
insulin
metabolism
myxoedema
pancreatic islets
parathyroids
phaeochromocytoma
pituitary gland
polycystic ovary syndrome
thyroid gland

## CHAPTER FOCUS

The endocrine system is comprised of a number of small glands which secrete hormones, chemical messengers which aid in maintaining homeostasis in the body. Hormones are involved in physiological processes such as metabolism, growth, fluid balance and reproduction. Over- or under-production of these hormones can have widespread effects because of the close relationship between the endocrine and other systems in the body. An understanding of the function of these hormones, and the effects of hormone imbalances, gives healthcare professionals the ability to interpret dysfunction and to care for individuals with an endocrine disorder.

## LIVED EXPERIENCE

I was always a very fit and active person until I started to notice that my heart rate would increase rapidly when simply walking up stairs and I would become hot and sweaty for no reason and unable to sleep. Then one day a few minutes into a jog I had heart palpitations and I was completely out of breath: I was terrified. My doctor tested my blood pressure and my heart for a murmur and I had blood tests for a whole range of things. While waiting for the results I lost 4 kg in just 3 days! This coincided with an enormous increase in appetite—I was eating 5 meals a day!

My blood test results showed I had Graves' disease. I had never even heard of it before. And neither had anyone in my family.

After being diagnosed with Graves' disease it took months of cycling from hyperactive to underactive while adjusting my medication until I felt 'normal' again. Some days I would be hot, sweaty and intolerant to heat, have an increased appetite, lose weight and be unable to sleep. Then I would just as quickly be cold and tired; I would feel depressed and I would put on weight.

**Carli, 33-year-old fitness instructor**

Carli just started getting really restless and hyperactive. I told her it was because of all the exercise she was doing, but it didn't make sense. I couldn't even sleep in the same bed! She would toss and turn and kick off the doona.

When she started eating two breakfasts every morning and chocolate every night, and she was losing weight, we knew it was something more than just nerves.

The problem is that Carli's radioactive treatment worked too well—now she has to take thyroid hormone replacement for the rest of her life.

**Ian, Carli's husband**

# STRUCTURE AND FUNCTION OF THE ENDOCRINE SYSTEM

## Endocrine glands and hormones

The endocrine system is a cellular communication system involving the secretion of hormones by glands. A **hormone** is a chemical regulator that integrates and coordinates cellular activities. Once secreted, hormones are transported to areas of the body where they stimulate a specific cellular activity in a target organ (Patton & Thibodeau 2012). Figure 36.1 illustrates the major endocrine glands and their location. Hormones are either steroids or proteins, and despite being circulated widely by the blood, only target cells with specific receptors have the ability to respond to a specific hormone. Binding to these receptors initiates a response that may take seconds or days: compared to the nervous system, the effects of hormones are much more prolonged (Marieb & Hoehn 2014).

The effects of many hormones are widespread and diverse, while others are quite tissue specific. The major bodily processes controlled by the endocrine system are: reproduction; growth and development; maintenance of fluid electrolytes; maintenance of blood nutrients; and cellular **metabolism** and energy regulation (Marieb & Hoehn 2014). Most hormones are continuously secreted at a rate determined by stimulation of the gland that releases them. Endocrine gland secretion may be enhanced or depressed by blood-borne stimuli, neural input or other hormones: some hormones can exert control over other endocrine glands and other hormones by influencing their action, metabolism, synthesis and transport. The activation or inhibition of endocrine glands relies on negative feedback to maintain homeostatic levels of hormones and their effects (Patton & Thibodeau 2012). Disruption of this **homeostasis** presents as endocrine and hormone imbalances and pathologies. Table 36.1 lists all the major hormones, their effects and the endocrine glands responsible for their production and release.

## The pituitary gland

The pituitary gland, or hypophysis, is about the size of a pea and is positioned at the base of the brain in a depression in the sphenoid bone. The **pituitary gland** (Figure 36.2) is often referred to as the 'master gland' of the endocrine system (Marieb & Hoehn 2014). This term reflects not only the number of hormones it secretes, but the influence of many of these hormones in controlling other endocrine tissues as well. It lies just beneath the hypothalamus, to which it is physically connected by a stalk containing blood vessels and nervous tissue. It has two functional lobes: the anterior lobe comprised of glandular secretory tissue; and the posterior

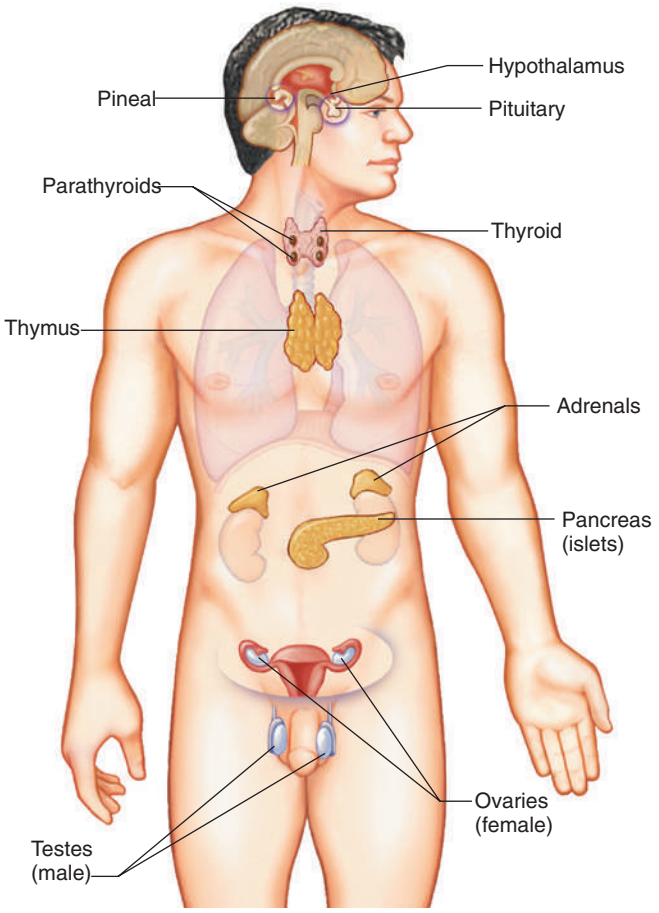


**Figure 36.1** The endocrine system
*(Patton & Thibodeau 2012:547)*

lobe which is nervous tissue. Each lobe performs specific functions which reflect their embryological origin.

The anterior lobe or adenohypophysis produces and releases:

- Growth hormone (GH), which is a metabolic hormone concerned with body growth, particularly that of skeletal muscles and long bones
- Thyrotrophic hormone (TH), also referred to as thyroid-stimulating hormone (TSH), which is responsible for controlling the growth and activity of the thyroid gland
- Adrenocorticotrophic hormone (ACTH), which regulates the activity of the cortex of the adrenal glands in hormone production
- Prolactin (PRL), also referred to as lactogenic hormone, which stimulates the mammary glands to secrete milk after the birth of a baby
- Gonadotrophic hormones, which control the development and functions of the ovaries and testes. These hormones are:
  - follicle-stimulating hormone (FSH), which in the female stimulates the maturation of the ovarian follicle and ovum and the secretion of oestrogen, and in the male stimulates the seminiferous tubules to produce sperm
  - luteinising hormone (LH), which in the female triggers ovulation and stimulates ovarian production of oestrogen and progesterone (the corpus luteum which forms after ovulation secretes progesterone), and in the male stimulates the testes to secrete testosterone.

**TABLE 36.1 | The major endocrine glands, hormones and their roles**

| Endocrine gland | Hormone | Target | Role or effect |
|---|---|---|---|
| Anterior pituitary | Growth hormone (GH) | All body tissues | Promotes growth and metabolism |
| | Thyroid-stimulating hormone (TSH) | Thyroid gland | Regulates production and release of thyroid hormones |
| | Adrenocorticotrophic hormone (ACTH) | Adrenal cortex | Regulates secretion of corticosteroids |
| | Follicle-stimulating hormone (FSH) | Ovaries | Stimulates maturation of ovarian follicle and production of oestrogen |
| | | Testes | Regulates production of sperm |
| | Luteinising hormone (LH) | Ovarian follicle | Triggers ovulation and stimulates production of oestrogen and progesterone |
| | | Testes | Promotes production of testosterone |
| | Prolactin (PRL) | Breasts | Stimulates milk production |
| Posterior pituitary | Oxytocin | Uterus | Stimulates uterine contractions and initiates labour |
| | | Breasts | Stimulates milk secretion |
| | Antidiuretic hormone (ADH) (vasopressin) | Renal tubules | Regulates reabsorption of water |
| | | Vascular muscle | Vasoconstriction |
| Thyroid | Thyroxine ($T_3$ & $T_4$) | All body tissues | Regulates metabolic rate, regulates growth |
| | Calcitonin | Bone | Decreases plasma calcium levels |

*Continued*

**TABLE 36.1 | The major endocrine glands, hormones and their roles—cont'd**

| Endocrine gland | Hormone | Target | Role or effect |
|---|---|---|---|
| Parathyroids | Parathyroid hormone (PTH) | Bone<br>Kidneys | Increases plasma calcium levels<br>Regulates reabsorption of calcium and excretion of phosphorus; activates vitamin D |
| Adrenal cortex | Glucocorticoids (e.g. cortisone)<br><br>Mineralocorticoids (e.g. aldosterone)<br>Sex hormones (e.g. androgens, oestrogens) | All body tissues<br><br>Renal tubules<br><br>Widespread | Regulates metabolism of protein, fat and carbohydrate<br>Suppresses inflammation<br>Stress response<br>Regulates sodium and potassium balance<br><br>Maintenance of fluid balance<br>Weak influence on development of secondary sexual characteristics and growth |
| Adrenal medulla | Adrenaline and noradrenaline | Widespread | Sympathetic effects<br>Response to stress<br>Secretion of ACTH |
| Pancreatic islets | Insulin<br><br>Glucagon | Widespread<br><br>Liver<br>Muscles<br>Adipose cells | Stimulates decrease in plasma glucose and cellular uptake<br>Stimulates increase in plasma glucose and glycogenolysis |
| Gonads (ovaries) | Oestrogen<br><br>Progesterone | Reproductive tissues<br>Breasts<br>Uterus | Development of secondary sexual characteristics, maturation of sexual organs and function<br>Development of mammary tissue<br>Preparation for implantation and maintenance of pregnancy |
| Gonads (testes) | Testosterone | Widespread | Development of secondary sexual characteristics, maturation of sexual organs and function |
| Thymus | Thymosin | Immune system | Lymphocyte development |
| Pineal | Melatonin | Hypothalamus<br>Midbrain | Circadian rhythm |

*(Brown et al 2015; Marieb & Hoehn 2014; Patton & Thibodeau 2012)*

The posterior lobe receives, stores and releases the following hormones which are synthesised in the hypothalamus:

- Oxytocin, which stimulates uterine contraction and the initiation of childbirth, and causes the ducts of the mammary glands to contract and expel breast milk
- Antidiuretic hormone (ADH), which stimulates the kidney tubules to reabsorb water, resulting in decreased excretion of water in the urine (Marieb & Hoehn 2014).

TSH, ACTH, FSH and LH may all be considered as trophic hormones in that they affect the activity and secretion of other hormones from other endocrine glands. To this effect, alterations in pituitary gland function or health have widespread consequences (Patton & Thibodeau 2012).

## The pineal gland

The pineal gland is a small cone-shaped structure situated in the roof of the third ventricle of the brain. The endocrine function of the pineal gland is unknown but it is believed to secrete the hormone melatonin, which appears to rise and fall during the course of the day and night and is believed to establish the body's day–night wake–sleep pattern (Marieb & Hoehn 2014). A rare neoplasm of the pineal gland (pinealoma) may obstruct the flow of cerebrospinal fluid, causing hydrocephalus (Farrell & Dempsey 2013).

## The thymus

The thymus gland is positioned in the upper thorax posterior to the sternum. It is large in infants and children, reaching its maximum size at puberty, then decreasing in size and function throughout adulthood (Patton & Thibodeau 2012). The thymus produces a hormone called thymosin, which promotes the growth of lymphoid tissue in the body and aids in the body's immune response. While endocrine dysfunction of the thymus gland is uncommon, congenital thymic hypoplasia causes deficient cellular immunity, making the individual more susceptible to infections.

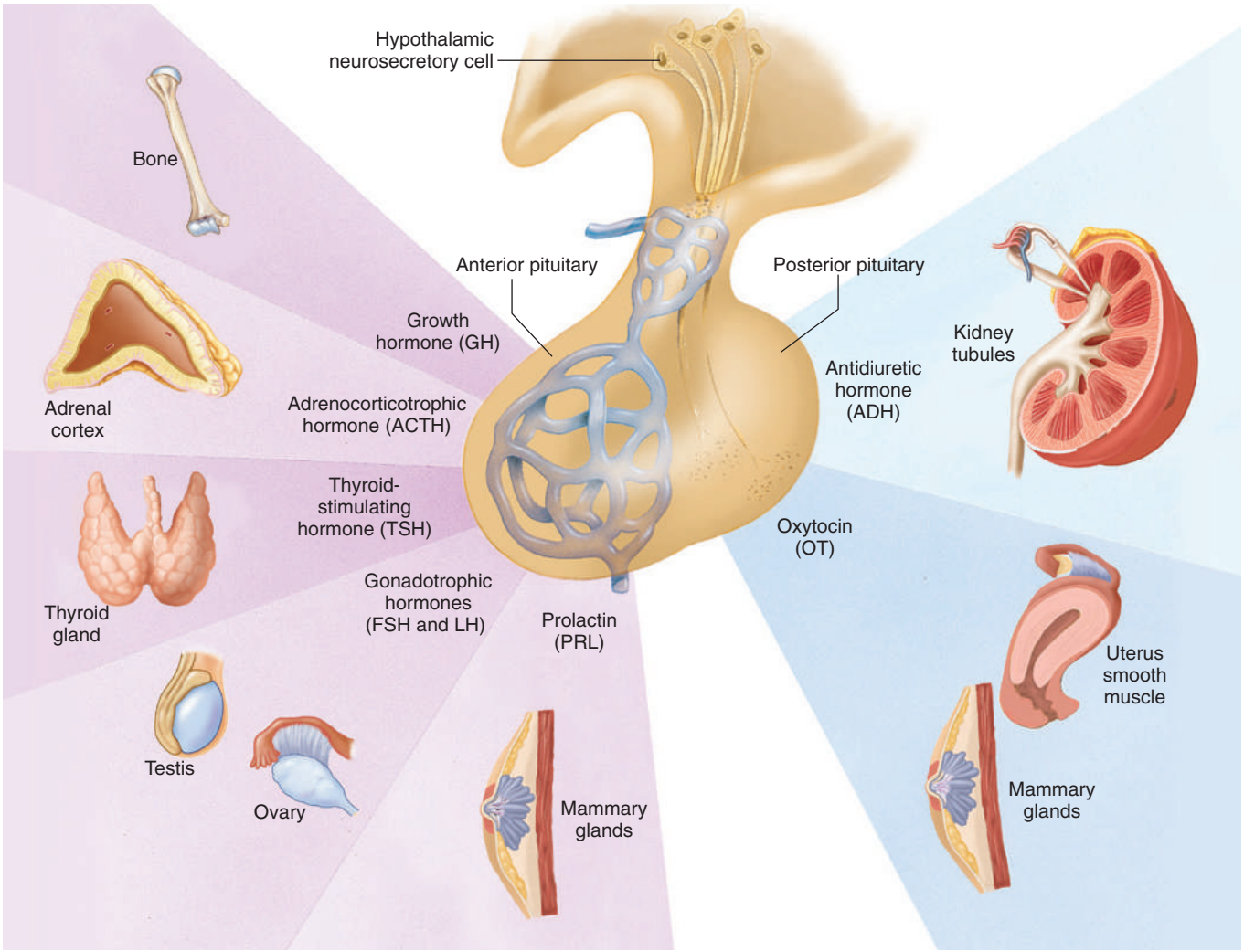


**Figure 36.2** The pituitary gland and hormones
*(Patton & Thibodeau 2012:565)*

## The thyroid gland

The **thyroid gland** lies in the anterior neck just inferior to the larynx. It consists of two lateral lobes positioned either side of the trachea. The lobes are joined together by a central mass called the isthmus, which lies anteriorly across the trachea. The thyroid gland is covered by a connective tissue capsule that forms trabeculae, which then pass inwards and divide the gland into lobes. It is richly vascularised, which presents surgeons with a tricky and dangerous task. The thyroid gland is the largest pure endocrine gland in the body, and produces two main hormones: thyroid hormone and calcitonin (Patton & Thibodeau 2012).

Thyroid hormone (TH) is actually two iodine-containing amine hormones: thyroxine ($T_4$) and triiodothyroxine ($T_3$). Thyroid hormone contains large quantities of iodine which is derived from the diet and stored in the thyroid gland, and is produced by the follicles of the thyroid gland. Thyroid hormone largely controls cellular metabolism, thereby affecting virtually every cell in the human body. In doing so, TH influences:

- Growth and physical development
- Neural and mental development
- Nutrient metabolism and metabolic rate
- Body temperature.

Calcitonin, also referred to as thyrocalcitonin, is produced by the parafollicular cells of the thyroid gland, and decreases blood calcium levels by stimulating calcium uptake and deposition in the bones. In humans, the relative role of calcitonin is not important: individuals who have had thyroid surgery or removal are not adversely affected by the loss of calcitonin secretion. However, individuals with skeletal disorders such as Paget's disease may be administered calcitonin therapeutically (Marieb & Hoehn 2014).

## The parathyroid glands

The **parathyroids** are four small glands embedded in the posterior surface of each lobe of the thyroid gland. The parathyroid glands produce parathyroid hormone (PTH), also referred to as parathormone, which is primarily responsible for the regulation of blood calcium and phosphate levels.

Parathormone release is triggered by falling blood calcium levels and is antagonistic to calcitonin: it promotes release into the blood of calcium and phosphate from bone; enhances reabsorption of calcium and excretion of phosphate by the kidneys; and also promotes the activation by the kidney of vitamin D, which assists in calcium absorption by the gut (Marieb & Hoehn 2014).

## The pancreas

The pancreas is largely an exocrine gland, secreting enzyme-rich digestive juices destined for the small intestine (see Chapter 30). Scattered among these cells are the **pancreatic islets**, small clusters of endocrine cells formerly referred to as the islets of Langerhans. They produce two hormones, insulin from beta (β) cells and glucagon from alpha (α) cells, which both help to regulate blood glucose level (Patton & Thibodeau 2012).

Insulin and glucagon are antagonistic hormones, and their general effects and relationship are illustrated in Figure 36.3. **Insulin** promotes **hypoglycaemia**, which happens when the pancreas detects high or elevated glucose levels (the presence of some amino acids and fatty acids also stimulate or increase insulin release). The major effects of insulin are to lower blood **glucose** by increasing the uptake of glucose into the cells and reducing the release of glucose from the liver. Insulin also promotes the conversion of glucose to fatty acids within the liver, and generally stimulates protein synthesis. Insulin is essential for the use of glucose by the cells of the body; without it, most cells would be unable to access or utilise glucose for energy (Marieb & Hoehn 2014).

Glucagon in contrast promotes **hyperglycaemia**. It is released in response to a reduction or decrease in blood glucose level. Its output is reduced in the presence of raised blood glucose and insulin and thus acts as an antagonist of insulin. Glucagon raises blood glucose levels by stimulating the breakdown of glycogen in the liver (glycogenolysis), inhibiting glycogen synthesis and enhancing the production (gluconeogenesis) and release of glucose (Patton & Thibodeau 2012).

## The adrenal glands

The paired **adrenal** (suprarenal) **glands** are located on top of each kidney. Each gland is surrounded by a capsule and

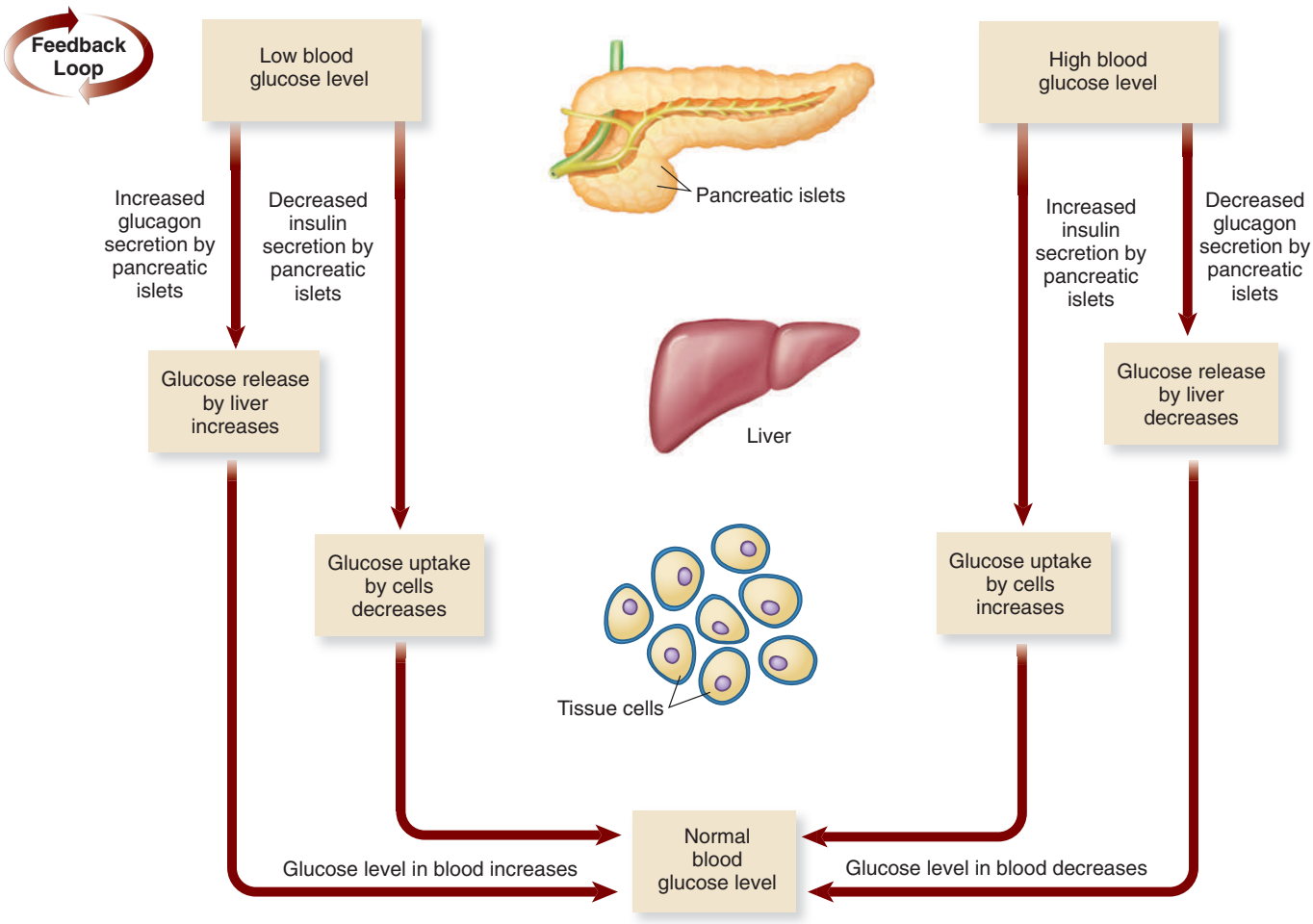


**Figure 36.3** Homeostasis of glucose—insulin and glucagon
*(Patton & Thibodeau 2012:583)*

contains an outer cortex and an inner medulla. The cortex and medulla synthesise different hormones and, just like the pituitary gland, reflect different glandular and neural embryological origins (Marieb & Hoehn 2014).

### The adrenal cortex

The cortex is divided structurally and functionally into three zones. Each zone is responsible for the secretion of a different class of steroid hormones, collectively called corticosteroids. The adrenal cortex, and therefore the corticosteroids, are under the influence of ACTH released by the anterior pituitary gland (Patton & Thibodeau 2012).

The following are examples of hormones synthesised and released by the adrenal cortex:

- Mineralocorticoids: mostly aldosterone, which is concerned with the reabsorption of sodium ions and the elimination of potassium ions in the kidneys. Aldosterone thus helps regulate both water and electrolyte balance in body fluids
- Glucocorticoids: which include cortisone, hydrocortisone (cortisol) and corticosterone and are concerned with:
  - Metabolism of protein, fat and carbohydrate (promote glucose synthesis and release)
  - Response to stress
  - Depression of inflammatory and immune responses
  - Potentiation of the effects of the catecholamines, TH and GH

  Given their role in glucose metabolism, glucocorticoids are often referred to as hyperglycaemic hormones
- Gonadocorticoids: (sex hormones—androgens and oestrogens) are concerned with the development of secondary sexual characteristics and the functioning of the reproductive organs. Both male and female hormones are produced by the adrenal cortex, regardless of gender. These gonadocorticoids released by the adrenal cortex are relatively weak and in low concentration compared to the hormones released by the gonads (Marieb & Hoehn 2014).

### The adrenal medulla

The medulla, or inner portion of the adrenal glands, produces two similar hormones referred to as catecholamines: adrenaline (also referred to as epinephrine) and noradrenaline (also referred to as norepinephrine). When the medulla is stimulated by neurons of the sympathetic nervous system, the two hormones are released into the bloodstream. The physiological responses to the medullary hormones mimic those of the sympathetic nervous system, which are:

- Cardiac and skeletal vasodilation; visceral and dermal vasoconstriction
- Increase in heart rate and contractility; increase in blood pressure
- Dilation of the bronchial tubes
- Reduction of peristalsis in the digestive system
- Stimulation of the liver to release more glucose into the bloodstream
- Dilation of the pupils
- An increase in the metabolic rate.

Adrenaline prepares the body for fight or flight, and its secretion is increased when the person feels threatened or experiences strong emotions such as fear, anger or excitement, thereby helping the body to cope with a stressful situation (Marieb & Hoehn 2014).

## The gonads

The female gonads are the ovaries and the male gonads are the testes (see Chapter 37). The female and male gonads produce sex hormones identical to those produced by the adrenal cortex, but in greater concentrations and potency. During and after puberty, the gonads assume the major role in reproductive hormone production.

The hormones produced by the ovaries are oestrogens and progesterone. In females, oestrogens influence development of the reproductive organs and the secondary sexual characteristics. Oestrogen also promotes oogenesis and ovulation, and stimulates the lining of the uterus to thicken in preparation for a fertilised ovum to develop. Progesterone promotes the final thickening of the uterine lining and inhibits uterine contraction, enabling implantation of the fertilised ovum. Progesterone also inhibits ovulation during pregnancy and stimulates the mammary glands to produce milk.

The testes produce the androgen testosterone, which stimulates the development of male characteristics and the growth and function of the reproductive organs. Testosterone and androgens generally masculinise the human body, irrespective of gonadal sex (Patton & Thibodeau 2012).

# ENDOCRINE DISORDERS

## Disorders of the pituitary gland

Abnormalities of the pituitary gland are generally associated with hyper- or hyposecretion of its products. Diseases of the pituitary gland, diseases of the hypothalamus, radiation therapy to the head or neck, trauma or tumour interfere with pituitary function and thus the function of other trophic glands like the thyroid, adrenals and gonads. Therefore pituitary problems potentially affect the homeostasis of other hormones and their effects are widespread. Individuals with anterior pituitary disorders require nursing interventions to assist them to cope with the physical and emotional changes and also to prevent complications involving other organs (Farrell & Dempsey 2013). Major endocrine disorders are summarised in Table 36.2.

Hyperfunction of the pituitary gland commonly results from a tumour, which may create pressure on cerebral structures and cause neurological manifestations, such as severe headaches and visual disturbances, or excessive secretion of pituitary hormones, with consequent increased stimulation of the target organs (Brown et al 2015; Patton & Thibodeau 2012). In adults, **hypersecretion** of the anterior pituitary gland most commonly involves ACTH or GH and results in Cushing's disease and syndrome or acromegaly, respectively.

**TABLE 36.2 | Summary of major endocrine imbalances**

| Disorder | Gland or hormone implicated | Homeostatic imbalance |
|---|---|---|
| Acromegaly | Pituitary—GH | Hypersecretion in adults |
| Cushing's disease | Pituitary—ACTH | Hypersecretion |
| Diabetes insipidus | Pituitary—ADH | Hyposecretion or insensitivity to insulin |
| Gigantism | Pituitary—GH | Hypersecretion in children |
| Pituitary dwarfism | Pituitary—GH | Hyposecretion in children |
| SIADH (syndrome of inappropriate antidiuretic hormone secretion) | Pituitary—ADH | Hypersecretion |
| Cretinism | Thyroid—TH | Hyposecretion during development |
| Graves' disease | Thyroid—TH; or TSH from pituitary | Hypersecretion |
| Hypothyroidism: Hashimoto's disease, myxoedema | Thyroid—TH | Hyposecretion |
| Hyperparathyroidism | Parathyroid—PTH | Hypersecretion |
| Hypoparathyroidism | Parathyroid—PTH | Hyposecretion |
| Diabetes mellitus—Type 1 | Pancreas—insulin | Hyposecretion/Hypoactivity |
| Diabetes mellitus—Type 2 | Pancreas—insulin | Resistance or insensitivity to insulin |
| Cushing's syndrome | Adrenal cortex—corticosteroids | Hypersecretion or overuse |
| Hypoadrenalism—Addison's disease | Adrenal cortex or ACTH from pituitary—corticosteroids | Hyposecretion |
| Primary aldosteronism—Conn's syndrome | Adrenal cortex or ACTH from pituitary—aldosterone | Hypersecretion |
| Phaeochromocytoma | Adrenal medulla—catecholamines | Hypersecretion |
| Osteoporosis | Ovary—oestrogen | Post-menopausal hyposecretion |
| Polycystic ovarian syndrome | Ovary—numerous | Hypersecretion of androgens |

Hypersecretion of prolactin is also common. Diseases of the posterior pituitary are rare: hypersecretion of the posterior pituitary is most commonly associated with the syndrome of inappropriate antidiuretic hormone (SIADH).

## Gigantism

Disturbances to GH release are chronic progressive disorders marked by hormonal dysfunction and skeletal overgrowth, which most commonly can appear in two forms: **gigantism** and acromegaly. Hypersecretion of GH in childhood results in gigantism, and begins before epiphyseal closure (Marieb & Hoehn 2014). Children with gigantism may grow up to 15 cm a year, reach a height of 2.4 m, exhibit slow sexual development and may have slow mental development. Radiation therapy, surgical removal of the tumour and drug therapy may be used to decrease secretion of the growth hormone and slow down the excessive growth pattern (Craft et al 2014; Urden et al 2014). With this treatment, prognosis for the individual with gigantism is generally good (Brown et al 2015).

## Acromegaly

**Acromegaly** is the manifestation of GH hypersecretion and occurs in adulthood after epiphyseal closure. It is characterised by atrophy of skeletal muscle and formation of new bone and cartilage. The long bones are unable to grow in length, but the smaller bones of the hands, feet and face grow, giving the individual a characteristic appearance, with an enlarged lower jaw, bulging forehead and thickened ears and nose (Figure 36.4). The extremities become elongated and enlarged, resulting in large hands and feet (Patton & Thibodeau 2012). Thickening of the tongue may cause the voice to sound deep and hollow, associated with slurred speech. Acromegaly is a chronic disfiguring disease that often shortens life expectancy, as it may lead to respiratory, cerebrovascular and congestive heart diseases (Urden et al 2014). Surgical intervention to

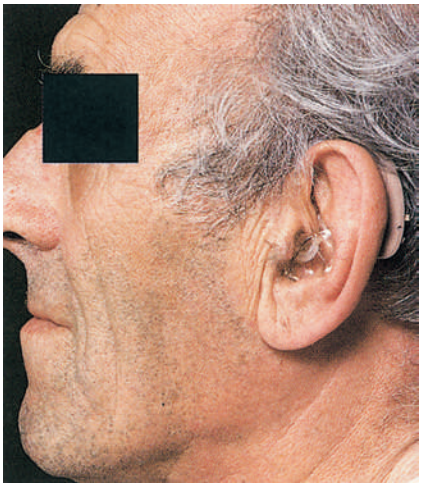

**Figure 36.4** Acromegaly: typical facial appearance

Clinical Examination

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remove the pituitary tumour may lead to hypopituitarism (Australian Pituitary Foundation 2015a).

## Prolactinoma

The most common tumour resulting from hypersecretion is prolactinoma (Australian Pituitary Foundation 2015b). Hypersecretion of prolactin often results in gynaecomastia and galactorrhoea (breast swelling and milk production) in both males and non-breastfeeding females, and may be accompanied by menstrual or libido alterations. Evidence suggests that despite around 10% of the population possessing microprolactinomas, only 0.1% will be clinically affected each year in Australia (Australian Pituitary Foundation 2015b).

## SIADH

The syndrome of inappropriate antidiuretic hormone (SIADH) includes excessive ADH secretion from the posterior pituitary, but it may also be non-endocrine in origin. Individuals with pulmonary problems such as carcinoma, severe pneumonia and other lung dysfunctions often also suffer from SIADH (Craft et al 2014). As a result, a consideration of pulmonary health is important in the nursing care and management of SIADH.

Individuals with this disorder display enhanced renal water retention which leads to imbalances in sodium balance and blood osmolarity. Hyponatraemia is induced due to the relative increases in water, and is common in hospitalised individuals (Hannon & Thompson 2010). Hyponatraemia suppresses the release of renin from the kidneys, which in turn regulates aldosterone release. The result is a loss of sodium in the urine. Diagnoses of SIADH include low serum osmolarity and sodium and urine hyperosmolarity; the symptoms are determined by the extent of severity of the continued ADH release.

Restricting and monitoring fluid intake, as well as the possible administration of diuretics, may reduce the underlying cause (Brown et al 2015). Careful fluid restrictions for individuals with SIADH of 0.5–1 L daily are suggested to allow sodium levels to increase slowly. Likewise, monitoring urine output and quality, weight and blood chemistries are indicated for individuals at risk (Urden et al 2014).

Hypofunction of the anterior pituitary gland can also result from a tumour in the gland, secondary to trauma of the hypothalamus or infection (Urden et al 2014). Hypopituitarism results in an absence or deficiency of GH and gonadotrophins and is marked by growth retardation, which in children causes dwarfism and delay of puberty. It can present in three forms, which share the characteristics of delayed or retarded growth, and decreased mentation and sexual development: Fröhlich's syndrome, commonly caused by an anterior pituitary tumour; **dwarfism**, which results from **hyposecretion** of growth hormone and is characterised by proportionately small individuals; and Simmonds' disease, atrophy of the anterior lobe of the pituitary gland, which is a rare disorder with widespread effects (Farrell & Dempsey 2013).

Treatment of hypopituitarism commonly involves hormone replacement of the target gland hormone (Australian Pituitary Foundation 2015c; Endocrinology Expert Group 2014). Constant monitoring and adjusting of hormone levels is required to attain optimal results.

## Diabetes insipidus

**Diabetes insipidus** is a rare condition characterised by a deficiency of ADH and may be of neurogenic (posterior lobe damage, resulting from head trauma, tumour or surgical or irradiative interventions) or nephrogenic in origin (kidneys failing to respond to adequate levels of ADH) (Craft et al 2014). Without ADH, the individual exhibits polyuria, passing vast quantities of dilute, colourless urine (volumes vary, but may be as high as 20 L daily), the osmolarity and specific gravity of which is very low (see Case Study 36.1). To compensate for the dehydration from the excessive fluid loss, the individual experiences polydipsia (excessive thirst, especially for cold drinks) and drinks large amounts of fluid (Farrell & Dempsey 2013).

Diagnostic procedures centre on fluid management. A fluid deprivation test in which the individual is unable to concentrate urine or continually passes large volumes is indicative of diabetes insipidus. This test is based on the principle that withholding fluid for several hours stimulates secretion of ADH. Other procedures include measurement of plasma ADH and osmolarity, or IV infusion of hypertonic saline (Craft et al 2014; Farrell & Dempsey 2013). Treatment for individuals with diabetes insipidus involves medication as opposed to limiting fluid intake, because the high volume of fluid loss through urine is independent of fluid intake. The replacement of ADH with synthetic analogues such as vasopressin or desmopressin has a good prognosis (Endocrinology Expert Group 2014; Urden et al 2014). During the acute

## CASE STUDY 36.1

You are a nurse and you have just begun your shift. You first deal with a 27-year-old male who shows no abnormalities during a routine physical examination and whose vital signs are all within range. He tells you that he cycles regularly and tries to keep fit. He has had blood tests and has had a urine sample taken for urinalysis earlier in the day. While you are reading his information and flicking through his charts, you ask him how he has been feeling. He tells you that recently he has been feeling very thirsty and drinking a lot, and also frequently urinating large volumes of urine.

1. What are the clinical terms for these conditions, and what common disorder are they typical of?

You ask him whether he has been eating differently as well as drinking a lot, and he tells you that he has made little change to his diet.

'Would you say that you eat a lot of sweets or cakes or sugar?' you ask.

'No more than normal,' he replies.

You check the blood serum tests and find that fasting glucose is normal. You also look at the urinalysis results and find they are negative for glucose.

2. What is the rationale behind asking about diet and sugar intake, and do the blood and urine results confirm or rule out your original assumption?

'I'm always drinking and going to the toilet,' he says. 'It's really interrupting my work.'

You suspect that there may be an imbalance in the amount of antidiuretic hormone (ADH), as this is a major hormone of water balance in the body.

3. What are the two major endocrine disorders associated with imbalances in ADH levels?
4. What are the typical signs or symptoms of these disorders?

'What do you think it could be?' he asks.

You explain that the blood and urine glucose levels indicate that it probably isn't diabetes mellitus, but you're not sure, so you make a closer inspection of the chart and results. The blood tests also indicate that the individual's plasma osmolality is high, with sodium levels more than 145 mmol/L.

5. What does this mean? Do you think this might be classified as hyper- or hyponatraemia?

You check the corresponding information on the urinalysis results and find that the previous nurse noted a low specific gravity (1.001) and that the urine was pale and almost colourless. The volume was considerable.

'It looks like you passed a lot of weak urine for your test,' you say.

'Exactly! That's what I told my doctor and the other nurse this morning,' he replies.

6. Given what you know about the blood and urinalysis results, which disorder of ADH do you think he may be suffering from? Explain your rationale.
7. Was there anything in his history that confirms your conclusion?
8. Do you think the information that the individual provided while you were chatting to him assisted your conclusion?

During your rounds you revisit this individual and ask him how he's going.

'Fine, but I'm thirsty again,' he says.

You ask him if he has had a drink recently and he tells you that he can't, as he has been asked to undertake a 'fluid deprivation test' and an MRI of his head.

9. What purpose would withholding water from this individual serve, and why would an MRI of his head be important?

stage of this condition, individuals need supportive care in relation to their polyuria and increased need for fluids.

### Diagnostic tests

Pituitary function may be assessed by estimating the level of trophic hormones and by measuring the response to stimulation or suppression tests (Brown et al 2015). The most common tests for evaluating anterior pituitary function are the serum growth hormone test and the insulin intolerance test. The insulin intolerance test, also called the growth hormone stimulation test, provides information about the secretion of growth hormone and ACTH. Investigations may also include x-ray, magnetic resonance imaging (MRI) or computerised tomography (CT) scan of the skull (Farrell & Dempsey 2013). Testing posterior pituitary function includes the water-deprivation test, which is performed when the individual's symptoms indicate diabetes insipidus.

## Disorders of the thyroid gland

### Hyperthyroidism

Hyperthyroidism is one of the more common endocrine disorders and about 2% of Australian women will experience some hyperthyroidism (Queensland Health 2014a). Hyperthyroidism may be caused by many factors, such as thyroiditis or hypersecretion of TSH. An increase in the secretion of the thyroid hormones $T_3$ and $T_4$ affects the basal metabolic rate, as well as the functions of other body systems. The manifestations of hyperfunctioning are generally related to increased metabolic processes, and exhibit characteristic signs and symptoms which reflect heightened metabolism or adrenergic stimulation, and are sometimes collectively referred to as thyrotoxicosis. The presenting condition is often nervousness. The condition can also be caused by genetic or immunological factors (Bahn et al 2011), thyroid gland nodules or

chronic inflammation of the thyroid gland (Craft et al 2014). Table 36.3 lists the most common signs and symptoms of hyperthyroidism and hypothyroidism.

## Graves' disease

An autoimmune disorder, **Graves' disease** is the most common hyperthyroid disease (Craft et al 2014; Farrell & Dempsey 2013; Thyroid Australia 2007). Elevated levels of circulating TSH receptor antibodies stimulate the thyroid gland, leading to the production and release of high concentrations of thyroid hormones and potential glandular hypertrophy. Graves' disease more commonly affects young women, and is eight times more prevalent in females (Farrell & Dempsey 2013) (see Lived Experience). It may appear after a stressful episode, illness or shock. Symptoms include all the characteristics of hyperthyroidism: tachycardia, nervousness, hyperactivity and excitability. The individual will have a voracious appetite but loses weight and can be quite underweight. Diarrhoea is common, as peristaltic rate increases. Excessive sweating and extreme thirst are also common, because of the increased metabolic rate. One outstanding characteristic of Graves' disease is that of exophthalmos, or protrusion of the eyeballs, which is due to oedema in the tissues behind the eye, and does not resolve even when the hyperthyroidism is corrected (Craft et al 2014) (Figure 36.5). A serious complication of Graves' disease is thyroid crisis (or storm), which is discussed in Clinical Interest Box 36.1.

**TABLE 36.3 | Some common signs and symptoms of hyperthyroidism (including Graves' disease) and hypothyroidism**

| Hyperthyroidism | Hypothyroidism |
|---|---|
| Nervousness, hyperexcitability and irritability | Apathy, fatigue, low mental energy |
| Cardiac palpitations and arrhythmias, tachycardia and increased systolic blood pressure | Bradycardia, oedema |
| Poor heat tolerance | Cold intolerance, lowered metabolic rate |
| Alterations (usually increase) in appetite and dietary intake | Cold dry skin |
| Weight loss and possible diarrhoea | Weight gain, constipation |
| Possible exophthalmos and goitre | Goitre, coarse facial features, myxoedema (advanced), impaired speech |

*(Craft et al 2014; Urden et al 2014)*

## Goitre

An enlarged thyroid gland (**goitre**) may be the result of thyroiditis, neoplasia, hyper- or hypoactivity. Goitre can cause local problems by exerting pressure on the trachea, which may produce dysphagia or respiratory distress (Urden et al 2014). Simple goitre (non-toxic goitre) is due to an iodine deficiency that causes a compensatory enlargement of the thyroid gland in an attempt to maintain thyroid hormone production. Introduction of iodised salt has reduced the incidence in Australia and in most other western countries (Australian Thyroid Foundation 2014; Farrell & Dempsey 2013), although localised iodine deficiency still persists in Australia (Blumenthal et al 2012; Endocrinology Expert Group 2014). Exophthalmic goitre occurs in hyperthyroidism (Figure 36.5).

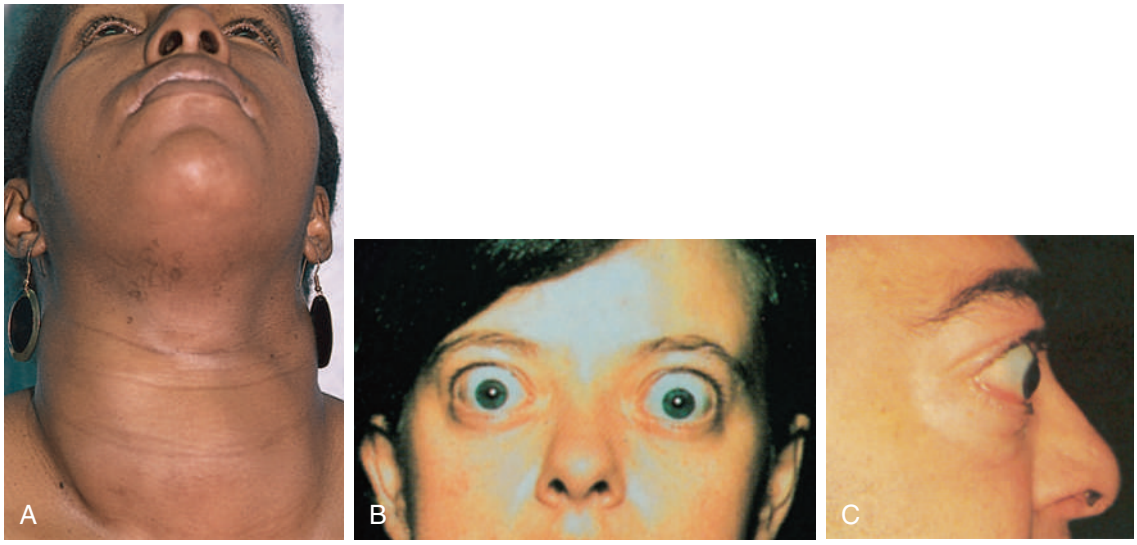


**Figure 36.5** Exophthalmos and/or goitre

*(A. Swartz 2002; B. Stein et al 2000; C. Swartz 2006)*

## Hypothyroidism

Hypothyroidism is the most common disorder of the thyroid and occurs more commonly in women (6–10%) (So et al 2012; Endocrinology Expert Group 2014). The prevalence rises with age—up to a quarter of women over the age of 65 years may be affected. Men are also affected, but less frequently (Queensland Health 2014b). Hypothyroidism is characterised by a decreased secretion of thyroid hormones and may be congenital or it may develop later in life. Cretinism is the congenital form of hypothyroidism and typically results from absence or underdevelopment of the thyroid gland or from severe maternal iodine deficiency during pregnancy. The manifestations of cretinism are related to a marked depression of metabolic processes and progressive mental impairment. Typically the infant is overweight, lethargic, has dry thick skin, coarse features, a broad flat nose and protruding tongue and abdomen (Marieb & Hoehn 2014). If the disease goes unchecked, sexual organs fail to develop and muscle growth is retarded. Treatment is started as soon as diagnosis is made and involves lifelong thyroid hormone replacement therapy (HRT). Hypothyroidism can also result from surgical intervention used to correct hyperthyroidism.

The most common natural cause of hypothyroidism is an autoimmune disorder, Hashimoto's disease. Symptoms of hypothyroidism are the opposite of those of hyperthyroidism (see Table 36.3). The individual is fatigued, drowsy and sensitive to cold temperatures, gains excessive weight, has thin nails and brittle hair, decreased pulse and respiratory rates and irregular menstruation (Urden et al 2014) (Figure 36.6). Advanced hypothyroidism may produce personality and cognitive changes characteristic of other mental dysfunctions such as dementia or depression. Depression has been linked to, both causatively and symptomatically, and misdiagnosed as hypothyroidism (Chueire et al 2007; Krausz et al 2007). Diagnosis of hypothyroidism may be difficult due to the nonspecific nature of the symptoms, which are often diverse and atypical (Endocrinology Expert Group 2014). Despite this, hypothyroidism responds well to HRT and symptoms may disappear after a few months of treatment.

**Myxoedema** is the characteristic sign of severe or prolonged hypothyroidism. The name refers to oedema in the dermis of the skin, especially around the eyes, hands and feet (Brown et al 2015) (Figure 36.6). Myxoedema and myxoedema coma, however—the decompensated state of severe hypothyroidism in which an individual may lose consciousness—if left untreated may lead to death. Maintenance of vital functions and monitoring for increasing severity of signs and symptoms is a major nursing intervention (Urden et al 2014).

### CLINICAL INTEREST BOX 36.1 Thyroid crisis (thyroid storm or thyrotoxicosis)

This situation is a sudden, severe form of hyperthyroidism, and usually occurs in a person already with advanced hyperthyroidism. It is typically characterised by high fever, severe tachycardia, tachypnoea and an altered mental state: all symptoms of excessive thyroid hormone. An individual presenting with thyroid crisis requires immediate attention and supportive nursing care, as it is considered a medical emergency and is life threatening. It can be instigated by emotional stress, infection, trauma, cardiovascular disease or following thyroid surgery. Management involves lowering body temperature, providing sufficient oxygen and IV fluids containing carbohydrate and interfering with thyroid hormone release.

*(Craft et al 2014; Farrell & Dempsey 2013)*

**Figure 36.6** Myxoedema (A) and hypothyroidism (B)

*(A. Talley & O'Connor 2009; B. Dr P. Marazzi/Science Photo Library)*

### Diagnostic tests

A combination of tests is generally performed to evaluate thyroid function, including direct tests of thyroid function, tests that measure concentration and binding of the thyroid hormones and tests involving the use of scanning or imaging techniques (LeMone et al 2014). Blood tests are performed to measure serum hormone levels. The best screening test of thyroid function is the measurement of serum TSH concentrations, due to its sensitivity. This may be augmented by assessing serum free or bound $T_3$ and $T_4$. Radioactive iodine tests, such as the radioactive iodine uptake test, evaluate thyroid function by measuring the amount of orally ingested iodine that accumulates in the thyroid gland over a time regimen (Brown et al 2015). Thyroid scanning is visualisation of the thyroid gland after administration of a radioisotope. Thyroid ultrasonography helps evaluate thyroid structure and differentiation between a cyst and a tumour on the thyroid gland. If an individual is to have thyroid tests, the nurse must ascertain medications taken by the person (especially if they contain iodine) (Farrell & Dempsey 2013).

Most people with classic hyperthyroidism rarely need hospitalisation. Critically ill individuals, those with extreme manifestations of thyrotoxicosis plus a significant concurrent illness, require inpatient acute care on a medical unit. Management of hyperthyroidism involves assisting the individual and their family to manage the symptoms associated with hyperthyroidism until it is controlled with medication (hormone replacement therapy is the preferred option) or surgery if indicated. Surgical intervention may involve a subtotal or even total removal (especially if the gland is cancerous). A person who has had a total thyroidectomy requires long-term hormone replacement (Australian and New Zealand Endocrine Surgeons 2013).

The nurse should assess the nutritional and emotional status of an individual with hyper- and hypothyroidism, and manage appropriately. The nurse should also reassure the individual that the emotional reactions, especially with hypothyroidism, are normal for that condition (Farrell & Dempsey 2013).

## Disorders of the parathyroid glands

### Hyperparathyroidism

Hyperparathyroidism results in an overproduction of PTH. This condition can be caused by hereditary factors, tumours or enlargement of the glands. It is more common in postmenopausal women (MacKenzie-Feder et al 2011). Secondary hyperthyroidism can be caused by renal disease or other calcium perturbations such as osteomalacia or rickets. Excessive PTH production leads to hypercalcaemia (excessive calcium in the blood) as the hormone stimulates resorption of calcium from bone, the kidney and gut (Marieb & Hoehn 2014). As the calcium is pulled from the bones, individuals with this condition display manifestations that are widespread and include symptoms such as backache, bone curvature and pathological fractures from bone weakness (Farrell & Dempsey 2013). Renal stones may develop because of the excess calcium output in the urine, especially in conjunction with metabolic acidosis and alkaline urine. The digestive system increases absorption of calcium, causing abdominal pain, vomiting and constipation. Hypercalcaemia leads to hyperactivity of muscles, causing impaired neuromuscular coordination and cardiac arrhythmias (Marcoci & Cetani 2011). Interestingly, vitamin D deficiency is also correlated with hyperparathyroidism (Rankin 2011).

### Hypoparathyroidism

Hypoparathyroidism is relatively uncommon and is indicated by deficiency in PTH secretion. Causes may include familial hypoparathyroidism, autoimmune disorders or, most commonly, surgical removal of parathyroid glands in an effort to treat other thyroid disorders (Clarke 2015). Low or lack of circulating PTH causes hypocalcaemia and hyperphosphataemia (high phosphate levels in the blood), resulting in neuromuscular symptoms ranging from paraesthesia to tetany. Manifestations include muscle spasm, anxiety, hyperreflexia and laryngeal spasm (Wheeler & Shoback 2015).

Tetany results from hyperexcitability of nerves and skeletal muscles because of low calcium blood levels. It begins with tingling in the fingertips, toes and around the mouth (Brown et al 2015). The tingling increases and produces muscle tension and spasms, with consequent adduction of the thumbs, wrists, elbows and toes (carpopedal spasm). The tetany associated with hypoparathyroidism mainly affects the face and hands, causing uncontrolled contraction of these muscles.

### Diagnostic tests

The general diagnosis of both hyper- and hypoparathyroidism is often difficult due to the vague symptoms of pain or fatigue. Tests used to assess parathyroid function therefore include estimation of serum calcium and serum phosphorus levels (LeMone et al 2014). Elevated serum calcium alone is not definitive as blood calcium may be influenced by diet and medications also. A 24-hour urine collection may be performed to measure the total urine calcium, as hyperparathyroidism causes increased excretion of calcium in the urine, and hypoparathyroidism causes decreased excretion of calcium. Scans or x-rays to ascertain bone changes and antibody parathyroid tests may also be implemented. Testing for hypocalcaemia and hypoparathyroidism involves checking for a positive Chvostek's sign (facial muscle spasm occurring when the facial nerve is tapped) and a positive Trousseau's sign (hand muscle spasm when pressure is applied to the nerves and vessels of the upper arm) (Farrell & Dempsey 2013).

Treatment of hyperparathyroidism is directed at the cause and often results in good prognosis for the individual. Surgical removal of tumours or removal of the parathyroid glands may be necessary, leaving half of one parathyroid gland, which is all that is required to maintain normal PTH levels. Other treatments include hydration or diuretic therapy to force increased excretion of calcium by the kidneys, decreasing calcium intake in the diet (Farrell & Dempsey 2013) or a vitamin D supplement (Rankin 2011).

## CRITICAL THINKING EXERCISE 36.1

The following is an account of a series of true events experienced by Natasha, a mother of three children.

*I was 35 weeks pregnant and, as usual, I came to the end of my day feeling tired, irritable, nauseous and emotional; all normal pregnancy symptoms! But that night was different. I was experiencing heart palpitations and the nausea and vomiting was worse than usual. I started to shake and despite thinking everything was most probably fine, I felt I should go to the ER department of our local hospital just to make sure. To my surprise, the nurses admitted me and I began undergoing immediate tests.*

*During that night, they discovered that the _____ levels in my blood were very high and the staff told me that this was most likely the result of a tumour on one or more of my _____ glands. The endocrinologists, together with the obstetrics team, decided to deliver my baby the next day by caesarean section.*

*Two weeks after the birth, I underwent an MRI scan to locate the tumour and 2 weeks later I was operated on. The following few days were spent in hospital, and I had nurses and doctors giving me 2–3 blood tests daily to ensure that my _____ levels were coming down.*

*Days later, now at home and recovering from the operation, I began to experience severe numbing and a pins-and-needles-type feeling in my hands and feet and around my mouth. I woke during the night with major tingling in my arms, legs and face. Within minutes of waking I was almost completely paralysed, my face contorted and my hands spasming. Speaking became impossible. I no longer had control over any of my movement. My husband woke to find me unable to speak and with my muscles locked, and I was rushed to hospital in an ambulance.*

*My _____ levels had plummeted too low and as a result my muscular system had been majorly affected. It was like nothing I had ever experienced! I was absolutely terrified! Once at the hospital, the nurses set me up with a _____ drip and within 2 hours my body was back to normal. I then went into a deep sleep for several hours, much like a person after a severe epileptic fit. I was completely exhausted.*

*Today, I am feeling 100% and take just one _____ tablet to keep my levels in check. I still have 3-monthly check ups with my endocrinologist. Who would ever have thought _____ plays such an important role in our bodies?*

1. Fill in the gaps: given the signs and symptoms Natasha had experienced, which basic nutrient, vitamin or mineral do you think might be involved? Explain your answer.
2. Which hormone, and therefore which gland, is implicated in the above? What is the major role of this hormone?
3. Based on your answers for the above two questions, can you suggest any physiological reasons as to why a tumour might affect this gland, and why there was such a change in the homeostasis of this nutrient, vitamin or mineral following removal of this tumour?
4. What general terms (prefixes) do we tend to give conditions involving an abnormally high or low secretion of hormone (or level of substance in the blood)?

An important aspect of the nursing care is health education and management of dietary calcium and phosphate intake. Treatment of hypoparathyroidism with mineral supplements gives a good prognosis (McCance & Huether 2013). Parathyroid autotransplantation, where the individual's parathyroid glands are replaced during a thyroidectomy, is being implemented more often in Australia (Ebrahimi et al 2009). Following thyroidectomy, hypocalcaemia and tetany may occur. In this instance the individual is infused with calcium intravenously. Parenteral PTH may also be administered.

## Disorders of the adrenal glands

### Disorders of the adrenal cortex—hyperadrenalism

Hyperadrenalism is usually confined to the cortex of the gland. It may be caused by neoplasia or hyperplasia, or it may be iatrogenic; that is, a condition caused by medical treatment or procedures. Other factors resulting in hyperfunctioning of the cortex include tumours or hyperplasia of the pituitary gland, whereby the negative feedback control of the adrenal cortex by ACTH is disturbed. Manifestations of hyperfunctioning are generally related to an excess of glucocorticoids, mineralocorticoids and sex hormones. Three major disorders can result.

***Cushing's syndrome*** **Cushing's syndrome** is a collection of endocrine disorders due to excess corticosteroids (Brown et al 2015). This condition may result from excessive use of corticosteroids, hypersecretion of pituitary ACTH (Cushing's disease) or a tumour of the adrenal glands or pituitary (Australian Pituitary Foundation 2015d). Manifestations of this condition are related to hyperglycaemia, abnormal distribution of lipids and protein wasting. Classic symptoms include obesity of the trunk with a pad of fat across the shoulders (buffalo hump), a moon face, striae on the breasts, abdomen and legs, muscle weakness, osteoporosis and skin fragility (Craft et al 2014; Farrell & Dempsey 2013) (Figure 36.7). Persistent hyperglycaemia may develop into diabetes mellitus. Elevated cortisol levels exacerbate catecholamine effects and, as a result, hypertension is a common feature. This may lead further to atherosclerosis, ischaemic heart disease and nephrosclerosis.

Women are more likely to develop Cushing's syndrome, and excess androgen production causes virilisation in females of all ages (Farrell & Dempsey 2013). Male traits such as

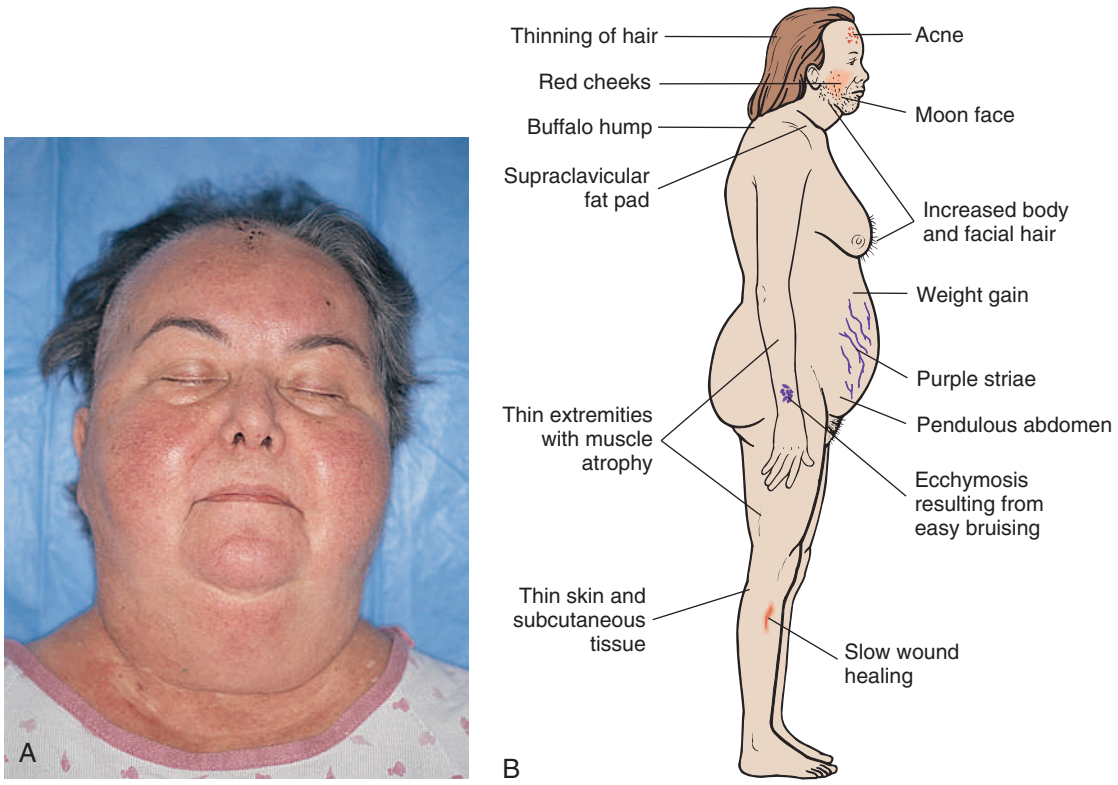


**Figure 36.7** Cushing's syndrome

*(A. Seidel et al 2006; B. Lewis et al 2011)*

## CLINICAL INTEREST BOX 36.2 Cortisone, cortisol and Cushing's syndrome

Cortisone is a therapy used to treat inflammatory conditions such as arthritis because of its anti-inflammatory properties. It does not cure the disease but gives individuals pain relief enabling them to continue their daily lives with as much normality as possible. Problems arise, however, because cortisone and other glucocorticoids like cortisol also depress the body's immune system. Hypersecretion, long-term use or abuse and over-administration of cortisone or cortisol may lead to the development of Cushing's syndrome, so the nurse needs to monitor these individuals for symptoms of this syndrome. Additionally, due to the enhanced anti-inflammatory response, infections become overwhelmingly severe before producing recognisable symptoms. The nurse should also therefore protect the individual from infection. Sadly, without treatment, almost half of the individuals with Cushing's syndrome die within 5 years of onset due, in part, to complications with infection and hypertension.

*(Craft et al 2014; LeMone et al 2014; Marieb & Hoehn 2014)*

hirsutism and voice deepening and breast atrophy may occur. A complication of Cushing's syndrome is the individual's decreased immune response and increased susceptibility to infection (see Clinical Interest Box 36.2).

***Primary aldosteronism*** Primary aldosteronism, also known as Conn's syndrome, is usually caused by an adrenal tumour and is the result of hypersecretion of the mineralocorticoid aldosterone (Craft et al 2014). Conn's syndrome leads to impaired reabsorption of sodium and water in the renal tubules, resulting in hypertension, hypokalaemia, muscle weakness, polyuria, polydipsia, metabolic acidosis and neuromuscular dysfunction (Brown et al 2015). Given the high incidence of hypertension in Australia (see Chapter 25), alterations of aldosterone function should be of consideration and interest in the nursing assessment.

***Androgenital syndrome*** Hypersecretion of androgens may result in androgenital syndrome, especially in prepubertal children. Excessive secretion of androgens may cause contradictions in secondary sexual characteristics. For example, female children are seen with excessive hair growth on the legs, chest and abdomen, an enlarged clitoris, a deepened voice and amenorrhoea (features exhibited also by individuals suffering Cushing's syndrome). Male children may experience precocious puberty (premature sexual development) and gynaecomastia (breast development) (Congenital Adrenal Hyperplasia Support Group Australia 2013).

## Disorders of the adrenal cortex—hypoadrenalism

***Addison's disease*** Hypofunctioning of the adrenal cortex may be caused by primary insufficiency, resulting in a condition known as **Addison's disease**, or adrenocortical

insufficiency. This is a rare condition thought to be due to an autoimmune reaction, infection, acquired immunodeficiency syndrome (AIDS), cancer or adrenal gland atrophy (O'Connell & Siafarikas 2010; Rushworth & Torpy 2014). Up to 90% of the cortex can be destroyed before the symptoms become evident; as a result, the disease is often advanced before it is diagnosed (Australian Addison's Disease Association 2011; Brown et al 2015). The manifestations are related to a deficiency of all corticosteroids. The lack of mineralocorticoids depletes sodium, which leads to diarrhoea, dehydration, weakness, weight loss and hypotension. The lack of glucocorticoids affects blood sugar levels, leading to hypoglycaemia (Marieb & Hoehn 2014). An increased ACTH level, due to disturbed negative feedback control, may lead to brown pigmentation or bronzing of the skin and mucous membranes, affecting the palms, elbows, scars, skin folds and areolae (Australian Addison's Disease Association 2011). Addison's disease may also have profound effects on an individual's mental state, with individuals exhibiting depression, confusion or apathy (Brown et al 2015).

Congenital adrenal hyperplasia (CAH) is often classified together with Addison's as general adrenal insufficiency. Similar to Addison's disease, cortisol and aldosterone are either partially or not produced. The condition may be classified as 'classic' (congenital, a genetic defect in steroid synthesis) or 'late onset' (early adult onset). Growth and adrenal problems may develop, as for other adrenal insufficiencies (Endocrinology Expert Group 2014). Treatment centres on replacement of the corticoids with analogues such as dexamethasone and fludrocortisone.

### Disorders of the adrenal medulla

***Phaeochromocytoma*** **Phaeochromocytoma** is a generally benign tumour of the medulla or of the sympathetic chain, which causes over-secretion of adrenaline and noradrenaline. Incidence peaks in middle age and is also high in familial members, and may occur as part of multiple endocrine neoplasia (MEN) (Farrell & Dempsey 2013; Rare Cancers Australia 2015). The resultant increase in sympathetic activity manifests as episodes of hypertension, tachycardia, chest pain, pallor, sweating, headaches, anxiety, tremor, nausea and vomiting and frequency of urination. These symptoms can cause life-threatening scenarios for the individual, so early diagnosis and treatment is imperative (Clifton-Bligh 2013).

### Diagnostic tests

Typically, blood and urine tests are performed that enable measurement of the levels of adrenal cortical hormones. Blood tests determine the level of serum aldosterone, serum cortisol or serum catecholamines (LeMone et al 2014). These levels aid in the diagnosis of adrenal function; for example, serum cortisol levels are increased in Cushing's syndrome, while decreased serum cortisol levels are seen in Addison's disease. A 24-hour urine collection may be performed to estimate the total daily free cortisol, aldosterone or catecholamine levels. A CT scan or suprarenal venography may also be used to aid in the diagnosis of tumours.

Surgical removal of the tumour or the dysfunctional adrenal gland (adrenalectomy) may correct Cushing's syndrome for the individual (LeMone et al 2014). Lifetime hormone therapy to replace the cortical hormones is then required. Clinical Interest Box 36.2 provides an insight into cortisone therapy. Nurses should decrease risk of injury and infection, encourage rest and activity, promote skin care and stimulate mental activity for individuals with Cushing's syndrome. Treatment and nursing care for Addison's disease and CAH includes corticosteroid therapy, and the assessment and management of fluid levels, signs of shock and careful monitoring of symptoms (Craft et al 2014; LeMone et al 2014).

Measurements of blood and urine for catecholamines are the most direct and conclusive tests for disorders of the adrenal medulla like phaeochromocytoma. Likewise, the presence of hypertension, headache, hypermetabolism and hyperglycaemia indicates phaeochromocytoma. Imaging studies may also be carried out to identify the location of the suspected tumour, which is preferably removed surgically. Treatment and nursing management procedures include those for high blood pressure, high blood glucose and tachycardia, and HRT is often indicated following surgery (Brown et al 2015; Rare Cancers Australia 2015).

**CRITICAL THINKING EXERCISE 36.2**

A 47-year-old male under your care presents with hypertension (160/101 mmHg), tachycardia and increased respiratory rate. Given what you know about the endocrine system, which hormones might be responsible for these signs? Is there more than one endocrine gland or imbalance that might be responsible for his condition?

**CRITICAL THINKING EXERCISE 36.3**

You are caring for Navdeep who has recently been diagnosed with Cushing's syndrome. Cushing's syndrome is a pathophysiology of excess of which hormones? Cushing's syndrome has a number of signs and symptoms; however, what do you think is the most important nursing intervention when caring for Navdeep? Why do you think this is so?

## Disorder of the gonads

### Hypergonadism and hypogonadism

Gonadal disorders may reflect interruptions in the normal control by the pituitary, a tumour or congenital syndromes such as Turner's or Klinefelter's (Endocrinology Expert Group 2014; Craft et al 2014). Hypergonadism, as opposed to hypersecretion of gonadotrophins by the pituitary gland or androgenital syndrome, results from increased gonadal hormone production before puberty and leads to precocious sexual development and enhanced sexual characteristics in both sexes. Causes of hypergonadism are primarily unknown

but some cases have been caused by ovarian tumours and testicular tumours (Sembulingam & Sembulingam 2012). Treatment for both sexes involves removal or radiation of the tumours, and hormone therapy to suppress or counteract the effects of the sex hormone.

Hypogonadism results from decreased sex hormone production by the age of normal puberty. Due to the control of gonad function by the pituitary and adrenals, hypogonadism prior to puberty reflects abnormalities of these endocrine glands. Treatment with testosterone or oestrogen is usually effective (Endocrinology Expert Group 2014).

Endocrine deficiencies of the gonads in the adult female, for example, are implicated in two common disorders: osteoporosis and **polycystic ovary syndrome** (PCOS). This reflects the strong interrelationship between endocrine organs and hormones in the human body. Osteoporosis and PCOS are discussed further in Clinical Interest Boxes 36.3 and 36.4 respectively.

### Diagnostic tests

Diagnoses of disorders of the gonads is based on a positive clinical history and, as for other disorders, are confirmed by blood tests showing elevated sex hormone levels.

## Disorders of the pancreas

### Diabetes mellitus

Diabetes mellitus (DM) is a group of metabolic disorders characterised primarily by abnormal glucose metabolism, with the key feature of elevated blood glucose (hyperglycaemia). Diabetes mellitus affects a great number of Australians, with more than 5% of the Australian population under the age of 34, and 28% of Australians between the ages of 65 and 74, having diabetes (Australian Institute of Health and Welfare (AIHW) 2015a). Type 2 diabetes mellitus is more common than type 1, with over 95% of all diabetic individuals having type 2. Incidences and death rates in Australia are higher for males than females, and Indigenous Australians are almost three times as likely to be diagnosed (Australian Institute of Health and Welfare 2015b). Such is the increasing prevalence in diabetes worldwide that diabetes nursing is becoming more specialised, with distinct nursing career and competency frameworks being developed (Davis et al 2008). Diabetes Australia (2014c) has published Best Practice Guidelines, developed by medical experts and researchers for health professionals to address the prevention, diagnosis and management of diabetes.

Diabetes mellitus is a disorder of glucose regulation characterised by abnormal metabolism of carbohydrate, protein and fat (Farrell & Dempsey 2013). A feature of the disorder is some degree of hyperglycaemia. Diabetes mellitus results from hyposecretion or hypoactivity of insulin, intolerance to insulin (hyperinsulinaemia) or from the production of substances antagonistic to insulin, which cause it to be ineffective. It may be caused by genetic or hereditary factors, pancreatic disorders or by disorders of other endocrine glands such as the pituitary or adrenal glands (recall that these endocrine glands secrete hormones that affect glucose

### CLINICAL INTEREST BOX 36.3 Osteoporosis and oestrogen

Osteoporosis is characterised by an imbalance between bone formation and bone resorption, where bone cells called osteoclasts digest bone faster than it can be deposited. Nurses and individuals usually become aware of osteoporosis only when the weakened bones break and individuals are admitted as a result of fractures. While osteoporosis is strongly linked to calcium intake, calcium metabolism is controlled by the parathyroid glands and PTH. Likewise, the appearance or acceleration of bone weakening with the onset of menopause in females is closely related to the levels of oestrogen: oestrogen secreted by the ovaries actually exerts inhibition over the osteoclasts, preventing them from digesting too much bone and calcium. Decreasing levels of oestrogen post-menopause may therefore contribute to osteoporosis. The use of hormone replacement therapy (HRT) and dietary supplements helps to address this endocrine imbalance.

*(Marieb & Hoehn 2014; Osteoporosis Australia 2014)*

### CLINICAL INTEREST BOX 36.4 Polycystic ovarian (ovary) syndrome (PCOS)

Despite the misleading name, polycystic ovarian (ovary) syndrome (PCOS) is a hormonal disorder in females in which excessive androgen production is triggered by inappropriate secretion of gonadotrophins. This is perhaps better reflected by the alternative name 'hyperandrogen anovulation syndrome'. Surprisingly it is the most common endocrine disturbance affecting women, affecting from 5% to 12% of reproductive-age women in Australia.

PCOS develops as a result of ovarian hypersecretion of androgens, with an overall result of increasing testosterone levels. Hyperinsulinaemia is thought to stimulate this hypersecretion of androgens. Elevated levels of androgens lead to elevated levels of oestrogen and testosterone, which trigger an imbalance in the pituitary gonadotrophins FSH and especially LH.

Clinical signs or symptoms of PCOS reflect the interruption of ovulation and the elevated male hormone levels. Various signs or symptoms exhibited by individuals mirror those of other endocrine disorders (especially those of the thyroid, adrenal cortex and gonads generally), thus nursing assessment of PCOS may be difficult. Manifestations include dysmenorrhoea or amenorrhoea, hirsutism or androgenic alopecia, obesity and infertility. Women with PCOS also appear to be at greater risk of developing hyperglycaemia, cardiovascular disease and type 2 diabetes mellitus later in life.

*(Craft et al 2014; Endocrinology Expert Group 2014)*

metabolism). It is also thought to be autoimmune in origin: the destruction of β cells by the body may be a response to molecular mimicry by a pathogen, or due to possible diabetes susceptibility genes (Craft et al 2014; Farrell & Dempsey 2013; Marieb & Hoehn 2014).

A deficiency of insulin causes changes in the metabolism of glucose, which results in numerous physiological effects (Figure 36.3). In the liver glycolytic enzymes are inhibited, gluconeogenic enzymes are activated and amino acids are used to form glucose. Consequently, additional glucose is liberated into the bloodstream. Without insulin, glucose is unable to cross the cell membranes into muscle and fat cells, and hyperglycaemia ensues (Marieb & Hoehn 2014). The blood glucose level eventually exceeds the renal threshold, and the excess glucose is excreted in the urine (glycosuria). The most significant effect of elevated blood glucose level is dehydration of the tissue cells because the increased osmotic pressure in the extracellular fluids causes osmotic transfer of water out of the cells. In addition, the loss of glucose via the urine causes diuresis (polyuria), because of the osmotic effect of glucose in the renal tubules. The result is extreme thirst, or polydipsia (Urden et al 2014).

Gestational diabetes is one form of the disorder and appears only during pregnancy (about 5% of pregnancies) (AIHW 2010; Diabetes Australia 2015), and is characterised by impaired glucose tolerance. A woman who has had gestational diabetes runs a greater risk (50–60%) of developing diabetes mellitus later on in life (AIHW 2010; Craft et al 2014). **Diabetes mellitus** itself is classified into two major types: **type 1**, or insulin-dependent diabetes mellitus (IDDM) (formerly known as juvenile-onset diabetes); and **type 2** (formerly known as non-insulin-dependent diabetes mellitus (NIDDM)). A third minor type, type 3c diabetes, may contribute to diabetes mellitus or Alzheimer's (de la Monte & Wands 2008; Hardt et al 2008) and is believed to be generally un- or misdiagnosed. The diagnosis of diabetes mellitus is confirmed, among other tests, by the presence of an elevated blood glucose level. The manifestations of diabetes mellitus vary according to the type.

***Type 1 diabetes mellitus*** Type 1 diabetes mellitus is characterised by the genetic or autoimmune destruction or deficiency of the pancreatic β cells that produce insulin and usually progresses so quickly it is often diagnosed in childhood; hence its previous name of juvenile-onset diabetes (Farrell & Dempsey 2013) (see Case Study 36.2). It can occur, however, at any age from infancy up to about age 40. There is a sudden onset of signs and symptoms related to hyperglycaemia, which includes weight loss, polyuria and polydipsia (related to osmotic diuresis), fatigue and the presence of glucose and ketones in the urine (glycosuria and ketonuria) (Craft et al 2014). Hyperglycaemia and dehydration accelerate the development of metabolic acidosis and, if untreated, can lead to coma and death.

***Type 2 diabetes mellitus*** Type 2 diabetes mellitus is characterised by hyperglycaemia despite the availability of insulin (insulin resistance at the cell) and is more likely to occur after age 40. The signs and symptoms develop slowly and the individual is generally obese: obesity and metabolic syndrome are significant risk factors and often precursors for type 2 diabetes mellitus (Craft et al 2014). Type 2 diabetes mellitus may often go undetected, as the signs and symptoms of fatigue, polyuria and polydipsia can be quite insignificant. Diagnosis occurs when the individual presents with another disease, which is a common complication of diabetes mellitus (McDowell et al 2007). The individual with diabetes mellitus is prone to a range of complications, especially if the blood glucose level is uncontrolled. Complications include:

- Hyperglycaemia
- Hyperinsulinaemia
- Diabetic ketoacidosis
- Hyperosmolar non-ketotic hyperglycaemia
- Retinopathy
- Neuropathy

## CASE STUDY 36.2

You are a nurse. Joan, a diabetes educator, visits you and introduces Mr Lei, a 60-year-old male. Joan explains that he has type 2 diabetes mellitus and would like you to assist in educating Mr Lei about his condition.

Mr Lei feels shy and confused, and says, 'Joan, she is nice lady, but I no understand all she say about my diabetes and my blood. I am having to test all the time and take these.' He shows you a list of medications that Joan has indicated he may be required to take.

You begin by explaining to Mr Lei about his blood sugar levels and ask, 'Do you know what your blood glucose levels should be?'

Mr Lei cannot remember, so you remind him.

1. What is a normal blood sugar/glucose level?

'What you mean fasting? I can eat, can't I?' Mr Lei asks.

'Of course you can,' you answer, reassuring him. 'Did Joan explain to you when you should test your blood?'

'Yes, in the morning before my breakfast. Why?'

2. What is meant by fasting in this instance? And why should Mr Lei test his blood glucose prior to breakfast each day?

He sighs and admits, 'This is no easy. She say I have to do many other things, like diet. It is very much for me to handle.'

3. Regarding his diet, what general suggestions can you make to assist Mr Lei in monitoring and controlling his condition?
4. What about his lifestyle? Do you have any suggestions as to what sorts of changes or considerations Mr Lei could make to his habits?

You feel that Mr Lei is overwhelmed, so you comfort him and reassure him that his concerns are normal and that his questions are valid.

5. Other than Joan, his specific diabetes educator, which other health professionals could you refer Mr Lei to, or at least make him aware of?

Mr Lei smiles and says, 'Thank you, you make it easy for me and now I feel much better. Thank you.'

- Cardiovascular and peripheral vascular disease
- Nephropathy
- Hypoglycaemia (imbalance of food, exercise and medications).

It is these complications that the nurse may need to assess and monitor. The maintenance of blood glucose levels are achieved by a balance between blood-borne stimuli, nervous input (e.g. the sympathetic nervous system) and hormonal influences. As such, there are a number of influences on blood glucose levels that the nurse should take into consideration.

## Complications of diabetes mellitus

Complications may develop rapidly or progress insidiously over years before they become evident. The two main complications that occur because of uncontrolled blood glucose levels are hypoglycaemia and hyperglycaemia.

***Hypoglycaemia*** Hypoglycaemia, sometimes referred to as insulin shock, is an abnormally low blood glucose level (3.5–4.0 mmol/L) (Diabetes Australia 2013) and may be caused by excessive insulin, delayed or decreased food intake, excess physical activity and carbohydrate use (Farrell & Dempsey 2013). Hypoglycaemia may develop when glucose levels drop rapidly and early manifestations are hunger, pallor, sweating, tachycardia, yawning, nausea, blurred vision, slurred speech, confusion or irrational behaviour (Brown et al 2015). If the hypoglycaemia is not corrected rapidly, the person will become comatose and, if the coma is prolonged, permanent brain damage or death may occur (Farrell & Dempsey 2013).

**Management and intervention** Mild symptoms can often be reversed by ingesting a simple carbohydrate, such as fruit juice or honey. People with type 1 diabetes should ensure that they always have ready access to some form of carbohydrate that is easily absorbed, such as barley sugar or jelly beans (Farrell & Dempsey 2013). If the person is unable to ingest a carbohydrate substance, intravenous administration of glucose (up to 50%) (Endocrinology Expert Group 2014) or the hormone glucagon will be necessary. Glucagon can also be administered subcutaneously or intramuscularly. The Somogyi effect is a complication that may follow a hypoglycaemic episode or administration of too much insulin, and results in rebound hyperglycaemia (McDowell et al 2007). Management of this phenomenon involves lowering the insulin dosage (Craft et al 2014).

***Hyperglycaemia*** Hyperglycaemia is an abnormally high blood glucose level and is a clinical feature of diabetes. It may be caused by low insulin levels, incorrect diet high in carbohydrate, lack of physical activity or stress (with infection being a common stressor). Glucose and lipids are not able to enter target cells, depriving them of nutrients. This is turn stimulates increased hunger and food intake (polyphagia). Together, polyphagia, polyuria and polydipsia are the three main symptoms of hyperglycaemia (Craft et al 2014). If hyperglycaemia is not corrected, metabolic acidosis occurs, producing vasodilation and hypotension. Severe acidosis, if untreated, results in coma and death. Hyperglycaemia develops gradually over a period of hours or days, and the early manifestations are thirst, anorexia, nausea, vomiting, abdominal pain, muscle cramps, polyuria and drowsiness. Deep rapid respirations (Kussmaul's breathing) develop in an attempt to control acidosis (Brown et al 2015). Dehydration and electrolyte imbalance occur as a result of osmotic diuresis.

Ketones, produced by the liver as fat, are broken down instead of glucose (diabetic ketoacidosis), glucose is excreted in the urine and the breath smells of ketones (sweet fruity odour). Diabetic ketoacidosis (DKA) develops primarily in individuals with type 1 diabetes mellitus, and in the absolute deficiency of insulin. As a result of altered liver metabolism, acidosis ensues, which may lead to coma or death (LeMone et al 2014). Advanced diabetic ketoacidosis is an emergency requiring nursing and medical care. Similarly, hyperglycaemic hyperosmolar state (HHS) occurs in people with type 2 diabetes and is characterised by higher than normal blood osmolarity, greatly elevated blood glucose and altered levels of consciousness. It is a serious medical emergency with a slow onset (Farrell & Dempsey 2013; LeMone et al 2014).

**Management and intervention** Management of hyperglycaemia focuses on correcting the fluid and electrolyte imbalances and lowering blood glucose levels to normal (Diabetes Australia 2014c). Intravenous fluids such as normal saline are administered together with intravenous short-acting insulin. After the initial decrease in blood glucose level, the insulin dosage is reduced. This allows the blood glucose levels to return to normal more slowly, and prevents the development of hypoglycaemia. If the individual becomes comatose as a result of hyperglycaemia and ketoacidosis, care is directed at preventing the complications of unconsciousness (Brown et al 2015; McDowell et al 2007).

## Long-term complications

***Cardiovascular diseases*** Atherosclerosis is a relatively common complication of diabetes mellitus, with coronary artery disease being the major complication. Myocardial infarction, cerebrovascular accident and renal failure are among the major causes of death in people with diabetes (AIHW 2015b). Peripheral vascular disease is often widespread, causing manifestations of peripheral ischaemia—cold lower extremities, intermittent claudication, diminished or absent pulses, ulcers, infection and gangrene. Hypertension is also a common complication of diabetes mellitus (AIHW 2015b). It affects 20–60% of all individuals and is a major risk factor for cardiovascular disease and microvascular complications such as neuropathy and retinopathy (LeMone et al 2014).

***Neuropathy*** Neuropathy (inflammation and degeneration of the peripheral nerves) gives rise to disturbances of sensation such as tingling and numbness, particularly in the lower limbs (Farrell & Dempsey 2013). Another form of neuropathy is characterised by a decreased sense of position (proprioceptive disturbances) and diminished sensation to touch, pain and temperature. These sensory deficits increase the possibility of injury and increase the chance of injuries being unnoticed by the individual. Peripheral motor involvement results in muscle weakness and atrophy, which may lead to

deformities, particularly of the feet (Charcot's arthropathy) (Farrell & Dempsey 2013). Early identification of peripheral neuropathy is an important part of preventative foot care (Endocrinology Expert Group 2014).

***Retinopathy*** Retinopathy is a disorder of retinal blood vessels, characterised by haemorrhages and leakage of blood and serum into the retina. Repeated vitreous haemorrhage may result in retinal detachment or blindness. Glaucoma and cataracts may also develop in the presence of diabetes mellitus. Individuals should consider consulting or be referred to an ophthalmologist or optometrist (Farrell & Dempsey 2013).

***Nephropathy*** Nephropathy, or kidney disease, may occur over a period of many years, and few signs or symptoms occur until the presence of blood proteins in the urine (microalbuminuria), uraemia and oedema develop (Farrell & Dempsey 2013; LeMone et al 2014). Diabetic nephropathy is more likely to develop if diabetes is poorly controlled. Renal function is gradually impaired by glomerulosclerosis, and it may progress to chronic renal failure. Preventing and treating any condition that may impair renal function, such as urinary tract infections or hypertension, reduces the development of diabetic nephropathy (McDowell et al 2007).

***Sexual dysfunction*** Impotence occurs in about half of all men with diabetes (LeMone et al 2014). In addition to the psychological causes of impotence, the condition is thought to be caused by damage to the nerve endings as a result of diabetic neuropathy, where the nerves controlling reflex blood flow to the penis are affected by persistently altered blood glucose levels. Controlling blood glucose levels may therefore help to prevent or alleviate the problem of impotence associated with diabetes. Possible complications in women include decreased vaginal lubrication and libido, and increased urinary tract infections and vaginitis (LeMone et al 2014).

### Diagnostic tests

Laboratory evaluation of the pancreatic islets is mainly concerned with levels of glucose in the blood (see Clinical Skill 36.1: Measuring blood glucose) and urine. Urine is typically examined for the presence of glucose and ketones (see Chapter 31). As a result of increased lipolysis, excess ketone bodies accumulate and are excreted in the urine. Urine may also be tested for the presence of protein (microalbuminuria), which may detect the early onset of nephropathy. Blood tests measure the body's use of glucose and include:

- Glucose tolerance test. This test evaluates glucose absorption after its oral or intravenous administration. The individual fasts overnight before the administration of glucose; glucose levels are then measured at intervals to diagnose diabetes mellitus
- Fasting serum glucose test. Also referred to as fasting blood or plasma glucose (FBG, FPG), this test measures glucose level after the individual has fasted for an 8-hour period; the blood glucose level is then measured. In diabetes mellitus, the absence or deficiency of insulin allows persistently high serum glucose levels above 7.8 mmol/L (LeMone et al 2014)
- Two-hour postprandial serum glucose. This test provides information about the body's utilisation and disposal of glucose after a meal. An elevated blood glucose level is indicative of diabetes mellitus
- Tolbutamide tolerance test. An intravenous injection of the drug tolbutamide usually stimulates the secretion of insulin. Normally, after administration of the drug, the serum glucose level will fall rapidly and return to normal baseline levels in 3 hours. In diabetes mellitus there is a slow initial drop and a prolonged time to return to pre-set levels
- Glycosylated haemoglobin ($HbA_{1C}$) test. This test is performed to review the control of diabetes mellitus over the previous 2–3 months. Results reflect the average glucose level attached to haemoglobin within erythrocytes rather than the serum glucose level, and the timeline reflects the average longevity of the erythrocyte. In diabetes mellitus it may be elevated to three times the normal level
- Serum cholesterol, triglyceride and electrolytes (Brown et al 2015; LeMone et al 2014; McDowell et al 2007).

## CARE OF THE INDIVIDUAL WITH AN ENDOCRINE DISORDER

Because of the complexity of the endocrine system and its interrelation with other body systems, **dysfunction** of any endocrine gland can have widespread effects (Clemmons 2012). The possibility of an endocrine cause needs to be kept in mind in a wide range of medical emergencies. Most endocrine disorders result from hyper- or hypoactivity of the gland or tissue. The manifestations and effects resulting from a glandular disorder therefore relate to the hormone the affected gland secretes.

### Effects of endocrine dysfunction

Endocrine dysfunction has widespread effects, and the medical management and nursing care depends on the diagnosis of a specific disorder. When care is being planned, the nurse must consider the effects that the disorder may have on the individual, and any issues the individual may be coping with. While individual treatments and care suggestions have been listed for a number of conditions already discussed, below are major nursing care considerations.

### A major change in lifestyle

As a result of an endocrine imbalance, the individual may have to depend on lifelong medication, dietary and fluid intake modifications, reductions in activity or exposure to stressors, and potentially irreversible physical and physiological changes (Clemmons 2012). In addition, individuals may experience sexual dysfunction, an often neglected complication of endocrine disorders (Bhasin et al 2007). For example,

## CLINICAL SKILL 36.1 Measuring blood glucose

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Blood glucose meter<br>Reagent strips<br>Tissues or cotton balls<br>Peripheral blood access device (lancet)<br>Sharps container<br>Disposable gloves<br>Warm washcloth<br>An appropriate chart for documentation |

| **Skill activity** | **Rationale** |
|---|---|
| Determine the need for BGL assessment and validate the medical orders in the individual's record | Ensures correct procedure is about to take place<br>Physical signs and symptoms such as confusion, drowsiness and limb weakness may indicate alterations in neurological function |
| Prior to commencing the procedure introduce self, identify the individual, validate and explain the rationale for the procedure, obtain consent, locate and gather the necessary equipment<br>Ensure therapeutic interaction<br>Assess for any contraindications | Ensures consent<br>Ensures efficiency<br>Reduces the incidence of performing an activity on the incorrect individual<br>Reduces anxiety/apprehension and gains trust and cooperation<br>Promotes participation in care and understanding of health status<br>Ensures correct procedure is about to take place |
| Critically think through the assessment data and problem solving (e.g. identify indications and rationale for performing the activity, state normal range for result (demonstrating knowledge of target range for individual), why and when they should be performed) | Evaluate each aspect and its relationship to other data to help identify specific problems and modifications of the procedure that may be needed for the individual |
| Place the equipment in a convenient location near the bedside<br>Raise the bed to the appropriate working position based on your height<br>Position the individual | Ensures all equipment is at individual's bedside to maximise efficiency<br>Facilitates performance of the procedure and promotes functional body alignment and body mechanics while the procedure is being performed |
| Perform hand hygiene<br>Don appropriate PPE as per infection control protocols | Prevents cross-infection and contamination |
| Dilate the capillaries by applying a warm compress | Promotes vasodilation |
| Assist the individual to wash hands with soap and warm water then dry them | Promotes skin cleansing, even the smallest bits of food can alter a reading<br>Warm water increases the peripheral circulation due to vasodilation, facilitating blood flow from the puncture site. Make sure the site is entirely dry because even water can affect results |
| Select the site, usually the side of the fingers<br>Gently massage at the base of the finger and stroke towards the puncture site. Place finger in a dependent position | There are fewer nerve endings on the sides of the fingers; therefore, it is less painful<br>Increases vasodilation and blood flow |
| Prepare the glucometer as per the manufacturer's instructions<br>Check the machine has been calibrated with the test strip<br>Check the date on the reagent strip and ensure the lid is closed securely | Glucometers require recalibration to ensure accuracy of result<br>Reagent strips are affected by moisture in the air |

*Continued*

| CLINICAL SKILL 36.1 Measuring blood glucose—cont'd | |
|---|---|
| Insert the reagent strip into the glucometer<br>Follow manufacturer's guidelines as to when to insert the strip | This is generally before the blood is applied to the strip |
| Obtain the blood specimen<br>Prepare the lancet<br>Place firmly against the side of the finger<br>Pierce the finger quickly | Ensures the skin is pierced<br>Reduces discomfort. The fingertip is the most accurate test site because it registers changes in blood glucose more quickly than the rest of the body. To avoid calluses, soreness and infection, prick the finger on the side not the pads<br>Ensure adequate blood for accuracy of result. Do not squeeze finger immediately after prick, as this will actually decrease blood flow. Instead wait a moment and then gently milk the finger |
| Allow the blood to drop onto the test strip | This may differ depending on the monitor<br>The blood should cover the test strip<br>Some strips fill from the side |
| Apply pressure to the puncture site with tissue or cotton swab | Promotes haemostasis |
| Timing is determined by the manufacturer | Ensures accurate results<br>Most glucometers display a digital read out |
| Read the digital result from the glucometer | Note result to allow comparison with normal blood glucose level |
| Turn off the meter, remove the test strip and dispose of supplies appropriately<br>Place used lancet in sharps container<br>Remove used PPE and dispose of appropriately<br>Perform hand hygiene<br>Clean glucometer as per manufacturer's instructions. Return to appropriate storage area | Reduces risk of transmission of infection |
| Lower the bed and assist the individual to reassume a comfortable position<br>Ask the individual to report any complications during and post procedure if able | Promotes rest and relaxation, monitors for adverse effects |
| Record results accurately on chart and in correct location in healthcare record. Share the result with the individual and then report the observation to the Registered Nurse. Report abnormal result to medical officer as per facility/organisation policy | Keeps individual informed. Documentation provides a record of the reading<br>Provides relevant information to other members of the healthcare team<br>Allows for the planning and implementation of care |
| *(Australian Diabetes Society 2012; Australian Commission on Safety and Quality in Health Care 2012; 2015; Berman et al 2015; Dempsey et al 2014; Diabetes Australia 2014c; Rebeiro et al 2013; Sparkes et al 2014)* | |

individuals with diabetes mellitus may have to depend on lifelong medication and dietary alterations, and a lifelong commitment to monitoring blood glucose. All individuals with chronic conditions should also be encouraged to wear a medical alert bracelet.

## The prospect of facing major surgery

Removal of the thyroid gland may be indicated in the presence of hyperthyroidism, goitre or carcinoma of a gland. Likewise, adrenalectomy may be the preferred intervention with adrenal gland tumour or hypersecretion of corticosteroids or catecholamines. A similar approach may be taken, in addition to medication, for pituitary tumours. Individuals facing major surgery should be educated and counselled on the preparation for surgery, the procedure and care required postoperatively.

## Possible postoperative changes

Surgical intervention may result in the balance of hormones shifting in the opposite direction. For example, thyroidectomy

for hyperthyroidism or hyperparathyroidism may result in hypofunction of the gland after removal of much of the tissue. Individuals should be educated in the likelihood of having hypofunction of the gland and the reliance on medication to address these changes.

## Alterations in nutritional status

Weight gain often occurs in hypothyroidism, whereas weight loss is common in people with type 1 diabetes mellitus. Nutritional status may also be affected if the individual is experiencing anorexia, nausea or vomiting. Hyperthyroidism is associated with increased cellular metabolism and individuals often experience rapid weight loss: management of calorific intake is therefore a concern. In addition, iodine intake may need to be restricted or increased in individuals with goitre or thyrotoxicosis.

Nursing care plans should also consider the reduction or management of dietary intake of calcium for individuals with parathyroid imbalances. Diabetes mellitus obviously requires the management of glucose intake by health professionals and educators, and most especially by the individual.

## Alterations in fluid and electrolyte balance

Excessive loss of fluid (polyuria) may occur in diabetes mellitus or posterior pituitary gland disorders such as diabetes insipidus. Loss of fluid may also occur if the individual has diarrhoea, and may be present in disorders such as hyperthyroidism and Addison's disease. To address polyuria, the increased thirst (polydipsia) and fluid intake of individuals with diabetes mellitus and diabetes insipidus should be considered.

Conversely, retention of fluid may occur in disorders such as Cushing's syndrome, the oedema associated with hypothyroidism (and myxoedema) and SIADH. Careful fluid restrictions for individuals with SIADH are suggested to allow sodium levels to increase slowly. Where the effects of aldosterone are compromised or enhanced (e.g. primary aldosteronism), electrolyte intake (especially of sodium) as well as fluids should be considered.

## Management of discomfort

Many endocrine disorders result in problems related to body temperature regulation. A person with hypothyroidism is very sensitive to cold, whereas an individual with hyperthyroidism is commonly intolerant to heat. Other factors that may cause discomfort include pruritus associated with hyperthyroidism or diabetes mellitus, and joint pain associated with acromegaly. Anxiety and nervousness associated with certain disorders such as hyperthyroidism, or hypertension and headache with phaeochromocytoma, may also cause discomfort as the individual is restless and finds it difficult to relax. Apathy and difficulty in concentration may occur in hypothyroidism.

Calcium imbalances potentially affect nervous and muscular function, and individuals with hyper- and hypoparathyroidism may experience anxiety, uncomfortable nervous tingling and muscle spasms, or backache associated with calcium resorption from bones.

## Reduced independence

Extreme fatigue often accompanies endocrine disorders, and the individual may require assistance to carry out activities of daily living. Certain disorders (e.g. Cushing's syndrome or hyperparathyroidism) may be accompanied by alterations in mental status, learning and memory (McCance & Huether 2013). Altered states of awareness or consciousness (hypothyroidism, decreases in fluid electrolyte levels) will also reduce the individual's level of independence.

Hypertension and arteriosclerosis associated with disturbances to glucose and lipid metabolism (e.g. diabetes mellitus, Cushing's syndrome) may also restrict individuals to less exertive activities and a greater reliance on assistance.

## Altered body image

Individuals may experience both physical and mental alterations to body image and subsequent changes in behaviour to address these concerns. Healthcare professionals should be prepared to explain the manifestations to the individual, and to consult and counsel the individual in the event of changes in self-esteem or behaviour associated with physical changes (Clemmons 2012).

Obvious changes in physical appearance occur with Cushing's syndrome (e.g. buffalo hump, moon face), and exophthalmos and possible goitre associated with hyperthyroidism (Clemmons 2012). Individuals may also exhibit changes in height and appearance with gigantism and acromegaly. Hirsutism associated with adrenal, pituitary or gonadal dysfunction may severely affect the self-esteem of individuals (especially females), and children suffering from androgenital syndrome are especially likely to suffer from psychological effects of an altered body image. Individuals with Addison's disease may experience increased skin pigmentation (bronzing).

The plan of care that the nurse designs for an individual should specifically address the need for comfort, psychological support and maintenance of nutritional and fluid status. Individuals should also be given information regarding professional support and self-help groups and should be encouraged to contact these organisations for further support and information. A list of organisations and websites is provided in online resources.

### CRITICAL THINKING EXERCISE 36.4

A 38-year-old mother of two has been admitted with a possible adrenal tumour. Considering the role of the adrenal gland, what possible endocrine disorders might the individual suffer from? What might be their physical manifestations, and how can you best explain to the individual what she might be experiencing?

### CRITICAL THINKING EXERCISE 36.5

Louise, 46, is an active community care worker who has arrived at a medical clinic for assessment, concerned by the gradual onset of several symptoms. She complains of weight gain. She also conveys to you a feeling of generally 'slowing down', describing symptoms such as constipation, tiredness, an impaired memory and feeling cold despite the warm spring evenings. She speaks slowly, occasionally slurring her words.

1. On examination, you observe a bradycardia of 52 beats per minute, and note the individual's dry skin, oedematous eyelids and enlarged tongue. What endocrine disorder is Louise likely to be suffering from?
2. Louise is started on medication with the aim of normalising her thyroxine levels. If these oral thyroid medications cause her to become hyperthyroid, what signs and symptoms would you educate her to be aware of?
3. What further education will Louise require to help her cope with the diagnosis?

## Care of the individual with diabetes mellitus

The main aims of management of the individual with diabetes mellitus are to maintain the blood glucose level within an acceptable range and to implement measures to assist the person to live as normal a life as possible (Diabetes Australia 2014c). Diabetes can be controlled at present, but not cured; management is therefore aimed at controlling it and preventing complications. Care of an individual with diabetes involves regulating the blood glucose level by diet, exercise and insulin or oral hypoglycaemic agents, preventing infection and monitoring blood and urine glucose levels. The overall aim for the individual is self-management of the disorder, which makes education of the individual in all aspects of care an essential part of management (Diabetes Australia 2014c) (see Nursing Care Plan 36.1).

### Diet, nutrition and energy requirements

Diet is an important aspect in control of both type 1 and type 2 diabetes mellitus. A dietitian works with the individual to develop a well-balanced, healthy food intake. It is essential that the individual gains understanding of the principles and can then modify and adapt the diet to meet demands experienced during illness, injury, emotional stress or major changes in lifestyle. The aims of the diet for a person with diabetes are to:

- Satisfy hunger
- Improve health and prevent or delay complications
- Provide for normal growth rate in children
- Provide a balanced dietary intake
- Attain and maintain a desirable body weight
- Meet energy requirements and
- Maintain the level of blood glucose within the normal range to prevent hypoglycaemia and hyperglycaemia.

Normal or average blood glucose is around 5 mmol/L (4–6 mmol/L fasting), with a range of 3.5–8 mmol/L. Fasting plasma glucose in a non-diabetic individual is usually less

### NURSING CARE PLAN 36.1

**Assessment:** Janine Wells underwent setting of carpal fracture yesterday. No complications from surgery and reports of little pain or discomfort. Janine has type 2 diabetes and is exhibiting fatigue; she is lethargic, lacks energy and is unable to maintain her normal feeding and bathing routine. Janine has been asked numerous times about her general wellbeing and her pain regarding the recent surgery—she appears disinterested and unenthusiastic. Janine is non-committal regarding assistance to accomplish her tasks.
**Issue/s to be addressed:** Lack of motivation, listlessness and inability to maintain enthusiasm or routine
**Goal/s:** To encourage and assist Janine to maintain daily tasks and to increase energy levels, interest and awareness of her surroundings

| Care/Actions | Rationale |
|---|---|
| Discuss with Janine the need for activity (ambulation—no risk for wrist). Plan with Janine activities or assistance with activities to avoid fatigue | Education and participation may provide motivation to increase activity level even though Janine may feel too weak or disinterested |
| Ensure Janine undertakes periods of supervised activity alternating with rest | To prevent excessive fatigue |
| Monitor pulse, respiratory rate and BP before and after activity | Indicates physiological levels of tolerance |
| Increase Janine's participation in ADLs as tolerated | Increases confidence level, self-esteem and tolerance level |
| Involve Janine in discussions on strategies to conserve energy during tasks such as bathing (or activities as planned) | She will be able to accomplish more with a decreased energy expenditure and may increase tolerance of activity and/or confidence |

**Evaluation**

Janine managed to bathe and complete her meal unassisted and is more receptive to questioning. Janine has managed an uninterrupted afternoon rest and has reported she feels a little less lethargic.

than 6.1 mmol/L, and a repeated fasting level of at least 7.0 mmol/L is indicative of hyperglycaemia (LeMone et al 2014). The Heart and Diabetes Institute of Australia recommends goals for dietary and nutrition management (Heart and Diabetes Institute of Australia 2011).

Alcohol should be limited, as not only is it high in sugar and may cause adverse reactions to some medications used in the treatment of diabetes mellitus, it may also mask hypoglycaemia (Endocrinology Expert Group 2014). The dietitian will supply the individual with instructions for planning nutritious and varied meals within the prescribed limitations. The importance of regular meals and snacks is emphasised, particularly an evening snack to prevent nocturnal hypoglycaemia. The diet is continually evaluated and adjusted as required. When the individual is in hospital it is important that the nurse observes the amount of each meal eaten because if nutrients are not all consumed the person may experience hypoglycaemia (Brown et al 2015; Craft et al 2014; Farrell & Dempsey 2013).

## Exercise

The amount of exercise required by the individual should be estimated and planned to balance with the dietary intake and insulin (Farrell & Dempsey 2013). A well-planned program of regular exercise that is adjusted as necessary is beneficial in weight control, in its physiological and psychological effects and in terms of blood glucose control. Regular gentle exercise stimulates the uptake of glucose by muscle cells, lowering blood glucose levels and increasing the absorption of injected insulin. For these reasons, exercise can increase the likelihood of hypoglycaemia. To prevent hypoglycaemia after exercise, the individual needs to either increase the nutritional intake or decrease the insulin dosage. Education is essential for the individual to gain understanding to correctly balance the level of exercise with dietary intake and insulin dosage under varying conditions. Exercise also has the benefits of decreasing cholesterol and triglycerides, and reducing the risk of cardiovascular disease (LeMone et al 2014). Strenuous exercise, however, can trigger the release of hyperglycaemic hormones, such as adrenaline and glucagon, so should be avoided (Brown et al 2015). For a sample of an entry in progress notes see Progress Note Example 36.1.

## Insulin

As insulin is essential for the normal metabolism of glucose, it is a major factor involved in the regulation of blood glucose levels. Many types of insulin are available and these may be rapid onset-fast acting, short-, intermediate- or long-acting, or mixed (Diabetes Australia 2008). The different types of insulin vary in the time of onset and the duration of action, and are selected according to the time of day, activity and nutritional intake. As soon as possible after diagnosis, the individual is given instruction on insulin administration and care for the equipment required. Insulin may be administered via syringe and needle (now less commonly used), specialised pens or by pump (CSII—continuous subcutaneous insulin infusion) (Diabetes Australia—Vic 2010; LeMone et al 2014; McDowell et al 2007). Individuals are also instructed on rotating injection sites around the abdomen and thighs to prevent tissue atrophy or hypertrophy at regularly used injection sites. The abdomen provides the fastest and most consistent rate of absorption and is an accessible site for the person to use (Figures 36.8 and 36.9).

Short-acting insulin may also be delivered continuously at a basal rate subcutaneously by a CSII pump, with dosages entirely self-determined and monitored by the individual. Individuals choosing this insulin regimen need to be motivated, and educated by a nurse or diabetes educator (Australian Diabetes Educator Association 2015). Insulin pumps and associated equipment are subsidised in Australia by the NDSS (National Diabetes Services Scheme) (Endocrinology Expert Group 2014; Diabetes Australia–NDSS 2015).

## Oral hypoglycaemic agents

Oral hypoglycaemic agents may be prescribed in the management of type 2 diabetes mellitus unresponsive to diet alone. The medications used in the treatment of diabetes mellitus act in a variety of ways, by stimulating the pancreas to release insulin (secretogogues), reducing insulin resistance

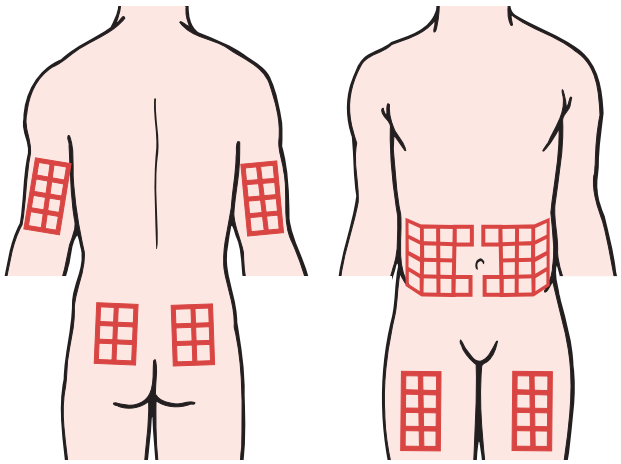

**Figure 36.8** Insulin injection sites
*(Lewis et al 2011)*

### PROGRESS NOTE EXAMPLE 36.1

| | |
|---|---|
| 02/03/2015<br>0950 hrs | Nursing: Janine supervised with exercise (walk around floor) due to general lethargy and unresponsiveness. Activity completed and Janine able to return to bed. Was instructed to call for assistance when bathing. Janine indicated that she felt more capable and will request assistance only if she is feeling too tired. |

***D. Schanz* (Schanz) EN**

**Figure 36.9** Insulin pen
*(iStockphoto/Abidika)*

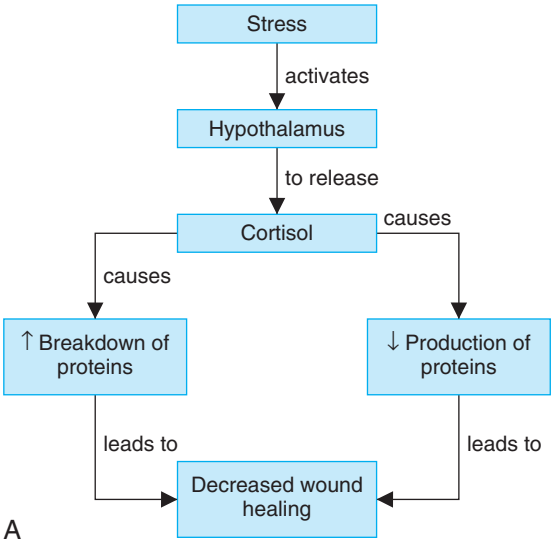

**Figure 36.10** Diabetic foot ulcer
*(**B**: Courtesy of Isabelle Ellis)*

(sensitisers), the promotion of glucose use or delaying glucose absorption across the gut (Endocrinology Expert Group 2014).

## Hygiene and preventing infection

People with diabetes mellitus are susceptible to infection as a result of impaired body defence mechanisms and elevated glucose providing an environment for bacterial growth (Craft et al 2014). The person with diabetes is particularly at risk of developing urinary tract infections, fungal infections such as *Candida* and infected skin lesions (Brown et al 2015). To minimise the risk of infection the person should understand the importance of good control of blood glucose levels, of maintaining a high standard of personal hygiene and of avoiding unnecessary exposure to infection (LeMone et al 2014). The skin should be kept clean and free from excessive irritation, friction or pressure. All injuries to, or infections of, the skin, however minor, should be cleaned with a mild antiseptic solution and covered with a dressing (McDowell et al 2007).

Skin lesions of the feet commonly occur in people with poorly controlled diabetes mellitus (Heart and Diabetes Institute of Australia 2011; Santamaria et al 2004). Such lesions result from, or are exacerbated by, impaired circulation and peripheral neuropathy (Craft et al 2014). If a minor injury or lesion is undetected or untreated, ulceration and infection may develop (Figure 36.10). Between 50% and 75% of lower extremity amputations are performed on people with diabetes (Farrell & Dempsey 2013). The nurse should also consider the lesion or aberration to be of different origin: melanomas of the feet have been misdiagnosed as diabetic foot ulcers (Rogers et al 2007; Yesil et al 2007). Care of the feet and prevention of foot lesions is therefore of prime importance and national guidelines on the prevention, identification and management of foot complications in diabetes are available (Heart and Diabetes Institute of Australia 2011).

## Guidelines for foot care in individuals with diabetes

- Wear well-fitting socks or stockings, and shoes. Socks should be made from natural fibre (e.g. wool or cotton) with care taken to avoid hosiery with seams under the feet
- Practise daily cleansing, drying and inspection of the feet. A mild soap is used and the feet should not be soaked for long periods. After washing, the feet should be patted dry rather than rubbed. Dry feet may be gently massaged with lanolin or oil to prevent fissures
- Consult a podiatrist if corns or calluses need attention
- Trim the toenails straight across, to avoid damage to the surrounding skin
- Keep the feet warm but avoid placing them close to heating devices, to prevent possible skin damage. If an electric blanket is used to warm the bed, it should be turned off before the person gets into bed
- Avoid walking barefooted or on hot surfaces
- Perform foot and leg exercises to increase circulation
- Avoid constrictive clothing (e.g. socks with elasticised tops) and crossing the legs, both of which may reduce blood flow

- Seek immediate attention from the podiatrist or medical officer if there is any injury, colour change, infection or discharge of pus or blood (Craft et al 2014; Diabetes Australia 2014a; 2014c; Farrell & Dempsey 2013; LeMone et al 2014; McDowell et al 2007).

## Monitoring blood glucose levels

Blood glucose monitoring is an accurate method of assessing the effectiveness of diet, exercise levels and medication therapy and to gain information regarding an individual's current blood glucose level (Diabetes Australia 2014b; 2014c). Blood glucose monitoring is described in Clinical Skill 36.1, and is usually performed by obtaining a drop of capillary blood, which is applied to a reagent strip and read by one of the many types of glucometers available on the market. Most meters available currently show acceptable reading precision, and errors are clinically insignificant (Cohen et al 2006; Rebel et al 2012). A digital display of the glucose level is provided, or the colour of the strip may be compared with a standard, either visually or with a reflectance meter. A variety of blood glucose monitoring machines are available, including ones with automatic finger-pricking, which run either on batteries or from mains power (Figure 36.11).

The aim of self blood glucose monitoring is to assist individuals with diabetes to assume more independence in managing their condition. Each person using blood glucose monitoring receives individual instruction in the technique from a diabetes health educator; for example a member of the Australian Diabetes Educators Association. People with diabetes are advised on the appropriate times at which to perform the test and are shown how to make suitable adjustments to their insulin dose if the blood glucose levels are above or below those recommended. If the nurse is required to perform blood glucose monitoring they should also receive instruction in the technique and should become familiar with the manufacturer's instructions accompanying each monitoring device (see Clinical Skill 36.1).

Although not as accurate or desirable, blood glucose and ketone analysis may be augmented by urinalysis, performed by either a nurse or the individual at home. Glycosuria is also indicative of other disorders such as Cushing's syndrome. As a result, information on the effects of treatments or severity of other endocrine disorders may be provided by the specific gravity, presence of ketones or pH recorded on urinalysis strips. For further information on urinalysis, see Chapter 31.

## Education

The person with diabetes mellitus has to learn to accept the condition and the resulting lifestyle changes that need to occur. They need to gain confidence in managing the condition, which requires learning a considerable amount of medical information and technical skills. A well-planned education program helps alleviate anxiety, creates autonomy in management and results in well-managed individuals. Involving family members and close friends in the education program also assists the individual. The aims of an education program are that the individual will:

- Accept the condition and understand the importance of good diabetic control
- Acquire the technical skills needed to monitor blood glucose levels and administer medications

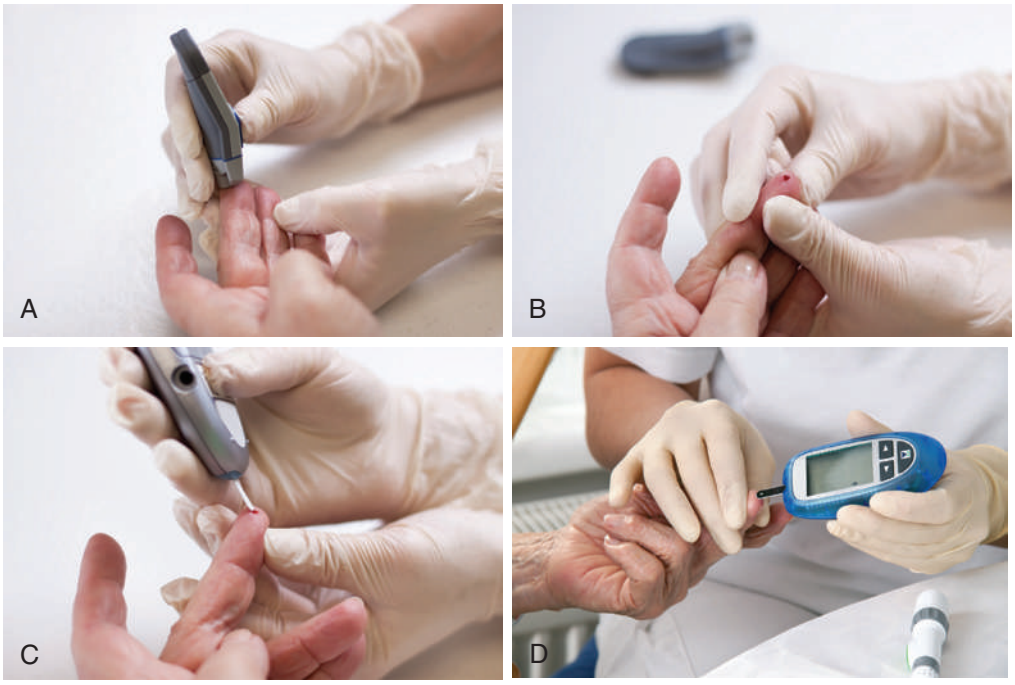


**Figure 36.11** Blood glucose meter and monitoring

*(**A**, **B**, **C**: © Miriam Doerr/Shutterstock; **D**: © Lisa S./Shutterstock)*

- Understand the importance of diet, exercise and medications in maintaining blood glucose levels
- Recognise disturbances of blood glucose levels and the development of complications.

A person with diabetes mellitus should always carry a form of diabetic alert identification with them, such as a card, bracelet or medallion. This ensures that appropriate care will be administered if a medical emergency occurs. Individuals suffering from diabetes mellitus or at risk may be referred by their health professional to the Australian Government National Diabetes Services Scheme for access to subsidised products to assist in home blood testing (Australian Diabetes Educators Association 2015; Diabetes Australia–NDSS 2015).

### CRITICAL THINKING EXERCISE 36.6

Paul is an obese 54-year-old man with a 4-year history of type 2 diabetes mellitus. Despite his best efforts, he tells you that he is finding it difficult to alter his diet and activity levels. His doctor has recently told him to take extra care with his feet. He asks you, a nurse, why this is important. What do you say to him about skin care in people with poorly controlled diabetes mellitus?

## Summary

The endocrine system is made up of a number of glands that secrete chemical substances called hormones directly into the bloodstream. Each hormone has a specific purpose in the body, and their effects are often wide-ranging and prolonged. The endocrine system influences major bodily processes as diverse as growth, sexual maturation, blood calcium and fluid balance. All glands and hormones work in concert to maintain homeostasis.

Hormone imbalances and endocrine dysfunction may result from autoimmune reactions, trauma, tumours and genetic disorders, among other factors. More common or recognisable endocrine health problems include Graves' disease, Cushing's syndrome, acromegaly and diabetes mellitus. Diagnostic tests to assess gland function include estimating serum hormone and metabolite levels, urine tests, scanning and ultrasonography. A number of disorders are characterised by definitive signs and symptoms and nursing intervention and care varies according to the specific disorder. The nursing care is designed to support and help individuals meet all their needs.

Diabetes mellitus is specifically a disorder of blood glucose regulation. Management of diabetes mellitus includes monitoring diet and blood glucose, activity levels, use of insulin and the prevention of complications.

### DECISION-MAKING FRAMEWORK EXERCISE 36.1

You are a Diploma of Nursing student who is on clinical placement for the second time. You have just successfully completed the medication administration unit and are assisting with the care of a person who has Graves' disease, a condition that affects the thyroid gland.

Your buddy nurse asks you to speak with this person and to either administer their medication (antithyroid tablet) or assist the person to do so. The buddy nurse will be close by as they will be dealing with an individual on the other side of the room.

1. Before you undertake this action, do you have the necessary education in order to administer or assist with the administration of oral medication?
2. You are not an Enrolled Nurse yet—as a student on placement, what authority do you have in regards to performing this practice? Do you need assistance? Of what importance is the proximity of the buddy nurse?
3. You do not feel confident in undertaking this action. Should you go ahead anyway?
4. Given you have completed your stage two only a week or so prior to placement, and this is your second placement round for your Diploma, are you competent to perform this action? Explain why or why not.

## Review Questions

1. Describe how the pituitary gland regulates the thyroid and adrenal glands, and the gonads.
2. Describe gigantism. Does gigantism occur before or after epiphyseal closure? How does this differ to acromegaly?
3. What is the function of antidiuretic hormone? Blood tests of one of your individuals shows they are suffering from hyponatraemia, serum hypo-osmolarity and urine hyperosmolarity. What sort of endocrine imbalance might be occurring? Which gland do you think is responsible?

4. Explain the difference between diabetes insipidus and diabetes mellitus. A dysfunction of which endocrine glands might be responsible for these conditions?
5. How do you account for the hyperactivity, tachycardia and nervousness which are typical signs of Graves' disease?
6. List three (3) situations that could instigate a thyroid storm or thyroid crisis.
7. The parathyroid glands secrete parathormone (PTH). What is the action of this hormone? What is the name and source of the hormone which is antagonistic to PTH? Where else do we find hormones with opposite actions? (Give an example of complementary hormones.)
8. Describe the main functions of glucocorticoids such as cortisol. What possible health problems may develop with prolonged secretion or administration of cortisol?
9. Explain how problems with the adrenal cortex might manifest in body fluid imbalances.
10. How is it that the adrenal medulla has an identical, but more prolonged, influence on your body than the sympathetic nervous system?
11. What sort of signs or symptoms would you expect a female individual with an excess of androgens to exhibit?
12. Describe the two types of diabetes mellitus. Is diabetes necessarily a problem with the pancreas, or a product of the pancreas? Explain.
13. Describe the significance of finding a high level of ketones in the urine of an individual with type 1 diabetes mellitus.
14. Where is the best location on a person's finger to perform a blood glucose test and why?
15. Match the list of endocrine organs/tissues below with their hormones.

| Gland | Hormone |
|---|---|
| Pancreas | Adrenaline |
| Adrenal | TH |
| Thyroid | GH |
| Pituitary | Insulin |

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australasian Paediatric Endocrine Group: www.apeg.org.au

Australian Addison's Disease Association: www.addisons.org.au

Australian and New Zealand Bone and Mineral Society: www.anzbms.org.au

Australian and New Zealand Endocrine Surgeons: www.endocrinesurgeons.org.au

Australian Bureau of Statistics: www.abs.gov.au

Australian Diabetes Educators Association: www.adea.com.au/

Australian Diabetes Society: www.diabetessociety.com.au

Australian Institute of Health and Welfare: www.aihw.gov.au

Australian Pituitary Foundation: http://pituitary.asn.au/Home.aspx

Australian Thyroid Foundation: www.thyroidfoundation.com.au

Clinical Practice Guidelines: www.clinicalguidelines.gov.au

Diabetes Australia: www.diabetesaustralia.com.au

Endocrine Society of Australia: www.endocrinesociety.org.au

ENSA—The Endocrine Nurse's Society of Australasia: www.ensa.org.au

Heart and Diabetes Institute of Australia—Baker IDI: www.bakeridi.edu.au/

Jean Hailes—Women's Health Organisation: https://jeanhailes.org.au/

National Institute of Clinical Studies—National Health and Medical Research Council: www.nhmrc.gov.au/nics

Osteoporosis Australia: www.osteoporosis.org.au

Phaeochromocytoma and Paraganglioma Research Support Organisation: www.pressor.org

Therapeutic Guidelines: http://www.tg.org.au/

Thyroid Australia: www.thyroid.org.au

CHAPTER
37

# Nursing assessment and management of reproductive health

*Christine Baker*

## KEY TERMS

amenorrhoea
balanitis
candidiasis
circumcision
contraception
dysmenorrhoea
dyspareunia
endometriosis
epispadias
erectile dysfunction (ED)
gamete intrafallopian transfer (GIFT)
hydrocoele
hypospadias
in vitro fertilisation (IVF)
infertility
mastitis
oogenesis
Papanicolaou (Pap) test
phimosis
priapism
prostate-specific antigen (PSA)
prostatitis
spermatogenesis
testicular self-examination (TSE)
testosterone
transurethral resection of the prostate (TURP)
varicocoele
vasectomy

## LEARNING OUTCOMES

At the completion of this chapter and with some further reading, students should be able to:

- Define key terms
- Describe the physiology of the male reproductive system
- Describe the physiology of the female reproductive system
- Consider alterations in health status that affect male and female reproductive systems
- Discuss factors that influence reproduction
- Identify factors that may affect sexual and reproductive health
- Discuss major clinical conditions which may affect sexual and reproductive health
- Identify diagnostic tests used to assess reproductive function
- Develop individual management strategies for the management of sexual and reproductive disorders
- Identify nursing responsibilities in relation to child sexual abuse
- Understand the physical and social implications of sexually transmitted infections
- Discuss the impact of disability on sexual health

## CHAPTER FOCUS

This chapter looks at the important aspects of reproductive health as they affect individuals throughout the lifespan. It looks briefly at the normal anatomy and physiology of the male and female reproductive systems and discusses common alterations that impact on reproductive health. The chapter also looks at common diagnostic tests and examinations conducted to assess an individual's health status and the role of the nurse in identifying individual needs and implementing a management plan.

## LIVED EXPERIENCE

Last week I finally consulted my GP about getting 'the snip'. My wife and I have four healthy children. My wife had started using contraception after the birth of our third child, but after a bad cold she fell pregnant and before we knew it we were planning for the birth of our fourth. We have discussed the decision at length and both agree that we don't want to have any more children so it is time for me to take some responsibility and book in for a vasectomy. I am a bit nervous; what if something goes wrong?

**Peter, 40-year-old father**

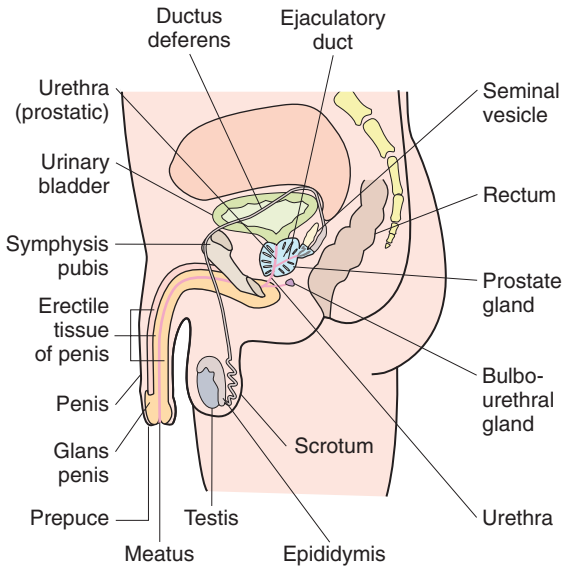


**Figure 37.1** The male genital system

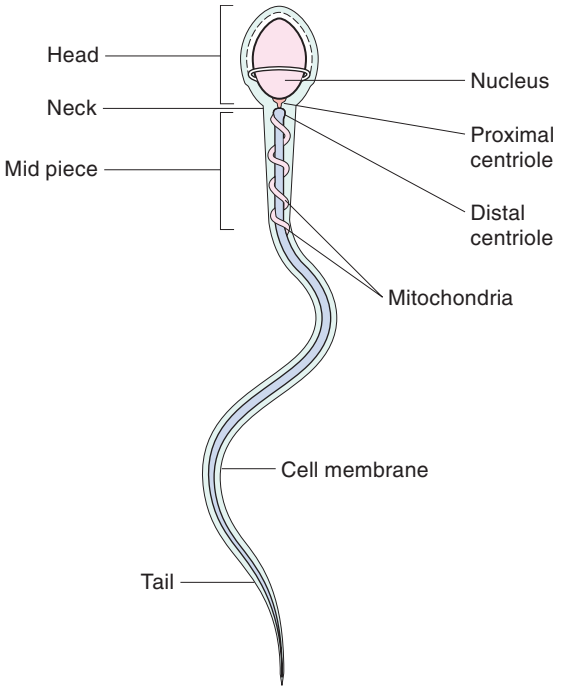


**Figure 37.2** The structure of a sperm cell

# THE MALE REPRODUCTIVE SYSTEM

The male reproductive system (Figure 37.1) is comprised of the testes, epididymis, ductus deferens, seminal vesicle, prostate gland, penis and urethra. The penis comprises a passage for both semen for semen during ejaculation and urine, travelling to the outside via the urethra which is common to both the urinary and the reproductive systems.

## Spermatogenesis

**Spermatogenesis**, the production of sperm cells, is a process occurring in the testes during puberty. In early fetal life, the testes remain suspended in the abdomen and descend at birth or soon after, through the inguinal canal into the scrotum, suspended in place by the spermatic cords.

Spermatogenesis is triggered by an increase in gonadotrophin-releasing hormone (GnRH) by the hypothalamus. Luteinising hormone (LH) and follicle-stimulating hormone (FSH) are secreted by the anterior lobe of the pituitary gland as a result of GnRH stimulation. With the release of LH, the Leydig's cells located in the testes release testosterone. FSH acts on the Sertoli cells in the seminiferous tubules to stimulate cell division and sperm production.

The mature sperm consists of a head, which contains the genetic material of the cell; a mid-piece, which comprises the mitochondria; and the tail, which helps to propel the cell as it travels through the female reproductive tract (Figure 37.2).

### Testosterone

The effect of **testosterone** on the body depends on both age and sex. During puberty, testosterone is associated with the development of secondary sex characteristics (hair growth, increase in muscle mass, change in voice and libido and enlargement of sex organs).

Production of testosterone continues throughout the adult life of the male. Testosterone levels may decrease in older age and as a result of injury, disease or radiation and after surgeries such as a vasectomy.

## DISORDERS OF THE MALE REPRODUCTIVE SYSTEM

A majority of disorders affecting the male reproductive system are due to developmental or age-related causes. It is important to consider early corrective surgery for congenital or structural defects of the genitourinary tract if the physical and psychological impact of the defect is to be limited. The nursing interventions during this time mainly focus on providing support to both the child and the family during the preoperative and postoperative phase. This can be accomplished by providing adequate time to express concerns and fears as well as educating the family and, if appropriate, the child about what to expect before and after the procedure. Often the use of appropriately targeted fact sheets is successful in providing this information.

Disorders affecting the male reproductive system are referred to as genitourinary disorders due to the shared anatomical structures of the urinary and reproductive systems. Conditions are usually characterised according to the type of alteration such as:

- Alteration in elimination
- Alteration in sexual function
- Alteration in urethral discharge.

### Disorders of the penis

#### Hypospadias and epispadias

Both **hypospadias** and **epispadias** are congenital defects affecting the urethral opening. Hypospadias is classified according to the position of the urethral meatus which may be on the underside or dorsal side of the penis. In epispadias the urethral opening occurs on the ventral or upper surface of the penis. Surgery for both defects involves closure of the abnormal opening and extending the urethra to the normal location (Matthew et al 2015).

#### Phimosis and paraphimosis

**Phimosis** is characterised by narrowing of the prepuce orifice, which prevents retraction due to an infection, an inflammation or a congenital lesion. The condition predisposes to infection and, if present in the adult, leads to difficulties during sexual intercourse. Where the condition is complicated by a forcible retraction of the prepuce over the glans penis inflammation of the prepuce collar can lead to swelling and constriction, a complication called paraphimosis. The treatment is **circumcision**.

**CRITICAL THINKING EXERCISE 37.1**

Circumcision is a potential treatment option for the individual diagnosed with phimosis. While most commonly the procedure is performed as an infant or child there are occasions when it may be performed as an adult. Would post-surgical management of the circumcised penis be different if performed as an adult?

**CASE STUDY 37.1**

Ian is a 17-year-old male who has come to the sexual health clinic where you work extremely anxious and agitated. After some time you manage to discover Ian had fallen asleep after having sexual intercourse with his girlfriend several nights ago when he used a condom that he stated had been in his wallet for the past 12 months. Ian explains that his penis is painful to touch and there is a slight 'cheesy' smell. Ian is scared that he may have an STI. An examination of Ian's penis reveals he is not circumcised. What is the possible reason for Ian's symptoms?

#### Balanitis

**Balanitis** is a common condition characterised by inflammation of the glans penis which can occur at any age. The condition is more common in non-circumcised males who do not retract the foreskin when cleaning the penis. The common causative organism is *Candida albicans*. It can also develop as a result of an allergic response to chemicals such as latex and soaps or be an indicator of diabetes. While the condition can cause discomfort it is easily managed by finding and treating the cause. Treatment may involve circumcision to limit the recurrence of infection. (See Case Study 37.1.)

#### Peyronie's disease

This condition is characterised by hardening of penile tissue (fibrosis) which sometimes causes a palpable lump or area of scar tissue (plaque). The affected area limits the ability of the erectile tissue in the penis to respond during an erection and can appear as if the penis has a bend. The condition can sometimes occur after an injury to the penis; however, a majority of cases do not have a specific link to an event.

Treatment may include surgery to excise the scar tissue, implantation of a prosthesis to assist with maintenance of a satisfactory erection or plication of the penis (a tuck is put into the lining of the penis on the opposite side to the bend to straighten the penis). The procedure will result in slight penile shortening (Chung & Brock 2013).

#### Cancer of the penis

Penile cancer usually presents on the skin surface as a painless wart-type growth or ulcer. If left untreated the cancer

will infiltrate tissues and cause urinary symptoms. Diagnosis of penile cancer involves biopsy of the lesion to confirm the diagnosis, chest x-ray, CT scan and lymph node biopsy to check for metastases. After confirmation of the diagnosis, management involves surgery and a combination therapy of internal and external radiation and chemotherapy. Surgical procedures can range from circumcision, laser or cryotherapy treatment to partial or total amputation of the penis.

Penile cancer in Australia is rare, with the annual incidence of 0.8 per 100 000 in 2007 (Grulich et al 2010). The incidence of penile cancer is considered to have a link to diagnosis of human papillovirus (Morris et al 2012).

Nursing management of the individual before and after diagnosis is based on providing emotional support and ensuring counselling is readily available. Education should be offered to manage the physical and psychological impact of the related loss of sexual function and the cosmetic impact of a penile amputation.

## Erectile conditions

***Erectile dysfunction*** **Erectile dysfunction (ED)** is considered to be one of the most common male sexual conditions in Australia owing to the fact that a majority of cases probably go undiagnosed. The prevalence of moderate-to-severe ED increases from 10% in younger men (under 35 years) to 28% in men aged 55–74 years (Adams et al 2013).

ED is usually characterised as the inability to achieve and maintain an erection sufficient to permit satisfactory sexual intercourse. It is a common condition with an increased incidence in males as they get older. Causes may be due to psychological, neurological, hormonal, arterial or cavernosal impairment or from a combination of these factors (Table 37.1). The condition can be classified as psychogenic, organic or mixed psychogenic and organic. Psychogenic factors may include performance anxiety, lack of arousability, relationship difficulties or mental health disorders such as depression and schizophrenia.

The management for a person with ED is dependent on the underlying reason and should include investigation for a chronic disease such as heart disease or diabetes. For most men, a cure for erectile dysfunction may not be possible although treatment may allow for improvement.

The three main types of treatment include:

1. Non-invasive methods such as oral medications (phosphodiesterase-5 (PDE5) inhibitors) and use of external devices including rings and vacuum pumps
2. Penile injections
3. Surgery such as the insertion of a prosthesis or vascular surgery.

New treatments for erectile dysfunction include the use of low-intensity extracorporeal shock wave therapy which acts on the blood vessels (Andrology Australia 2014c). (See Case Study 37.2.)

***Priapism*** This condition is characterised by a persistent and often non-pleasurable erection lasting for longer than 6 hours, usually only affecting the corpus cavernosum, and not

**TABLE 37.1 | Causes of erectile dysfunction**

| Cause | Presentation |
|---|---|
| Psychosocial problems | Performance anxiety<br>Sexual attitudes and upbringing<br>Relationship problems<br>Employment and financial pressures<br>Depression<br>Psychiatric disorders |
| Nerve function interference | Spinal cord trauma<br>Multiple sclerosis<br>Diabetic neuropathy<br>Prostate or bowel surgery<br>Parkinson's disease<br>Alzheimer's disease |
| Reduced blood flow | Atherosclerosis |
| Medication, alcohol and other drugs' interference | Alcohol and drug abuse<br>Drugs such as:<br>• Antihypertensives<br>• Lipidaemics<br>• Antidepressants and psychiatric medications<br>• Prostate medications |
| Metabolic problems interfering with blood vessel function | Diabetes<br>Hypertension<br>Obesity<br>High cholesterol<br>Sleep apnoea<br>Cigarette smoking |
| Urological problems | Peyronie's disease<br>Pelvic trauma |
| Endocrine dysfunctions | Thyroid disease<br>Acromegaly<br>Excessive cortisone<br>Hypogonadism |

*(Adapted from Andrology Australia 2014c)*

### CASE STUDY 37.2

Nathan is a 64-year-old man who was diagnosed with diabetes mellitus when he was in his thirties. Five years ago he started having difficulty achieving and maintaining his erections, which has prevented him from having a normal relationship with his wife. An article in the newspaper over the weekend highlighted the latest treatments available for people with similar issues to Nathan. What treatments are available for Nathan?

induced by stimulation of sexual desire. There are two types of **priapism**:

1. Low-flow priapism—most common form, caused by increased blood viscosity that slows blood flow. This type of priapism is considered an emergency as it may lead to permanent damage.
2. High-flow priapism—less common, usually caused by trauma to penile structures (Yeng et al 2012).

**Priapism** may develop due to a complication of diseases such as sickle cell disease, leukaemia, malaria, carbon monoxide poisoning or use of some anaesthetic agents such as papaveretum. Excessive use of drugs used to treat erectile dysfunctions may also lead to priapism which is not able to be resolved through usual methods. A sustained erection leads to a build-up of toxins in the blood often called 'black blood' which will lead to anoxia and necrosis of tissue. The blood must be aspirated from the blood vessels in the penis in order for the erection to be resolved. If left untreated a priapism may lead to erectile dysfunction.

## Conditions affecting the testes

### Cryptorchidism (undescended teste)

At birth the prevalence of cryptorchidism is estimated to be one in 20 boys with the rate becoming one in 50 boys by 6 months (Andrology Australia 2015). The cause of the condition can be either congenital or acquired. Congenital causes occur more commonly in premature males where one or both of the testes fail to descend into the scrotum at birth. It may also be due to hormonal or genetic reasons. Acquired cryptorchidism occurs where the spermatic cord fails to grow at the same rate as the rest of the body and so the shortened cord pulls the testes back into the groin.

The condition is diagnosed by the absence, on palpation, of one or both of the testes in the scrotum. There is believed to be a link between a diagnosis of cryptorchidism and other health conditions such as hernias, testicular cancer and infertility in later life. The condition may be treated with hormone injections or surgery. Surgical placement of the testes in the scrotum (**orchiopexy**) is recommended before the second year of age to preserve sperm-forming cells that require a lower temperature than that of the abdomen. If the condition is not treated before puberty there is a risk of atrophy and sterility. The affected testis tends to be smaller and contain more fibrous tissue than the unaffected one.

### Carcinoma of the testes

Cancer of the testes is the second most common cancer in young men between 18 and 39 years (AIHW 2012a). The rate of testicular cancer is reported to have increased by 50% in the past 30 years (Cancer Australia 2015a); the reason for this is unknown; however, in a majority of cases treatment is successful and there are very few recorded deaths.

Men between the ages of 20 and 40 years are at most risk, with 98% of testicular tumours determined to be germ-cell in original (Shanmugalingam et al 2013). Recognised risk factors for testicular cancer are shown in Table 37.2. There is no proven link between the incidence of testicular cancer and the wearing of tight clothes, hot baths or testicular injuries.

**TABLE 37.2 | Risk factors for testicular cancer**

| | |
|---|---|
| Undescended testes (cryptorchidism) | Ten times the chance of developing testicular cancer. The incidence decreases significantly where correction of the undescended testis has occurred prior to 12 months of age |
| Previous history of testicular cancer | One in 25 males with a diagnosis of testicular cancer in one testis will be diagnosed with the condition in the other testis |
| Previous history of male infertility | Pre-cancer cells have been found in biopsies taken to diagnose infertility issues |
| Familial history | A minor risk where another male member of the family has been diagnosed with testicular cancer |
| Down syndrome | A considered increased genetic risk |

*(Adapted from Andrology Australia 2014a)*

Early diagnosis and improved treatment modalities such as chemotherapy have contributed to improved outcomes for men diagnosed with the condition; this can be seen in a 5-year survival rate of 96.8% for all age groups under 60 years (Shanmugalingam et al 2013). An early stage indicator is the presence of a smooth painless lump in the scrotum or a dull ache located in the testes or lower abdomen. Other metastatic symptoms include bowel or urinary obstruction and abdominal pain.

If a lump is detected in the testes, the male who seeks medical advice will have the diagnosis confirmed with an initial physical examination, ultrasound of the scrotum and collection of blood for presence of blood serum markers. Elevated levels of alpha-fetoprotein (AFP) and human chorionic gonadotrophin (hCG) will be detected in testicular cancer. Ultrasonography differentiates between a solid and a cystic lesion. Tests to detect potential metastases include chest x-ray and CT scans of the chest, abdomen and pelvis.

Treatment for testicular cancer is dependent on the type and stage of the cancer. Surgical removal of one or both testicles (orchidectomy) is usually performed for all cases of testicular cancer. The testis is then sent to pathology for confirmation of the type and stage of the cancer. Following surgery, chemotherapy and radiotherapy usually follow surgery to kill any remaining cancer cells which may be located in other parts of the body.

Treatment often leads to infertility, which is a major consideration in the management of the male in the pretreatment phase. For the male who may still want children,

possible sperm banking should be considered. The male should also be reassured that the condition should not affect their virility and should not affect their ability to achieve an erection. The individual may be referred to support services outside the hospital and should be educated in testicular self-examination. It is recommended that he carry out periodic examinations, as there is an increased risk of a second tumour occurring. It is important to reassure the individual that removal of one testis does not necessarily lead to a loss of sexual function and there are options, both medical and surgical, available to manage cosmetic abnormalities.

### Torsion of testis

Torsion of testis is a condition in which the testis becomes twisted around itself. It is more commonly seen in young athletic males after violent movement or trauma and may also occur due to abnormality of the male anatomy. The twisting results in obstruction of venous blood flow that may lead to infarction. If left untreated, necrosis and total lack of function may occur. The condition may present with severe pain, scrotal swelling and nausea and vomiting. Urgent medical attention is necessary to preserve the viability of the testis as permanent damage may occur within 4–6 hours of the torsion developing (Boettcher et al 2013).

### Hydrocoele

**Hydrocoele** is a painless collection of fluid within the tunica vaginalis of the testis from defective or inadequate reabsorption of fluid normally produced within the testis. The condition is fairly common in male infants where it is the most common cause of testicular swelling. In infants the accumulation of fluid is due to unhindered drainage from the abdomen, whereas in adult males it may be associated with infections, trauma or tumours. The individual may experience a feeling of heaviness or pain associated with increased scrotal size and may feel embarrassed because of the appearance of the scrotum.

Ultrasound and transillumination are diagnostic tests used to differentiate between hydrocoele and other causes such as tumours. If a hydrocoele is present, transillumination will allow transmission of light through the scrotum. Treatment is not usually required unless there is compromised testicular circulation. However, a scrotal support can be worn to increase comfort.

### Varicocoele

A varicocoele more commonly affects the left testis and occurs when the valves within the veins prevent blood from draining fully from the testis. This leads to pooling and swelling of the vein above the testis. **Varicocoele** is often described as a varicose vein of the spermatic cord. The individual will usually present describing their symptoms as a 'pulling' sensation, dull ache in the scrotum, pain and scrotal swelling. On palpation the scrotum feels like a 'bag of worms'. If left untreated, the condition can lead to a reduced sperm count, atrophy of the testis and can cause infertility. Treatment of a varicocoele can be either by surgery—the affected vein is ligated—or by an embolisation which can be performed under local anaesthetic. Post procedure the individual may require mild analgesics for discomfort and the intermittent use of ice packs to reduce swelling. Wearing a scrotal support can also reduce oedema and discomfort. Strenuous activity should be avoided until after review by the surgeon.

## Disorders of the prostate gland

### Prostatitis

**Prostatitis** is an inflammatory or infective condition of the prostate gland which may be bacterial (usually *Escherichia coli*). Up to 8% of males report experiencing urinogenital pain at some time in their lives; of these 15% suffer symptoms of prostatitis (Dickson 2013). It generally develops in association with an obstruction in the urinary tract in elderly males with prostatic hyperplasia, a urinary tract infection (UTI) or a sexually transmitted infection. Clinical manifestations include urinary symptoms of urgency, frequency, nocturia and dysuria. Bacterial prostatitis is characterised by sudden chills and a moderate to high fever. Pain in the perineum, rectum and lower back during ejaculation are other symptoms. Diagnosis is based upon urine, urethral and prostatic fluid cultures. Digital rectal examination frequently reveals a tender swollen prostate. Treatment of acute bacterial prostatitis is usually with an appropriate antibiotic and analgesic or, where an abscess has formed, the surgical drainage of the pus. Oral antispasmodic agents may provide relief from urinary frequency and urgency. The nurse can support the individual with comfort measures such as salt baths to relax the muscles of the pelvic floor. Stool softeners can reduce pressure on the prostate gland and are given as prescribed. Fluids should be encouraged to mechanically flush out the urinary tract. Repeated episodes of prostatitis may lead to scarring and thickening of the prostate.

### Prostatic hyperplasia

Prostatic hyperplasia is a widespread condition which increases with age, often occurring after the age of 40 years. The hormone testosterone stimulates the growth of the prostate resulting in it doubling in size between the ages of 21 and 50. The prostate gland will double in size again between the age of 50 and 80 years. In a majority of males the condition is benign, referred as benign prostatic hyperplasia (BPH). Hyperplasia of the prostate can compress the urethra laterally at the neck of the bladder which can impede urinary flow. Symptoms of BPH may be classified as either noticeable or obstructive (Table 37.3).

Noticeable changes begin as the prostate becomes progressively more enlarged and will eventually lead to a referral to a urologist for management. An International Prostate Symptom Score (IPSS) is a validated tool used to determine the need for therapy and treatment response (Table 37.4). (See Case Study 37.3.)

The cause of BPH is not well known. There has been some research suggesting there is a genetic or familial link. There has also been research which links old age and testosterone to the development of BPH as it is known that the condition occurs in the presence of testosterone.

**TABLE 37.3 | Symptoms of benign prostatic hyperplasia (BPH)**

| | |
|---|---|
| **Upper urinary tract symptoms—voiding** | • Weak stream<br>• Hesitancy<br>• Intermittency<br>• Abdominal straining<br>• Incomplete bladder emptying |
| **Upper urinary tract symptoms—storage** | • Frequency<br>• Nocturia<br>• Urgency<br>• Urinary incontinence |
| **Post-micturition symptoms** | • Sensation of incomplete bladder emptying |
| **Other** | • Perineal pain<br>• Dysuria<br>• Haematuria |

*(Adapted from Woo et al 2011; Andrology Australia 2015)*

Diagnosis of the condition is based on the symptoms and may include urinalysis to eliminate urinary tract infections, voiding analysis charts, ultrasounds, digital examination which detects changes in the surface of the prostate and blood tests such as a **prostate-specific antigen** (PSA) test which measures the level of PSA, a glycoprotein produced by the prostate gland. In the presence of BPH, the PSA levels may be raised. Biopsy of the prostate may also be performed. Biopsies are collected during a transrectal ultrasound (TRUS) which may also be used when there is a strong suspicion of prostate cancer.

Treatment options for BPH range from:

- No treatment
- Drug therapies
- Natural therapies
- Surgical intervention—transurethral resection of prostate (TURP), transurethral incision of prostate (TUIP), open or retropubic prostatectomy.

No treatment may in many cases be the best option where the symptoms are mild. It involves close monitoring of the condition. Drug therapy involves the use of medications to relax the muscles in the prostate gland, bladder neck and urethra (alpha blockers) or the use of medications to block the release of testosterone to help shrink the size of the prostate (alpha-reductase inhibitors). Some men may also try natural therapies or surgery if the condition is severe.

The type of surgery will depend on the size of the prostate, location of the enlargement, whether surgery on the bladder is also needed and the individual's age and physical condition. The most common surgical management for BPH is **transurethral resection of the prostate (TURP)**. Surgery relieves symptoms quickly, typically doubling the urinary flow within weeks. A fibre optic scope is passed through the urethra to the prostate. Using a tiny blade or an electric loop, the surgeon pares away the lining of the urethra and bits of excess prostate tissue to expand the passageway. After a TURP, the individual usually stays in hospital until the prostatic bed stops bleeding and they are able to void normally with minimal haematuria, which may be up to 48 hours. The individual should be educated on the importance of remaining well hydrated after removal of the urinary catheter to ensure they void regularly and do not develop retention due to a micro-clot in the urethral bed. Possible risks of surgery should also be provided to the individual prior to surgery, which may include erectile dysfunction, urinary incontinence, urinary tract infections and urethral strictures. Standards for recognising and responding to the deterioration of an individual in the healthcare setting should be accessible to assist in the effective management (Australian Commission on Safety and Quality in Health Care 2012; 2015). (See Case Study 37.4.)

Other approaches to management of the condition which usually have a shorter stay in hospital and recovery include:

- Laser therapy—green light prostatectomy
- Transurethral microwave therapy (TUMT)
- Transurethral needle ablasion (TUNA)
- High-intensity focused ultrasound (HIFU)
- Electrovaporisation (TVP)

### CASE STUDY 37.3

Stephan is an active 65-year-old man who has presented to his local health clinic with concerns about his ability to pass urine. When questioned he tells you that over the past month he almost always needs to get up at night with the sensation of needing to pass urine, but when he tries only a small amount of urine is passed and half the time he has the feeling of not completely emptying his bladder. Often Stephen's urine flow is weak, almost always stopping and starting. When you question Stephan further he admits the he usually needs to strain to begin urinating and feels the need to pass urine every couple of hours.

Using the IPSS chart provided how would you score Stephan? Does Stephan have a possible hyperplasia of his prostate?

### CASE STUDY 37.4

Peter, a 72-year-old male, has been admitted for a transurethral resection of the prostate gland. Peter first visited his doctor a week ago after noticing it was becoming increasingly more difficult to pass urine and he was only able to void small amounts with each attempt. Peter describes that he always feels as if he has a full bladder. What is likely to be wrong with Peter and what are his treatment options?

## TABLE 37.4 | International Prostate Symptom Score (IPSS)

| | Not at all | Less than 1 in 5 | Less than half the time | About half the time | More than half the time | Almost always | Score |
|---|---|---|---|---|---|---|---|
| **Incomplete emptying:** over the past month, how often have you had a sensation of not emptying your bladder completely after you finish urinating? | 0 | 1 | 2 | 3 | 4 | 5 | |
| **Frequency:** over the past month, how often have you had to urinate again less than 2 hours after you finished urinating? | 0 | 1 | 2 | 3 | 4 | 5 | |
| **Intermittency:** over the past month, how often have you found you stopped and started again several times when you urinated? | 0 | 1 | 2 | 3 | 4 | 5 | |
| **Urgency:** over the past month, how difficult have you found it to postpone urination? | 0 | 1 | 2 | 3 | 4 | 5 | |
| **Weak stream:** over the past month, how often have you had a weak urinary stream? | 0 | 1 | 2 | 3 | 4 | 5 | |
| **Straining:** over the past month, how often have you had to push or strain to begin urination? | 0 | 1 | 2 | 3 | 4 | 5 | |
| **Nocturia:** Over the past month, how many times did you most typically get up to urinate from the time you went to bed until the time you got up in the morning? | 0 | 1 | 2 | 3 | 4 | 5 | |
| **Total Prostate Symptom Score** | | | | | | | |
| | **Delighted** | **Pleased** | **Mostly satisfied** | **Neither satisfied or dissatisfied** | **Mostly dissatisfied** | **Unhappy** | **Terrible** |
| Quality of life (QOL) due to urinary symptoms. If you were to spend the rest of your life with your urinary condition the way it is now, how would you feel about that? | | | | | | | |

*(Adapted from Woo et al 2011. © Copyright 2011,* The Medical Journal of Australia, *Reproduced with permission)*

Most of the newer treatment methods are based on destroying, vaporising or dissolving hyperplasia and can be done with little more than a local anaesthetic on an outpatient basis. While less invasive options usually allow individuals to go home on the day of the procedure, there is a possibility that symptoms will return.

**CRITICAL THINKING EXERCISE 37.2**

The average length of stay for the individual who has undergone a TURP is 24 to 48 hours. Individuals will usually be discharged with haematuria and moderate discomfort. For this reason, discharge education of the individual is important. What discharge information should you give the individual?

### Prostate cancer

Prostate cancer occurs mainly in males over the age of 50 years, tends to grow slowly and may have metastasised before it is detected. Prostate cancer is considered to be the most common diagnosis of cancer in Australia and the third most common cause of cancer death with 13% of cancer deaths in men during 2012 being due to prostatic tumour (AIHW 2015).

Initially the person with prostate cancer may be asymptomatic. When symptoms appear, they are often similar to those caused by BPH: difficulty urinating, a weak stream, a frequent urge to urinate, nocturia, painful or burning urination and haematuria. Because prostate cancer tends to metastasise to the bone, bone pain, particularly in the back, can be another symptom. Usually the younger the individual, the more aggressive the cancer. The two main methods of diagnosis include digital rectal examination and prostate-specific antigen (PSA) levels. A biopsy may also be taken if there is a high level of suspicion. A procedure called a **transperineal ultrasound** may be performed to collect biopsies. It involves the insertion of a probe into the rectum and collection of biopsies which are viewed in the laboratory and given a grading using the Gleason Score. Aggressive tumours will be rated between 8 and 10.

***Treatment*** Prostate cancer may be treated by radiotherapy, chemotherapy, hormone therapy (palliative) or by open prostatectomy. Surgery for prostatic cancer is often done for palliative reasons because of the late onset of symptoms resulting in the condition being in the late stages on diagnosis and metastases often already being present. Radiotherapy may be performed to reduce the size of the tumour. Alternatively, hormonal therapy may be used in the short term, which also reduces the size and slows the rate of tumour development. It is usually only successful while the tumour relies on hormonal levels to sustain itself; after time it will become independent and growth becomes rapid again.

***Prostatectomy*** Open prostatectomy may involve either a radical or a partial procedure. A radical prostatectomy is used for individuals who are in good health and less than 70 years. A prostatectomy for prostate cancer is considered to extend the life of the recipient an additional 10 years. The procedure can be performed using either a perineal or a retropubic approach. The retropubic approach involves an incision through the lower abdomen to remove the prostate and possibly the pelvic lymph nodes whereas the perineal approach requires an incision through the perineum. The retropubic approach is associated with a larger number of blood transfusions and longer operative times. By contrast with the perineal approach there is a reported higher level of impotence and incontinence with the retropubic approach.

Most prostatectomy procedures are performed using a laparoscopic approach which involves the use of a remotely assisted controller-subordinate system—the da Vinci® surgical system. This procedure is essentially robotic surgery which involves multiple, small incisions into the abdominal wall and the introduction of instruments required to perform the surgery.

Nursing management involves supporting the individual prior to surgery and maintenance of hydration and fluid status. An indwelling or suprapubic catheter may be necessary to establish and monitor urinary output. Bowel preparation may include drinking 2–3 L of a cathartic and administration of an evacuant enema. Postoperatively the nurse should maintain bladder irrigation and drainage, and monitor for clots and haemorrhage. Post-procedural and discharge education needs to take physical and psychosocial factors into consideration.

*Discharge education* After a radical prostatectomy, an indwelling urinary catheter (IDC) may remain in situ for about 2 weeks, so education of the individual should concentrate on care of the catheter including changing or emptying the leg bag and the importance of maintaining a high fluid intake to reduce the risk of clot formation.

## Systemic diseases and ageing

Sexual function declines with age even in healthy men. The period between sexual stimulation and erection increases, erections are less turgid and ejaculatory force and volume is less. Conditions such as diabetes mellitus, chronic renal failure and cardiovascular disease are believed to be linked to erectile dysfunction.

A thorough medical, sexual and psychosocial assessment should be undertaken. Urinalysis, full blood count and fasting serum glucose, creatinine, cholesterol, triglycerides and testosterone are recommended laboratory tests. Treatment depends upon the cause. It can include a variety of drug therapies, which may be administered via the oral, transurethral, subcutaneous or intracavernous injection route.

## Surgical procedures

### Vasectomy

A **vasectomy** is a surgical procedure commonly performed on males who have children and do not want to father any more. It is estimated that in Australia between 15 000 and 16 000 vasectomies are performed annually with 1%

performed for males under 25 years and 90% performed for males between 30 and 49 years of age (Woolcott 2014). A number of males (4–5%) will seek reversal of their vasectomy.

The procedure can be performed under general anaesthesia; however, a majority will be performed under local anaesthesia in a fertility clinic, day procedure unit or a general practice. The procedure involves a small incision being made either side of the scrotum and the ductus deferens being brought to the surface. Either a ligature is placed around the ductus deferens to seal off the passage of sperm past the blockage or, in the majority of cases, a small segment of the ductus deferens is removed and the ends diathermied to seal the ends.

There is usually no alteration to the male's ability to maintain a sexual relationship or the effectiveness of their erection. Ejaculation is still possible; however, there should be no sperm in the fluid as it will have been prevented from travelling past the epididymis where it is reabsorbed into the body. Postoperatively the male may have minor discomfort and swelling related to the procedure which settles after 24 to 48 hours. The wound heals quickly without the need for specialised care. The individual should be advised to abstain from unprotected sex until a clear seminal fluid analysis has been completed (between 6 and 12 weeks) which shows no evidence of sperm in the ejaculatory fluid. In a small number of cases the procedure may be unsuccessful and the individual may need to undertake further surgery.

## Assessment and diagnostic tests

Anxiety and embarrassment may be experienced during physical examination and discussion of his sexual history. A calm insightful approach is required, as is preservation of the person's individuality and dignity throughout. Cultural and religious customs such as circumcision should be considered.

### Examination of external genitalia

A complete history of the individual should be collected prior to any procedure. For the male who presents with a condition affecting their reproductive system, this history should concentrate on the presence of urinary problems and symptoms which suggest alteration in normal sexual function. It may be necessary to conduct a physical assessment of the male genitalia and inguinal canal which may detect or confirm the presence of penile discharge, tenderness, lesions, swelling, lumps or asymmetry.

### Testicular examination

**Testicular self-examination (TSE)** should be performed on a regular basis. The testes are examined for size, shape, symmetry and texture. It is important that both testes are checked at the same time (see Clinical Interest Box 37.1).

### Digital rectal examination

Digital examination of the prostate involves the insertion of a gloved finger inside the rectum to palpate the prostate. The examination detects the size, shape and firmness of the prostate through the wall of the rectum.

### CLINICAL INTEREST BOX 37.1 Individual teaching—testicular self-examination

- It is often easier to perform this examination after a warm bath or shower when the skin of the scrotum is relaxed
- It is important to check both testes at the same time
- Use the palm of the hand and support the scrotum (Note: it is not unusual for one testis to be slightly larger than the other)
- It is important to be familiar with the feel of the texture and size of the testis so you are able to detect reportable changes
- Roll one testis gently between the thumb and fingers to feel for lumps or swellings
- Repeat with the other testis. The surface of the testis should feel smooth and firm
- Use the thumb and fingers to feel along the epididymis for any swelling
- Even if you have had testicular cancer or are being treated, it is still important to perform a testicular self-examination as one in 25 men may develop testicular cancer in the other testis

*(Adapted from Andrology Australia 2015)*

### CLINICAL INTEREST BOX 37.2 PSA testing

Most research suggests PSA testing is not indicated in males 75 years or older unless there is a known diagnosis of cancer.

Results of the PSA test are usually resulted in ng/mL with levels of total PSA >4.0 ng/mL considered to be abnormal. The test may be repeated every 1–3 months if an abnormal result is reported.

*(Brett 2011, reprinted 2014)*

### Prostate-specific antigen test

This test measures the level of PSA which is a protein produced by cells of the prostate gland. The test is performed by taking a sample of blood and sending it for analysis. A high PSA is suggestive of a condition affecting the prostate but may not necessarily mean the individual has prostatic cancer. (See Clinical Interest Box 37.2.)

### Transrectal ultrasound (TRUS)

In transrectal ultrasound a small probe that emits and picks up high-frequency sound waves is inserted into the rectum. The reflected waves are detected and a visual image displayed on a monitor. The test does not provide sufficient information to make it a good screening tool by itself but is useful as a follow-up to a suspicious digital rectal examination or PSA test. It is also used to guide biopsies in sampling

abnormal areas of the prostate, to estimate the volume of the prostate for calculating PSA density and to position radiotherapy implants (Andrology Australia 2015).

### Biopsy

Biopsies of the prostate gland are usually performed in combination with the transrectal ultrasound to detect abnormal cells. A needle is inserted through the perineal skin and a quantity of prostate tissue is aspirated. Biopsy specimens of tissue are sent for cytological examination.

### Urethral culture

A small swab is inserted 3–5 cm into the urethra to obtain a specimen for microbiological analysis. A preliminary result of findings for this test will usually be available within 24 hours of collection, with a more definitive result after 48 hours.

### Semen analysis

A sample of semen is obtained and the sperm examined for motility, morphology, quantity and quality. The test requires the individual to provide a fresh sample of ejaculatory fluid which is sent for analysis as soon as possible after collection. Results of semen analysis are usually available within 24 hours.

### Urological tests

A series of tests may be performed to evaluate the urinary tract. These include cystoscopy, intravenous pyelogram, urine flow studies, urogram and ultrasound.

### Blood samples

Specific blood tests include hormone levels for infertility; alpha-fetoprotein (AFP) and human chorionic gonadotrophin (hCG) for testicular cancer; and blood urea nitrogen (BUN), creatinine and urea to evaluate renal function.

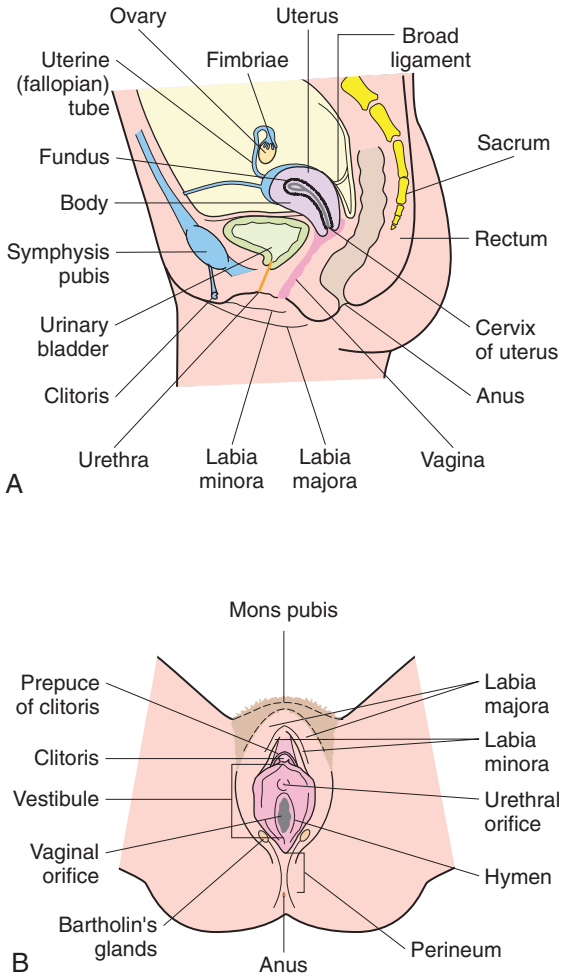


**Figure 37.3** A: The normal female reproductive system B: The vulva

## NURSING INTERVENTIONS IN MALE REPRODUCTIVE HEALTH

The man with a condition affecting his reproductive system would be expected to experience concerns about sexual function, fertility, urinary problems and the effects of the condition they are diagnosed with. The nurse should be aware of these concerns and provide supportive services such as counselling in their approach to care, provision of supportive services and the promotion of a healthy lifestyle.

## THE FEMALE REPRODUCTIVE SYSTEM

The female reproductive system (Figure 37.3) functions to secrete hormones, produce ova, receive sperm and allow for fertilisation, implantation, development and birth of the baby. The female reproductive system consists of essential and accessory organs.

The external structures of the female reproductive system include the mons pubis, labia majora, labia minora, Bartholin gland and clitoris. The area between the anus and vaginal opening is referred to as the **perineum**. Internal reproductive structures include the vagina, uterus, cervix, fallopian (ovarian) tubes and the ovaries.

### Oogenesis

The ovaries function to produce ova (**oogenesis**) and hormones. Production of ovarian hormones begins at puberty. Oestrogen influences the development of the female secondary sexual characteristics including changes in the breast, development of pubic and axillary hair, onset of menses and widening of the pelvis. Oestrogen is also responsible for preparing the uterus for the implantation of a fertilised ovum (see Clinical Interest Box 37.3).

### Mammary glands

Mammary glands are accessory glands of the reproductive system. The breast is a complex structure composed of a glandular and ductal network, fat, connective tissue, fascia, blood vessels, nerves and lymphatic vessels (Figure 37.4). Each breast contains 15–20 lobes that radiate around the nipple and are separated from each other by adipose tissue. Within the lobes are lobules that contain clusters of

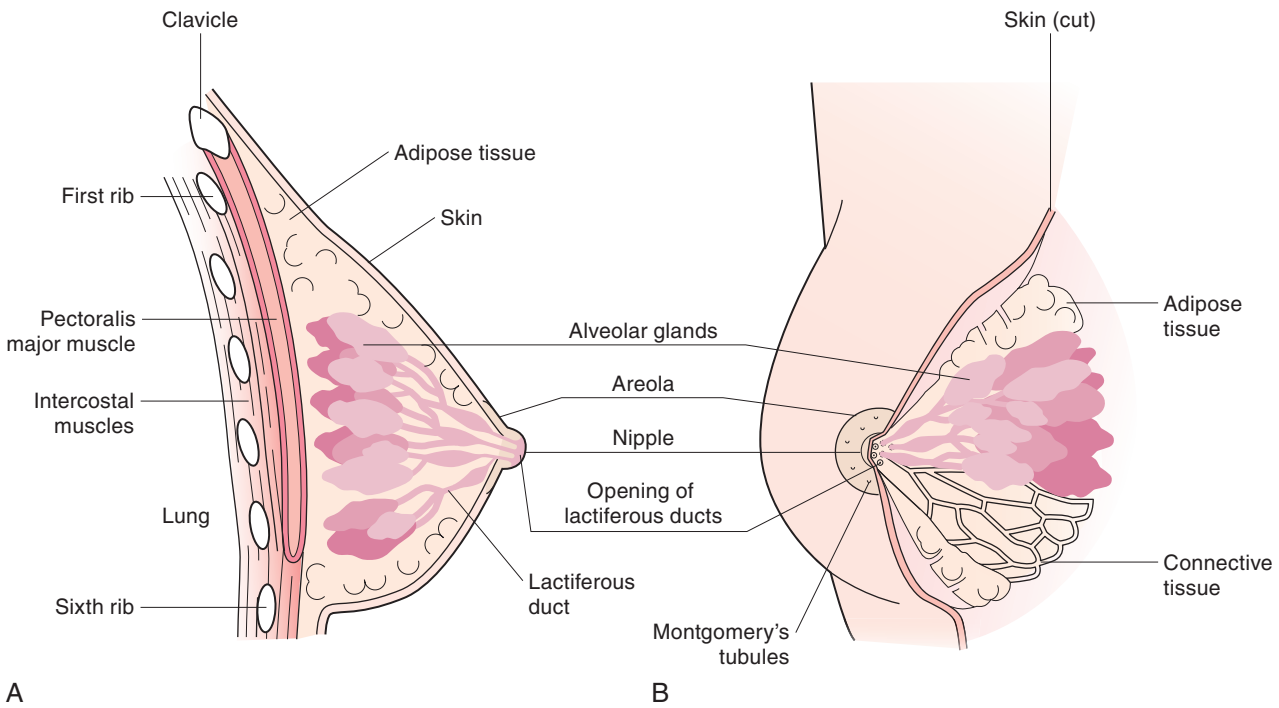


**Figure 37.4** The breast
A: Sagittal section B: Anterior section

## CLINICAL INTEREST BOX 37.3 Oogenesis

In utero, the fetus is thought to have 6–7 million oocytes. This number decreases to 1–2 million by the time of birth, and no further oocytes will be produced.

By puberty, the number of oocytes have reduced to 300 000. Of this number only 400 are believed to be released during a lifetime. Pre-menopause the number of oocytes drops further until nil remain by menopause.

*(Porter & Kaplan 2011)*

## CLINICAL INTEREST BOX 37.4 hCG levels

hCG levels are often used to confirm pregnancy, with levels increasing in the first trimester. Reference intervals for hCG can vary between different testing laboratories based on their numeric test result methods. Intervals can also vary dependent on age, gender and sample population. Ranges generally represent values in 95% of individuals in the 'normal' population.

*(Lab Tests Online 2015)*

milk-producing cells called alveoli. Lactiferous ducts drain the alveoli into openings in the nipple. Breast development at puberty is influenced by ovarian hormones. The mammary glands have the function of synthesising, secreting and delivering milk to the newborn, during which time the gland will reach 'a mature developmental stage through hormonal changes' (Hassiotou & Geddes 2013). After cessation of lactation, the breast will return to its normal 'resting' stage.

### The menstrual cycle

The menstrual cycle consists of a series of cyclic changes occurring at regular intervals, involving the reproductive organs. The average menstrual cycle is about 28 days but may vary from 24 to 35 days (Figure 37.5) and has three phases: follicular, ovulatory and luteal. Hormones produced during the menstrual cycle are summarised in Table 37.5. If fertilisation of an ova occurs a hormone called human chorionic gonadotropin (hCG) is produced which stimulates the corpus luteum to maintain progesterone levels until the fetus is capable of producing its own hormones. (See Clinical Interest Box 37.4.)

## DISORDERS OF THE FEMALE REPRODUCTIVE SYSTEM

### Common symptoms

The symptoms most commonly observed in a female with a disorder of the reproductive system include bleeding, pain, vaginal discharge, pruritus, urinary problems and breast changes.

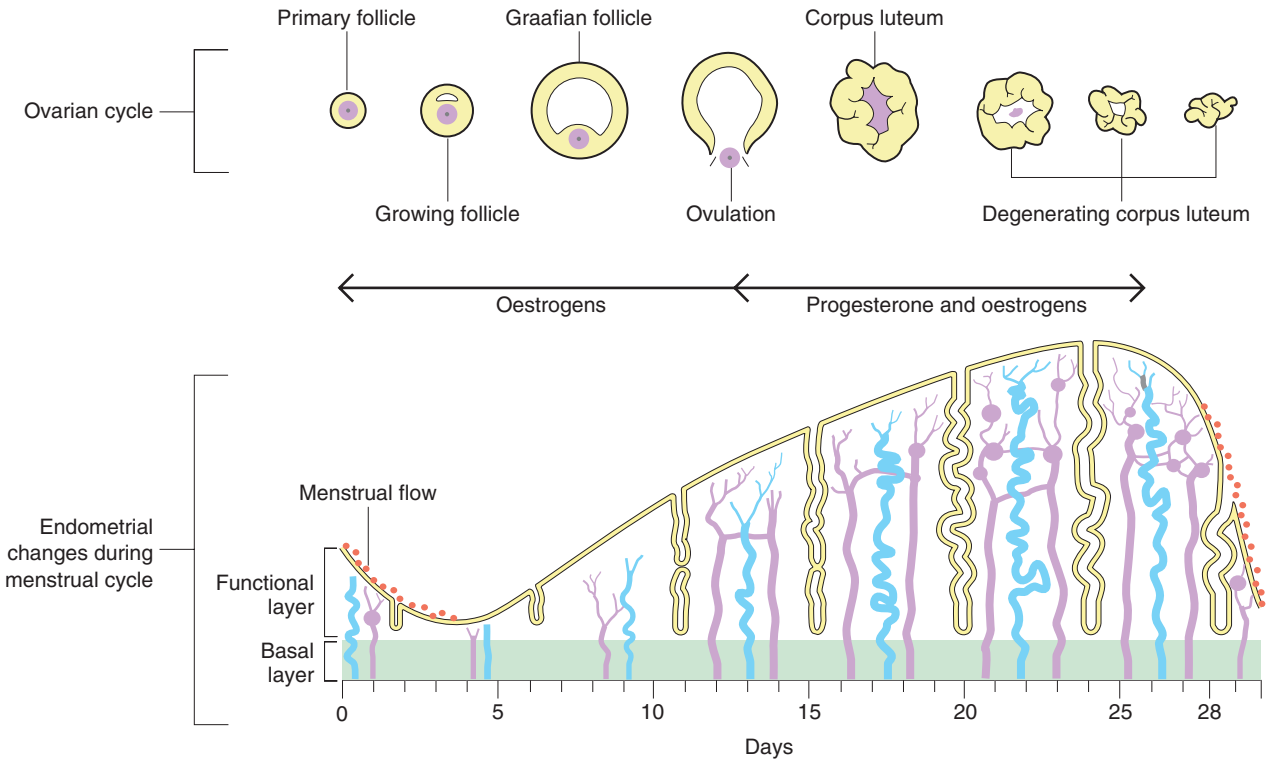


**Figure 37.5** The normal menstrual cycle

**TABLE 37.5 | Hormones affecting the menstrual cycle**

| Hormone | Secreted from | Function |
|---|---|---|
| FSH | Anterior pituitary | • Stimulates growth of follicle<br>• Stimulates oestrogen secretion from developed follicle |
| Oestrogen | Ovaries | • Development of endometrium<br>• Stimulates LH secretion |
| LH | Anterior pituitary | • Increase leads to ovulation<br>• Development of corpus luteum<br>• Stimulates progesterone secretion |
| Progesterone | Ovaries (corpus luteum) | • Thickens endometrium<br>• Inhibits LH and FSH |

*(IVF Australia 2015)*

## Bleeding abnormalities

**Amenorrhoea** is the absence of menstrual bleeding in women. It is normal before puberty, during pregnancy and after menopause. Primary amenorrhoea is considered the failure of menstruation by the age of 14–16 years. Secondary amenorrhoea generally results from anovulation due to hormonal dysfunction after menarche. In women of reproductive age, a diagnosis of amenorrhoea will usually only be made after first eliminating pregnancy as a possible aetiology.

**Oligomenorrhoea** is a condition where menses occurs at intervals longer than 35 days apart. Common reasons may be due to the lead up to menopause, following childbirth or after cessation of a pregnancy due to miscarriage or termination. It may also be a symptom of an underlying condition and should be investigated.

**Menorrhagia** is excessive and/or prolonged bleeding associated with erosive lesions, endometrial hyperplasia, bleeding disorders or neoplasms (tumours). Post-menopausal bleeding may result from the administration of oestrogen (hormone replacement therapy (HRT)), from an oestrogen-producing ovarian neoplasm, uterine hyperplasia, carcinoma or vaginitis. Metrorrhagia, or intermenstrual bleeding, can occur at the time of ovulation, or it may be due to factors such as hormonal imbalance or neoplasms.

### Pain

Pain may occur as **dysmenorrhoea** (painful menstruation) which is the most commonly experienced type of pain in women with prevalence between 16% and 91% of women of reproductive age. Between 2% and 29% of women will experience severe pain (Hong et al 2014). Pain may be described as intermittent, cramping lower abdominal pain, and it can radiate to the back, thighs and groin. Dysmenorrhoea can have a primary cause where pain occurs with no underlying pathological pelvic disease and is generally seen in women 20 years old when menstrual cycles have been established. Secondary dysmenorrhoea occurs when there are underlying pelvic conditions such as endometriosis, uterine fibroids or pelvic inflammatory disease (PID) and is usually in women over 20 years of age (Lentz et al 2012).

Pain may occur in the lower back due to menstruation, infection, inflammation or neoplasm and may be due to conditions such as torsion of an ovarian cyst or a ruptured ectopic pregnancy. If blood from the ruptured fallopian tube tracks to the diaphragm and stimulates the phrenic nerve, shoulder-tip pain may be evident.

Sexual intercourse may result in pain (**dyspareunia**), which is the result of conditions such as vaginal or vulval infections, endometriosis, neoplasms or PID. Decreased vaginal lubrication may also result in dyspareunia.

### Vaginal discharge

Normal vaginal discharge should be clear or white. An offensive odour or changes in the character or amount of discharge may be suggestive of an underlying problem of the vagina or cervix.

### Pruritus

Pruritus is an irritating symptom suggestive of inflammation, vaginal infection or possibly contact dermatitis.

### Urinary problems

Urinary problems associated with female reproductive problems are common and often present as dysuria, stress incontinence caused by infection, neoplasm and cystocele.

### Breast changes

Changes may occur in breast tissue which may present as pain or tenderness in the breast, a discharge from the nipple, inversion of the nipple or the presence of lumps.

## Vulval and vaginal changes

The adult vagina is generally very resistant to infections due to the presence of a characteristic normal flora which creates an environment which is unsuitable for the growth of most microorganisms. When the normal balance of the vagina's pH is disturbed, which may occur with certain medications, diseases and debility, it becomes predisposed to infections.

### Vulvovaginitis/vaginitis

Vulvovaginitis is inflammation of the vulva and vagina. Causes of vaginitis include infection, vaginal mucosal atrophy, vulval atrophy, chemical irritants and poor personal hygiene. Yeast infection results from the presence of *Candida albicans* in mucous membranes and on the skin. Under certain circumstances overgrowth and infection can occur. Predisposing factors include diabetes mellitus, pregnancy, broad-spectrum antibiotic therapy and the use of oral contraceptives. Clinical indicators include pruritus and a thick, white vaginal discharge. Haemophilus vaginitis is caused by the bacterium *Haemophilus vaginalis*. Sexually transmitted infections (STIs) such as gonnorhoea, chlamydia and trichomoniasis are often characterised by vaginitis.

### Candidiasis (thrush)

It is estimated that approximately 75% of women will experience the symptoms of a thrush infection at least once in their lifetime. Half of these women will have more than one episode and 5% will be diagnosed with recurrent thrush (Foran 2013). Thrush hardly ever occurs in females before the onset of menses.

**Candidiasis** is caused by an overgrowth of a yeast-like fungal organism. In 85% of cases the causative organism will be *Candida albicans* (Foran 2013). The condition is characterised by pruritus, vaginal and vulval redness, a thick, white or creamy vaginal discharge and discomfort and pain during sex. Treatment may include the use of anti-fungal medication, probiotics and good hygiene practices.

**CRITICAL THINKING EXERCISE 37.3**

Thrush can develop due to conditions such as diabetes, stress and different medications including antibiotics, immunosuppressive therapy and contraceptives. How would you educate the individual on how to prevent thrush?

### Genital herpes

Genital herpes is an infection caused by the herpes simplex virus and is transmitted through vaginal, oral or anal sex. Genital herpes is characterised by flu-like symptoms and painful blisters in the genital area within 2–14 days of exposure. (See Case Study 37.5.)

**CASE STUDY 37.5**

Susie is 18 years old and has only recently become sexually active. After a one-night stand at a party 3 weeks ago she has presented to the medical clinic with a history of discomfort and itchy labia. The doctor performed a physical examination and discovered five small lesions on her labia, each the size of 5-cent piece.

1. Should Susie try to contact the person she had a one-night stand with?
2. What tests would the doctor order to confirm diagnosis of Susie's condition?
3. How would Susie's condition be managed?

### Genital warts

Genital warts are caused by particular types of the human papilloma virus (HPV) and are transmitted through vaginal, oral and anal sex. The warts appear on the vulva, clitoris and cervix, inside the vagina and urethra and in or around the anus. HPV is linked to cervical cancer; participation in the Australian Cervical Screening Program has led to halving of cervical cancer incidence and mortality rates (Budd et al 2014).

In 2007, Australia introduced a HPV vaccination program in schools capturing females aged 12–13 years. In the first 5 years of the program the incidence of HPV declined by 90% (PapScreen Victoria 2011). The vaccination protects against both the most common high- and low-risk HPV types and is generally well tolerated. To be fully protected against HPV, the vaccination needs to be administered as three injections over 6 months. If a pre-existing HPV infection exists the vaccine is not considered helpful. The vaccine is also offered to boys via the school-based program.

## Disorders of the internal reproductive organs

### Pelvic inflammatory disease (PID)

Pelvic inflammatory disease (PID) is any acute, sub-acute, recurrent or chronic infection of the uterus and uterine tubes that can extend into the pelvic cavity. Causative organisms of PID include *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. Symptoms of PID may include pain, discharge and pyrexia. Treatment tends to be symptomatic with the use of antibiotics, analgesics and antipyretics. Nursing care of the woman with a PID includes education to ensure regular perineal hygiene is observed, regular changing of pads where vaginal discharge is present and counselling about the potential complications of PID which include chronic abdominal pain, ectopic pregnancy and infertility. The impact on fertility may be significant if the woman is planning to have children (see Case Study 37.6).

#### CASE STUDY 37.6

Casey is a 21-year-old female who has been admitted to the ward complaining of lower abdominal pain which has been present for the past 10 days and is increasing. On admission she reveals that she went to a party with a boyfriend 2 weeks ago and had unprotected sexual intercourse. She describes a vaginal discharge which is heavy and has an odour. Casey also describes a desire to pass urine frequently along with pain and burning on urination. She has already conducted a home pregnancy test which was negative.

1. What do you think may be causing the lower abdominal pain?
2. What signs and symptoms above are suggestive of your decision?
3. What nursing management and tests would you recommend?

## Disorders of the uterus

### Endometriosis

**Endometriosis** is a common condition found in approximately 10% of women between the ages of 20 and 40 years (Shadbolt et al 2013). It is characterised by the presence of functioning endometrium outside the lining of the uterus, usually confined to areas in the pelvic cavity. The cause is unknown, but research suggests that some endometrium is expelled from the uterus into the pelvic cavity at the time of menstruation.

The symptoms of endometriosis are dependent on the location and the extent of the tissue affected. In mild cases the condition may be asymptomatic or there may be only slight discomfort or pain during menstruation. In severe cases there may be dysmenorrhoea, dyspareunia, menorrhagia, dysuria, diarrhoea or constipation, abdominal distension, premenstrual tension and infertility. The use of the oral contraceptive pill (OCP) has been found to protect against the development of endometriosis. The OCP may also be used to manage the condition by altering the menstrual cycle through hormonal manipulation (Black & Fraser 2012). The aim is to produce a pseudo-pregnancy, pseudo-menopause or persistent anovulation, thereby creating an environment in which the endometrium does not grow or is not maintained. The ectopic endometrial tissue will not be subject to the normal menstrual cycle stimulation and the pain associated with endometriosis will be diminished.

Surgical treatment is also widely used to treat endometriosis. The conservative option is removal of all obvious ectopic endometrial implants from the abdomen and pelvis. A laparotomy or laparoscopy is performed, with the latter approach having a lower cost and recovery time. Endometrial tissue is destroyed using a variety of techniques, including vaporisation or excision. Surgery to remove all endometrial tissue involves removal of the ovaries and sometimes the uterus. Treatment for endometriosis is aimed at the ectopic implants but the symptoms can be managed directly. Non-steroidal anti-inflammatory drugs have proved to be of benefit as first-line treatment. Surgical intervention to interrupt neural pathways for pain conduction may be of benefit in selected cases. Doctors have also recommended that women with endometriosis should become pregnant as the altered hormone levels and not having a menstrual cycle for 9 months have in some cases been successful in reducing the symptoms.

#### CRITICAL THINKING EXERCISE 37.4

A laparoscopic hysterectomy may be performed when non-surgical options have not been successful in treating endometriosis. Length of stay in hospital is usually 2 to 3 days. What discharge considerations should you educate the individual on prior to them going home?

### Pelvic organ prolapse

Pelvic organ prolapse is characterised by the downward displacement of pelvic organs, mostly the uterus, urinary bladder

and rectum through the vaginal opening and will probably affect up to 50% of the women, with 19% requiring surgical interventions to manage symptoms (Liang 2014).

Uterine prolapse occurs when muscles and ligaments that suspend the uterus become stretched, damaged or weakened through sustained forces brought about by events such as pregnancy and straining. These muscles and ligaments no longer provide the support to prevent the uterus from falling into the vagina. The collapse can be either a complete collapse where it protrudes outside the body, or partial (Table 37.6). (See Clinical Interest Box 37.5.)

Risk factors for uterine prolapse include:

- Pregnancy
- Vaginal delivery
- Large fibroids or tumours
- Ageing and menopause
- Obesity
- Chronic coughing, constipation and straining
- Heavy lifting
- Genetic conditions
- Previous pelvic surgery
- Spinal cord and other muscle atrophy conditions
- Familial or racial history (Liang 2014).

Depending on the stage of prolapse, women will experience symptoms of the condition ranging from backache, a 'dragging' sensation and cervical erosion to bleeding and urinary difficulties. Stress incontinence is a common problem experienced by women and may lead to urinary tract infections. Where the posterior aspect of the urinary bladder protrudes into the uterus (cystocele), there may be a feeling of pelvic pressure and where the rectum herniates into the uterus (rectocele) there is often a feeling of rectal fullness, faecal urgency and incomplete defecation.

Management of the condition may be conservative or surgical. Where the condition is managed conservatively, the woman may be required to perform a series of pelvic floor exercises to strengthen the pelvic floor muscles. Exercises consist of regular tightening then relaxation of muscles surrounding the entrance of the vagina, urethra and anus. Each time the muscle is tightened it is held for 5–10 seconds and then relaxed. The exercise is repeated a number of times and the woman is encouraged to repeat the exercises several times a day. There are devices like balls which can be inserted into the vagina to ensure the exercises are being performed correctly.

Surgical management of uterine prolapse includes procedures such as a hysterectomy using either the vaginal or the abdominal approach and a procedure called a sacrohysteropexy which involves an abdominal incision and insertion of a mesh to reinforce and strengthen the abdominal muscles.

**TABLE 37.6 | Stages of uterine prolapse**

| Stage | Results |
|---|---|
| I | Descent of the uterus to any point in the vagina above level of the hymen |
| II | Descent of uterus to level of hymen |
| III | Descent of uterus beyond hymen |
| IV | Total eversion of procidentia |

*(Adapted from Kuncharapu et al 2010)*

**CLINICAL INTEREST BOX 37.5**
**Clinical scenario uterine prolapse**

*I first experienced symptoms of my prolapse after my second child. It started with passing a little bit of urine when I laughed too much and then I noticed that it was the same if I lifted anything too heavy such as the shopping bags or the basket of washing. I thought it would get better. I did some pelvic floor exercises that I read about in a pamphlet and for a while it did. It was after a day of gardening that I noticed my body didn't seem to feel the same. When I went to see my doctor she told me my uterus had prolapsed and I would need to see a specialist to have it repaired. They had to do a complete pelvic floor repair involving my bladder and uterus. It's fine now but I think I was lucky. I have heard other women have to have a hysterectomy and are left with residual incontinence problems.*

## Disorders of the ovaries

### Ovarian cysts

Ovarian cysts are usually non-cancerous and develop in women of reproductive age when an ovarian follicle fails to burst and release the mature egg, resulting in the accumulation of a fluid-filled sac. Cysts can be either single or multiple small cysts developing about 10 mm in diameter, although they have been known to grow to about 6–7 cm in diameter. They are filled with a clear fluid which is high in oestrogens. In many cases the cysts remain asymptomatic; however, if they rupture they can cause severe abdominal pain and bleeding. Other symptoms may include haemorrhage, torsion and compression of abdominal and pelvic organs depending on size. Diagnosis can be made by pelvic examination, ultrasound, CT scan, MRI scan and possibly a blood test for tumour markers. Generally the cysts resolve without the need for treatment but a small number of women may require surgery (laparoscopy and/or laparotomy).

### Polycystic ovary syndrome

Polycystic ovary syndrome (PCOS) is a common hormonal condition affecting 12–18% of women of reproductive age, with 21% of those affected being in the high-risk category (e.g. Indigenous women (Jean Hailes 2014)). PCOS is often associated with the presence of multiple, large cysts in the ovary which may cause health complications if left untreated.

Most symptoms associated with PCOS are caused by increased androgen levels in the body. Many women will experience difficulty maintaining an optimal weight and there may be fertility issues and psychological effects, due to either hormonal imbalance or anxiety related to infertility. (See Table 37.7.)

## Tumours of the female reproductive system

### Ovarian cancer

Ovarian cancer is the seventh most common cause of cancer mortality in Australian women (Budd et al 2014).

Tumours affecting the ovaries can vary in their size, diversity and occurrence (see Table 37.8). This is one of the more common of the cancers affecting women. Both germ cell and sex cord–stromal cell tumours respond well to treatment and are often curable. If only one ovary is affected and therefore removed there is a good chance the woman will still be able to have children.

In 2014 it was estimated that approximately 1470 Australian women would be diagnosed with ovarian cancer; an estimated 1640 are expected to be diagnosed in 2020 (AIHW 2014). Diagnosis of ovarian cancer is definitively made only after surgery during which biopsies and removal of a frozen section are performed to determine the presence of cancer cells. The woman may have a transvaginal ultrasound (TVU) and blood taken to detect the presence of the tumour marker CA125. It may be possible to detect irregularity on palpation of the abdomen or physical examination if the tumour is large. TVU, which involves the use of a probe inside the vagina to detect the presence of a tumour, and other imaging tests such as abdominal x-rays, CT scans or magnetic resonance imaging (MRI) are occasionally used.

Diagnosis of ovarian cancer is difficult due to its vague presentation. For this reason most cases of ovarian cancer present as advanced tumours with a survival rate of less than 20%. If detected early the survival rate can be greater than 90%.

Symptoms of ovarian cancer include:

- Abdominal and pelvic pain
- Increase in abdominal size or persistent abdominal bloating
- Urgency and frequency of urination
- Feeling of fullness after eating
- Changes in bowel habits
- Unexplained weight loss or gain
- Unexplained bleeding
- Excessive fatigue
- Back pain
- Indigestion and nausea (Ovarian Cancer Australia 2014).

**TABLE 37.7 | Symptoms related to PCOS**

| Symptom | Management |
|---|---|
| Irregular menstrual cycles | Use of hormonal contraception such as:<br>• Low-dose oral contraceptive pill<br>• Progesterone (such as an IUD)<br>• Hormonal implants<br>• Vaginal contraceptive rings<br>• Insulin-sensitising medications such as metformin (where women develop symptoms associated with insulin resistance) |
| Excess hair growth | • Waxing, laser hair removal, electrolysis<br>• Reduce androgen levels in the body<br>• Hormonal contraception<br>• Insulin-sensitising medications such as metformin |
| Acne | • Medications such as topical creams, antibiotics, Roaccutaine, insulin-sensitising medications<br>• Reduce androgen levels in the body (hormonal contraception, anti-androgen medications) |
| Infertility | • Weight management<br>• Monitor ovulation<br>• Ovulation induction |
| Psychological effects | Depression and/or anxiety related to difficulty getting pregnant, miscarriage, symptoms associated with PCOS and hormonal imbalance |

*(Adapted from Jean Hailes 2014)*

**TABLE 37.8 | Types of ovarian cancer**

| Type | Clinical behaviour |
|---|---|
| Epithelial | Most common type of ovarian cancers. Accounts for 90% of cases |
| Borderline tumours | A group of epithelial tumours which are not as aggressive as other epithelial tumours. They are often referred to as 'low malignancy potential' (LMP) tumours. Prognosis is good regardless of when diagnosed |
| Germ cell tumours | Begin in cells that mature into eggs. Account for 5% of tumours and more commonly in women under 30 years |
| Sex cord–stromal cell tumours | Begin in ovarian cells that release female hormones. Account for 5% of cases and can affect women at any age |

*(Ovarian Cancer Australia 2014)*

Treatment for ovarian cancer may initially involve a laparotomy where biopsies are taken and sent for analysis to confirm diagnosis. On confirmation of diagnosis, the surgeon will remove the affected ovary. Where the tumour has spread to affect other structures, it may be necessary to perform a partial or total hysterectomy.

## Cervical cancer

Cervical cancer is relatively uncommon affecting approximately 1.7% of Australian women. Since the introduction of the Cervical Screening Program in 1991 (Clinical Interest Box 37.6), the incidence and mortality associated with cervical cancer was shown to have halved by 2006 (Cancer Australia 2015b). Cervical cancer may be one of two types: a squamous cell carcinoma, which accounts for approximately 80% of cases, or an adenocarcinoma.

Cervical cancer begins as a change in the epithelial covering of the cervix and, if not treated, eventually involves the epithelial layer. Invasive carcinoma extends beyond the surface, involves the body of the cervix and may spread via the lymphatic system to surrounding structures. Clinical signs of cervical cancer do not appear in the early stages. Later manifestations are 'spotting' between menstruation, postmenopausal bleeding, bleeding after sexual intercourse or a brown vaginal discharge.

Diagnosis of cervical cancer can initially be made with a routine Pap smear combined with presenting symptoms. The stages of cervical cancer are described in Table 37.9.

## Endometrial cancer

It is estimated endometrial cancer, also referred to as uterine cancer, will affect 2830 Australian women by 2020 (AIHW 2012a). It is most common in menopausal women; however, a quarter of cases may occur in premenopausal women.

The benign form presents as **fibroids** which grow in the wall of the uterus of women in their forties. They are usually asymptomatic and as the woman enters menopause the fibroids tend to get smaller. If they cause heavy bleeding they may need to be surgically treated. Other presentations may be as endometriosis and endometrial hyperplasia.

The usual management for women who have malignant neoplasms (cancers) is surgical intervention with a combination of chemotherapy and radiotherapy to eliminate any remaining cancer cells. The typical surgical procedures conducted include:

- Hysterectomy with bilateral salpingo-oopherectomy
- Pelvic lymphadenectomy (unless early-stage disease present)

Vaginal vault brachytherapy may also be performed for endometrial cancer. This involves insertion of small hollow tubes inside the vagina through which small amounts of radioactive agents are administered. The treatment takes approximately 30 minutes to perform.

Hysterectomy is the surgical removal of the uterus and may also involve the removal of other structures depending on the extent of infiltration or damage to reproductive organs. Prior to any woman undergoing a hysterectomy, it is important they are aware they will no longer menstruate or be able to conceive a child. For some this prospect may bring relief, while for others it may be distressing. A compassionate approach to nursing care is important.

The main four types of hysterectomy operations (see Table 37.10) performed in Australia are:

1. Sub-total or partial hysterectomy: involves removal of fallopian tubes, upper two-thirds of uterus and preservation of cervix. Not commonly performed in Australia
2. Hysterectomy with ovarian conservation: involves removal of fallopian tubes, uterus and cervix and preservation of the ovaries. Procedure is often referred to as a 'total hysterectomy'
3. Hysterectomy with oopherectomy: involves removal of fallopian tubes, uterus and cervix and either one or both ovaries
4. Radical or Wertheim's hysterectomy: involves removal of fallopian tubes, uterus, cervix, ovaries, nearby lymph nodes and upper portion of the vagina.

With all types of hysterectomy it is important the woman is fully aware of the procedure to be performed and the

### CLINICAL INTEREST BOX 37.6 National HPV vaccination program

In April 2007 the Australian government commenced the National HPV Vaccination Program. The program is offered to school-age females 12–13 years of age and males 14–15 years of age. Initially the program also offered the vaccine free for girls and young women aged between 14 and 26 years.

Young women not in school and under 27 years were provided access to the vaccination through their GP.

The vaccine is given in a series of three injections, spread out over a 6-month period, at 0, 2 and 6 months.

*(Australian Government, 2014b. © Commonwealth of Australia)*

**TABLE 37.9 | Cervical cancer stages**

| | |
|---|---|
| Stage 1 | The cancer is found only in the tissue of the cervix |
| Stage 2 | The cancer has spread outside the cervix to the upper part of the vagina or other tissue next to the cervix |
| Stage 3 | The cancer has spread to the tissue on the side of the pelvis (pelvic sidewall) and/or the lower part of the vagina |
| Stage 4 | The cancer has spread to the bladder or rectum, or beyond the pelvis to the lungs, liver or bones |

*(Cancer Australia 2015b)*

**TABLE 37.10 | Types of hysterectomy**

| Surgery | Description of procedure | Advantage | Disadvantage |
|---|---|---|---|
| Vaginal hysterectomy | An incision is made into the upper portion of the vagina and the uterus is removed through the vagina | Less pain and shorter hospital stay; absence of a visible scar | Does not allow free access to pelvic organs<br>If fibroids are large or there is extensive endometriosis, uterus is difficult to remove; may need to change to an abdominal approach |
| Abdominal hysterectomy | Can be performed using a 'bikini-line' approach or via a vertical incision which is from umbilicus to pubic hairline | Less obvious scar associated with the bikini-line approach and a shorter recovery time<br>Main advantage of procedure is the lower incidence of damage to urinary tract and blood vessels<br>Allows good vision of pelvic structures and possible repair of prolapse at same time<br>Allows removal of large uterus, fibroids | A more painful approach and requires a longer hospital time<br>Costs more than a vaginal hysterectomy<br>Leaves a visible scar on the abdomen if vertical approach |
| Laparoscopically assisted vaginal hysterectomy (LAVH) | Part of the procedure is performed using a laparoscope which involves four small incisions into the abdomen | Shorter hospitalisation and possibly recovery time compared to other procedures | May lead to longer operation time depending on how much of procedure performed by laparoscope<br>Higher risk of damage to urinary tract<br>May need to change to an abdominal approach if uterus/fibroids are large |

*(Women's Health Queensland Wide 2011)*

implications associated with the surgery. There may be issues with feelings of altered self-image, loss of femininity and sexuality. The woman may need counselling to help her work through these feelings. The surgical procedures have a long convalescence postoperatively; the individual is unable to return to normal activities for anywhere between 6 weeks and 3 months. It is also important the woman be aware of what to expect in the immediate postoperative phase, such as whether she will have an indwelling catheter, drain tubes or vaginal pack.

A vaginal pack may be inserted after a vaginal hysterectomy and remains in situ for 24 hours. Postoperatively the nurse is required to assess the volume of discharge from the vagina and if there are any difficulties with voiding. If a urinary or suprapubic catheter has been inserted during the operation it may be necessary to commence bladder retraining prior to the removal of the catheter to assist in re-establishing normal bladder sensation and control.

## Conditions affecting menstruation

At some time in a woman's life she is likely to experience some form of benign menstrual problem which will often be painful and debilitating. The main menstrual symptoms include dysmenorrhoea, dyspareunia, menorrhagia and pain.

### Premenstrual syndrome

This is a term used to describe the symptoms experienced by some women in the lead-up to the onset of menstruation. The common symptoms experienced in the 4–7 days before menstruation include transient fluid retention, which may result in oedema in the legs, fingers and abdomen; breast tenderness; headaches and mood swings.

### Menopause

Menopause is often described as the 'change of life' and signals the end of a woman's reproductive life. During menopause eggs are no longer produced by the ovary and the production of oestrogen and progesterone ceases. In most women, menopause will occur between the ages of 45 to 50 years. Premature menopause occurs from 40 years and may occur due to a cessation of ovarian function, after a total hysterectomy or as the result of cancer. A woman is considered to be post-menopausal when 12 consecutive months without a menstrual cycle have elapsed.

The premenopausal woman often describes symptoms such as irregular periods, hot flushes, high sweats, palpitations, vaginal dryness, tiredness, mood swings and crawling sensations of the skin. The woman who believes she is premenopausal can have the diagnosis confirmed with blood tests to determine declining hormone levels. The management of menopause is often determined by the impact of symptoms. Many women try natural therapies such as black cohosh, vitamin E, dong quai, licorice and evening primrose to manage the symptoms. Alternatively, women may commence hormone replacement therapy (HRT) (see Case Study 37.7 and Clinical Interest Box 37.7).

## Disorders of pregnancy

### Spontaneous abortion

Spontaneous abortion is common, with approximately one in four pregnancies resulting in an abortion in the very early stages of a pregnancy. They often occur without the woman being aware of what is occurring. In the event that the abortion is incomplete and products of conceptions are retained in the uterus, there is a high risk of infection and this situation needs to be managed surgically to preserve the integrity of the uterus and to avoid infertility.

### Ectopic pregnancy

An ectopic pregnancy occurs where the fertilised ovum implants outside of the uterus. A majority of ectopic pregnancies occur in the fallopian tubes, with only a small number in locations such as the abdominal cavity or ovary. Generally ectopic implantation occurs where the woman has a disorder that slows the passage of the ovum to the uterus such as scarring, endometriosis and tumours. In the initial stages the woman's pregnancy will show normal signs of conception with amenorrhoea and hormonal changes; however, as the fetus develops, spotting and cramping may develop and the fallopian tube will rupture, resulting in severe pain and abdominal swelling. Once the tube has ruptured it is considered a surgical emergency if the woman is to survive the rapid blood loss and shock.

### Pre-eclampsia

Pre-eclampsia occurs in a small percentage of pregnancies. The condition usually presents with three characteristic signs: generalised oedema, hypertension and proteinuria. It usually develops about the 20th week of pregnancy. If detected, mild symptoms may be controlled with little risk to fetus or mother; however, in the event that symptoms become severe a multidisciplinary approach to management of both mother and baby is required.

## Breast disorders

The main disorders affecting the breast are:

- Mastitis
- Fibrocystic changes
- Tumours.

### Mastitis

**Mastitis** is an inflammatory condition which usually occurs during lactation and breastfeeding, when the infant causes damage to the nipple of the breast allowing entry of bacteria which causes an infection in the ducts of the breast. Most commonly the causative organism is *Staphylococcus aureus* and *Streptococcus* spp. Presentation of the condition includes inflammation, swelling, heat and pain. The infective process may cause abscess formation and cessation of milk flow. Treatment may include the use of cold compresses and antibiotics and, where an abscess is present, possible drainage of fluid (see also Chapter 45).

### Fibrocystic changes

Fibrosis of the breast is a benign condition caused by hyperplasia of the fibroblasts in breast tissue. Women between 30 and 40 years are more commonly affected and the condition is usually detected as a tender or painful mobile lump often felt just prior to menstruation. The condition is not believed to predispose the woman to cancer.

Cystic changes of the breast occur more commonly in women during the last half of their reproductive life (between

### CASE STUDY 37.7

Anna is a 50-year-old woman who has noticed over the past 4 months an increase in 'sweats and chills'. On further questioning she reveals she has observed increased emotional lability over the past couple of months—crying unexpectedly, feeling depressed and tired all the time. Anna has also noticed her periods have become irregular in the past 12 months. On occasions her periods are heavy, whereas in other months they are very light. She also states that some months she will miss menses. There has also been a loss of sexual drive, with dryness and decreased libido.

1. What tests would be ordered to confirm Anna's medical diagnosis?
2. How could Anna manage her problem non-pharmacologically and pharmacologically?

### CLINICAL INTEREST BOX 37.7
### Clinical scenario: menopause

*The hot flushes started when I was about 42 years old. They were infrequent and passed quickly so I didn't worry too much. It was another 5 years before I started to see changes in my normal menstrual cycle. There were months where I didn't get a period at all or they would alternate between heavy to a light flow of blood. I spoke to my doctor and she ran a few tests that confirmed my hormone levels were lower. It was probably another few years before I decided to start hormone replacement therapy.*

40 and 55 years) and are characterised with single or multiple lumps in the breasts. Each cyst is filled with a thin turgid fluid and, if large, may be visible as a bluish lump under the skin. Each cyst can be drained and the fluid analysed to determine malignancy.

### Tumours of the breast

Carcinoma of the breast usually occurs in women over the age of 50 years, although it may also be diagnosed in younger women. The woman may notice an alteration in the size of the breast, dimpling of the skin, a palpable mass and alteration in the shape, retraction of the nipple, a clear discharge and possibly ulceration (Clinical Interest Box 37.8). It should be noted that carcinoma of the breast can also occur in males. The incidence of breast cancer is steadily increasing with a recorded death rate in 2012 of 2795 women and 24 men (AIHW 2012b). Of the women diagnosed with breast cancer, there is a 5-year survival rate of 89%.

Possible causes of breast cancer include:

- Increasing age
- Familial history
- Inheritance of mutation gene (BRCA2, BRCA1 or CHEK2)
- Exposure to female hormones
- Obesity
- Excessive alcohol consumption.

**CLINICAL INTEREST BOX 37.8**
**Symptoms of breast cancer**

- Lump or thickening in breast or under arm
- Sore nipples
- Discharge from nipple
- Inversion of nipple
- Dimpling of breast tissue
- Rash or redness of the breast
- Pain is rare

*Cancer Australia 2015c*

Diagnosis of breast carcinoma will initially involve a physical examination of the breast and armpits, a diagnostic mammogram and possibly an ultrasound of the breast tissue. More definitive or invasive tests may be conducted to confirm diagnosis and may include:

- Fine-needle aspiration
- Core biopsy
- Open biopsy
- Hormone tests
- Lumpectomy.

## Care of the individual with a breast disorder

Surgical treatment of breast carcinoma may include a total mastectomy where the entire breast is removed along with lymph nodes from the axilla, or a more conservative approach may be taken—breast-conserving surgery, where the bulk of the breast tissue is conserved. Surgery is usually accompanied by radiotherapy and chemotherapy to eliminate any remaining cancerous cells.

Breast surgery may cause issues with body image, feelings of femininity and sexuality. While reconstructive surgery may be performed, this is often not an option until several months after the mastectomy. Reconstructive surgery involves the formation of a breast mound, nipple and areola. A prosthetic in the woman's bra may be used in the interim to give the appearance of a normal breast. Surgical reconstruction of the breast may be considered at a later date. Hormone therapy may also be indicated to reduce the size of the breast lump prior to attempting a surgical approach.

A sample of an entry into progress notes has been provided, which documents the care of a patient recovering from a mastectomy (see Progress Note Example 37.1).

### Preoperative preparation

As with any surgical procedure it is important that the woman is fully aware of the implications of the surgery she is undergoing and is provided with adequate emotional support. It is advisable that the woman be put in contact with a breast support nurse, psychologist and support networks.

**PROGRESS NOTE EXAMPLE 37.1**

| | |
|---|---|
| 12/10/2015<br>1330 hrs | Nursing: Mrs Cooper 2 days postoperative after left-sided radical mastectomy with axillary clearance complaining of pain (rating 6 out of 10) at site of wound. Describes a 'pulling' sensation at site of drain tubes × 2. Diagnosed with breast cancer 1 week ago on mammography and ultrasound. History of Ca Breast on mother's side of family. No relevant clinical past history. On physical examination wound appears clean and integrity of wound edges appear healthy. Sutures remain in situ. The medial drain tube has minimal drainage and 35 mL has drained into apical drain over past 8 hours. Pathology shows 6–12 positive lymph nodes. Observations all remain within normal parameters in comparison to baseline. Mrs Cooper is self-caring with assistance with dressing and management of drains. Maintaining nutritional status. Medications administered as per medication orders with request for additional analgesia 2–3 hourly requiring PRN medication for breakthrough pain. Request review from MO to adjust/assess pain management and possible r/o medial drain. Specialist appointments to be confirmed with oncologist and radiotherapist. Social worker to visit and discuss home supports for discharge and for spiritual/psychological support.<br>**C. *Baker* (Baker) EN** |

Breast prostheses are available in a range of styles. A soft, lightweight prosthesis is recommended initially while the incision is healing and until tenderness has decreased.

### Postoperative care

Physical postoperative care includes providing pain relief, promoting comfort, care of the wound, prevention of complications, exercise instruction and continued emotional support. The woman should be encouraged to perform a series of postmastectomy exercises to prevent shortening of the muscles and contracture of joints. Gentle exercise also decreases oedema and maintains range of movement in the arm.

**CRITICAL THINKING EXERCISE 37.5**

In the surgical management of conditions such as breast cancer, lymph glands are usually removed, either as an axillary clearance where between five and 30 nodes are removed, or sentinel removal, where only 1–2 nodes closest to the cancer are taken. The development of lymphoedema should be considered. What kind of exercises should be performed to avoid lymphoedema in the postoperative individual?

## ASSESSMENT AND DIAGNOSTIC TESTS

The performance of a physical examination for any woman is a time of great anxiety and embarrassment. For this reason it should be a priority for every nurse to make the experience as relaxing and comfortable as possible (see Chapter 19). The presence of a female nurse during the examination by a male practitioner is mandatory in most health facilities. Consideration should also be given to addressing social and cultural requirements when performing a physical examination.

### External examinations

#### Hysterosalpingogram

A hysterosalpingogram (HSG) is an x-ray of the cervical canal, uterine cavity and interior of the fallopian tubes. It usually involves the use of a radio-opaque dye which is injected through the cervix.

#### Ultrasonography

Ultrasonography uses high-frequency sound waves to obtain a visualisation of the pelvic organs. It is commonly used to evaluate symptoms of PID or to monitor pregnancy.

#### Breast examination

A physical examination of the breasts of men and women is referred to as a clinical breast examination. A clinical breast examination involves a thorough physical examination of the whole breast area, including breasts, nipples, armpits and up to the collarbone. Most of the breast tissue in men (a potential site for malignancy) is located behind the nipple, whereas women have breast tissue throughout the breast. It is recommended for a woman to perform a breast self-examination (BSE) once a month; this should be performed 3 to 4 days after the cessation of menstruation in young women. Despite this recommendation, only 20–30% of women perform BSE every month (Visser et al 2015).

***Inspection*** Inspect the breasts for size and symmetry. Note breast shape and any masses, flattening, retraction or dimpling. When inspecting the female breast, it may help the individual to know what to look for when she inspects her breasts so place a mirror in front of her so that she can see what to look for (Figure 37.6). The nipples are inspected for size, shape, colour, discharge and the direction they point.

***Palpation*** Palpation allows you to determine the condition of underlying breast tissue. Successful detection of a lump during palpation relies on the individual's familiarity with how their breast feels. Hormonal changes can also affect how breast tissue feels on palpation. Lumps can go undetected despite routine palpation, but palpation continues to be important in the detection of breast irregularities.

Use the pads of the first three fingers to compress breast tissue gently against the chest wall, noting tissue consistency (Figure 37.7). Palpation is performed systematically in one of three ways (Figure 37.8):

1. A back-and-forth technique with the fingers moving up and down each quadrant
2. Clockwise or counter clockwise, forming small circles with the fingers along each quadrant and the tail
3. Palpating from the centre of the breast in a radial fashion, returning to the areola to begin each spoke.

Until recently, breast self-examination was promoted as an early detection strategy for breast cancer in women. However, there is no evidence that use of specific breast examination techniques makes any difference to the detection

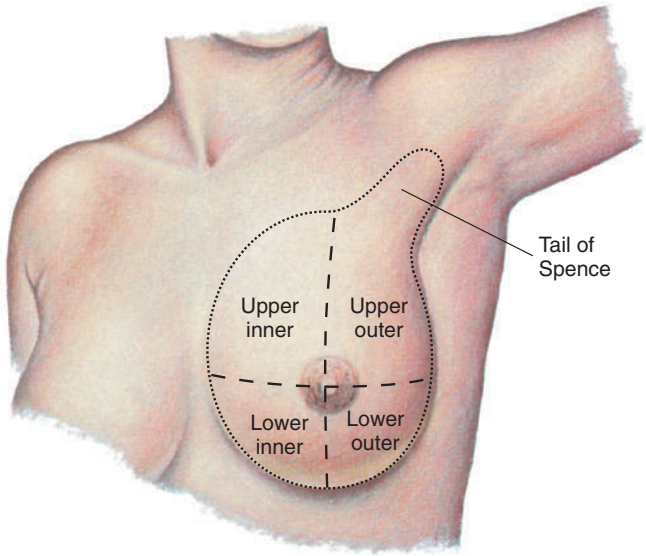


**Figure 37.6** Quadrants of the left breast and axillary tail of Spence
*(Seidel et al 2011)*

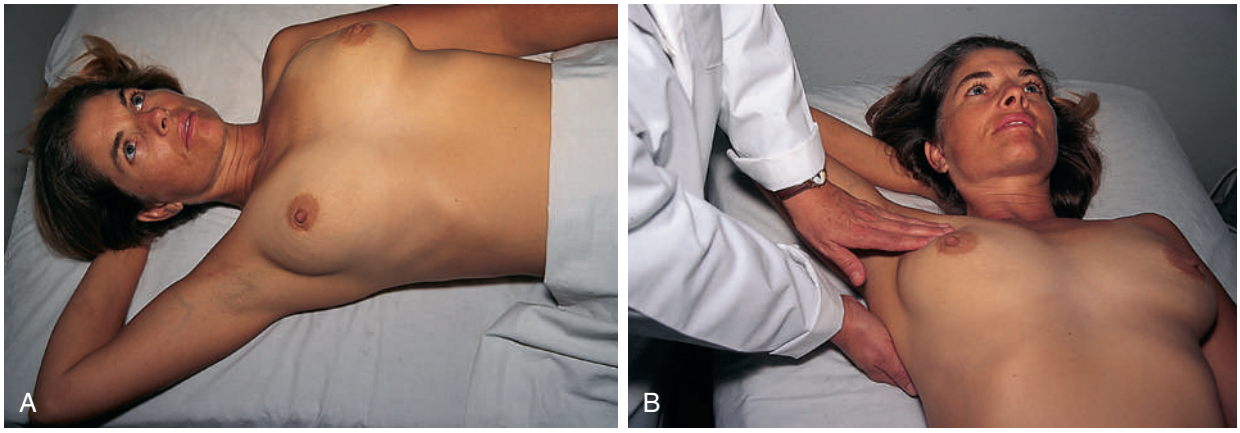


**Figure 37.7** **A:** The woman lies flat with arm abducted and hand under head to help flatten breast tissue evenly over the chest wall **B:** The nurse palpates each breast systematically
*(Potter & Perry 2004)*

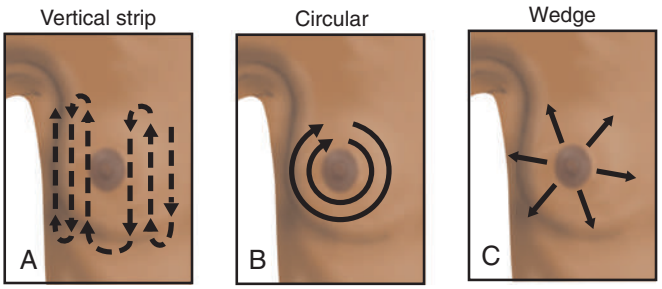


**Figure 37.8** Various methods for palpation of the breast
**A:** Palpate from top to bottom in vertical strips **B:** Palpate in concentric circles **C**: Palpate out from the centre in wedge sections
*(Belcher 1995)*

of breast cancers. Instead, Cancer Council Australia (2015c) recommends the following guidelines for the early detection of breast cancer:

- Develop breast awareness strategies, which include:
  - viewing breasts in the mirror when dressing and undressing
  - feeling breasts while bathing or showering. It is recommended that the woman feels all of her breast from the collarbone to below the bra line and in the armpits as well. The National Breast and Ovarian Cancer Centre (NBOCC) website provides a tool to assist women to develop breast awareness
  - consulting a healthcare provider if any changes are noticed in the breasts
- Teach the woman to look for:
  - a new lump or lumpiness, especially if it is only in one breast
  - a change in the size or shape of the breast
  - a change to the nipple, such as crusting, ulcer, redness or inversion
  - a nipple discharge that occurs without squeezing
  - a change in the skin of the breast such as redness or dimpling
  - an unusual pain that does not go away.

### Mammography

A mammogram is one of the procedures used to detect or confirm the presence of a palpable lump in the breast. The mammogram is an x-ray which is usually provided free for women between the ages of 50 and 69 years as part of the BreastScreen Australia program. It is recommended that the test be done every 2 years. Where there is a familial link to the occurrence of breast cancer it may be recommended to commence screening earlier. Mammograms in younger women are often more difficult due to the elasticity of breast tissue prior to menopause. For this reason younger woman are usually screened by MRI.

### Breast ultrasound

Breast ultrasounds are often scheduled for women under 35 years who have detected a lump in the breast. The ultrasound allows the medical officer to identify whether the lump is fluid filled or solid. In the event of a fluid-filled cyst, the medical officer can perform an ultrasound-guided aspiration of fluid for analysis. The procedure is ideal for the pregnant woman who detects a lump because there is little risk to the growing fetus.

## Internal examinations and sampling

### Papanicolaou test

The **Papanicolaou (Pap) test** (Pap smear) involves the collection of superficial cells from the surface of the cervix which are examined under microscopic analysis to diagnose changes which may be suggestive of cervical cancer. Changes to cervical cells may occur due to acute or chronic inflammatory disease, benign tumours such as polyps and premalignant and malignant carcinoma. To perform the test, the medical officer inserts a vaginal speculum into the vagina and a cytobrush is used to scrape the surface of the cervix and collect cells which are then transferred onto a microscope slide and fixed with 'cytospray' before being sent for analysis. All women over the age of 18 years who have ever had sex should have a Pap smear every 2 years, even if they are no longer sexually active. Half

of new cases of cervical cancer occur in women 50 years or older (Australian Government Department of Health 2015).

### Pelvic examination

The pelvic examination is often performed in conjunction with the Pap smear; although where there is clinical indication it may be performed as a diagnostic method to palpate the ovaries and uterus. Initially the medical officer inserts two gloved fingers into the vagina and applies gentle pressure to the lower abdomen. A speculum is then inserted into the vagina to allow visualisation of the vagina and cervix.

### Colposcopy

A colposcopy usually occurs during a Pap smear or physical examination when, after the insertion of the speculum, a colposcope is used to magnify and illuminate the cervix. A biopsy of the cervix may be completed during the procedure.

### Cervical biopsy

A cervical punch biopsy is the removal of a small column of cervical tissue. The cervix is compared to a clock face and biopsy tissue labelled accordingly. Cone biopsy is the removal of a cone-shaped piece of tissue from the cervix. Possible complications after the procedure are haemorrhage and infertility due to the removal of mucus-producing glands, and the formation of scar tissue.

### Laparoscopy

Laparoscopic procedures are used to visualise the organs in the pelvic cavity and reproductive organs. Laparoscopy involves three to four small incisions into the abdomen and the use of probes which allow the surgeon to make a diagnostic examination, take biopsies or possibly to perform surgical procedures.

### Diagnostic uterine curettage

A dilation and curettage (D&C) involves the removal of the uterus lining (endometrium). It can be used to obtain a specimen for diagnostic purposes or to remove products of conception which have been retained after a miscarriage or post-partum.

## WOMEN'S HEALTH PROMOTION

There are a number of national health promotion strategies addressing target health risk areas throughout Australia. Information and education are available in many languages through state, territory and federal health departments. Strategies cover the prevention of sexually transmitted infections (STIs), choosing a suitable contraceptive method and screening for cervical, breast and ovarian cancer. The nurse plays an integral part in the promotion of health, education and support of the individual. The nurse should reinforce the medical officer's explanation about any implications for the individual's lifestyle and ensure that the information is understood. It may also be necessary to provide information about fertility control and prevention of STIs.

The nurse should be aware of the changes that occur to the normal reproductive structures and functions throughout the lifespan and be able to determine alterations. It is the role of the nurse to actively promote reproductive and sexual health through individual teaching, education and health promotion strategies. Individual teaching is implemented by educating individuals about normal developmental changes that occur throughout the lifespan.

Health-promotion strategies and programs should be adapted to local needs, taking into account social, cultural and economic structures.

### Breast screen

Breast examination by a healthcare professional is recommended as a health screening component when women present for regular Pap smears.

### Pap smear

Cervical cancer is one of the most preventable and curable of all cancers. It is estimated that most cases of squamous cell carcinoma could be prevented if cell changes were detected and treated early. The Pap smear is performed to obtain a scraping of cervical cells and is currently the best available screening tool for preventing the development of cervical cancer.

In 1991 Australia began what is now known as the National Cervical Screening Program. This joint federal–state/territory-funded program recommends and encourages women to have Pap smears every 2 years throughout their lives. States and territories maintain cervical cytology registries. Women automatically go on the register unless they specifically ask to be excluded. Confidential records and results are retained on a database. Reminders are sent to women on the register when Pap tests are overdue. (See Clinical Interest Box 37.9.)

### CLINICAL INTEREST BOX 37.9 Individual teaching—Pap smears

- All women with a cervix who have ever had sex in their life are at risk of cervical cancer
- Approximately half of new cases of cervical cancer each year are in women under 50 years of age
- Regular Pap smears every 2 years can prevent up to 90% of the most common types of cervical cancer
- Unless a woman has had a total hysterectomy she should be advised to have a Pap smear every 2 years
- If a woman is 70 years or over and has had two normal Pap smears in the past 5 years, she should be advised that she no longer needs to have this test.

*Royal Australian College of General Practitioners (2012)*

## CONTRACEPTION

A variety of contraceptive options are available for both men and women. The option chosen will be dictated by cultural, economic and personal factors and possibly the time available.

**Contraception** is used in females to prevent ovulation, fertilisation or the successful implantation and development of a fertilised ovum. Women have a number of options available, but there is limited choice for men—use of a condom or a vasectomy.

For most women, selecting and using a method of contraception is a significant decision. Choices about birth control are possible because of safe and available methods of contraception.

It should be noted that not all methods of contraception are 100% effective. Each method has a number of advantages and disadvantages (see Table 37.11). Birth control methods may be classified as:

- Mechanical barriers
- Chemical barriers
- Natural (ovulation)
- Intrauterine devices
- Hormonal contraceptives
- Sterilisation.

The **oral contraceptive pill (OCP)** was introduced into Australia just over 50 years ago, with Australia being the second country in the world to have access to 'the pill'. The combined oral contraceptive pill which is a combination of both oestrogen and progestogen is one of the most commonly used of the options. A low-dose alternative is the progestogen-only pill or mini-pill. The way the OCP works is by stopping the release of an ova from the ovaries and preventing pregnancy.

There are two types of the **intrauterine contraceptive device (IUD)**: one is copper bearing and the second, which is more commonly used, is hormone releasing. Both have long-acting benefits and can also reduce the blood loss during

**TABLE 37.11 | Contraceptive methods**

| Type | Description | Advantages | Disadvantages/side effects | Convenience | Effectiveness |
|---|---|---|---|---|---|
| Male condom | Sheath made of latex or polyurethane<br>Provides a barrier between the sperm and ova | Offers protection against STIs<br>Used only as required<br>High level of effectiveness<br>Easy to use | Irritation and allergic reactions<br>May break<br>May alter feeling and sensitivity during intercourse<br>May affect spontaneity<br>Pregnancy may result if not used correctly | Applied immediately before intercourse<br>Readily available; no prescription needed | 82–98% |
| Female condom | Sheath made of polyurethane<br>Provides a barrier between the sperm and ova | Offers protection against STIs<br>Does not interfere with the menstrual cycle<br>Used only as required<br>High level of effectiveness<br>Easy to use | Irritation and allergic reactions<br>May break<br>May alter feeling and sensitivity during intercourse<br>May affect spontaneity<br>Pregnancy may result if not used correctly | Applied immediately before intercourse<br>No prescription needed | 79–95% |
| Diaphragm/ cap | Diaphragm: thin, soft latex dome-shaped device that fits between vagina and pubic bone<br>Cap: Smaller latex or silicone device that fits over the cervix | Does not interfere with the menstrual cycle | May slip out of position<br>May alter feeling and sensitivity during intercourse<br>Possible irritation from the material<br>May affect spontaneity<br>Pregnancy may result if not used correctly | Applied any time before intercourse<br>Reusable devices<br>Must be left in place for 6 hours after intercourse<br>Fitted by health professional for correct sizing | 88–94% |

## TABLE 37.11 | Contraceptive methods—cont'd

| Type | Description | Advantages | Disadvantages/side effects | Convenience | Effectiveness |
|---|---|---|---|---|---|
| Spermicides | Spermicidal preparations in foam, creams, jellies and vaginal suppositories<br>Block the passage of sperm and render sperm inactive | Do not interfere with the menstrual cycle<br>Highly effective when used with a mechanical barrier<br>Help to provide vaginal lubrication | Used alone, without a mechanical barrier, contraceptive failure is high<br>May result in irritation of mucous membranes | Available without prescription | 70–80% |
| Natural methods | Based on abstinence from sexual intercourse during the fertile phase of the menstrual cycle<br>Methods include: rhythm/calendar, temperature measurement, cervical mucus observation | No disruption to menstrual cycle<br>Safe, easy and effective if practised correctly | Unreliable if menstrual cycles are irregular<br>Infection may alter temperature pattern<br>Needs practice to assess cervical mucus variations | All methods require considerable motivation and self-discipline<br>Requires frequent monitoring of body functions | 78–99% |
| Intrauterine device (IUD) | Device inserted into the uterus to prevent pregnancy<br>IUS (intrauterine system) releases low dose of hormone daily. Can be hormonal or copper based. | No disruption to the body's hormonal system<br>Continuous contraceptive coverage. High level of effectiveness<br>IUS is completely reversible | Increased menstrual bleeding, abdominal cramps, low back pain<br>May be expelled from the uterus<br>Risk of PID*, infertility, ectopic pregnancy if contraceptive failure | One-time insertion<br>May remain in place for up to 10 years depending upon type | 99% |
| Hormonal oral contraceptive (combined pill) | Combination of oestrogen and progestogen<br>Inhibits ovulation | High level of effectiveness<br>Regular menstruation, reduced menstrual bleeding<br>Protects against ovarian and endometrial cancer, PID | Nausea, weight gain, fluid retention, breast tenderness, breakthrough bleeding, mood changes, loss of libido. Rarely, cardiovascular disease, including thromboembolism and hypertension | Must be taken daily regardless of frequency of intercourse<br>Requires prescription | Declines with non-compliance, medications and illness |
| Hormonal oral contraceptive (mini-pill) | Contains progestogen only<br>Prevents thickening of the endometrium so implantation is unlikely<br>Alters composition of cervical mucus | High level of effectiveness<br>Reduced menstrual discomfort<br>Protects against ovarian and endometrial cancer, PID | Menstrual disturbances, weight gain, breast tenderness | Must be taken daily regardless of frequency of intercourse<br>Requires prescription | As above |

*Continued*

**TABLE 37.11 | Contraceptive methods—cont'd**

| Type | Description | Advantages | Disadvantages/side effects | Convenience | Effectiveness |
|---|---|---|---|---|---|
| Hormonal injection | Long-acting progestogen in injectable form<br>Inhibits ovulation, changes endometrial lining and cervical mucus | Continuous contraceptive coverage | Menstrual disturbances, weight gain, breast tenderness | One injection every 3 months<br>Requires prescription | 94–99% |
| Hormonal implant | Long-acting progestogen in implant form. Made up of matchstick-size rubber rods implanted under skin of upper arm | Continuous contraceptive coverage | Inflammation or infection at site of implant<br>Menstrual disturbances<br>Weight gain<br>Breast tenderness | Effective for up to 3 years<br>Requires prescription<br>Implanted by healthcare provider as minor surgical procedure | 99.8% |
| Morning-after pill | Combination of oestrogen and progestogen in high doses<br>Emergency measure after unprotected intercourse | High level of effectiveness<br>Provides birth control if mechanical barriers failed during intercourse, if unprotected intercourse occurred or if the woman forgot to take a contraceptive pill | Nausea<br>Spotting or bleeding a few days later | Should be taken within 72 hours<br>May require prescription | Depends on effective use |
| Sterilisation | Vasectomy for the male, tubal ligation for the female<br>Both methods are designed to prevent fertilisation | Generally effective and safe<br>Does not disrupt the normal menstrual cycle or sexual feelings | Should be considered as an irreversible process<br>Slight failure rate<br>Minor discomfort after surgery | One-time surgical procedure | 100% |

**PID = pelvic inflammatory disease*
*(Family Planning NSW 2013)*

menstruation. The device must be inserted into the uterus by a doctor and when in situ a nylon string comes out of the cervix into the vagina. This string helps when it needs to be removed. The hormone-releasing IUD causes mucus thickening, preventing sperm from entering the uterus.

**Contraceptive implants** are inserted under the skin of the inner arm and release a steady dose of progestogen to prevent ovulation. The implant can be effective for up to 3 years and is easily reversed. The implant commonly used in Australia is called Implanon.

**Injectable contraceptives** such as Depo Provera have the benefit of providing protection against pregnancy for up to 12 weeks. Unlike other methods of contraception the effects are not easily reversible, with fertility effects still possible up to 18 months after the injection.

Emergency contraception pills (ECP), commonly referred to as the morning-after pill, are designed to be used after unprotected sexual intercourse, a condom has broken or the OCP has been missed. Current ECPs use only progestogen and are most effective up to 72 hours after intercourse but can still be effective up to 120 hours. In recent years ECPs have become available without a prescription from pharmacies.

Less commonly used methods of contraception are also available such as the **diaphragm**. The advantage of the diaphragm is its relative low cost and ease of use. For effective

use the woman does need to be fitted to ensure the correct size. Alternatively, family planning clinics may suggest the use of devices such as the female condom, dams and vaginal rings.

## Termination of pregnancy

Pregnancy termination can be induced, where the pregnancy is actively terminated (abortion), or can be spontaneous, often called a 'miscarriage'.

The reasons an induced termination occurs may include:

- Family history of fetal chromosomal abnormalities where the fetus has been determined to have abnormalities
- Fetal death in utero when the fetus does not spontaneously terminate
- Unwanted pregnancy where after assessment and counselling it is determined to be in the best interests of all parties to terminate the pregnancy.

A termination may be performed either surgically or medically. Medical terminations are possible when the woman is less than 7 weeks pregnant. Performed under the supervision of a doctor, it involves taking two doses of a medication called mifepristone. The second tablet is taken 36–48 hours after the first tablet, with the woman experiencing a miscarriage shortly after. A surgical termination can take place between 7 and 12 weeks of pregnancy and involves the use of a suction curette that removes the lining and contents of the uterus. The procedure can be done as a day procedure at a clinic or hospital.

# DISORDERS OF REPRODUCTION

## Infertility

**Infertility** is defined as the inability of a couple to achieve conception after a year of unprotected intercourse, or the inability to carry pregnancies to a live birth. It is estimated that one in six couples suffers infertility (Figure 37.9), with a number undergoing both surgical and medical treatment and lifestyle changes. In many instances, no cause can be determined.

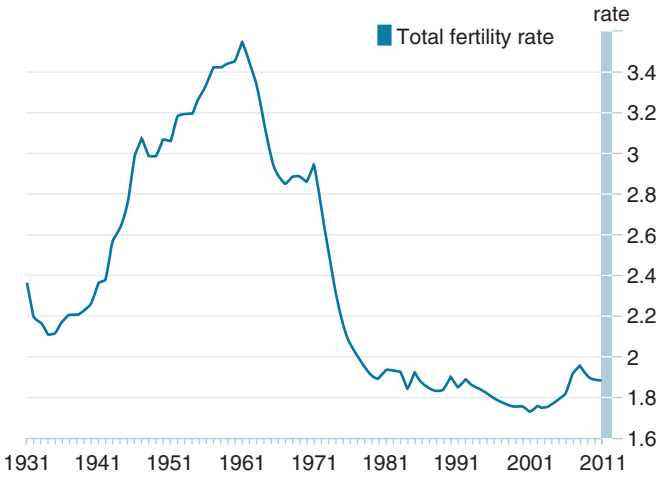


**Figure 37.9** Total fertility rates, Australia (1931–2011)
*(Australian Bureau of Statistics 2011)*

### Male factors

Many factors can affect the production, transport or ejaculation of sperm and the process can be interrupted by a number of causes, many of which have been discussed within this chapter; for example, excessive heat or tight clothing causing an increase in the temperature of the testes and inhibiting sperm production (see Table 37.12). Hormonal dysfunction of the anterior pituitary gland or hypothalamus will affect testicular function. Autoimmune factors may also be implicated. Diseases such as coeliac disease, diabetes mellitus and alcoholism may prevent normal spermatogenesis.

### Female factors

Most female infertility problems are the result of ovulation problems. Stress, diet or rigorous athletic training are lifestyle

**TABLE 37.12 | Known causes of male infertility**

| | |
|---|---|
| Sperm production problems | • Chromosomal or genetic causes<br>• Undescended testes (failure of the testes to descend at birth)<br>• Infections<br>• Torsion (twisting of the testis in scrotum)<br>• Heat<br>• Varicocoele (varicose veins of the testes)<br>• Medicines and chemicals<br>• Radiation damage<br>• Unknown cause |
| Blockage of sperm transport | • Infections<br>• Prostate-related problems<br>• Absence of ductus deferens<br>• Vasectomy |
| Sperm antibodies | • Vasectomy<br>• Injury or infection in the epididymis<br>• Unknown cause |
| Sexual problems (erection and ejaculation problems) | • Retrograde and premature ejaculation<br>• Failure of ejaculation<br>• Infrequent intercourse<br>• Spinal cord injury<br>• Prostate surgery<br>• Damage to nerves<br>• Some medicines |
| Hormonal problems | • Pituitary tumours<br>• Congenital lack of LH/FSH (pituitary problem from birth)<br>• Anabolic (androgenic) steroid abuse |

*(Adapted from Andrology Australia 2014b)*

factors that can affect hormonal balance. Conditions affecting the female reproductive system and which result in infertility in women have been identified; they include structural abnormalities, endometriosis and scarring from PID.

### Assessment of infertility

Assessment of infertility in males is based on the collection of a specimen of ejaculatory fluid to determine the number of viable sperm in the sample. The semen analysis is checked for the number or quality of sperm produced, which is normally 20 million per millilitre. It is also assessed for shape and mobility which can also affect fertility.

As the majority of sperm are situated in the first part of the ejaculate, it is important to educate the individual to collect the first part of the specimen. It is also important to educate them on the importance of not having intercourse or masturbating for 2 to 5 days before the test.

The first step in assessing the woman is to determine if she is ovulating. This may be done by testing basal body temperature and by examining cervical mucus.

Diagnostic tests include:

- Blood tests for hormone levels
- Ultrasound of ovaries to check for ovulation
- Hysterosalpingogram to check patency of uterine tubes
- Laparoscopy to check for disease of tubes or ovaries
- Endometrial biopsy to check if lining is normal.

### Treatment options

Treatment will depend upon the cause and could include the use of medications and surgical procedures.

***Assisted reproductive technology*** Assisted reproductive technology (ART) is the use of laboratory technology for fertilisation of the ova with a sperm. All reproductive clinics engaging in this technology are required to comply with the NHMRC *Ethical Guidelines on the Use of Assisted Reproductive Technology in Clinical Practice and Research* (2007) (ART Guidelines 2014). Many ART methods are very costly, both financially and emotionally. Common methods of ART used in Australia include the following.

*In vitro fertilisation* **In vitro fertilisation** (IVF) has been available for many years and was originally introduced to assist infertile women. The treatment involves sperm collection from the male which is mixed with the eggs of a female partner. The female partner will have undertaken an intensive regimen of fertility drugs to ensure they produce an increased number of eggs which will be removed during a simple surgical procedure or 'harvest'. The sperm is collected from a fresh specimen of sperm produced through masturbation the day of the female egg 'harvest'. Excess embryos may be frozen for future use if a number have been fertilised to enable use at a later date.

*Gamete intrafallopian transfer (GIFT)* **Gamete intrafallopian transfer (GIFT)** is based on IVF; the fertilised ova are placed into a functioning fallopian tube.

*Intracytoplasmic sperm injection (ICSI)* In the event that it is the male who is the infertile partner in the relationship, ICSI is more commonly used. The procedure involves a single sperm being injected into the egg through the outer covering of the egg (zona pellucida). The sperm can either be collected from ejaculate or be removed from the testes or epididymis.

Many couples will enter into the procedures involved in ART after years of trying to become pregnant, the inability to sustain the pregnancy to birth and the emotional roller-coaster of infertility testing to determine the cause and possible options available to them as a couple. Add to this months of tests and injections before each egg harvest and then implantation of a fertilised egg, followed by weeks of waiting to determine if the procedure has been successful, as well as all the counselling which is required to accompany each episode of ART: the process can be very challenging for a couple's relationship.

## SEXUAL ABUSE

Sexual abuse can occur at any age and to anyone, regardless of social or ethnic background. Females experience sexual abuse more often than males but males can also be targeted. It is the responsibility of the nurse, as it is for any healthcare provider, to be alert to situations where sexual abuse may be occurring. For the nurse, information may be gained from the presence of physical symptoms which would be suggestive of abuse and from discussions during the admission and individual assessment. The abuse may be happening currently or may be part of the individual's past experience.

Upon recognising potential sexual abuse, it is the nurse's responsibility to instigate the necessary supports which may be available. A person who has been raped may need to work through the experience and may need ongoing help before being able to resume comfortable intimate relationships. Family therapy may be indicated in cases of incest or other abuse.

During 2011–12, an estimated 51 200 (0.3%) Australians aged 18 years and over were a victim of sexual assault. Almost one-third (30%) of victims of sexual assault had the most recent incident they experienced reported to the police.

There is no standard profile to identify a person who has experienced sexual abuse, but a combination of clinical signs and symptoms and/or a pattern of behaviour or injury can arouse suspicion. It is the role of the nurse to be mindful of cultural practices (e.g. female circumcision) and certain disease processes that may result in variations from the usual.

More information on the symptoms which may suggest a child is being sexually assaulted can be found from:

- ReachOut.com
- Child Safety Australia
- White Ribbon
- SNAP.

## SEXUALLY TRANSMITTED INFECTIONS

Sexually transmitted infections (STIs) (see Table 37.13) are infections that are passed on through close body contact or the exchange of body fluids (Australian Government

## TABLE 37.13 | Common STIs in Australia—causative organisms and routes of transmission

| STI and responsible organism | Main route of transmission |
|---|---|
| **Viral infections** | |
| Genital herpes (herpes simplex type 2 (HSV-2)) virus | Direct skin–skin contact with infected site during vaginal, anal or oral sex |
| Genital warts (human papilloma virus (HPV)) | Vaginal, anal or oral sex |
| Hepatitis B (hepatitis B (HBV) virus) | Vaginal, oral and especially anal sex<br>Contaminated drug needles<br>Skin pierced by contaminated medical instruments<br>Contaminated blood or blood products |
| Human immunodeficiency virus infection/acquired immune deficiency syndrome (HIV/AIDS) (HIV virus) | Vaginal, oral and especially anal sex<br>Contaminated drug needles<br>Infected blood or blood products<br>Transmitted from infected mother to infant in utero, during birth or while breastfeeding |
| **Bacterial infections** | |
| Bacterial vaginosis—common but not a true STI (caused by variety of bacteria of the vagina) | Believed to be due to changes in the vagina during and after sex |
| Chlamydia (*Chlamydia trachomatis*) | Vaginal and anal sex |
| Gonorrhoea (*Neisseria gonorrhoeae*) | Vaginal, anal or oral sex |
| Syphilis (*Treponema pallidum*) | Vaginal, anal or oral sex |
| Non-specific urethritis (NSU). Caused by a variety of organisms (any inflammation of male urethra not caused by gonorrhoea is classed as NSU) | Vaginal, anal or oral sex |
| **Fungal infections** | |
| Thrush (candidiasis) (*Candida albicans*) | Vaginal infection can be spread sexually |
| Protozoal infections | |
| Amoebiasis and similar conditions (parasites such as *Giardia lamblia*) | Anal or oral–anal sex |
| Trichomoniasis (*Trichomonas vaginalis* parasite) | Sexual contact but also possibly by contact with infected objects (survives on items such as washcloths) |
| **Parasitic infestations** | |
| Pubic lice ('crabs') (*Phthirus pubis* lice) | Any intimate contact—not necessarily sexual |
| Scabies (*Sarcoptes scabies* mites) | Any intimate contact—not necessarily sexual |

*(Australian Government Department of Health 2014a)*

Department of Health 2014a). Despite health promotion strategies the individual incidence of sexually transmitted infections are increasing.

Given the prevalence of sexually transmitted infection, the CDC recommends routine screening for the following high-risk groups:

- Women with multiple sexual partners
- Sexually active women under 20 years of age
- Women over 24 years of age with an inconsistent history of barrier contraception, or having a new or more than one sex partner during the past 3 months.

STIs are able to be transmitted via sexual contact which may include kissing, vaginal, anal, oral and oral–anal sex and the use of sexual aids such as vibrators. Some STIs can also be transmitted from a mother to her baby during pregnancy or during the birth process. Diseases such as human immunodeficiency virus (HIV) and hepatitis are blood-borne viruses present in body fluids and can therefore be transmitted through the exchange of body fluids. STIs can also be transmitted by viruses, bacteria or parasites.

Some STIs are relatively harmless and easily treated but others are dangerous and life threatening. The symptoms of STIs vary with each type but there are some common signs. Nurses should be aware of the symptoms of STIs and be prompted to explore the sexual history of individuals reporting any of the following:

- Itchiness, burning or discomfort in the genital or anal area
- Pain or discomfort during urination or sexual activity
- Unusual discharge of fluid from the vagina or penis
- Blisters, sores, ulcers, warts, lumps or rashes anywhere in the genital or anal area.

Some STIs may be asymptomatic. Some STIs start with mild symptoms that the individual might ignore until they disappear.

The impact of STIs on sexual and general health is enormous. It is easier to prevent infection than treat it, and prevention needs to be the concern of all health professionals.

## Diagnosis

The medical officer confirms diagnosis of an STI with swabs and blood tests. It is not uncommon for an individual to have more than one STI at a time.

## Human immunodeficiency virus (HIV)

Human immunodeficiency virus (HIV) is a virus that affects the immune system. The individual may be HIV positive for a number of years without showing symptoms, during which time the virus progressively damages the immune system and the virus is able to be spread to others through body fluid transmission.

HIV infection may be treated with combination therapies to reduce the amount of virus being reproduced in the body. It is recognised that HIV eventually results in acquired immune deficiency syndrome (AIDS), commonly about 10 years after infection but in some cases up to 17 years later. HIV and AIDS weaken the body's immune system, allowing opportunistic infections to cause serious health problems.

The individual with HIV/AIDS can present with a variety of complex needs at any time during their illness, each requiring careful nursing assessment. Sexuality issues include concerns with the effect on the relationship, the ability to find an accepting partner, the risk of transmission and the impact on decisions in relation to parenting. The individual with HIV/AIDS is encouraged to maintain a healthy lifestyle and many find alternative therapies helpful. Individuals are also treated with antiviral drugs. Drug therapy aims to promote repair of the immune system and increase the ability to fight infection. Side effects of the medication can cause unpleasant symptoms until a suitable combination of drugs is determined.

## Syphilis

Syphilis is sexually transmitted infection caused by the organism *Treponema pallidum*. If diagnosed and treated as a primary infection, syphilis is usually controlled. However, if untreated, it has the potential to become a chronic disease, which can have variable lengths of latency and presentation. Tertiary syphilis can present 10 or more years after initial infection. An exacerbation of the infection during pregnancy can lead to it transferring to the infant from the mother.

In Australia, there has been an increase in the number of reported cases of syphilis. This is thought to be due to an increase in unprotected sex, as a secondary HIV infection, having more sexual partners and an increase in recreational drug use. Diagnosis of infection is with a swab and dark-ground elimination. Penicillin is the treatment of choice, with the need for all sexual partners to be treated.

## Chlamydia and gonorrhoea

Chlamydia is caused by the bacterium *Chlamydia trachomatis* and for many people they remain asymptomatic, which makes diagnosis and treatment difficult. In males, infection can affect the prostate, urethra and testes and in females it can affect the cervix, uterus and pelvis. Diagnosis is based on either a urethral swab or a clean catch of urine and the infection is treated with antibiotics and good hygiene practices.

Gonorrhoea is caused by the bacterium *Neisseria gonorrhoea* and can present similarly to chlamydia; however, it tends to be more symptomatic. The rates in relation to gonorrhoea appear to be stable. Diagnosis is based on the presence of a thick yellow urethral discharge and dysuria which develops within a week of infection and is confirmed with a urethral swab and Gram-stain smear or clean catch of urine.

## Prevention of sexually transmitted infections (STIs)

Avoiding infection means responsible sexual behaviour. The only absolutely certain way to avoid infection is not to have sex. Nurses can reinforce, especially to young individuals, that they should never feel that they have to have sex if they don't want to. Nurses can also promote and educate people about safer sex practices. Safer sex reduces the risk of STIs, but the

risk is not completely eliminated. For example, protection by use of condoms provides some protection against HIV and gonorrhoea, but they are less effective in protecting against trichomoniasis and chlamydia and provide virtually no protection against HPV, the cause of genital warts. This is because any intimate contact may spread some STIs.

Education about safe sex practices includes discussing choices about:

- Limiting activity to sensual caressing, massage and mutual masturbation
- Having sex with only one person in a monogamous relationship (the nurse providing education needs to stress that being safe means knowing that neither partner has or will have any other sexual partners and that both are uninfected)
- Insisting on tests for STIs before engaging in sexual activity with a new partner
- The use of good-quality latex condoms, with knowledge of how to use them safely and effectively
- Not allowing drugs or alcohol to impair judgment.

Education about the prevention of STIs also includes stressing the need for:

- Prompt treatment of any infection
- Investigation and treatment of anyone who has had sexual contact with an infected person
- Avoiding sexual activity during the infective stage of the disease
- Avoiding sexual contact with a person known to be, or suspected of being, infected
- Those engaging in sexual activity with other than reliable sexual partners to have periodic health checks and tests for STIs, regardless of other preventive measures employed
- Advising sexually active women to have a Pap smear every 2 years
- Advising that the full course of any prescribed antibiotics must be taken
- Implementing the recommended blood and secretion precautions as effective infection control measures.

Nurses have a responsibility to promote the reduction of incidence of STIs and so limit the distress they cause. A knowledgeable and skilled nurse will successfully encourage individuals to discuss STIs, will inform about modes of transmission and treatments and will ensure that at-risk individuals recognise the manifestations of STIs if and when they occur. The education that nurses are often in a position to relay helps disseminate accurate information. This can increase the number of individuals that seek early medical advice, and so reduce the damaging physical and psychological effects of STIs. (Refer to Nursing Care Plan 37.1.)

## NURSING CARE PLAN 37.1

**Assessment:** Lucy is 16 years old and has attended her local primary health facility. You are responsible for performing an initial assessment within your SOP before Lucy sees the on-call medical officer. Lucy states she has burning with urination and admits she engaged in intercourse 48 hours previously. She has recently had to take time off work due to bronchitis. Lucy states she was given a commonly known antibiotic for her bronchitis and her prescription for the OCP ran out a couple of days ago. Lucy states they did not use a condom when she had intercourse and is scared that she may be pregnant or may have caught an STI. Lucy is too scared to tell her parents and has come to the clinic for advice and support.
**Issue/s to be addressed:** Maintenance of confidentiality vs support for Lucy during episode of care
Possible diagnosis of post-coital cystitis
Possible ineffective OCP coverage due to recent illness and antibiotic treatment leading to a possible diagnosis of pregnancy
Possible diagnosis of STI due to unprotected intercourse with partner
**Goal/s:** Eliminate possible issues and obtain definitive diagnosis
Maintain supportive environment to allow parents, partner to be informed of diagnosis
Provide education and options for treatment dependent on the diagnosis

| Care/Actions | Rationale |
|---|---|
| Perform a comprehensive assessment of the following:<br>Lifestyle choices—nutrition, exercise, rest, substance abuse, alcohol and drug use, occupation and financial details<br>Medications—OTC, non-prescription and prescription medications<br>Review of body systems—reproductive (Pap smears, previous STIs, sexual practices, menstrual history)<br>Surgical history | Assess Lucy's health status and possible risk to fetus if pregnant<br>Determine underlying issues that have not been identified<br>Determine underlying conditions, regularity of menstrual cycle and where in cycle intercourse took place to determine ovulation history |

## NURSING CARE PLAN 37.1—CONT'D

| Care/Actions | Rationale |
|---|---|
| Family history—medical conditions, genetic conditions (cystic fibrosis, bleeding, birth defects)<br>Sexual partner history<br>Past history—childhood diseases (chicken pox, measles), immunisation status, contraceptive history<br>Psychological history—family situation, occupation, cultural preferences<br>Physical examination—visual, BSE, tests | Any abdominal surgery, trauma<br>In the event of pregnancy decision to maintain pregnancy<br>How many previous partners, length of relationship, possibility of sexual health<br>Immune status and OCP coverage and effectiveness<br>Determine level of support if Lucy is pregnant or needs medical treatment, ability to support a baby, is Lucy still at school, possible barriers to treatment due to cultural/religious beliefs. Has Lucy spoken to partner in past 2 days?<br>Is Lucy well groomed (ability to look after self, financial, living situation), signs of malnourishment, injury? Evidence of infection? Has Lucy done a home pregnancy test? Collect urine for pregnancy test/ possible blood for analysis |

**Evaluation**

Urine test tests positive for pregnancy/await pathology results for βhCG results.
Discuss possible use of morning-after pill and treatment for possible STI.
Discuss possible need for D&C, relevant preoperative preparation and postoperative education.
Discuss need to involve family in ongoing management.
Refer to MO for pelvic examination and specimen collection for STI clearance.
Set up appointment for review in 1 week for further follow-up.

## Summary

The function of the male and female reproductive systems is primarily to reproduce. The female role is to produce ova, receive sperm and, after fertilisation (the fusion of a spermatozoon and an ovum to form one cell), development and birth of the baby. The male role is to produce the sperm which will ultimately fertilise the ova which will result in an embryo.

Conditions affecting both the male and the female reproductive system can limit the ability to reproduce and therefore continuation of the species. Remaining alert to symptoms which may suggest an infection or disease and referral for early investigations will go a long way towards preventing these conditions further limiting the reproductive health of individuals.

A large number of both nationally and state-based health promotion activities exist to provide a resource for information, support and education and are making a very positive impact on the health of all.

Choices concerning reproduction are influenced by physiological, psychological, social, religious, economic and environmental factors. In Australia the birth rate is declining due mainly to changing social attitudes and the availability of contraception.

Nurses who work in the area of sexual and reproductive health should be aware of cultural and religious beliefs as well as individual sexual practices and preferences. As health professionals they are actively involved in promoting reproductive and sexual health in a variety of healthcare settings. Nursing management of the individual with a disorder of the male or female reproductive system requires an acute awareness of the importance of providing psychological support as well as skilled clinical interventions.

## DECISION-MAKING FRAMEWORK EXERCISE 37.1

Luke is a 21-year-old male who presents to the accident and emergency department where you are working. He is holding a jumper in front of himself and walks with a gait suggesting he is in considerable pain. Luke appears embarrassed to answer questions in the triage area of the A&E.

Taking Luke into a private room he reveals that he took some of his father's medication the previous night before going out to a local nightclub. He states he has a partial erection which has been present for almost 8 hours. Further discussion reveals that he has tried several approaches to get rid of the erection but has only been successful at slightly reducing the swelling. Luke begs you to relieve his discomfort.

1. Is this considered a medical emergency?
2. Is there a protocol for the management of this situation?
3. What are the risks associated with the procedure?
4. Who needs to perform this procedure (EN/RN/MO)?
5. Is the procedure within your scope of practice?
6. How can you assist Luke?

## Review Questions

1. When collecting an individual assessment you suspect the male individual has an enlarged prostate. What symptoms would confirm your suspicions?
2. A diagnostic test that can be performed to determine the possibility of prostate cancer is the PSA test. Explain its use. What other diagnostic assessment may be performed to confirm diagnosis?
3. Erectile dysfunction is a condition that can affect young and older males. List the possible causes of erectile dysfunction.
4. When performing a TSE, what should be looked for?
5. An individual is due for discharge after a vasectomy. What education is important for this individual?
6. A torsion of the testes can lead to serious complications if not treated quickly. What complications may occur if torsion of the testes is left untreated?
7. Endometriosis can present with severe menstrual symptoms. How would a diagnosis of endometriosis be confirmed and what is the medical management?
8. Discuss the preoperative care for a woman who is scheduled for a radical hysterectomy.
9. What are your responsibilities if you suspect abuse of a child in your care?
10. The pregnant woman should be monitored for the onset of pre-eclampsia in the third trimester. What are the characteristic signs of possible pre-eclampsia toxaemia?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Andrology Australia Available at andrologyaustralia.org

Breastcare Australia Available at www.breastcareaustralia.com.org

BreastScreen Australia, National Cervical Screening Program and National Bowel Cancer Screening Available at www.health.gov.au/internet/screening/publishing.nsf/content/home

Enough is Enough Available at www.protectkids.com

Fertility Society of Australia Available at www.fertilitysociety.com.au

IVF Australia Available at www.ivf.com.au/

Ovarian Cancer Australia Available at www.ovariancancer.net.au

Urological Cancer Organisation Available at www.uco.org.au

What contraceptive are you? Available at www.whatcontraceptiveareyou.com.au

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UNIT
9

# Healthcare in specialised practice areas


CHAPTER 38
Nursing care in palliation

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Mental health and mental illness

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CHAPTER 38

# Nursing care in palliation

*Leigh Darcy*

## KEY TERMS

care of the dying
death and dying
empathic
end-of-life care
family-centred care
loss and grief
multidisciplinary palliative care
palliation
palliative approach
palliative care
person-centred
symptom management

## LEARNING OUTCOMES

At the completion of this chapter, and with further reading, students should be able to:

- Define the key terms
- Outline the philosophy of palliative care
- Describe a multidisciplinary approach to palliative care
- Identify a range of physical and psychosocial symptoms that may occur in the individual who is dying
- Identify nursing interventions to address physical and psychosocial symptoms
- Identify nursing interventions to support family
- Describe grief and the purpose of grief
- Identify nursing interventions to support grief responses in the individual and family
- Discuss how nurses may be supported in providing palliative care

## CHAPTER FOCUS

Palliative care is the specialised care of people who are no longer responsive to curative treatment and who are dying. The aim of palliative care is to provide symptom management by addressing pain and other physical symptoms, and by providing psychosocial and spiritual care. Multidisciplinary teams are required to provide high-quality palliative care and nurses are important members of the multidisciplinary team. Nurses provide person-centred and family-centred symptom management with the multidisciplinary team. A caring nurse–person relationship that facilitates psychological and spiritual wellbeing is central to quality palliative nursing.

## LIVED EXPERIENCE

The nurses told us that Dad would die in the next few days and encouraged us to call my brother, who was overseas. We were all very anxious that he would not get back in time, especially mum. My Dad died half an hour after my brother arrived at the hospital. Even though he wasn't conscious, it seemed as if he knew and had waited for my brother. We were all thankful that my brother was able to say goodbye. Saying goodbye for a final time is difficult but we were able to be together as a family and the nurses encouraged us to take the time we needed with Dad.

**Daughter, age 25**

## DEATH AND DYING

**Death and dying** is a part of life. However, the concepts of death and dying are uncomfortable for most people. Although death is common in older people it can occur at any age. Care of people and families experiencing death and dying is central to the nursing role (McLean Heitkemper et al 2015). Therefore, nurses require understanding of, and skills in, palliative care. This includes an understanding by the nurse of others' attitudes, feelings and beliefs about death and dying. Importantly, nurses require an understanding of their own attitudes and feelings about death and dying and how these might influence the nursing care they provide (Egan 2013; McLean Heitkemper et al 2015).

Understanding that people and families respond very differently to death and dying is essential to quality nursing care. People's responses to death and dying have been learned from their family of origin and also from the culture they come from (Berger et al 2013; Leininger & McFarland 2002). Feelings about death and dying can also reflect the individual and family adjusting to their pending loss. Where possible, the nurse builds a trusting, caring relationship with the individual and their family. When the person and their family trust the nurse they are more likely to disclose their beliefs and feelings about death and dying. The person and the family are the experts about their feelings and beliefs. Empathic listening is essential to quality nursing care (Egan 2013). The range of feelings people can experience during death and dying include sadness, anger and fear; or relief and acceptance of death as a natural event (Egan 2013). Some people experience considerable fear about dying. Common fears include:

- Fear of pain and isolation while dying
- Fear of loss of dignity
- Fear of the unknown, of nonexistence
- Fear of what happens after death (Berger et al 2013; McLean Heitkemper et al 2015).

A nurse needs to support the individual who is dying and their family in whatever feelings they experience. All people process and experience their feelings differently. There is no expected outcome per se and no 'right' or 'wrong' feelings or sequence of feelings in death and dying (Berger et al 2013). Some people will express feelings of acceptance and some people will not. This is demanding on the nurse as the nurse is faced with the challenge of tolerating very difficult feelings in the person and in themselves. A nurse needs to accept all feelings as valid and be respectful and **empathic** (Egan 2013).

A person who is facing their own death may ask the nurse difficult questions such as, 'Am I going to die?' Many nurses, understandably, will be uncomfortable with these questions. The nurse's response depends on many factors, such as:

- Has the person and/or their significant others been informed of the prognosis?
- What is the person's stage of growth and development, and their level of understanding?
- Have the significant others requested that the person's prognosis be withheld from them, and is this a reasonable request?
- Are the nurses caring for the person adequately supported by experienced and specialist nurses, and by the multidisciplinary team? Have they been prepared adequately to deal with such questions?

There are no standard answers to questions that may be asked by people who are dying. If a person asks the nurse such a question this indicates that they trust the nurse (Egan 2013). It also suggests that they wish to discuss their feelings about their death. Nurses may feel able to engage in a conversation about the person's feelings about death and dying. Alternatively, they may prefer to refer the person to an experienced nurse, a palliative care nurse specialist or relevant

member of the multidisciplinary team such as a counsellor or psychologist (Berger et al 2013). Additionally, the nurse can prepare themselves to improve their understanding of the issues that surround death and dying, and of relevant counselling approaches. For example:

- Reading recommended literature, particularly in relation to the individual dying in a healthcare setting
- Discussing aspects of death and dying and their own feelings and attitudes with experienced nurses, palliative care nurse specialists and bereavement counsellors
- Attending in-services, seminars, courses or other related educational forums to broaden skills and knowledge.

Discussing death and dying is still considered by many people to be morbid or in poor taste, and western culture tends to deny death (McLean Heitkemper et al 2015). The experience of death and dying is perceived by many in Western culture as a personal and private matter. It is interesting to note, however, that contemporary society's attitudes are changing (McLean Heitkemper et al 2015). Expressing grief is increasingly seen as a normal and healthy response. This is evident in recent world examples, such as the public responses to the deaths of thousands of people in Japan and New Zealand following the earthquakes affecting each in 2011.

## PALLIATIVE CARE

Palliative care is defined by the World Health Organization (2002) as 'an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual'. (See Clinical Interest Box 38.1.) Palliative care is the specialised care of people who are no longer responsive to curative treatment and who are dying (Palliative Care Australia 2015). The aim of palliative care is to achieve the best possible quality of life for both the person who is dying and for their family. This includes symptom relief, psychological and spiritual care, care in regard to grief and loss and care of the person who is dying and their family in the terminal phase of the illness (Crisp et al 2013). Palliative care aims to relieve distress and suffering, and keep the person comfortable without hastening or postponing death. Holistic care, that is person- and family-centred, is essential to quality palliative care and a 'good death'. Palliative care respects the dignity of the person who is dying and their family (Berger et al 2013; Palliative Care Australia 2015). The focus is on the person's and the family's needs and wishes in accordance with their cultural and spiritual beliefs. Where possible, care is provided in the environment of the person's choice such as in the home or in a hospice. Holistic palliative care is dependent upon multidisciplinary teams including nursing, medical and allied health professionals, and on volunteer services.

Those providing palliative care in a multicultural society require sensitivity to differences in the way people from various cultures understand issues surrounding death and dying. For example, pain and suffering, and quality and meaning of life, may be interpreted quite differently cross-culturally and intra-culturally (D'Avanzo 2008; Leininger & McFarland 2002). Sometimes judgments and care decisions are influenced by the nurse's personal cultural values. It is important to avoid making assumptions about the individual's wishes by asking the individual what is preferred in relation to all treatment, care and quality-of-life activities (Berger et al 2013). For example, prayer rites and readings from the Quran are important during death and dying for many Muslim people (Cheraghi et al 2005). Therefore, the individual and family may wish for an imam to support them during this experience.

Palliative care is not an alternative to other care but is complementary to and a vital part of total patient care. A person who receives palliative care will have an active, progressive and advanced disease with little or no prospect of cure (Palliative Care Australia 2015; Crisp et al 2013). In some settings where **end-of-life care** is provided by non-specialists, a **palliative approach** is used. A palliative approach is the term used to describe the care provided by generalist healthcare professionals who may consult with palliative care specialists. Alternatively, palliative care may be provided within a funded specialist service that provides care in partnership with generalist health practitioners, for example, in community-based home care (Kralik & van Loon 2011). Palliative care may also be provided solely by specialist services as, for example, occurs in many hospices. In some countries such as Australia, people receive palliative care within a funded specialist service, generally in the last 6 months of their life (Victorian Department of Human Services 2011).

### CLINICAL INTEREST BOX 38.1 Palliative care

- Provides relief from pain and other distressing symptoms
- Affirms life and regards dying as a normal process
- Intends neither to hasten nor postpone death
- Integrates the psychological and spiritual aspects of care
- Offers a support system to help individuals live as actively as possible until death
- Offers a support system to help the family cope during the individual's illness and in their own bereavement
- Uses a team approach to address the needs of individuals and their families, including bereavement counselling, if indicated
- Will enhance quality of life, and may also positively influence the course of illness
- Is applicable early in the course of illness, in conjunction with other therapies that are intended to prolong life, such as chemotherapy or radiation therapy, and includes those investigations needed to better understand and manage distressing clinical complications.

*(World Health Organization 2002)*

### CLINICAL INTEREST BOX 38.2 Residential care—an Enrolled Nurse's experience of palliative care

Within the facility I work at we try to ensure that the end of life for our residents is as peaceful as possible. We ensure privacy of the person and invite the family to spend as much time as they need to with their loved one. I like that every staff member tries to ensure that the person is kept as comfortable as possible. We provide pressure care, hygiene, aromatherapy, chairs, music, lighting as per the individual's preferences. We ensure pain relief is timely and adequate. We also try to address any family concerns quickly and with compassion. This could include contacting clergy or funeral directors at the individual's and/or family's request. By listening to the person and their families I find most concerns can be addressed. I like that there is flexibility where I work to meet an individual's needs.

Throughout this chapter the term 'family' is used to represent all people identified by the person who is dying as being significant to them. Family therefore includes partners, relatives, friends, neighbours and anyone else providing support (Maher & Hemming 2005). Palliative care involves grief and bereavement support for the family that extends throughout and beyond the duration of the illness.

## Who can receive palliative care?

Anyone who has an illness that is not responsive to curative measures can receive palliative care, regardless of age, gender, class, culture, race and religion or belief system (Kralik & van Loon 2011). Most people receiving palliative care have cancer, but some have progressive chronic neurological problems such as motor neuron disease or multiple sclerosis. Others have acquired immune deficiency syndrome (AIDS), Alzheimer's disease or end-stage heart, lung or kidney failure. As the concept of palliative care develops, more specialist palliative care teams are caring for people with illnesses other than cancer (Berger et al 2013; Chang & Johnson 2014). Palliative care measures are also implemented for residents living in aged care facilities who are in the last stages of life. Clinical Interest Box 38.2 provides an example of how palliative care may be implemented in the residential care environment.

# PERSON- AND FAMILY-CENTRED PALLIATIVE CARE

Quality **person-centred** and **family-centred care** depends on empathic nurse–individual caring relationships. A quality nurse–individual caring relationship is built on trust and respect. This requires that the nurse has excellent interpersonal and communication skills, cross-cultural nursing skills, is able to listen empathically and tolerate hearing difficult feelings and attitudes that may or may not match the nurse's own beliefs (Maher & Hemming 2005). The relationship

### CLINICAL INTEREST BOX 38.3 A caring nurse–individual relationship facilitates discussing feelings about dying

Where I work there are many people from various cultural backgrounds. Maria, who I looked after as she was dying, was from an Eastern European background. She had strong religious beliefs and always carried rosemary beads. One shift, Maria was audibly distressed, but care staff were unsure about what to do: they said she said she wasn't in pain but kept chanting. When I went in to Maria's room, her daughter was there also, and I asked what was wrong. Maria's daughter explained that the loud chanting was Maria's way of coping with the emotional distress of dying. This led to a conversation of what Maria would like in her final days. I learnt a lot about how to approach difficult conversations from this experience. The main point is to start the conversation. I shared my discussion with all the team; we are all more aware of cultural differences and ensure we ask people about their own personal needs.

**Craig, Enrolled Nurse, working in aged care**

forms the foundation for the individual and their family to express their feelings, thoughts and beliefs about death and dying. At times, the nurse will not know what to say or how to respond to the person. It may be appropriate to share this with the individual and family (Stein-Parbury 2014). Importantly, a quality nurse–individual caring relationship can also provide a foundation for joy, remembering and finding meaning in life for the person and their family. Clinical Interest Box 38.3 provides an example of open communication between a nurse and an individual.

# MULTIDISCIPLINARY PALLIATIVE CARE

The provision of high-quality **palliative care** means that individuals and families need access to support from a coordinated **multidisciplinary** team (Victorian Department of Human Services 2011). This includes generalist healthcare professionals and those with specialty training in palliative care. The team includes medical officers, nurses, allied health workers, counsellors, chaplains and volunteers. The knowledge and expertise of the multidisciplinary team combines to help people live as fully as possible and maximise their quality of life within the increasing limits of the illness (Caresearch 2014). Individuals and their families are encouraged to actively participate in all aspects of their care including care planning and care delivery.

Palliative care aims to help individuals and their families feel in control of the quality-of-life and symptom-management decisions, including the decision about where care will be provided. Palliative care can be provided in the person's own home, a specialist inpatient hospice unit, an aged care residential unit (see Case Study 38.1), a hospital

## CASE STUDY 38.1

Lewis, a 69-year-old man, has recently been diagnosed with an inoperable brain tumour. He has been having severe headaches, balance problems, nausea and has had a number of seizures. Lewis has a number of comorbidities including obesity, diabetes (he is a type 2 diabetic requiring insulin), CCF and high blood pressure. Lewis has also noticed a recent deterioration in his eyesight and has been having difficulty managing his diabetes.

Lewis lives alone. His only relative is his sister Joan who is also unwell and lives an hour's drive away.

Lewis has decided not to have any radiotherapy or chemotherapy and wishes for palliative treatment only.

Lewis has decided that a residential aged care facility would be the best way to ensure his wishes regarding his declining health and his death are met. He has developed an advance care plan with his doctor, the palliative care team and the care manager at the facility. His biggest fears are dying in pain and alone, falling and being sent to hospital unnecessarily.

1. In what ways can a multidisciplinary palliative care team continue to support Lewis in an aged care facility?
2. What nursing actions can you take to assist Lewis in managing the symptoms associated with his illness?

or other healthcare facility (Chang & Johnson 2014; Crisp et al 2013).

## Home-based care

Many people wish to die at home (Kralik & van Loon 2011). Community-based generalist nursing services, palliative care services and general practice services provide care in partnership with **palliation** individuals and their families to enable this wish to be fulfilled. When a person prefers to die at home, nurses assist family members in providing care. The nurse may also be required to provide counselling and teaching services; for example, teaching a family member how to sponge the person in bed or how to assist them safely to a commode (Berger et al 2013; Crisp et al 2013). Nurses also support individuals and their families to manage symptoms associated with palliation.

Specialist palliative care services provide palliative care nurse specialist and medical specialist care, and offer a wide range of other services and supports (Kralik & van Loon 2011; Chang & Johnson 2014). These include counselling, bereavement support and pastoral care, occupational therapy, physiotherapy, relaxation and music therapy, dietary advice and loan of equipment. Many of these services and supports are offered at a day centre or, if the individual is unable to attend, in the home. Trained volunteers play an important role in providing various forms of assistance, including respite for family members and bereavement support (Victorian Department of Human Services 2011). Clinical Interest Box 38.4 provides an example of when home-based palliative care can help.

## CLINICAL INTEREST BOX 38.4 Home-based palliative care

Darcy was returning home with his family after relapsing for the third time with acute leukaemia. Darcy wanted to die at home, where he felt more comfortable. Darcy's biggest fear was dying in pain and he was very anxious about this. A multidisciplinary palliative care team became involved in Darcy's palliative care. Darcy and his family went home much less anxious, as the team had developed a clear plan with Darcy and his family on how to manage his care. At home Darcy and his family had access to 24-hour nursing care and doctors but, also importantly to Darcy, his family and friends could visit. They were also reassured that the hospice would be available to Darcy if needed. Darcy died peacefully at home surrounded by his family, as he wished.

**Darcy, aged 19 years**

## Hospice-based care

A hospice unit is an inpatient unit where specialist health professionals care for people with incurable illnesses (Palliative Care Australia 2015). Individuals are admitted to a hospice in the last stages of their illness and remain until death occurs, or they may be admitted for assessment and relief of pain or other distressing symptoms and then return home. Admission to a hospice can also provide support for an individual who is experiencing emotional distress or anxiety (Victorian Department of Human Services 2011). Sometimes individuals are admitted for a period of respite care. Respite care provides a break for a carer or family member. The aim of an inpatient hospice unit is to provide expert care in a calm environment that is as home-like as possible. Palliative care units in busy mainstream hospitals are not always able to provide the same calm atmosphere as a hospice (Kralik & van Loon 2011). Clinical Interest Box 38.5 provides an example of when hospice-based palliative care can help.

## Residential aged care

A residential aged care facility is a facility that provides support to people who require help because of illness or disability, or because of needs or family, friends or carer. Staff at an aged care home can provide assistance with personal care and 24-hour nursing care (Department of Social Services 2015). Many people enter a nursing home when they can no longer manage at home. Residential aged care facilities will aim to provide the best quality of life for individuals. For many people the staff in the facility will assist with managing their end-of-life care when needed. This may include managing pain and symptoms, emotional and cultural support, communicating with family about decisions with care and

### CLINICAL INTEREST BOX 38.5
### Bill's story—in hospice care

Having been diagnosed with terminal cancer, I found my disease was progressing faster than I expected. Being 86 years old, and my wife 84 years old, the physical debilitation was hard to manage. My wife couldn't help me in the shower any more, and I was getting weaker and weaker. Palliative care had been involved and we called them and the nurse discussed the hospice and found us a bed in the hospice. The staff are wonderful: they take care of all the physical aspects of my care and have encouraged my wife and me to talk more openly with the rest of the family. I am so glad I agreed to come here as I was feeling a burden on my family.

**Bill, aged 86, 1 week prior to dying of metastatic prostate cancer**

supporting family and friends (Department of Social Services 2015). Staff can provide a warm, caring environment for a dying resident in an aged care facility by providing a softly lit, quiet environment, encouraging family to stay with the individual and staying close to the individual and family.

Staff within the nursing home can engage with other health professionals as required to help support the individual. Some health professionals who may be accessed could include: general practitioners; medical specialists; palliative care teams; wound specialists; allied health professionals including physiotherapists; psychologists; therapists skilled in music, massage, aromatherapy or colour; and acute medical and nursing teams if necessary (Department of Social Services 2015).

### Acute/hospital-based care

The majority of palliative care is provided in the person's home in a community setting, but as the illness progresses the individual may require admission to an acute inpatient facility. The reasons for admission may include treatment for an acute medical or surgical condition, symptom control, respite for carers or to die (Chang & Johnson 2014). The Australian Commission on Safety and Quality in Health Care undertook a major work into understanding the complexity of issues and barriers affecting the delivery of safe and good quality end-of-life care in acute facilities. The outcomes found need for several changes to the delivery of end-of-life care in acute facilities, which may involve the development of safety and quality or clinical care standard criteria and training curricula (ACSQHC 2014). A *National Consensus Statement: Essential Elements for Safe High Quality End of Life Care* (ACSQHC 2015) sets out suggested practice for the provision of end-of-life care in settings where acute care is provided. The Consensus Statement aligns with the National Safety and Quality Health Service Standards, and provides recommended practice. It also aligns with the *National Consensus Statement: Essential Elements for Recognising and Responding to Clinical Deterioration* (ACSQHC 2010), and it is intended that these documents be applied together.

### CRITICAL THINKING EXERCISE 38.1

In what ways do the culture in busy acute care hospitals impact on the experience of individuals who are dying? How does it impact on their family members? How might nurses improve the circumstances for the individual who is dying and their family in this setting?

## SYMPTOM MANAGEMENT

Palliative care affirms life and regards dying as a normal process. All care is therefore aimed at relieving pain and other symptoms. The individual may have symptoms that relate to physical, emotional or spiritual concerns (Old & Swagerty 2007; Chang & Johnson 2014). Physical comfort is a priority and essential if palliative care work is to be effective (McLean Heitkemper et al 2015). However, emotional or spiritual concerns can affect physical symptoms. Therefore a holistic approach is necessary in **symptom management**. Many individuals experience multiple symptoms concurrently. Pain is a common symptom; however, not all people experiencing palliation report pain.

Symptom management requires thorough assessment and possibly referral to the relevant member of the multidisciplinary team (Maher & Hemming 2005). Excellent communication and discussion with the multidisciplinary team is essential to effective symptom management. Assessment must always precede intervention to establish the causes of the symptoms wherever possible (Kindler et al 2015). Cultural factors must be included in symptom assessment in order to tailor symptom management to the needs of the person and their family. Symptom management aims to minimise or eliminate pain and disability, and maximise comfort and functioning (Kindler et al 2015). Any concurrent additional disorders developing over the palliation episode of care (e.g. infections) are diagnosed and treated as necessary. Once treatment is initiated, nurses are involved in reviewing and evaluating the effectiveness of the intervention.

Symptoms other than pain are commonly experienced by people who are dying (Berger et al 2013). These include symptoms requiring physical care and psychosocial and spiritual care (Stein-Parbury 2014). Common physical symptom areas to be included in an assessment are pain, changes in body weight, nausea and vomiting, constipation or diarrhoea, fatigue and dyspnoea (difficulty breathing). Psychosocial and spiritual care issues include challenging emotions such as anxiety, depression and fear and grief and loss (Berger et al 2013). Quality nursing care is focused on meeting the person's treatment and physical care needs and psychosocial and spiritual needs.

### Pain

Pain is a common symptom, in particular when the person has a cancer illness. Woodruff (2004) defines pain as 'what

## NURSING CARE PLAN 38.1

**Assessment:** Graham is a 62-year-old man diagnosed with terminal pancreatic cancer. He is conscious; he has a subcutaneous narcotic infusion in situ to manage his pain. You have been allocated to look after Graham on your shift in an acute hospital. Graham is visibly upset and moaning with pain.
**Issue/s to be addressed:** Pain management.
**Goal/s:** To provide adequate pain relief and comfort measures.

| Care/Actions | Rationale |
|---|---|
| Assess Graham's pain:<br>Perform a comprehensive pain assessment including: location, characteristics, onset, duration, severity (e.g. 0–10 scale), and factors that have led to an increase in pain such as ambulation. Note any cultural issues impacting the pain. Determine individual's acceptable level of pain | Provides information to determine need for increase or change in pain management regimen, keeping in mind that verbal/behavioural cues may have little direct relationship to the degree of pain perceived<br>New pain may require a different pain relief strategy<br>Allows Graham to maintain a consistently acceptable level of pain |
| Provide education on asking for assistance sooner rather than later | May reduce need for/can supplement analgesic therapy, especially during periods when Graham would like to be more alert |
| Demonstrate and encourage use of positioning, relaxation techniques, guided imagery and meditation. Encourage family to assist Graham with this | Allows family to assist Graham practically |

**Evaluation**

Graham requested additional pain relief medication and changed position for further comfort. Graham's pain score was at a level he found acceptable.

the patient says hurts'. It emphasises that 'a patient's pain is what they describe and not what others think it ought to be'. Modern pain management means that palliative care individuals should be almost pain-free throughout their illness (Woodruff 2004; World Health Organization 2008). A variety of nursing interventions, including pharmacological and non-pharmacological approaches, provide relief from pain and physical discomfort (Kindler et al 2015). Nurses promote and undertake medication management including supporting individuals' self-management of analgesic medications through health teaching. Nurses also provide advice regarding application of heat and cold packs, positioning and support of limbs; for example, by application of a splint. They further advise the person and family about gentle exercise and rest (Kindler et al 2015). (See Nursing Care Plan 38.1.)

Assessment of pain is vital to effective pain relief. Pain can stem from injury and disease in any part of the body including internal organs and viscera, skin and connective tissue and nerves (Litwak 2009). Expert assessment is vital to identify the cause of the pain and the type of intervention and/or medication that will be most effective (Kindler et al 2015). Pain assessment is a core skill of the palliative care nurse and palliative care medical officer.

Analgesic medication is the primary method of controlling pain (Kindler et al 2015). Analgesic drugs include opioids, such as morphine, and non-opioid analgesics such as paracetamol and non-steroidal anti-inflammatory drugs. Analgesics may be administered as slow release oral preparations, rectally or as injections (Kindler et al 2015). Additionally, adjuvant medications may be prescribed. These medications are not analgesics; however, they have pain-relieving properties, particularly when prescribed with analgesics (Kindler et al 2015). Adjuvant drugs include antidepressants, anticonvulsants and corticosteroids (Kindler et al 2015; Foyle & Hostad 2007). Combination analgesic and adjuvant drug therapies are common in palliative care.

Advances in pain-reduction techniques have seen the introduction of analgesics such as fentanyl patches that can be applied to the skin (Kindler et al 2015). Fentanyl is a potent synthetic opioid medication. When a person is prescribed fentanyl patches, nurses must take extreme care in administering any additional opioid medications such as morphine because of the significant risk of overdose (Kindler et al 2015; Tiziani 2013).

Other pain-relieving medical interventions used in palliative care include surgery, radiotherapy, nerve blocks (injection of anaesthetic agent close to a nerve to cause temporary or permanent blockage in transmission of pain) and chemotherapy (McLean Heitkemper et al 2015). The benefits must outweigh the burden of these treatments, particularly when there are unwanted severe side effects. In quality palliative care, the person and their family are provided with sufficient information about the risks and benefits of any treatment in order to make an informed decision.

Allied health professionals can also provide effective pain relieving interventions; for example, physiotherapy techniques such as ultrasound and laser therapy can be helpful in managing pain (Kindler et al 2015). Additionally, complementary therapies, such as massage, aromatherapy and guided imagery, can be valuable and are often combined with medical and nursing care to enhance the effectiveness of pain-relief measures, to promote relaxation and to reduce anxiety. People

## PROGRESS NOTE EXAMPLE 38.1

| | |
|---|---|
| 20/07/2015<br>0745 hrs | Nursing: Graham visibly distressed and moaning, stating he had considerable pain. Pain assessed pain score 9/10. Graham stated that pain is the same as he has been having only worse. Graham has infusion for pain at 1 mL/hr subcutaneously. Reported to RN G. Bailey and breakthrough pain relief given. Graham repositioned. Within 30 minutes Graham's pain score at 3/10. Graham did not want any further pain relief. Education provided about managing pain, ensuring he asks for breakthrough pain relief when pain begins to escalate. Discussed with Graham and his family supplementary techniques that assist with pain, such as changing position on a regular basis and meditation. Graham has some guided meditation recordings to listen to.<br>***D. Beck* (Beck) EN** |

interpret their pain according to their life experiences, values and beliefs (Kindler et al 2015). Some people view the expression of pain as a sign of weakness or a sign that their condition is deteriorating. Some people are fearful of opiate drugs such as morphine because they believe they will become addicted or that it will hasten their death. The nurse plays an important role in counselling, supporting and educating the person and their family about the benefits and risks of analgesic medications and analgesic interventions. (See also Chapter 33.)

An example of how an entry in to progress notes might be documented has been provided on the subject of breakthrough pain relief and managing pain (see Progress Note Example 38.1).

## Symptoms requiring physical care

Nursing care is fundamental in addressing many symptom areas as identified in Table 38.1. This includes nursing care of activities of daily living, such as hygiene and mouth care; nursing care of continence difficulties, nursing management of mobility difficulties including positioning and nursing care to maintain skin integrity including pressure care (Foyle & Hostad 2007; McLean Heitkemper et al 2015). Individuals are encouraged to eat small nutritious meals frequently to maintain their energy requirements. Nurses encourage individuals to maintain hydration by drinking water frequently throughout the day.

Constipation and diarrhoea may be experienced by individuals and require thorough assessment to identify the cause prior to treatment (Foyle & Hostad 2007; McLean Heitkemper et al 2015). All people taking opioid medications will become constipated as this is an effect of these medications. Therefore, all people prescribed opioid medications should be prescribed aperient medication concurrently. (See Clinical Interest Box 38.6.)

Weakness and fatigue can be minimised by coordinating nursing and other care activities in accordance with the individual's wishes and by encouraging frequent rest periods (McLean Heitkemper et al 2015). Nausea and vomiting must be assessed in order to identify the cause prior to treating these symptoms. Generally, nausea and vomiting will be treated with anti-emetic medications. Dyspnoea is a challenging symptom as it causes anxiety in the affected person. Medical assessment and diagnosis is warranted prior to treatment (Foyle & Hostad 2007; McLean Heitkemper et al 2015). Depending on the cause of dyspnoea, acute medical interventions such as surgery or medication may be required. Conversely, in the terminal phases of the illness when the person is near death, dyspnoea is not generally treated because it is a characteristic of dying.

People who are experiencing a terminal illness commonly report insomnia (McLean Heitkemper et al 2015). Nursing assessment is required to ascertain the causes or factors contributing to the person's insomnia. These factors may be physical or psychosocial. Management will depend on the person's wishes and may include counselling or medication (McLean Heitkemper et al 2015; Stein-Parbury 2014). Complementary therapies may be effective; for example, relaxation and meditation.

Confusion and alterations in consciousness can occur. These symptoms are more likely in the terminal phases of the illness when the person is near death (McLean Heitkemper et al 2015). A thorough assessment is required to attempt to ascertain the causes of the alteration in consciousness. Management will depend on the cause and contributing factors. Pain, constipation, urinary retention and infections can promote confusion. These problems therefore should be identified and treated where necessary (McLean Heitkemper et al 2015). Alterations in consciousness are frightening experiences for individuals and their families. Nurses provide emotional support and reassurance. The nurse or family member should stay physically close to the frightened individual and provide verbal reassurance (McLean Heitkemper et al 2015). Nurses encourage family members to participate in care. Where possible, individuals with alterations in consciousness should be nursed in a quiet and calm environment.

Maintaining comfort depends on continuous reassessment of the individual's needs because physical changes can occur particularly quickly in advanced illness (McLean Heitkemper et al 2015). Pain can escalate rapidly and, because of fatigue, immobility, inadequate nutrition or emaciation, pressure ulcers can develop in a very short time. During all phases of care the nurse continually reassesses the situation while assisting the individual to be as independent as possible (Kindler et al 2015). Symptom management requires effective communication with the multidisciplinary team.

**TABLE 38.1 | Symptom management**

| Symptoms | Identification of issues | Nursing care |
|---|---|---|
| Pruritus (itching)<br>Diaphoresis (sweating)<br>Pressure areas | Impaired skin integrity | Assess skin for breakdown<br>Pressure area care<br>Keep skin clean and dry |
| Sore and dry mouth | Impaired oral mucous membrane | Assess oral mucosa for breakdown<br>Regular mouth care/denture care<br>Hydration |
| Continence difficulties | Urinary incontinence<br>Bowel incontinence | Assess urinary and bowel function<br>Use absorbent pads for urinary incontinence<br>Consider use of indwelling urinary catheter with multidisciplinary team<br>Encourage movement as tolerated<br>Encourage fibre in diet<br>Encourage fluids as appropriate<br>Consider use of aperients with multidisciplinary team |
| Changes in body weight (weight loss) | Imbalanced nutrition: less than body requirements | Assess the individual for anorexia<br>Provide frequent small meals in accordance with the individual's wishes and cultural preferences<br>Consider use of antiemetic therapies with the multidisciplinary team |
| Constipation or diarrhoea | Alteration in elimination<br>Constipation<br>Diarrhoea | Assess the individual for constipation<br>Encourage movement as tolerated<br>Encourage fibre in diet<br>Encourage fluids as appropriate<br>Consider use of aperients with multidisciplinary team<br>Assess the individual for diarrhoea<br>Assess possible contributing factors<br>Refer to multidisciplinary team |
| Nausea and vomiting | Nausea and vomiting | Assess the individual for nausea and vomiting<br>Assess possible causes of nausea and vomiting<br>Consider use of antiemetic therapies with the multidisciplinary team<br>Provide mouth care after the individual has vomited |
| Weakness | Fatigue | Assess the individual for fatigue<br>Encourage frequent rests<br>Time activities to conserve energy |
| Dyspnoea including cough | Ineffective airway clearance | Assess the individual for dyspnoea<br>Position the individual to facilitate airway and improve chest expansion<br>Administer oxygen<br>Refer to multidisciplinary team |
| Insomnia | Alteration in sleep patterns | Assess for insomnia, anxiety and fears<br>Explore the causes of insomnia with the individual<br>Consider referral to the multidisciplinary team<br>Encourage warm drink before bed<br>Listen to the individual and provide emotional support |
| Confusion, restlessness | Alterations in consciousness<br>Delirium | Assess for spiritual distress<br>Assess for delirium and refer to multidisciplinary team<br>Do not restrain<br>Provide a calm and quiet environment<br>Limit the number of people at the bedside |

*(Foyle & Hostad 2007; McLean Heitkemper et al 2015)*

## CLINICAL INTEREST BOX 38.6 Assessing constipation

Department of Health and Human Services Tasmania (2009) suggests that when assessing constipation in the palliative care person, contributing factors other than opioid-induced bowel dysfunction could include:

- Decreased fibre and fluid intake
- Reduced mobility
- Bowel obstruction or reduced rectal/anal tone and sensation
- Medications—serotonin blockers, iron, anticholinergics, some antihypertensives
- Metabolic disorders (e.g. hypercalcaemia, hypokalaemia, hypothyroidism, diabetic autonomic neuropathy)
- Changes in mood (e.g. depression)
- Closeness to death.

*(Department of Health and Human Services 2009)*

## Psychosocial and spiritual care

During a terminal illness, emotions such as anxiety, depression and fear are frequently experienced by individuals and their families (McLean Heitkemper et al 2015; Stein-Parbury 2014). Grief and loss are also part of the response to death and dying. People express grief and loss differently depending on their family and cultural background, and also depending on personal differences (Egan 2013).

Anxiety is a feeling of unease without knowing the cause, or where the cause or contributing factors are not easily identified (Egan 2013). Anxiety is related to fear. People are often more specific about what they fear and commonly report fearing pain, meaninglessness or the unknown. Depression can accompany anxiety (Stein-Parbury 2014). Causes of these challenging feelings can include poorly controlled symptoms such as pain, unwanted effects of medication, family issues or worry about the future for loved ones after the person has died. Nursing care in relation to psychosocial symptoms and spiritual care issues is dependent on the nurse's ability to listen empathically, build a trusting and respectful relationship and tolerate hearing about feelings that cannot necessarily be 'cured'.

A supportive and caring nurse–individual relationship forms the foundation for psychosocial and spiritual care (Egan 2013; Stein-Parbury 2014). Nurses talk to the individual and their family about their feelings and provide support (Egan 2013; Stein-Parbury 2014). Nursing interventions will depend on the nursing assessment findings and could include referral to a member of the multidisciplinary team such as a counsellor or bereavement counsellor, education to reduce anxiety and encouragement and ongoing emotional support. Medication management may be part of the treatment plan. At times anti-anxiety medications and antidepressant medications are warranted. In quality palliative care the individual and family are involved in all treatment decisions (McLean Heitkemper et al 2015).

Individuals, families, nurses and other members of the multidisciplinary team are involved in finding meaning in the death and dying experience (McLean Heitkemper et al 2015). This is understood as spirituality and may or may not include religion. Nurses and the multidisciplinary team are respectful of the different values, beliefs, spirituality and religions of individuals and families in palliative care (Brown et al 2015).

The spiritual dimension of each person is unique (Chaplin & Mitchell 2005; Egan 2013; Stein-Parbury 2014). For some people it may be connected to personal religious beliefs and practices. If the rituals and practices are followed the person is more likely to feel spiritually fulfilled, but if they are not observed the person may feel worried and anxious and suffer spiritual distress. Some people do not believe in a specific faith (Chaplin & Mitchell 2005). Their spirituality is nonetheless related to their sense of who they are and the meaning of existence. Nurses caring for people confronted with death may find them searching for understanding of these issues.

The spiritual dimensions of the individual who is dying may be reflected in a search for meaning in life, or in their suffering, or in their relationship with others (Egan 2013; Stein-Parbury 2014; Chaplin & Mitchell 2005). It may be reflected in a need for hope, love or a sense of forgiveness. Not all people who are dying experience the same needs, nor do they feel them with equal intensity. The nurse with expertise will be sensitive to the spiritual needs of each individual and will implement actions to help those needs to be met (Chaplin & Mitchell 2005; Egan 2013; Stein-Parbury 2014). Some people meet spiritual needs through the rituals associated with organised religion; others may find comfort and meaning in relationships, reading, music, art or meditation.

As with any aspect of caring for the individual who is dying, the multidisciplinary team identify how to provide spiritual support together with the individual (Chaplin & Mitchell 2005; Egan 2013; Stein-Parbury 2014). Religious leaders including chaplains or priests or pastoral care workers may be important people to involve in the person's care. The nurse often supports the individual in identifying the person they would like to speak to and may arrange a referral.

Hope is an important aspect of psychological and spiritual wellbeing (Crisp et al 2013). Effective communication is vital when nursing people who are experiencing loss of hope. Nurses are often confronted by individuals and families who experience a loss of hope during death and dying (Chaplin & Mitchell 2005; Crisp et al 2013). Nursing interventions focus on empathic listening. Additionally, nurses express hopefulness to individuals and families through psychosocial support. Nurses express hopefulness by reassuring individuals and families that the multidisciplinary team will provide expert management of symptoms (Chaplin & Mitchell 2005; Crisp et al 2013). Nurses also express hopefulness by supporting individuals to participate in their lives to the best of their ability. This includes encouraging individuals to

attend and participate in family or social events, encouraging humour where appropriate and discussing everyday issues.

Nurses further express hopefulness by supporting individuals and families to feel empowered (Chaplin & Mitchell 2005; Crisp et al 2013). Nurses facilitate empowerment by encouraging self-care and the participation of family members in care. Often family members want to care for the person during the illness and at the time of death. The nurse supports family members to provide care safely, in accordance with the individual's and family's wishes, by providing education regarding the focus of care; for example, hygiene or pressure care, that has been agreed to by the individual and family (Berger et al 2013). In the home setting, with support and education from visiting nurses, family members provide the specific care required by their loved one (Crisp et al 2013; Kralik & van Loon 2011). Empowering relatives supports their understanding of having contributed to a 'good death' for their loved one. This can be a source of comfort for family during bereavement after the person dies.

## LOSS AND GRIEF

People invariably experience **loss and grief** in response to death and dying (Crisp et al 2013). Loss can be actual or perceived, temporary or permanent, and occurs when someone or something can no longer be seen, heard, known, felt or experienced. Feelings of loss and grief can apply to many events. In palliative care, losses are generally related to life itself, relationships, health, lifestyle, independence, freedom and future hopes and dreams (Crisp et al 2013). All losses affect self-identity (Varcarolis & Halter 2014). The meaning attributed by an individual to a loss is related to the value placed by the individual on the loss. Loss and associated grief cannot be quantified, so it cannot be judged that one person's loss is greater or less than that of another person.

Loss of an aspect of the self can be devastating and can severely affect a person's body image and self-esteem (Crisp et al 2013). Individuals commonly experience grief over the loss of a body part or loss of a physiological function. However, many people adjust to losses throughout their lives and some people gain confidence after coping successfully with loss.

Most people experience grief in response to loss. People grieve very differently. Grief can be influenced by a number of factors including:

- The stage of an individual's growth and development
- Cultural and spiritual beliefs
- Socioeconomic status
- Relationships with significant others
- The meaning of the loss to the person
- Previous loss(es) and coping behaviours (Brown 2007; Cicero 2007).

Grieving is a human response to loss that is thought to assist an individual to adjust to the loss. It generally involves intense and painful emotions relating to loss. Painful feelings diminish with time but may never totally disappear. After any great loss, people return to their lives; however, it is likely that they are 'different' (Crisp et al 2013). A person faced with a serious loss may begin to grieve before the loss actually occurs. For example, older people may experience anticipatory grief as they anticipate the lifestyle changes and losses that old age brings. The process of grieving for a person who is dying is also anticipatory grief. It enables a degree of emotional preparation but, ultimately, the depth of grief is still acute when death eventually does occur (Cicero 2007; Old & Swagerty 2007). Acute grief is a reaction that begins at the time of a loss; for example, loss of a person through sudden death or the loss of a limb as the result of an accident.

While people experience grief in different ways, patterns of grieving have been observed and documented (Crisp et al 2013). Theorists often describe grief as a process that involves several stages or phases. The stages are identified according to descriptions of the responses commonly experienced by people as they face a loss. One well-known theory or model of the grieving process is that described in the late 1960s by Dr Elisabeth Kübler-Ross, a psychiatrist and renowned authority on the process of dying, who describes the grieving process as having five stages:

1. Denial and isolation
2. Anger
3. Bargaining
4. Depression
5. Acceptance (Kübler-Ross 1969).

By recognising the stages that a grieving person may experience, nurses are better able to understand what is happening and respond appropriately to that person (Crisp et al 2013). The grieving person may not experience every stage, or may experience the stages in a different order. Although grief may be observed to follow a logical sequence, it is not necessarily a linear process. For many people it is not simply a matter of 'moving on' if and when a previous stage is 'complete'. It is sometimes impossible to differentiate clearly between stages, as a person rarely moves neatly from one to another (Crisp et al 2013). Generally a person moves back and forth between the feelings of grief until final resolution or acceptance occurs.

The person must be allowed and encouraged to talk and 'work through' their grief (Egan 2013). The nurse requires a caring, understanding, empathic approach and an ability and willingness to listen. Nurses cannot grieve for the person, lessen the intensity of their feelings or protect or shield people (even children) from the pain of the grief experience (Crisp et al 2013). In caring for a grieving person the nurse needs to acknowledge the loss, facilitate the expression of thoughts and feelings and support the person as they move through the different feelings of grieving.

Where the person's health is significantly affected by their grieving, the nurse refers them to the multidisciplinary team such as the medical practitioner, bereavement counsellor or psychologist. (Case Study 38.2.)

## CARE OF THE DYING

**Caring for a person who is dying** is one of the most challenging tasks nurses face (Old & Swagerty 2007). It can be demanding and stressful but can also be very rewarding. Although a nurse cannot control the inevitability of death,

### CASE STUDY 38.2

Joe, 72, has lung cancer. He has been admitted to the hospice today. He has been a frequent visitor to the hospice day centre over the past few months, and several staff members have noted his positive attitude and how well he seems to have been coping physically and emotionally. Joe's condition has deteriorated now and he is not expected to live for more than a few more days. He is alert but extremely agitated at the moment. Margaret, his wife, can't understand this anxiety because he has been so calm throughout his illness. She and his three daughters are finding his agitation very distressing.

Consider factors that may be related to Joe's anxiety.

1. How would you explore his agitation with him?
2. What other health professionals may need to be consulted?

there is much that can be done to make the final stages of life as comfortable as possible for the individual and their significant others. It is important for the nurse to recognise that a person who is dying is also a living person and that, as long as people who are dying are alive, they have the same needs as anyone else (Berger et al 2013). As a result of the dying process, some of those needs assume a greater priority than others. Symptom management is an important priority of nursing care (Kindler et al 2015). The overall goal of care is the promotion of physical and emotional comfort and spiritual ease. Even during the dying process the individual should be helped to retain independence. When this is no longer possible, care should be provided in a manner that preserves self-esteem and dignity.

The nurse supports relatives to maintain a close relationship with the person who is dying right up until the time that death occurs (Berger et al 2013). It is helpful to reinforce that, although the sense of touch may be diminished, the individual may still be able to feel touch and find comfort in this. It is also often helpful to tell family members that hearing may remain intact up until death. If the person who is dying appears to be unaware of their surroundings and not responding, family are advised to speak to them as if they were conscious. It may be comforting for the person who is dying to be able to hear recognised voices or some favourite pieces of music, and relatives may take comfort in providing this solace for their loved one (Old & Swagerty 2007).

### CRITICAL THINKING EXERCISE 38.2

Imagine a specialist has just told you that you have a brain tumour that is inoperable and not curable. Reflect on your own values, attitudes and beliefs and consider what changes would happen in your life as a result of this prognosis. What would you need to help you cope? If you were living in a rural area 2 hours' drive from the nearest city, could you easily access health services to meet your needs?

## Physical care

The dying process is often accompanied by discomfort and nursing problems, including breathing difficulties and alterations in nutrition, hydration, elimination, mobility and sensory perception (Berger et al 2013). In addition, the person who is dying may experience acute or chronic pain. A nursing care plan is developed after assessing the person's needs and, while each individual may have different needs, there are some common problems and some general nursing interventions.

### Impaired mobility

When ambulation is no longer possible, maintenance of good body alignment is an essential comfort measure (deWit & O'Neill 2014). The individual should be positioned as comfortably as desired, with bedding and pressure-relieving mattresses and devices placed to enhance comfort. Individuals should be gently repositioned every 2–4 hours to promote maximum comfort and prevent muscle soreness, contractures and skin breakdown (see Chapter 29).

### Breathing difficulties

The individual may experience shortness of breath and may be unable to cough or expectorate to clear the airway. When possible, the person should be nursed in an upright or semi-upright position to facilitate breathing (Old & Swagerty 2007). When this is not possible, positioning should be on the side, to prevent aspiration of secretions. Oxygen therapy and oronasopharyngeal suctioning may be required to remove secretions and make breathing easier.

### Inadequate nutrition and hydration

If the individual is able to eat and drink, foods and beverages of choice should be provided at the times the individual feels like eating (Old & Swagerty 2007). Alcoholic beverages may stimulate appetite. Thirst may be relieved by chips of ice to suck or soda water. Semi-solid, soft or liquid foods may be offered in accordance with the individual's wishes. It is expected that appetite will decrease as death approaches (Berger et al 2013). Death is usually imminent when the individual can no longer eat and drink therefore medical interventions, including IV therapy for hydration, are not indicated in palliative care. Nurses provide regular mouth care and continue to provide symptom relief with the multidisciplinary team (Kindler et al 2015; Kralik & van Loon 2011). Additionally, families may require considerable support and education from nurses when their loved one is no longer able to eat and drink.

### Problems of elimination

Common problems experienced may include constipation, diarrhoea, impacted faeces, retention of urine and incontinence (of urine and faeces) (deWit & O'Neill 2014). Measures that may be implemented to prevent or alleviate these problems include:

- Laxatives to prevent constipation, if fluid or fibre intake are unable to be maintained
- Rectal suppositories to relieve constipation

- Catheterisation to relieve retention of urine or urinary incontinence
- Protective continence pads and specially designed sheets or external urinary drainage devices, to prevent discomfort and skin breakdown from urinary incontinence
- Maintenance of skin integrity, clean and dry bedding and an odour-free environment.

### Dry mouth

A clean and moist mouth is extremely important, particularly if the individual is unable to swallow (Berger et al 2013; deWit & O'Neill 2014). Mouthwash or rinses are appropriate if the individual is able to expectorate. To prevent the mouth from becoming dry and coated it should be cleansed gently every 2–4 hours. A light film of lip balm should be applied to the lips to prevent skin cracking or to relieve discomfort.

### Eye problems

Dryness and corneal irritation can occur as a result of decreased blinking reflexes (Berger et al 2013; deWit & O'Neill 2014). Measures to prevent or alleviate eye discomfort include cleansing the eyelids to remove crusts, instillation of artificial tears and instillation of eye lubricant ointment. (See Chapter 34.)

### Skin breakdown

If the individual is emaciated and lacks sufficient adipose tissue to support bony prominences, or is unable to move, the risk of developing decubitus ulcers is increased (Berger et al 2013; deWit & O'Neill 2014). To prevent breakdown, the skin should be kept clean and dry, with moisturising lotion applied to counteract any excess dryness. Pressure-relieving devices such as sheepskins or special mattresses including air mattresses could be used, and position changes should occur every 1–2 hours (Berger et al 2013; deWit & O'Neill 2014). (See Chapter 29.)

### Altered sensory perceptions

The person who is dying may experience decreasing visual acuity or tactile sensation (Berger et al 2013; deWit & O'Neill 2014). To minimise any anxiety associated with diminished sensory perception, the room should be softly lit and personal possessions should be placed where they can be easily seen or touched by the individual. Visitors should sit close by and, if the individual's vision is poor, visitors should tell the person who they are. It may be comforting for family to hold their loved one's hand.

The sense of hearing is usually not diminished, so it is important to continue to speak in a conversational tone (Berger et al 2013; deWit & O'Neill 2014). Even if the person who is dying appears to be unaware of surroundings, all family and personnel should assume that the person is still able to hear. Some individuals gain comfort from hearing their favourite pieces of music, and relaxation tapes may also be soothing. If the individual is unable to speak, the nurse should attempt to anticipate needs, and people should continue to make communicative attempts even though there may be no reply.

### Confusion and restlessness

Confusion and restlessness can be caused by physical discomfort such as pain, lack of sleep or retention of urine, or they may be related to medications, such as analgesics, hypnotics and anti-emetics (Kindler et al 2015). Restlessness may be related to anxiety or fear from a variety of sources. It is important to determine the cause and implement appropriate care. If no cause can be found, or if the individual remains restless and confused, mild sedation may be considered.

In palliative care contexts, death is generally precipitated by failure of one or more of the three major body systems: the central nervous system, the cardiovascular system or the respiratory system (Berger et al 2013; deWit & O'Neill 2014). As a person approaches death, the following physiological changes begin to occur:

- Loss of muscle tone, which results in relaxation of the facial muscles, difficulty in swallowing, decreased peristalsis, diminished body movement and decreased urine output, with possible incontinence of urine and faeces
- Slowing of the circulation that results in skin mottling, cyanosis of the extremities and cold skin
- Changes in the vital signs: decreased blood pressure, weaker pulse and changes in breathing. The respirations may become rapid, slow, shallow or irregular. Cheyne–Stokes respirations may occur; this is a cyclical pattern of respirations that gradually become more shallow, followed by periods of apnoea (no breathing) (deWit & O'Neill 2014).
- Changes in sensory perception: blurred vision and impaired sense of taste and smell.

Signs of imminent death include loss of reflexes, faster and weaker pulse, noisy breathing due to accumulating secretions in the throat (sometimes called 'the death rattle') and inability to move (Berger et al 2013; deWit & O'Neill 2014). It is important to remember that hearing is usually the last of the senses to fail.

Death occurs when breathing ceases completely and the heart stops (Berger et al 2013; deWit & O'Neill 2014). A central pulse may be palpable for a brief period following cessation of breathing. The pupils become fixed and dilated. This is the time of death.

## CARE OF THE BODY AFTER DEATH

Traditionally care of the body after death was attended to by the family, but today much care is completed by nursing staff. Every death and family is individual, so discussions with family and carers should be undertaken prior to death to establish how much involvement the family and carers would like. If the individual dies within a hospice, hospital or residential aged care facility, organisational policies and procedures will need to be followed.

Family and carers present at the time of death should be able to spend as much time as they need with their loved one. They should be encouraged to touch the body and some may wish to assist with washing the body. Families should be prepared for the changes that will occur in death, such as the cooling temperature of the body and rigor mortis (Caresearch 2014).

## CARE OF THE BEREAVED

After death has occurred, the significant others may experience shock and disbelief, even if the individual's death was anticipated (Crisp et al 2013). Reactions to the death will vary from numbness and immobility, to outbursts of weeping or wailing, or may include expressions of feeling relief or comfort from the fact that their loved one is no longer suffering. The nurse should not discourage bereaved persons from expressing their grief (Egan 2013). If the nurse is also affected by the death and feels like expressing sadness or crying with the bereaved, this may be appropriate. Alternatively, the nurse may prefer to express their own feelings and grief with a colleague in private.

If the significant others were not present at the moment of death the nurse should ask the family if they wish to view the body. Family members may prefer to view the body later at the undertakers. If family members choose to view the body of their loved one in the care facility or in the person's home the nurse should advise the family about what to expect (Crisp et al 2013). For example, the skin will be very pale, may be discoloured and will feel cold to touch. Depending on the family's wishes, the nurse may accompany the bereaved family into the room and remain or leave them in privacy for as long as they wish to be there.

### CASE STUDY 38.3

Tracey, 22 years old, has just died from leukaemia. You have been nursing Tracey for the past 2 weeks in the hospice and you developed a caring relationship with her over this period. On hearing that Tracey has died, you experience a sense of loss.

Reflect on your feelings. How might this experience influence your ability to nurse?

When the bereaved family are ready to leave their deceased loved one, it is appropriate to direct them to an area where they can sit down and where they can be given the opportunity to discuss their response to the experience (Egan 2013).

Bereaved family members are required to carry out various functions following a death, such as collecting the person's belongings (if the person died in an inpatient setting), informing friends and relatives, notifying a funeral director and arranging a funeral or memorial service. The nurse provides support according to the family's wishes and may inform the bereaved about relevant supports in the community.

## SUPPORT FOR THE NURSE

Care of the dying is challenging for nurses (Crisp et al 2013). It can be very satisfying and also demanding and stressful. Nurses need a network of support to help them cope with these demands. Supports that can help range from personal relaxation activities to professional workplace supports such as specialist education and training, critical incident reflection, clinical supervision and counselling (Crisp et al 2013). (See Case Study 38.3.)

## Summary

Palliative care is a speciality area of nursing. Nurses are valuable members of the multidisciplinary palliative care team and provide care to individuals with a life-limiting illness and their families. Palliative care takes place in many different settings, and many people prefer to die at home. In palliative care contexts, dying is a natural process and people who are dying should be empowered to live life as fully as possible within the limits of their illness. The palliative care team aims to meet physical, psychological and spiritual needs that arise for individuals at the end of their life and to support the individual's family. Quality palliative care and symptom management has the person and their family at the centre of care. Nurses are an important part of the multidisciplinary team supporting a 'good death' for individuals in the home and inpatient settings.

### DECISION-MAKING FRAMEWORK EXERCISE 38.1

You have just commenced working within a unit at the Sunray Residential Aged Care Facility as an Enrolled Nurse. Within this unit there are 25 residents, all with dementia, some of whom are palliative care. On this shift apart from you there are two care workers who both hold a Certificate III in aged care qualification, a diversional therapist and a volunteer. The aged care workers advise you that they will do the medications administration, and that you only need to do the dressings and assess any of the residents in case they exhibit challenging behaviours. The volunteer advises you that she is great with the residents when they become restless and will let you know so that you can give them their 'calming down' pills. You call your supervisor who advises you that this was the normal practice and task allocation.

Using the decision-making process address the following:
1. Do you accept this allocation of duties?
2. What (if any) are the issues that could potentially result in you working outside of your scope of practice?
3. Identify the potential and/or actual flaws within this scenario.

## Review Questions

1. List three (3) major functions of a multidisciplinary palliative care team.
2. Describe how you could provide a warm, caring environment for a dying resident in an aged care facility.
3. What is an advance care plan and how will this assist a palliative care person as their condition deteriorates?
4. List five (5) physical symptoms associated with incurable illness.
5. What nursing actions could help an emaciated individual whose pain is controlled but who cannot get physically comfortable in bed?
6. Describe five (5) ways you can promote a sense of wellbeing in the partner of a person who is dying in the acute care hospital setting.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Recommended Reading

Birks, M., & Chapman, Y. (2013). Complementary therapies in nursing practice. In J. Crisp, C. Taylor, C. Douglas, et al. (Eds.), *Potter & Perry's fundamentals of nursing* (4th ed.). Sydney: Elsevier.

## Online Resources

Cancer Council of Australia: www.cancer.org.au

Caresearch: www.caresearch.com.au

National Association for Loss and Grief (Australia) Inc: www.nalag.org.au/

Palliative Care Australia: www.palliativecare.org.au/

CHAPTER 39

# Mental health and mental illness

*Louise Alexander*

## KEY TERMS

constructive coping strategies
deinstitutionalisation
destructive coping mechanisms
mental health
mental illness
myths
self-concept
stigma
stress
theoretical models

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Understand the continuum of mental health and mental illness
- Identify factors that influence the development of mental health
- Reflect on the causes and impact of stigma on people with mental illness
- Understand the roles of the mental health nurse and the mental health team
- Gain an overview of the care issues involved when consumers experience anxiety or depression, or aggressive, self destructive, hyperactive or confused behaviour
- Develop an awareness of some of the basic legal and ethical issues in the field of mental health nursing

## CHAPTER FOCUS

The term 'individual' will be replaced in this chapter with the more contemporary and clinically acceptable term 'consumer' (Commonwealth of Australia 2010). Individuals within the mental health system are known as *mental health consumers*.

Mental health nursing is a specialised field of nursing; however, mental health *literacy* is important for all nurses regardless of their specialty area. One in every five Australians will have a mental illness in any 12-month period and the lifetime prevalence for developing a mental illness between the ages of 16 and 85 is over 45% (Australian Bureau of Statistics (ABS) 2008). It is estimated that by 2030 depression will be one of the leading causes of disease in Australia (Victorian Government 2007) resulting in considerable increase in government expenditure (Goss 2008). Research indicates that the mentally ill on average die prematurely compared with the general population—in some studies by around 25 years. This is significantly affected by socioeconomic status, access to healthcare and long-term side effects of psychotropic medications (Department of Health and Human Services 2012). A variety of educational programs are aimed at preparing mental health nurses (MHNs) to work specifically and effectively with consumers who have mental health disorders. A nurse who has not undertaken a course specific to mental health nursing is likely to be required to assist in caring for a consumer with a mental illness. The nurse may be required to work in a psychiatric unit or ward within a general hospital, or to assist in caring for a consumer who has been admitted to a general medical or surgical ward with a physical illness but who has a concurrent mental health problem. It is therefore important that every nurse has a basic understanding of mental health, mental illness and the principles of care related to consumers who are experiencing a disturbance in mental wellbeing. It is not the aim of this chapter to provide the reader with comprehensive knowledge and skills to care for consumers with mental health disorders. Rather, this chapter aims to introduce nurses to the basic concepts of mental health nursing, some of the theoretical frameworks that underpin psychiatric care and to raise awareness of some legal and ethical issues that confront MHNs. The texts and online resources listed at the end of this chapter provide more detailed information.

## LIVED EXPERIENCE

I would wake up in the morning feeling like I didn't want to face the day. There was a black cloud hanging over me. I wanted to stay in bed and shut out the world. I felt at these times that I was in an absolute pit of hopelessness and despair about life and I didn't want to go on. I was a burden to myself and my family. My sister took me to see my doctor and I was admitted to a psychiatric hospital. I didn't want to be there because I believed no one could help me. After some time the nursing care and antidepressant medication I was prescribed helped me to slowly climb out of my pit of despair. One day I found myself enjoying looking at the autumn leaves falling and I knew that I was getting better. Now I understand that depression is a severe illness and I will look for help if I feel myself slipping back.

**Maria, diagnosed with major depressive disorder at age 25**

# CONCEPTS OF MENTAL HEALTH AND MENTAL ILLNESS

Perhaps the most important aspect of understanding mental illness is being able to define the difference between mental illness and mental health. This first section aims to help nurses gain an understanding of mental health and mental illness and the factors that impact on both.

## What is mental health?

The concept of **mental health** is difficult to define, as mental health is much more complex than merely the absence of a mental illness; the two are not mutually exclusive (World Health Organization 2015). There are numerous definitions of what constitutes mental health. It has been defined as a state in which people are able to fulfil their own potential and manage recurrent stresses of everyday living in an acceptable way (WHO 2015). It has also been defined as the ability of people to cope well with stress, both internal and external (Antai-Otong 2008). According to the World Federation for Mental Health (2008, cited in Barkway 2013:123):

*Mental health is a state of complete physical, mental, spiritual and social wellbeing in which each person is able to realise one's abilities, can cope with the normal stresses of life, and make a unique contribution to the community.*

For most people, the experience of mental illness is non-linear; it is a continuum with ebbs and flows and can vary in intensity and duration. According to this view, mental health is a state that can change frequently and that can fluctuate according to specific circumstances. Touhy and Jett (2009) captured the concept of fluctuation in this definition:

*Mental health is like a violin with strings of interaction, behaviour, affect (mood) and intellect. All of this together may produce a pleasant or stimulating melody, or they may be discordant and irritating. The tune constantly changes. No one is entirely mentally unhealthy and no one is fully mentally healthy at all times.*

The terms 'mental health' and 'mental illness' are often used interchangeably but they should not be: the difference

between the two needs to be clear (Elder et al 2013). The American Psychiatric Association (APA 2013) defines mental illness or mental disorder as an illness or a syndrome with psychological or behavioural manifestations and/or impairment in functioning due to a social, psychological, genetic, physical/chemical or biological disturbance.

Table 39.1 illustrates some differences between mental health and mental illness.

## Development of mental health

Mental illness development is likely a multifactorial interplay between environment factors and biological characteristics. According to Hoffnung and colleagues (2013) the factors that influence the development of mental health relate to three main areas: inherited characteristics, nurturing during childhood and life circumstances.

### Inherited characteristics

It is believed by some theorists that the ability to maintain a mentally healthy and positive outlook on life is in part connected to a person's genetic makeup, just as inherited defective genes are thought to predispose particular people to illnesses such as schizophrenia and depression.

### Nurturing during childhood

Nurturing during childhood relates primarily to the relationships that develop between children, their parents and their siblings. It is thought that positive relationships, those that promote feelings of being loved, secure and accepted, facilitate the development of children into mature and mentally healthy adults. It is thought that negative relationships may result when children experience maternal deprivation, parental rejection, serious sibling rivalry and early communication failures. Such relationships are more likely to result in a poor sense of self-worth and a lower level of mental health (Hoffnung et al 2013). The quest for a sense of self begins in childhood; children who have positive nurturing experiences are more likely to have a stronger sense of identity than those who have negative nurturing experiences (Hoffnung et al 2013).

### Life circumstances

Life experiences can influence mental health from birth onwards. Positive life experiences include pleasurable times and success at school and with friends, a good job, financial security and good physical health. Negative experiences include poverty, poor physical health, unemployment and unsuccessful personal relationships (Shives 2011).

Different people will react to childhood experiences and life circumstances in different ways. Some, despite negative circumstances, will develop positive strategies for coping and will not become mentally ill. Generally it is people who have not achieved a strong sense of identity who are more prone to mental illness (Watkins 2001). Perhaps this is most clearly understood when considering the mental health of Indigenous populations. It is not difficult to imagine how the effects of colonisation, the removal of children from their families, the loss of traditional lifestyle and cultural practices and the resulting social disruption may impact negatively on mental wellbeing. It is generally understood that the difficulties involved in belonging and adjusting to two different cultural contexts can make it difficult to establish a strong sense of identity.

Nurses working with Indigenous people can better empathise and not negatively judge behavioural signs of mental illness if they recognise that it often stems from deep mental anguish and spiritual sorrow relating to the effects of European invasion (Hungerford et al 2015). Aboriginal and Torres Strait Islander (ATSI) peoples are hospitalised for mental illness at almost twice the rate of non-Indigenous Australians (Australian Institute of Health and Welfare (AIHW) 2011), have higher suicide rates (beginning at a younger age), demonstrate higher levels of self-harm (Department of Health 2013) and report higher levels of psychological distress (ABS 2011). Given that mental illness rates in the ATSI communities are disproportionately higher than in other demographics, ATSI mental healthcare is an important health practitioner consideration (Nadew 2012).

### Risk or vulnerability factors in mental illness

Risk, or as they are also known, vulnerability, factors are those circumstances which increase a consumer's vulnerability or susceptibility to develop a mental illness. While the presence of these factors does not equate to a certainty of developing a mental illness, they are good predictor of a consumer's susceptibility in developing a disorder. Risk factors are an interplay between consumer, familial and environmental factors which include:

- Lack of opportunities to exert control over one's life
- Genetic predisposition to mental illness (positive family history of mental illness)
- Poor health literacy
- Discrimination
- Low self-esteem
- Poverty, unemployment and homelessness
- Domestic and/or neighbourhood violence
- Political unrest or war
- Abuse (sexual, physical, verbal and neglect)
- Family conflict
- Poor conflict resolution skills
- Poor coping mechanisms to stressful situations (Compton 2010).

### Protective factors in mental illness

Given that risk or vulnerability factors may predispose or increase the likelihood a consumer will develop a mental illness, there are in contrast a number of factors that can aid in the prevention of mental illness. The presence of protective factors assists in the prevention of mental illness during times of stress and they include:

- Positive self-esteem and self-image
- Supportive relationships with peers and family
- Access to educational and employment opportunities

## TABLE 39.1 | Some differences between mental health and mental illness

| Signs of mental health | Signs of mental illness |
|---|---|
| **Happiness** | **Major depressive episode** |
| Finds life enjoyable<br>Can see in objects, people and activities the possibilities for meeting their needs<br>Can manage the day-to-day changes in life successfully | Loses interest or pleasure in all or almost all usual activities or pastimes<br>Describes mood as low, depressed, sad, hopeless, discouraged, 'down in the dumps'<br>Weight loss or gain<br>Sleep pattern changes<br>Feelings of hopelessness, excessive guilt or helplessness<br>Suicidal ideation<br>Concentration issues |
| | **Bipolar disorder (manic episode)** |
| | Experiences persistently elevated, expansive or irritable mood<br>Decreased need for sleep but remains energetic<br>Pressured speech<br>Inflated self-esteem<br>May present with psychotic features |
| **Control over behaviour** | **Control disorder: under-socialised, aggressive** |
| Can recognise and act on cues to existing limits<br>Can respond to rules, routines and customs of the group to which they belong<br>Has appropriate opportunities for control | Shows repetitive and persistent pattern of aggressive conduct in which the basic rights of others are violated |
| **Appraisal of reality** | **Schizophrenia** |
| Has an accurate picture of what is happening around them<br>Good sense of the consequences of both good and bad that will follow their acts<br>Can see the difference between the 'as if' and the 'for real' in situations | Delusions<br>Hallucinations<br>Thought disorder<br>Disorganisation in thoughts<br>Negative symptoms |
| **Effectiveness in work** | **Adjustment disorder with work (or academic inhibition)** |
| Within limits set by abilities can do well in tasks attempted<br>When meeting mild failure persists until determines whether they can do the job | Shows inhibition in work or academic functioning whereas previously there was adequate performance |
| **Healthy self-concept** | **Dependent personality disorder** |
| Sees self as approaching their individual ideal; as capable of meeting demands<br>Has a reasonable degree of self-confidence that helps them to be resourceful under stress | Passively allows others to assume responsibility for major areas of life because of inability to function independently<br>Lacks self-confidence (e.g. sees self as helpless or stupid) |
| **Satisfying relationships** | **Borderline personality disorder** |
| Experiences satisfaction and stability in relationships<br>Socially integrated and can rely on social supports | Shows patterns of unstable and intense interpersonal relationships<br>Has chronic feeling of emptiness<br>Engages in risk-taking behaviour<br>Mood fluctuations<br>Self-harm attempts or suicidal ideation |
| **Effective coping strategies** | **Substance dependence** |
| Uses stress-reduction strategies that address the problem, issue or threat (e.g. problem solving, cognitive restructuring)<br>Uses coping strategies in a healthy way that does not cause harm to self or others | Repeatedly self-administers substances despite significant substance-related problems (loss of employment, family and social networks)<br>Uses substances as a way of coping with daily stress or adverse events |

*(Compiled from Varcarolis & Halter 2010)*

- Effective self-regulatory skills such as healthy coping mechanisms, impulse control and the ability to emotionally regulate
- Suitable and appropriate role models
- Resilience (Compton 2010).

## What is mental illness?

Just as it is difficult to arrive at a precise definition of mental health, so too it is difficult to succinctly define mental illness because it is often related to what a given society considers is normal or acceptable behaviour and, as with mental health, mental illness is a matter of degree.

### What society considers normal

People tend to evaluate the behaviour of others based on their own social, cultural, ethical and behavioural standards. Therefore, behaviour that is regarded by one person as acceptable and normal may be perceived by another person as totally unacceptable. In addition, what is accepted as normal in a society may change over time. For example, homosexuality was previously considered a diagnosable clinical mental disorder but is now no longer classified as a mental disorder (Antai-Otong 2008). When a person's behaviour is in question it is appropriate to ask 'Who is qualified to decide whether this behaviour is acceptable or not?' and 'What is the meaning and relevance of this behaviour in relation to the context in which it is occurring and to the person's society, religion and culture?'

In every society and cultural group there are different interpretations of certain behaviours and events. For example, in Western psychiatric terms, visual or auditory hallucinations (images or sounds that are seen or heard by a consumer but by no one else) are viewed as abnormal and a sign of mental illness, whereas in some cultures these happenings are viewed as experiences of symbolic and spiritual importance and those experiencing them may be revered as visionaries rather than mentally ill (Varcarolis & Halter 2010).

### A matter of degree

Anxiety, fear, anger, sadness and the need to be alone are feelings commonly identified in mental illness but they are normal feelings experienced at different levels of intensity by most people at various times. Depending on the intensity of the emotions, people may not feel as mentally healthy as they do at other times but will not necessarily be classified as mentally ill. It is when the feelings are exaggerated and extend over longer periods of time than deemed normal that the person is likely to seek professional help and be diagnosed as having a mental illness. For example, a diagnosis of a depressive disorder is likely when sadness or feelings of being 'down in the dumps' become deep, long-lasting feelings of despair that the person cannot escape from without professional help. The ramifications of these negative feelings can impact on the consumer's ability to function at school or work, and in interpersonal relationships. Mental illness or mental disorder are therefore terms used to designate changes from normal mental functioning that are sufficient to become, and be diagnosed as, a clinical disorder. Broadly, **mental illness** can be defined as a state in which a consumer exhibits disturbances of emotions, thinking and/or action, but it can be defined in a multitude of ways.

Clinical Interest Box 39.1 provides a range of definitions of mental illness.

There is no clear line that divides mental health from mental illness, although the use of explicit diagnostic criteria is useful in identifying mental states which deviate from the 'norm'.

Table 39.2 provides some areas of comparison between the two but it should be noted that, while these are general

### CLINICAL INTEREST BOX 39.1 Definitions of mental illness

- Mental illness is a term that refers to all the different types of mental disorders. These include disorders of thought, mood or behaviour that cause distress and result in a reduced ability to function psychologically, socially, occupationally or interpersonally (APA 2013)
- A disease that causes mild to severe disturbances in thought and/or behaviour, resulting in an inability to cope with life's ordinary demands and routines (National Mental Health Association (USA) 2012)
- A disorder causing abnormal behaviour more often than in most people (Shives 2011)
- Psychopathology exhibiting frequent irresponsibility, the inability to cope, being at odds with society and an inaccurate perception of reality (Shives 2011)
- The absolute absence or constant presence of a specific behaviour that has social implications regarding its acceptance (Shives 2011)
- The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (DSM) is a classification system for mental illness (APA 2013). In the fifth edition (DSM-5), mental illness is defined as being a clinically significant behaviour or psychological syndrome or pattern that occurs in a consumer and that is associated with present distress (e.g. painful symptom) or disability (i.e. impairment in one or more areas of functioning) or with a significantly increased risk of suffering death, pain, disability or an important loss of freedom. In addition, this syndrome or pattern must not be merely an expectable culturally sanctioned response to a particular event; for example, the death of a loved one. Whatever its original cause, it must currently be considered a manifestation of a behavioural, psychological or biological dysfunction in the consumer. Neither deviant behaviour (e.g. political, religious or sexual) nor conflicts that are primarily between the consumer and the society are mental disorders unless the deviance or conflict is a symptom of a dysfunction in the consumer, as described above.

*(APA 2013)*

**TABLE 39.2 | Areas of comparison between mental health and mental illness***

| Attribute | The mentally healthy person | The mentally ill person |
|---|---|---|
| **Self-concept** | Accepting of self and others. Able to develop talents and potential to fullest extent<br>Adequately in touch with self and able to use the personal resources identified<br>Acknowledges personal strengths and limitations | Poor self-image, low sense of self-worth and unable to recognise talents, so cannot achieve personal potential<br>Lacks confidence and feels inadequate<br>Tends not to recognise personal strengths and limitations |
| Relationships | Able to form close, meaningful and lasting relationships. Can communicate emotions and can give and receive<br>Can accept authority<br>Can share with people and grow from the experiences<br>These factors often mean the presence of a strong social support network that aids coping in times of stress | Inability to cope with stress can result in disruption, disorganisation, inappropriate responses and unacceptable behaviour that make it difficult to meet the expectations of others in work or social environments. This means that there may be an inability to establish or maintain meaningful relationships. These factors may result in a limited social support network |
| Outlook on life | Optimistic and positive view, sense of purpose and satisfaction | Tends to a pessimistic negative view of present and future |
| Coping and adaptation | Able to tolerate stress and return to normal functioning after stressful events. Can cope with feelings such as frustration and aggression without becoming overwhelmed | Can feel overwhelmed by even minor levels of stress and may react with maladaptive behaviour |
| Judgment/decision making | Uses sound judgment to make decisions and is able to problem solve<br>Is able to learn the consequences of behaviour and apply it to new situations | May display poor judgment and avoid problems rather than attempting to solve them |
| Characteristics/traits | Can delay gratification | May feel an urgency to have personal wants and needs met immediately and may demand immediate gratification |
| Level of functioning | Accepts responsibility for own actions<br>Can function effectively and independently | May act irresponsibly, be unable to accept responsibility for own actions and may blame others for outcomes<br>May exhibit dependency needs because of feeling inadequate |
| Perceptions | Able to differentiate between what is imagined and what is real because can test assumptions by considered thought. Can change perceptions in light of new information | May be unable to differentiate reality |

*(Shives 2011; Sadock et al 2015; Varcarolis & Halter 2010)*

*It should be noted that these are general points only. Different types of mental illness manifest with different effects and, while there are traits that mentally healthy people tend to share, many mentally healthy people may experience several areas of dysfunction at different periods in their lives. Mental illness may occur as a temporary inability to cope; it may occur episodically with long periods of mental health in between; or it may occur as a chronic condition that is constantly present.

traits that mentally healthy or mentally ill people tend to share, different types of mental illness manifest with different effects and with different levels of intensity. In addition, mentally healthy people may experience more than one type of mental dysfunction at different periods in their lives. For some consumers, more than one mental illness may occur concurrently, or over time, or a consumer may develop a substance misuse disorder in addition to a mental illness (known as dual diagnosis).

## Signs and symptoms of mental illness

Symptoms of mental illness occur on a continuum and range from minimal to severe. The journey is seldom linear with ebbs and flows (Hungerford et al 2015). A person usually

receives a diagnosis of having a mental illness when the level of mental distress causes them to seek professional help or when others in society perceive that they need professional psychiatric help. It is important to recognise that, in relation to the differences between mental health and mental illness, there is a 'grey' area into which all consumers may enter from time to time. Those with a severe and long-term psychiatric disorder may dip back into relative mental health and reality-based living for a while and, similarly, sometimes the stresses of everyday living are so overwhelming that the well-adjusted 'normal' person may experience marked irrational thoughts, feelings and actions. Therefore, as in the case of physical illness such as diabetes, heart disease or cancer, anyone can develop a mental illness. A mental illness is not the fault of the person affected, and the cause may be related to a combination of biological, psychological and sociocultural factors or interplay of all these factors simultaneously.

Symptoms of mental illness include changes in personal habits, social withdrawal and changes in mood and thinking. While particular symptoms occur with specific disorders, there are warning signs that may indicate the presence of a mental health problem. Clinical Interest Box 39.2 provides examples of early warning symptoms of mental illness that may occur in children, adolescents and adults.

### Who is most at risk of developing a mental illness?

Anyone can develop a mental illness but some groups of people in society are particularly at risk. Clinical Interest Box 39.3 identifies groups of people at greater risk of mental illness.

Many people from all age groups and of different social, educational and cultural backgrounds cope with highly stressful events and accumulative stressors.

## Classification of mental disorders

There are more than 260 classified forms of mental illness. These include:

- Neurocognitive disorders (e.g. dementia, delirium)
- Substance-related and addictive disorders (e.g. alcohol abuse or dependence, drug abuse or dependence)
- Anxiety disorders (e.g. phobias, panic disorder)
- Obsessive–compulsive and related disorders
- Schizophrenia spectrum and other psychotic disorders (e.g. schizophrenia, schizophreniform disorder)
- Trauma and stressor-related disorders (e.g. PTSD)
- Dissociative disorders (dissociative identity disorder, formerly multiple personality disorder)
- Mood disorders (e.g. depression, bipolar disorder)
- Personality disorders (e.g. antisocial personality disorder, dependent personality disorder)
- Sexual and gender identity disorders
- Feeding and eating disorders
- Sleep-wake disorders
- Sexual dysfunctions
- Disruptive, impulse-control and conduct disorders
- Paraphilic disorders (APA 2013).

## Diagnosis

The American Psychiatric Association's (2013) *Diagnostic and Statistical Manual of Mental Disorders 5th edition* (DSM-5) is a respected and influential classification system under which a mental illness is determined according to the symptoms experienced and the clinical features of the illness. The International Classification of Disease (ICD) is produced by the World Health Organization and is mainly used In Europe. It also assists with diagnosis and classification. In Australia, New Zealand and the United States the fifth edition of the DSM (DSM-5) (APA 2013) is most commonly used.

There are many categories of classification but mental illness is mainly classified within the following areas:

- Thought disorders, such as schizophrenia and psychosis, which disrupt the ability to think and perceive things clearly and logically and can impair a person's perception of reality
- Mood disorders, which affect how a person feels and can result in persistent low mood (depression) or cycles of low and elevated moods (bipolar disorder)
- Behavioural disorders, which involve people acting in potentially destructive ways, including eating disorders such as anorexia nervosa and bulimia
- Personality disorders, which involve pervasive patterns of internal experience that deviate considerably from what others experience
- Mixed disorders, which have components of two or more of the other categories (APA 2013).

Diagnosis according to the DSM-5 (APA 2013) has the benefit that consumers may feel great relief when they have a diagnosis that helps them make sense of what is happening to them, and a medical diagnosis can guide clinical treatment. But this diagnostic system has a disadvantage in that a diagnosis can also be a label that has negative connotations; for example, a label of schizophrenia or a personality disorder is associated with significant social **stigma**. The impacts of stigma on consumers suffering mental illness are significant and range from reduced self-esteem, delay in treatment-seeking behaviour to treatment and medication non-adherence and suicide (Hansson et al 2011; Martinez et al 2011; Reavley & Jorm 2011). Diagnostic labels describe certain types of behaviour but they indicate very little about the nature or causes of the experience.

Mental health nurses develop nursing diagnoses in response to the consumer's experience, emotions and behaviours. Nursing care responds holistically to the consumer's biological, psychosocial, spiritual and environmental needs and specifically addresses the consumer's feelings and behavioural responses to those feelings, many of which are common across several different medically classified conditions. Examples of some nursing diagnoses commonly used in mental health nursing are provided in Clinical Interest Box 39.4.

A mental disorder can be categorised as temporary, episodic or chronic/enduring, according to the way it manifests:

- Temporary: a temporary inability to cope; for example, a single experience of depression. The vague definition

## CLINICAL INTEREST BOX 39.2 Warning signs and symptoms of mental illness

People may have one or two of these or other symptoms at any one time. This does not necessarily mean there is cause for alarm, but it is advisable they be assessed professionally. A combination of multiple symptoms is a strong signal that professional assessment and help should be sought as soon as possible.

In younger children:

- Decline in standard of performance in school work or activities that does not pick up again over time
- The child is not managing or coping with tasks as expected at their developmental age
- Suggestions from teachers that there may be a learning difficulty, a behavioural problem or a problem making friends
- Hyperactivity
- Persistent crying, waking at night or nightmares
- Persistent disobedience or aggression
- Frequent temper tantrums
- Excessive anxiety (e.g. preoccupation with fears of burglars, barking dogs, parents getting killed)
- Constant fighting with other children, and reports from school of the child being 'angry or disruptive'
- Refusal to go to school
- Refusal to go to bed, inability to sleep or a need to sleep with, or close to, parents
- Decreased interest in playing
- The child tries to stimulate themself in various ways (e.g. hair pulling, rocking of the body, head banging)
- The child constantly says things that indicate low self-esteem (e.g. 'I'm stupid', 'I never do anything right', 'No one likes me', 'I'm too skinny', or too fat, too tall, too ugly, etc)
- The child is preoccupied with fire, or sets fires
- The child is physically aggressive to people or animals.

In older children and adolescents:

- Frequently asks or hints at the need for help
- Fears or phobias that interfere with normal activities
- Substance misuse
- Change in sleeping/eating/hygiene habits
- Isolating self from others excessively
- Exhibits violence to others
- Inability to cope with problems and usual daily activities
- Excessive complaints about physical aches and pains
- Emergence of bizarre or unusual behaviour or thoughts
- Defiance of authority, truancy, theft and/or acts of vandalism
- Intense fear of weight gain
- Frequent outbursts of anger
- Demonstrates ritualistic behaviours (e.g. preparing for bed, a meal or going out) using routines that are exact, precise and never vary
- Provocatively sexual behaviour that is not appropriate
- Participates in mutilating or killing animals
- Persistent and prolonged low mood (a major concern, especially if accompanied by poor appetite or thoughts and talk of death or signs of self-mutilation)

In adults:

- Confused thought processes
- Prolonged periods of sadness/low mood and apathy or prolonged periods of excessive happiness
- Feelings of extreme highs and lows
- Persistent irritability
- Excessive anxiety/worrying
- Unrealistic or excessive fears
- Strange or grandiose ideas
- Social withdrawal
- Marked changes to eating/sleeping/hygiene or other habits
- Strong feelings of anger/outbursts of violent behaviour
- Increasing inability to cope with usual activities of everyday life
- Denial of anything being wrong even in light of obvious problems
- Numerous unexplained physical ailments
- Substance misuse
- Delusions or hallucinations
- Thoughts/talk about suicide or homicide (professional help needed immediately)

*(APA 2013; National Mental Health Association (USA) 2012)*

## CLINICAL INTEREST BOX 39.3 People at risk of mental illness

Anyone can develop a mental illness, but people at particular risk include:

Life stages:

- Adolescents: adolescents face a period of enormous physical, psychological and social change. Some adolescents may not have sufficient resources to cope with the demands placed on them at this challenging stage of life and to complete the developmental tasks necessary to move successfully from adolescence to adulthood. Erik Erikson's theory of personality development (Erikson & Erikson 1997) is one that is useful to explore in relation to life stages and developmental tasks. Childhood is a particular period of vulnerability to abuse and neglect, both of which increase the likelihood of mental illness developing
- New parents: new parents face a multitude of stressors (things that trigger a stress response) as well as many pleasures connected with a new baby. Stressors may include conflict over the acceptance of the pregnancy, transition from being a couple to being parents, loss of financial income, a baby's constant demands and anxiety about the infant's welfare
- Women: women face factors such as a disadvantaged status in society, internal conflict arising from decisions about whether to pursue a career, become a home-maker or try to achieve both, or being subjected to domestic violence or abuse. These are social factors that may possibly predispose some women to mental illness
- Older adults (male and female): older adults may face many stressors, including loss of work role status because of retirement, reduced income, fear of declining physical and mental abilities, relocation, death of a partner and/or friends and siblings of similar age. The effect of these multiple losses may accumulate and leave some older adults at risk of mental illness.

Populations:

- Refugees and migrants: these people may experience a grief reaction on leaving their homeland, friends and family to live in a country where the cultural practices, values and beliefs are different and where they may be considered of low status and worth. It may be difficult for some migrants to work successfully through their grief because of language barriers, the stress from job and financial uncertainty and lack of support from relatives and friends left behind. Some refugees and migrants may experience problems of adjustment, isolation and loneliness, each of which may contribute to mental illness. In some cases refugees have experienced torture and trauma in their country of origin, which creates a high risk of developing a post-traumatic stress disorder (Griffiths et al 2003)
- Aboriginal and Torres Strait Islander (ATSI) peoples
- Homeless
- Unemployed
- Physically or intellectually impaired persons: factors such as isolation, lack of meaningful relationships, social restrictions caused by disabilities, poor self-esteem and negative stigmatising community attitudes towards people with disabilities are all aspects of experience that can elevate the risk of mental illness, particularly anxiety and depression (Dewer & Barr 1996).

Individual risk factors:

- Alcohol and other drug use
- Physical health
- Genetics.

Community-level risk factors:

- Social exclusion
- Discrimination
- Bullying.

of 'a nervous breakdown' is a common non-medical term for this kind of isolated non-recurring illness

- Episodic: an illness that occurs episodically; for example, recurrent episodes of a disabling condition such as bipolar disorder (once known as manic depression) or schizophrenia. While the condition is disabling when it occurs, the person affected can often enjoy a comparatively normal life for much, if not most, of the time
- Chronic/enduring: a constant disabling and unrelenting illness that is extremely challenging for the affected person and their families to deal with; for example, chronic schizophrenia or bipolar disorder or irreversible dementia can be disabling.

Although use of the terms psychosis and neurosis to describe particular illnesses is no longer favoured, nurses need to be aware of the meanings associated with each as the terms are still used in some contexts. The terms are out of favour because symptoms ascribed to each condition can occur in the other, and this causes confusion. The term psychosis refers to disorders that are so marked and incapacitating that the person who is afflicted experiences altered sensory perceptions, unusual or bizarre thoughts and speech or behaviour that is disorganised. Psychosis was the term traditionally used to describe disorders such as schizophrenia and bipolar disorder,

## CLINICAL INTEREST BOX 39.4 Examples of identification of issues by nurses used in mental health nursing

- Impaired social interaction: insufficient or excess quantity or ineffective quality of social interactions
- Ineffective coping: inability to form a valid appraisal of the stressors, inability to use available resources
- Chronic low self-esteem: long-standing negative feelings about self or own capabilities
- Self-care deficit: impaired ability to perform or complete activities of daily living (e.g. hygiene, toileting, nutrition)
- Imbalanced nutrition, less than body requirements: intake of nourishment insufficient to meet the body's metabolic needs
- Powerlessness: perception that one's own actions will not significantly affect an outcome; a perceived lack of control over a current situation
- Disturbed thought processes: disruption in cognitive abilities and activities
- Disturbed sensory perceptions: alteration in the amount or patterning of incoming stimuli accompanied by a diminished/exaggerated/distorted/impaired response to the stimuli (often used for consumers who are experiencing delusions, hallucinations or illusions or have impaired awareness of self/environment)
- Impaired verbal communication: diminished, delayed or impaired ability to understand or transmit verbal messages
- Dysfunctional grieving: prolonged unsuccessful use of strategies and responses by which people attempt to work through the process of grieving
- Risk for injury: potential for injury as a result of environmental conditions interacting with the consumer's adaptive and defensive resources
- Risk for self-directed violence, risk for other-directed violence: existence of the potential for a consumer to be physically, emotionally or sexually harmful to self or others
- Risk for suicide: potential for self-inflicted life-threatening injury

*(Fortinash & Holoday Worret 2011; Varcarolis & Halter 2010)*

in which the symptoms experienced were quite different to those experienced by other people and included delusions and hallucinations (Elder et al 2013). Psychosis is typically seen in schizophrenia, severe mania and sometimes in severe depression. Clinical Interest Box 39.5 provides explanations and examples of delusions and hallucinations.

Unlike people suffering from a psychotic disorder, those with what used to be termed a 'neurosis' have insight into their condition. For example, a person who has an obsessive–compulsive disorder may experience persistent and intrusive thoughts (obsessions) about personal cleanliness (APA 2013). To decrease the level of anxiety the person may wash their hands hundreds of times a day, even if their hands become red and raw (compulsion to act). When they are extreme, such thoughts and acts may be so unusual and disrupt the person's life to the degree that to the observer the person is mentally ill. Unlike those experiencing a psychotic disorder, the affected person is aware that the behaviour is abnormal (there is insight into the behaviour and the illness). Despite their condition, people who have what was once classified as a neurosis can often continue to function in society, whereas a person who is psychotic may not function effectively (Varcarolis & Halter 2010). Nursing diagnosis should always be developed through the lens of a consumer-centred approach which respects the consumer's social and individual experience of their illness.

## Theoretical models and causation of mental illness

Historically the medical profession was prominent in the care of people with mental illness and as a result there has been, and still is, a strong focus on identifying physical causes of mental illness. However, others have looked at psychological, sociocultural, interpersonal and human development factors and there are now many **theoretical models** used to explain the presence of a mental disorder. Mental health nurses select concepts from the various relevant models that best explain the consumer's behaviours, problems and needs. They then draw on these concepts as a basis for the consumer's assessment and then for planning, conducting and evaluating care (Varcarolis & Halter 2010). The following provide very basic examples of a small selection of theoretical models. To work effectively in the area of mental health, however, nurses need a deep and sound understanding of a wide range of models.

### The medical or biological model

This model explains mental illness as being caused by physiological malfunction in the body. Physical causes can be separated into acquired and non-acquired factors. Acquired causes include head injury, cerebral infection and substance misuse. Non-acquired causes include genetic transmission, electrical conductivity changes in the brain or alterations to the production and/or activity of neurotransmitters (Elder et al 2013). There is evidence to support biological explanations. For example, studies indicate that depression and schizophrenia may be linked to abnormal neurotransmitter function, and that genetic factors may be linked to both (Elder et al 2013). A medical approach to treating mental illness tends to focus primarily on medication and sometimes includes electroconvulsive therapy (ECT), both of which aim to correct chemical imbalance in the body believed to be caused by abnormal neurotransmitter function in the brain. Emil Kraepelin (1856–1926) is a theorist associated with the origins of the medical model.

### Psychological and psychodynamic models

The psychoanalytical model, first conceptualised by Sigmund Freud (1856–1939), is possibly the best-known model in

## CLINICAL INTEREST BOX 39.5 Delusions and hallucinations*

**Delusion**: a fixed false thought or belief that is not reality based or true, is not consistent with the person's level of education and development or cultural background and is not amenable to reason. It is categorised as a thought disorder

| Type | Example |
|---|---|
| Somatic delusions (a false belief involving a body part or function) | A young woman believes her body is rotting away from the inside, her heart is made of ice and is gradually melting because she doesn't deserve to live |
| Nihilistic delusions (false feeling that the self, others or the world is non-existent) | A consumer refuses to eat, saying there is no need for him to eat because he has no body |
| Delusions of persecution (over suspiciousness: the person falsely believes themself to be the object of harassment) | A consumer believes the staff belong to a cult, are watching his every move and are out to get him. He is afraid to go to sleep for fear of what the staff might do to him |
| Delusions of control (false belief that one is being controlled by an external source) | A consumer believes her feelings, thoughts and actions are being controlled by aliens who send messages to her via the television, instructing her on what to do |
| Delusions of grandeur (exaggerated beliefs about personal importance or powers) | A consumer believes he is God and controls the universe |
| Delusions of self-depreciation (beliefs of unworthiness) | A consumer believes she is ugly and sinful, saying, 'I don't deserve to be loved—look at me—it shows that I am full of sin' |
| Delusion of erotomania (beliefs that someone usually of a higher status) has romantic feelings for them | A young man believes that a Hollywood actress is in love with him and they are going to marry |

**Hallucinations**: false sensory perceptions that are not founded on any external stimuli. They may involve any of the five senses. They are most commonly visual or auditory

| Type | Example |
|---|---|
| Visual hallucination | A consumer tells you that he sees demons when he looks out his bedroom window |
| Auditory hallucination | A 26-year-old consumer tells you the devil communicates to him saying 'You are worthless, you don't deserve to live' |
| Gustatory (taste) hallucination | A middle-aged consumer with organic brain syndrome complains of a constant metallic taste in his mouth |
| Olfactory hallucination | A 30-year-old consumer states that she smells 'rotten garbage' in her bedroom although no one else can smell anything unusual or unpleasant |
| Tactile hallucination | A middle-aged woman undergoing symptoms of alcohol withdrawal reports feeling ants crawling all over her body although no ants are present |

*(Fortinash & Holoday Worret 2011; Shives 2011)*
*Consumers can experience delusions and hallucinations together. For example, A consumer who claims to hear the voice of God whenever he walks past a place of worship believes that he has been chosen to do God's work by preaching to 'sinners'.

this group. Freud's model viewed human personality as developing predominantly within the first 5 years of life and focused mostly on unconscious, non-rational and instinctual parts of human behaviour (Varcarolis & Halter 2010). Freud attributed disrupted behaviour in the adult to developmental tasks that were not accomplished successfully at earlier developmental stages. For example, within this theoretical framework a mental illness may be linked to a failure during adolescence to move successfully from dependence on parents to independence. Freud's mode of treatment was

psychoanalysis, which aimed to bring unconscious problems to conscious awareness.

Carl Jung (1875–1961), Melanie Klein (1882–1960) and Erik Erikson (1902–1994) are some of the theorists who expanded on Freud's thinking about the nature of human development and behaviour. Erikson's theory has provided nurses with a developmental model that encompasses the entire lifespan. Erikson studied healthy personalities and focused on human strengths as well as weaknesses, emphasising how people who failed to achieve developmental milestones at various life stages could rectify these failures at later stages (Elder et al 2013).

It was Freud who identified the manner in which humans develop and used defence mechanisms to ward off anxiety that might otherwise be overwhelming and incapacitating (Varcarolis & Halter 2010). Defence mechanisms prevent conscious awareness of threatening feelings and can be a helpful response in adapting to **stress**, but their over-use can be a sign of maladaptation to stress and an indicator of mental ill health. They are particularly relevant in understanding stress-vulnerability and stress-adaptation models of health and illness. Stress-vulnerability/adaptation models recognise that throughout life there is a need for everyone to adapt to change; for example, to adjust to school and then work life, to living with a partner or to becoming a parent or a grandparent and then to retirement and perhaps the death of a spouse. The model views that some people find it more difficult than others to adapt to life's changes and to cope effectively with the stressors that change can bring. When life results in a stressful situation or there is an accumulation of multiple stressors, people who have been unable to develop and establish adequate coping skills and coping resources are at the highest risk of developing a mental illness.

### Social and interpersonal models

Social/interpersonal models draw attention to the impact of factors within a person's social environment on mental wellbeing. The basic concept is that negative social factors such as low status, low levels of support, isolation and poverty contribute to and increase the risk of developing a mental illness such as depression (Elder et al 2013).

Interpersonal models encompass the premise that internal conflict within one's personality and particular behaviours may be derived from unresolved conflicts within personal relationships, sometimes during early life experiences. This model also encompasses the premise that a consumer's wellbeing is dependent on the amount of stress experienced and the effectiveness of personal coping strategies in dealing with that stress. Karen Horney (1885–1952), Harry Stack Sullivan (1892–1949) and Hildegard Peplau (1909–1999), a nurse theorist, are some of the important theorists who have conducted research related to social and interpersonal factors and mental health.

### Cognitive behaviour models

Cognitive behaviour models stem from the assumption that behavioural responses are learned. Ivan Pavlov (1849–1936) developed the understanding of learned behaviours when he found that when a bell was repeatedly rung each time dogs were given food the dogs began to salivate just at the sound of the bell. This conditioned reflex was termed classic conditioning and is acknowledged as a form of learning that applies to humans, learning in which a previously neutral stimulus comes to elicit a given response through association. For example, behavioural theorists would suggest that children who observe parents responding to every minor stress with anxiety would soon learn the response and would develop a similar pattern of behaviour (Elder et al 2013). According to the behavioural model, this early learning experience would be considered a significant factor in the cause of an anxiety disorder and limited constructive coping strategies in later life.

BF Skinner (1904–1990) added to behavioural theory by introducing the concept of operant conditioning. Operant conditioning refers to the use of reinforcers to motivate the repetition of particular behaviours. The use of positive reinforcement (the continual rewarding of desired behaviours) forms the basis of behaviour modification therapy used to help motivate consumers to change undesirable behaviours. It has been effective for consumers with phobias, alcohol addiction and a variety of other conditions (Elder et al 2013).

Aaron Beck was one of the early founders of cognitive behaviour therapy (CBT), now a common and often very successful form of psychological treatment. It is based on the view that dysfunctional behaviour is linked to dysfunctional thinking, and that thinking processes are shaped by underlying beliefs. For example, the consumer with depression believes, 'I am no good at anything, I'm worthless, and nobody likes me.' Cognitive behaviour therapy is based on helping consumers recognise, challenge and change dysfunctional thinking. Beck's work has primarily focused on helping people with depression but he has expanded the use of CBT to include working with people who have complex disorders such as borderline personality disorder and schizophrenia, and there are distinct signs of success (Elder et al 2013).

Mental health, like physical health, is clearly affected by a multitude of factors. Consequently, MHNs and psychiatrists are concerned with all the aspects of people's lives that distinguish them as human beings. The mental health nurse uses knowledge from the psychosocial and biophysical sciences, and theories of stress vulnerability, personality and behaviour, to develop a framework on which to base the art of nursing. The mental health nurse is an integral part of the interdisciplinary team required to meet the needs of consumers who have a mental illness.

## THE PROVISION OF CARE

### The multidisciplinary team

Many people may be involved in assisting a person who is experiencing a disruption or potential disruption to their mental health. Mental healthcare commonly employs an interdisciplinary team approach to care management. The

## CLINICAL INTEREST BOX 39.6 Some members of the healthcare team

- The psychiatrist: a consultant physician whose specialty is mental disorders and who is responsible for diagnosis and treatment. A psychiatrist has the legal power to prescribe and to write treatment orders and, as such, is often the team leader
- The mental health nurse: a nurse with experience and expertise in clinical psychiatry, who promotes a holistic approach to care
- The clinical psychologist: a psychologist who has undertaken specialised education in the area of mental health and whose function includes applying and interpreting psychological tests and the implementation of specific therapies such as behaviour modification programs and sexual, marital or family therapy
- The psychiatric social worker: a social worker in the field of mental health, whose function includes assisting the consumer to prepare a support system that will help maintain their mental health on discharge into the community from an inpatient facility. A social worker may liaise with employers, contacts in day-treatment centres and those providing training and educational programs. The social worker may also assist the consumer to locate and access sources of financial aid and accommodation
- Occupational, recreational, art, music and dance therapists: according to their specialist areas of expertise, these various therapists assist consumers to gain skills that assist them to cope more effectively, to gain or retain employment, to use leisure time in a way that promotes their mental wellbeing and to express their emotions in healthy ways.

*(Sadock et al 2015; Varcarolis & Halter 2010)*

consumer's care, according to individual needs, is planned and implemented by a team composed of MHNs, psychiatric social workers, counsellors, clinical psychologists, general or specialist medical officers (depending on the consumer's physical status) and pharmacists. Additional team members may be required and, depending on individual needs, these may include: a dietitian; an occupational therapist; a recreational, art, music or dance therapist; complementary healthcare therapist; and a chaplain or other spiritual support person. (See Clinical Interest Box 39.6.)

It should never be forgotten that the most important member of the team is the consumer, and often consumers know what they need to promote their own recovery. Some consumers have reflected on the times when they have been at their most vulnerable. For example, some consumers who have experienced admissions to acute care settings have identified that what they need most at times of severe mental distress is somewhere they can feel safe and supported, somewhere they can relax and calm down and someone to be with them who will listen and really hear them (Hungerford et al 2015). While the consumer may feel the need for medication, it is not appropriate or helpful to implement other therapeutic interventions, such as group therapy, recreational therapy or family therapy, until the consumer is feeling less distressed and can collaborate in decisions about what sort of interventions will be most helpful. Skilled helping involves actively listening to the consumer and working collaboratively with the consumer to achieve a process of recovery. (See Chapter 8 for information concerning active listening as a therapeutic measure.) The therapeutic process involves health professionals, including nurses, as facilitators who use their knowledge to help the consumer become more resourceful and self-reliant. This helping relationship needs to be a participative but never a directive process (Elder et al 2013). The model of helping relationships established by Carl Rogers (1961) and the model of skilled helping established by Gerard Egan (1994) are consumer-centred models of caring on which MHNs can reliably base their therapeutic interactions with consumers.

## Responsibilities of the mental health nurse

Mental health nursing may be described as an interpersonal process in which the nurse uses the presence of self, interpersonal communication skills and knowledge of physiology, psychology and sociology to help consumers in mental distress. A combined understanding of biological processes and psychodynamic processes is essential for the MHN because many people with mental illness have a concurrent physical problem, and the two are often interconnected (Elder et al 2013).

Mental health nurses are very involved in psychiatric inpatient services and in community mental health services. They play a major role in education and health promotion, as well as in the provision of continuing care and counselling for people with mental health problems. For some experienced MHNs the role may include conducting specific psychological therapies such as cognitive behaviour therapy, solution focused therapy and acceptance and commitment therapy.

Nursing care aims to help consumers cope with the experience of mental illness, prevent relapse and to promote a return to mental health through a successful rehabilitation program. The primary aims of mental health nursing are to help individual consumers to:

- Identify and clarify their needs and problems and advocate for the consumer
- Create a better future for themselves (e.g. **empower** consumers by developing self-help strategies)
- Create strategies to enable them to move forward (e.g. consumers can become stuck in a particular way of responding to situations)
- Adopt a recovery-focused approach to care by empowering the consumer and their carer to actively participate in this process.

Rehabilitation is important for people who have been discharged from a psychiatric ward or unit. Some people need minimal support but others represent a population of chronically ill consumers who return to hospital periodically over many years and require support in several different areas of their lives. The community mental health nurse and other members of the community mental health team may be involved in:

- Monitoring medication
- Consumer and family therapy
- Crisis intervention
- Social skills training
- Medical care for concurrent physical problems
- Vocational training and support (Shives 2011).

## Recovery and mental illness

The concept of recovery has been apparent for the past few decades and is manifest mainly in policy at various levels such as health services management, practitioners and consumer/survivors of healthcare services (Edward et al 2014). Many consumers, some of whom were mental health professionals, began to speak about their experiences of mental illness and their individual journey of recovery which led to the development of the consumer-recovery movement (Deegan 1988; Lovejoy 1984). In the United States the consumer-recovery movement was boosted by William Anthony, a rehabilitation expert who challenged the state health system on its vision of recovery that was based on a belief that mental illness was essentially a 'chronic' condition with very little hope of getting back to full health (Anthony 2000). According to Anthony (2000), mental health services need to be grounded in the idea that people can recover from mental illness, and that the construction of the service delivery system must be based on this knowledge. From that period of time most Western countries adopted an approach to recovery that is based on practices and principles of autonomy and self-determination.

Contemporary mental health nursing care is now based on the recovery principles that refer to the person's rights to self-determination and inclusion in community life regardless of their diagnosis of mental illness. The implementation of

### PROGRESS NOTES EXAMPLE 39.1

18/4/2016
1725 hrs

Nursing: Jason is a 23-year-old-man admitted via ED following referral from GP requesting psych assessment for ? psychotic symptoms. Jason describes ongoing increasing feelings of paranoia towards mother (Pam).
Social: 5th year Law student. Stated he is failing this semester after being previously high-achieving student. Lives at home with his mother Pam. Recently separated from girlfriend of 4 years, 'I can't trust her.' Mother describes recent decline in social contacts with friends. Recently lost his part-time job at a legal firm after becoming argumentative with his supervisor over a security camera in the hallway.
P/H: No past psychiatric history, neuroleptic naïve. Past medical history includes mild asthma as a child.
Appearance & Behaviour: Dishevelled young man, average weight & height. Poor eye contact. Appears hypervigilant, frequently looking towards door and requiring ++ reassurance no one else is listening to our conversation. Generally cooperative with interview process; however distracted at times.
Mood: Congruent; however anxious at times. Rated mood 5/10, when asked to elaborate 'well how would you feel if your mother was trying to kill you?' Describes ongoing insomnia related to need to be vigilant during the night. Stated he sleeps for no longer than 2–3 hours at a time. Recently separated from girlfriend, last sexually active 2/12. Appetite poor, believes his food is being 'tampered' with by his mother. Eats mostly pre-packaged foods.
Affect: Blunted.
Speech: Disorganised at times.
Perception: Describes hearing the voice of a 'demon' (male, not recognised) who informs him of who can and cannot be trusted. Finds this voice 'distressing'. Also describes seeing this same 'demon' 'lurking in the shadows' and finds this experience highly distressing. Command hallucinations 7/7 telling him to hurt his mother and himself. Would not elaborate. Denied presence of perceptual disturbance during interview, yet seemed ++ distracted and distressed at one point.
Thought: Themes involving demonology and the need to read occult material to 'keep the demon quiet' were expressed frequently. Preoccupied with intrusive need to 'stay alert' to protect himself from his mother and friend Joey. Paranoid delusions expressed. Thoughts loosely associated and at times difficult to follow. Evidence of thought blocking.
Cognition: Intact. Memory good (recent, remote, past)
Judgment: Poor
Insight: Poor. Does not believe he is unwell. Refusing to try oral medication ('it's poison!').
Drug history: States he is a social drinker. Denies use of illicit drugs.
Risk:
Risk of nutritional deficits as evidenced by paranoia re food tampering
Risk of interpersonal violence as evidenced by command hallucinations telling him to kill others
Risk of self-directed violence as evidenced by command hallucinations telling him to kill himself.

***O. Garcia*** **(Garcia) RN**

peer support models of recovery in Australia has seen the advancing role of the consumer in sharing their journey of the lived experience in helping those currently experiencing mental illness (Davies et al 2014). Recovery principles are based on an approach that hope is central to recovery and that shifting the focus from symptom management and diagnostic labels to one which keeps people well gives their lives value and meaning. Personal and social recovery is the primary focus of contemporary mental health nursing care.

**CRITICAL THINKING EXERCISE 39.1**

Describe how a peer support model of recovery would be beneficial to consumers with mental illness.

## Facilitating development of constructive coping mechanisms

The nurse's role in stress and stress management has some specific points that need to be highlighted here. To recognise and deal with stress, consumers need to be provided with information about, and helped to recognise:

- Issues and events related to health and illness, and the importance of adhering to sound health practices (e.g. adequate nutrition, sleep, exercise and relaxation) as a way of promoting mental wellbeing
- The dimensions of potential stressors, possible outcomes and the consumer's own established positive and negative coping mechanisms and coping resources
- Their existing strengths and develop and maximise their abilities in problem solving, tolerating stress and dealing effectively with interpersonal relationships
- Where and how to gain access to additional coping resources (e.g. vocational training, support groups and counselling).

There is a wide variety of activities that consumers may find helpful in promoting coping, but there is no one right or best activity. What works for one person may not work for another. Nurses have a responsibility to provide consumers with information and options, but only the consumer can know what feels appropriate, so the choice of what activities to attempt or to become involved with should ultimately rest with the consumer. Clinical Interest Box 39.7 provides examples of **constructive coping strategies**, coping resources and **destructive coping mechanisms**.

## The nurse's role in educating the public and reducing stigma

One particularly important facet of the community mental health nurse's role is educating the public about mental illness to reduce the stigma that for many mentally ill people is the biggest hurdle to overcome (Hungerford et al 2015). There is a general lack of knowledge in the community about what constitutes mental illness and about the prognoses of mental disorders; this ensures that mental illnesses are often surrounded by mystery, misinformation and stigma (Elder et al 2013). Despite positive interventions in recent years, people

### CLINICAL INTEREST BOX 39.7 Examples of constructive coping strategies, coping resources and destructive coping mechanisms

**Constructive coping strategies**

- Postpone major life changes
- Resolve personal conflicts
- Take part in enjoyable activities
- Keep work under control
- Seek help
- Practise breathing and muscle relaxation techniques
- Do some research
- Establish good sleeping patterns
- Keep active
- Reduce alcohol and other drugs (Beyond Blue, www.beyondblue.org.au)

**Coping resources**

- Economic assets
- Established abilities and skills
- Social supports
- Personal motivation
- Physical health, strength and energy
- Positive beliefs about self
- Established problem-solving and social skills
- Social and material resources
- Knowledge and intelligence
- Strong sense of identity
- Cultural stability
- A clear and stable system of values and beliefs
- An orientation towards preventive measures in health

**Destructive coping mechanisms**

- Always being submissive to others and so failing to get own needs met
- Excessive use of alcohol and/or other drugs or overeating (seeking comfort in substances)
- Promiscuity (seeking love and acceptance in a way that does not improve self-esteem)
- Overuse of defence mechanisms to cope with unacceptable or ambivalent feelings. Defence mechanisms commonly used in a maladaptive manner (Elder et al 2013) include:
  - Regression: reverting to behaviour synonymous with earlier developmental stage (e.g. tantrums)
  - Projection: blaming others for what is happening
  - Denial: denying there is a problem (e.g. 'I am in control of my anger')
  - Rationalisation: avoiding dealing with an issue (e.g. 'What does a bit of shouting and banging matter? The children know I would never actually hit them')

*(Sadock et al 2015; Varcarolis & Halter 2010)*

suffering from mental illness remain among the most stigmatised, discriminated against, marginalised, disadvantaged and vulnerable members of society (Hungerford et al 2015; Elder et al 2013).

Review Case Study 39.1 that explores the stigma of mental illness.

### CASE STUDY 39.1 THE STIGMA OF MENTAL ILLNESS

John was diagnosed with schizophrenia 2 years ago. Getting a diagnosis was such a relief, because then we knew what had caused such a big change in him. The nurses taught us about the illness and now, because we know what to look for, we pick up the early warning signs. He knows where to get help and most of the time he avoids a relapse.

John's pretty much in control of his illness now, but the thing that's upset him and us most is the way some people have treated him. He lost his part-time job in the supermarket and even one of his lecturers at college told him he should consider leaving his engineering course because of it. Even my own sister won't have him babysit his young cousins anymore. John now feels it is not safe to tell anyone about it. How do you think that makes him feel? If it was diabetes that made him ill I wonder if people would have reacted the same.

**Marjorie, mother of John, age 21**

How would you respond to Marjorie?

Several **myths** about mental illness create fear of those affected and this fear serves to increase stigmatising behaviours and attitudes. For example, there is a widely held perception that people with mental illness are often out of control, unpredictable and may pose a threat. The truth is that most people with mental illness do not behave in this way; however, severe mental distress is often highlighted in the media, and this links images of dangerous behaviour with mental illness in the minds of the public (Hungerford et al 2015). In fact consumers with a mental illness are more likely to be *victims* of crime, rather than perpetrators (Appelbaum 2013; Pollack 2013; Putman 2008). The notion of perceived dangerousness in relation to mental illness probably stems from the media's propensity to portray the mentally ill as dangerous and unpredictable, and facilitates the isolation and stigmatisation of the mentally ill (Jorm & Reavley 2013). Overall, violence in society associated with mental illness is not significant (Elder et al 2013). The Sane Australia *Stigmawatch* website monitors misuse, misrepresentation or inappropriate references to mental illness in the media (Elder et al 2013).

The lack of accurate knowledge about mental illness that leads to fear, mistrust and sometimes violence against people living with mental illness and their families can also serve to:

- Lower the morale and self-esteem of people living with mental illness
- Prevent people with mental illness from admitting the problem and seeking professional help
- Prevent people with mental illness from gaining paid employment
- Contribute to people with mental illness becoming non-adherent to treatment regimens
- Result in social disadvantage and discrimination for people with mental illness
- Limit the participation of people with mental illness in community activities and force them into a reclusive lifestyle, further exacerbating their illness
- Cause families and friends to turn their backs on the mentally ill person when support is most needed.

The picture is not always as dismal as this. Many mental healthcare users are themselves excellent ambassadors for people with mental illness. By calling themselves consumers they have empowered themselves to become advocates for other people experiencing mental health disorders. Mental healthcare users or consumers now have a vital role to play in participating and planning the delivery of mental health services (Hungerford et al 2015). Consumer advocacy groups now exist in every state and territory of Australia and in New Zealand to promote participation of consumers in planning, implementation and evaluation of mental health services. Accordingly, most consumers live and work within a local community, use the same facilities (e.g. shops, library, cinema, sports centres) as everyone else, are accepted by the people within the community and experience no harassment and attract no hostility from the local residents (Markowitz 2007). All nurses can play a part in highlighting and reducing stigma by:

- Acknowledging the person by using respectful language; for example, never referring to someone as a 'manic depressive', but rather referring to them as a person with a bipolar disorder
- Discouraging the use of disrespectful language; for example, terms such as 'schizo, lunatic, psycho, crazy, nut case' or 'barmy'. The nurse can advocate for people with mental illness by alerting someone to the fact that they are expressing a stigmatising attitude. Many people do this automatically without realising the hurt they are causing and the negative impact on the person with the illness or their family members
- Emphasising the person's abilities rather than their limitations
- Avoiding representing a successful person with a mental illness as superhuman.

## Mental Health First Aid

Mental Health First Aid (MHFA) is a relatively new concept associated with the management of a mental health crisis by 'first responders' until a person capable of managing these types of situations arrives. This type of intervention is akin to the medical management of a patient during a medical emergency (or MET) call; the only difference being, it is *psychological* management. Individuals working in healthcare environments are often confronted with situations arising

from consumers and/or their families in distress and appropriate, sensitive and safe management, based on an understanding of mental illness and crisis, is important. Examples of a situation that may require MHFA include a threatened or attempted suicide, an incidence or threat of deliberate self-harm, distress related to psychotic symptoms such as acute paranoia, or an anxiety or panic attack. The first responder should remain calm, and engage the consumer in a compassionate and gentle manner. The Mental Health First Aid Australia (2015) and New Zealand (2015) websites are a useful resource for all nursing and healthcare students. These sites contain useful information regarding common mental illnesses, and the management of crisis situations.

### CRITICAL THINKING EXERCISE 39.2

There are many reasons why consumers delay seeking treatment for mental illness; however, stigma is one of the major reasons. Discuss the effects of stigmatisation of mental illness, including the implications to:

- The consumer
- Mental health practitioners
- Society.

In part it is the way people with mental disturbance were treated in the past that influences current perceptions of mental illness and the associated stigma. The next section provides a brief overview of historical perspectives relevant to understanding societal attitudes today.

## HISTORICAL PERSPECTIVES AND MENTAL HEALTHCARE

In the past, when emotions, thoughts or actions were deemed to be abnormal, the terms 'madness' and 'insanity' were linked to those affected. Reasons for the perceived abnormalities were once attributed to a variety of factors such as the influences of magic, witchcraft, possession by the devil or evil spirits, loss of the soul or punishment by the gods. Healing methods included exorcism, magical ritual and incantation (Videbeck 2013). Later it was proposed that an imbalance of 'body humours' was responsible—body humours being blood, black bile, yellow bile and phlegm—and such imbalances were corrected by bloodletting. During the medieval period, beliefs returned again to those connected with magic and demonology but also included beliefs that the moon influenced madness (lunacy). Some of those perceived as mad or lunatics were flogged, tortured and starved and those whose illness resulted in violent behaviour were shackled in prisons or put out to sea as a means of ridding them from society. Fear and lack of knowledge resulted in significant cruelty.

In the late 19th and early 20th centuries, those with behaviours that were not manageable, who were misunderstood or were simply not acceptable in society were placed in custodial care inside large public mental hospitals or asylums. It can only be imagined how being confined and isolated inside large institutions might have caused feelings of abandonment and rejection. During this period doctors classified the symptoms of mental illness but had limited understanding of the sources of mental anguish (Wilson & Kneisl 1996).

Increased understanding of mental distress was promoted by the psychological, psychosocial and interpersonal theories to explain behaviour espoused by theorists such as Freud, Erikson and Stack Sullivan. The introduction of psychotropic drugs, such as chlorpromazine (Largactil) in the 1950s, helped staff members manage large numbers of consumers with challenging behaviours, who were often accommodated in crowded conditions in the large institutions. In the 1990s (the time known as the decade of the brain) biological, scientific and technological concepts combined to expand on earlier understandings of mental illness. As a result, advanced brain-imaging techniques now allow direct viewing of the structure and function of the living brain while it is functioning (Wilson & Kneisl 1996).

In the latter part of the 20th century the negative impact of institutionalisation for people with mental illness was recognised. This recognition was in part the stimulus that shifted public policy to one of **deinstitutionalisation** and community-based care for people with mental illness. The push towards community-based mental health services also came from the human rights movement and the philosophy of normalisation for people with disabilities of all kinds. (See Chapter 41 for explanations about the principles of normalisation and people with disabilities.) The discovery of psychotropic drugs in the 1950s also contributed to the current predominance of care in the community because these agents helped to modify challenging behaviours (Jewell & Posner 1996).

### Mental healthcare today

Mainstreaming of mental healthcare has resulted in the provision of psychiatric care to consumers in general hospitals with an inpatient psychiatric unit, hostels and other residential care facilities and sometimes in forensic centres for the mentally impaired who have committed crimes. However, mental healthcare is primarily provided in the community and in Australia the community setting has become the place where most consumers receive their care. Not only is this a human rights directive, but most Australian states' mental health legal frameworks/Acts stipulate that consumers with mental illness be treated in the least restrictive environment.

Nurses may meet with consumers in a variety of community settings, including:

- The consumer's home
- The consumer's foster home
- Community care units
- Special residential units
- Day and drop-in centres
- General practitioner clinics
- Boarding houses
- On the street (homeless consumers).

Current healthcare policy promotes not admitting people to a treatment centre unless essential, and, when it is

necessary for consumers to be admitted to treatment centres, they are discharged back into the community as early as possible. Ideally, community-based mental health services provide appropriate networks of supports and resources for those who need it. The aim of service providers is to ensure that there are caring interventions aptly suited to assist each person to rehabilitate successfully and to cope well in society. The policy of community-based care has enabled many of those who once lived in psychiatric institutions to resettle successfully in the community and to be well supported. It is important to remember that the environment in which the consumer is seen affects the therapeutic relationship. In community settings the mental health nurse enters the home of the consumer as a guest, engaging with the consumer on a more relational and contextual basis.

Unfortunately, however, there are other instances in which the deinstitutionalisation process has not been supported with adequate community care. The result of this is that some people who experience mental illness have merely been relocated to substandard boarding houses or other semi-institutionalised accommodation, or face homelessness (Grigg et al 2004).

While there are still many problems for mentally ill people and health professionals to contend with and resolve, there is now more cause for optimism in relation to mental illness than in the past. Success rates for the treatment of many common mental disorders such as bipolar disorder, major depression and schizophrenia now equal or exceed the success rates for many other medical disorders (Hungerford et al 2015).

While this chapter does not aim to inform the nurse about the range of treatments available to assist consumers with specific disorders, the next section provides a summary of possible nursing responses to some common emotional and behavioural problems that challenge consumers with mental illness. The terminology used in mental healthcare, some of which is contained in the next section, is extensive and different from terms used in other areas of nursing. Some of the more common terminology is defined in Table 39.3.

## CARE OF CONSUMERS WITH SPECIFIC EMOTIONAL OR BEHAVIOURAL CHALLENGES

Here we address some of the more common mental states that consumers being cared for in non-psychiatric hospital settings may experience. Information is provided on caring for a person who is anxious, depressed, aggressive, displaying self-destructive behaviour, hyperactive, confused or disoriented.

### The consumer experiencing anxiety

Anxiety disorders are the most commonly diagnosed mental illness (Hungerford et al 2015). Anxiety is an internal feeling usually experienced as an unpleasant or uncomfortable emotion and which is frequently associated with conflicts and frustrations. While a certain mild degree of anxiety can be beneficial when it stimulates motivation and energy, severe anxiety can be devastating and is the basis of many mental health disorders. Anxiety differs from fear in that anxiety attacks the person at a deeper level than fear, and the source of the anxiety may be unknown. Sometimes, in extreme anxiety, a person may experience panic attacks that result in markedly disturbed behaviour. The person may be unable to process what is happening in the environment and may lose touch with reality. During a panic attack behaviour may be erratic, uncoordinated and impulsive. There are three different forms of panic attack: 'out of the blue' attacks, which are not brought on by a trigger; situation-bound attacks which are brought on by exposure to a trigger; and situation-predisposed attacks which are comparable to situation-bound but which do not happen every time the person is exposed to a trigger.

Anxiety invades the very centre of a person's being. Severe anxiety is profound and persistent and can erode and destroy a person's sense of self-esteem and self-worth that contribute to a sense of being fully human (Varcarolis & Halter 2010).

Anxiety is experienced in a wide variety of situations and is generally the result of a threat to a person's self-esteem or physical integrity. Threats to self-esteem include factors such as interpersonal difficulties, change in job status, social or cultural group pressures, a change in role or confusion over one's identity. Threats to physical integrity include factors such as decreased ability to perform the activities of daily living, for example, as a result of injury or illness, or lack of basic requirements such as food, shelter and clothing. Mild and moderate levels of anxiety can alert the person to the fact that something is wrong and may be the stimulus to take appropriate action. Severe levels of anxiety interfere with problem-solving abilities, so that those affected have difficulty finding effective solutions to problems. For example, someone who experiences panic attacks may use unproductive relief behaviours to avoid the attacks from occurring, such as refraining from leaving the house to avoid the risk of a panic attack when driving the car, at work or at the supermarket. Unproductive relief behaviours perpetuate the cycle of anxiety (Varcarolis & Halter 2010).

Whether the source is known or unrecognised, anxiety can produce physiological responses, behavioural changes and emotional reactions. The type and extent of response depends on the level of anxiety experienced. Table 39.4 lists some physiological and other responses to different levels of anxiety. Emotional reactions are usually apparent in the person's descriptions of their experience. For example, they may state that they feel apprehensive, irritable, angry, depressed, helpless, on edge, unable to concentrate or remember things or they may feel detached from events and the environment. The person may experience angry outbursts or a tendency to cry frequently.

Specific treatment and care of a person experiencing anxiety depends on the level of anxiety experienced and the effects on the consumer, but generally interventions are directed towards reducing intense anxiety to a more manageable level and helping the person to develop self-help strategies to prevent overwhelming anxiety. Cognitive behaviour

| TABLE 39.3 \| Terms associated with mental illness | |
|---|---|
| Addiction | Physical or emotional dependence, or both, on a substance, such as alcohol or other drugs |
| Affect | Current, observable state of emotion, feeling or mood such as sadness, anger or elation |
| Aggression | Forceful behaviour that may be physical or verbal, as well as subtle manipulation |
| Akathisia | A condition of excessive restlessness that causes a person to move about constantly, fidget or pace. This can be a side effect of certain medications used in psychiatry |
| Anhedonia | Reduced or complete inability to feel pleasure from activities previously enjoyed |
| Amnesia | Loss of memory of events for a period of time that may range from a few hours to many years |
| Anxiety | A feeling of apprehension, dread or unexplained discomfort, associated with a sense of helplessness, arising from internal conflict |
| Apathy | Lack of feeling, emotion, concern or interest |
| Asylum | A place of safety or sanctuary; a refuge from the stresses of life. Historically the term asylum was associated with institutions that provided custodial care for people with a mental illness. Unfortunately, they were often associated not with the real meaning of asylum but with mistreatment and cruelty |
| Autism | Preoccupation with the self and inner experiences; a process of introspective thinking that is often rich in fantasy |
| Behaviour | Any human activity, either physical or mental. Some behaviour can be observed while other behaviour can only be inferred |
| Behaviour modification | A method of changing or controlling behaviour through the application of techniques based on the principles of classical conditioning |
| Bipolar disorder | A type of mood disorder that causes alternating periods of low and high moods; a combination of depression and mania |
| Body image | The conscious and unconscious attitudes a person has towards their body (e.g. feelings about size, function and appearance) |
| Catatonia | A state characterised by muscular rigidity and immobility (stuporose type) and which, at times, is interrupted by episodes of extreme agitation (excited type) and is usually associated with schizophrenia |
| Compensation | Process by which a person makes up for a deficiency in their self-image by strongly emphasising some feature of themself that they regard as an asset |
| Compulsion | An uncontrollable persistent urge to perform an act repetitively in an attempt to relieve anxiety. Compulsive behaviour often accompanies obsessions and may be directly linked to them |
| Confabulation | The fabrication of experiences or situations recounted in a plausible way to fill in and cover gaps in the memory. Used most often as a defence mechanism and most commonly by people with head injuries, dementia, amnesic disorders or alcoholism, especially those with Korsakoff's syndrome |
| Confusion | A cluster of abnormalities constituting disturbances of judgment, orientation, memory, affect and cognition |
| Coping mechanisms | Any effort directed towards stress management. They can be unconscious (defence) mechanisms that protect the consumer against anxiety, or conscious attempts to solve a problem that is creating stress |
| Deinstitutionalisation | A shift in the location of treatment from large public hospitals to community settings |
| Delusion | A fixed false belief resistant to modification. A delusion of grandeur is a false belief that one has great prestige, power or money, which may be manifested in the belief that the consumer is a famous person. A delusion of persecution is a consumer's belief that they are in danger, being harassed, are under investigation or are at the mercy of some powerful force. A somatic delusion is a belief that one's body is changing and responding in an unusual way |

**TABLE 39.3 | Terms associated with mental illness—cont'd**

| | |
|---|---|
| Dementia | A mental disorder characterised by a gradual onset of usually irreversible cognitive impairments |
| Depression | A mood state that may be mild or short lived or more severe and persistent. The latter, a mood disorder, is characterised by extreme sadness, feelings of hopelessness, low self-worth and little or no conviction that things can ever improve |
| Disorientation | Lack of awareness of the correct time, place or person |
| Electroconvulsive therapy (ECT) | A therapeutic procedure in which an electric current is briefly applied to the brain to produce a seizure. This is used in treatment of severe symptoms that do not respond to other measures, most commonly used in the treatment of severe depression |
| Hallucination | A sensory experience that is not the result of an external stimulus; may be visual, auditory, tactile, gustatory or olfactory |
| Hyperactive | Excessively or unusually active |
| Illusion | Misperceptions and misinterpretations of real external stimuli; may be visual or auditory or, less commonly, olfactory or tactile |
| Labile | Subject to frequent or unpredictable changes: the term is commonly used with reference to emotions |
| Mania | A mood characterised by an intense feeling of elation or irritability, often accompanied by increased activity, rapid speech and poor judgment |
| Mood disorder | A group of disorders in which the predominant feature is disturbance in mood |
| Obsession | A persistent thought, idea or impulse that cannot be eliminated from consciousness by logical effort |
| Obsessive-compulsive disorder | An anxiety disorder characterised by intense, unwanted and distressing recurrent thoughts (obsessions) and repeated behaviours (compulsions) that are beyond the affected person's ability to control |
| Panic attack | A period of sudden intense anxiety, often associated with feelings of impending disaster and accompanied by strong physiological symptoms, including shortness of breath, pounding heart or palpitations and dizziness |
| Paranoia | A serious personality distortion in which the person is markedly suspicious and mistrusting of others and may be convinced that they wish to harm them, seen in schizophrenia |
| Phobia | An intense fear of some situation, person or object, so that the danger is magnified out of proportion and may result in a panic attack |
| Psychosis | A state in which a person's mental capacity to recognise reality, communicate and relate to others is impaired. Psychosis includes the presence of delusions, hallucinations and disorganisation of thinking and behaviour |
| Psychotic | A person who is psychotic experiences delusions and hallucinations which cause disorganised thinking, unusual behaviours and a loss of touch with reality. Psychosis is an acute presentation often present in schizophrenia, mania and some illicit substance intoxicated states |
| Schizophrenia | A complex condition caused by brain dysfunction that results in hallucinations and delusions, distorted thinking and other disturbances |
| Self-harm | Harmful actions towards oneself where there is intention to harm but not die. Examples include cutting, burning, scratching etc. Commonly seen in borderline personality disorder and dysphoric emotional states |
| Suicidal ideation | Thoughts of suicide with an intention to end one's life |
| Tardive dyskinesia | A side effect of some antipsychotic medications (usually first generation, typical agents) that manifests with a variety of involuntary muscle movements including those that affect the face, jaw and tongue, the trunk and the extremities of the body. The involuntary movements are often irreversible. They are also referred to as extrapyramidal side effects |

*(Hungerford et al 2015; Elder et al 2013)*

**TABLE 39.4 | Physiological and other responses to anxiety**

| Mild anxiety | Moderate anxiety | Severe anxiety | Panic level of anxiety |
|---|---|---|---|
| Slight discomfort<br>Attention-seeking behaviours<br>Restlessness, irritability or mild agitation<br>Mild tension-relieving behaviour (e.g. foot or finger tapping, lip chewing, hair twisting, fidgeting) | Voice tremors<br>Change in voice pitch<br>Difficulty concentrating<br>Shakiness<br>Repetitive questioning<br>Loss of appetite<br>Diarrhoea/constipation<br>Memory impairment (e.g. interference with recall of events/facts)<br>Chain smoking<br>Increased use of alcohol or other substances<br>Somatic (bodily) complaints (e.g. urinary frequency and urgency, insomnia)<br>Increased respiration rate<br>Increased pulse rate<br>Increased muscle tension that may lead to backache or headache<br>More extreme tension-relieving behaviour (e.g. pacing, banging hands on table, constant wringing of hands) | Feelings of dread or impending doom<br>Confusion and bewilderment<br>Purposeless activity, lack of coordination of movements and actions<br>Worsening of somatic complaints (e.g. dizziness, nausea, headache, sleeplessness)<br>Hyperventilation<br>Tachycardia<br>Elevated blood pressure<br>Sweating<br>Facial pallor<br>Dry mouth<br>Difficulty in breathing<br>Withdrawal from interpersonal interactions<br>Disturbances in sexual function<br>Loud and rapid speech<br>Intense tension-relieving behaviour that may include threats and demands | Feelings of absolute terror; fear that death may result<br>Immobility or severe hyperactivity or flight<br>Dilated pupils<br>Chest pains/palpitations<br>Severe dizziness<br>Unintelligible communication or inability to speak<br>Severe tremors<br>Sleeplessness<br>Extreme psychomotor activity may lead to exhaustion<br>Severe withdrawal (e.g. agoraphobia)<br>Hallucinations and delusions may occur and the person may lose touch with reality |

*(Shives 2011; Videbeck 2013)*

therapy (CBT), for example, helps consumers develop strategies for controlling their anxiety and reducing the incidence of panic attacks. Minor tranquillisers such as diazepam (Valium) and lorazepam (Ativan) are sometimes prescribed short-term to suppress the consumer's feelings of anxiety but, as medications do not cure the condition and there are problems with dependence, long-term use is not advocated (Hungerford et al 2015). Antidepressants are generally well tolerated, safe and effective in the ongoing treatment of anxiety, with proven clinical efficacy (Meadows et al 2012). Examples used for the long-term treatment of anxiety include the selective serotonin reuptake inhibitors (SSRIs) fluoxetine (Lovan, Prozac) and sertraline (Zoloft). In addition to these medications, beta-blockers such as propranolol (Inderal) and atenolol (Tenormin) are also used to treat the physiological impacts of anxiety (Meadows et al 2012).

General care involves:

- Establishing and maintaining a trusting relationship
- Managing acute symptoms such as hyperventilation
- Attempting to identify the cause (stressors) of the anxiety and encouraging the consumer to take effective action
- Facilitating open and honest communication about the consumer's anxiety and/or problems
- Identifying existing coping mechanisms and coping resources
- Discussing with the consumer ways of resolving conflicts
- Providing information about, and teaching, constructive coping strategies that can help to manage stress.

The most common coping mechanisms taught and encouraged are:

- Problem solving
- Assertiveness
- Positive self-talk
- Stress and anger management
- Communication skills
- Skills for establishing and maintaining relationships
- Conflict resolution
- Time management
- Community living skills (Hungerford et al 2015; Meadows et al 2012).

An understanding of the types and levels of anxiety and defensive patterns of behaviour used in response to anxiety is basic to effective psychiatric nursing care. Hildegard Peplau was a nurse theorist whose conceptual model of anxiety provides a firm basis on which nurses can plan interventions for consumers experiencing anxiety. Nurses would benefit from reviewing the work of Peplau (1991) and other psychiatric nursing texts to enhance their knowledge of the relationship between anxiety and mental illness and the range of treatment options available.

## Care during a panic attack

Care during a panic attack can take the form of:

- Remaining with the person during the attack and speaking in a calm confident voice using short and simple sentences

- Ruling out that the person is not experiencing a cardiac incident
- Asking the person to take slow deep breaths and to breathe in and out through their nose. Place their hand on their diaphragm to focus their attention on their breathing and reduce the breath rate to 10 per minute until the anxiety recedes
- Explaining to the person to cup their hands around their mouth and breathe can assist in preventing fainting from hyperventilating.
- Following the panic attack, explaining to the person what they have experienced is a panic attack; reassure the person that they can get help to manage panic attacks
- Referring the person to their general practitioner for a full physical assessment to rule out a physical cause (Jakopac & Patel 2009).

In addition, strategies to help tolerate and decrease the effects of anxiety can be taught, although these address the effects rather than the cause of anxiety. These strategies include complementary therapies such as visualisation techniques, guided imagery, meditation and relaxation training.

## The consumer experiencing depression

Depression is an emotional state that most people experience at one time or another. It can manifest anywhere along a continuum from intermittent feelings of sadness to a persistent deep sense of unending despair accompanied by hallucinations and delusions (Hungerford et al 2015). Often at the onset of depression the mood begins with a feeling of sadness that may be described as 'feeling down in the dumps'. As depression worsens, sad feelings deepen until those affected feel gloomy and dejected much of the time. At this level of depression people may describe the experience with statements such as 'I have no joy in my life anymore' or 'I just feel unhappy'. They will often describe feeling no pleasure in undertaking previously pleasurable activities (such as going to the movies with friends)—this is known as anhedonia. For some people the depressed mood can deepen even further until there is a persistent feeling of utter desolation. Severely depressed people have a sense of hopelessness about the past and the present, and the future looks black and bleak. The heavy feelings of despondency, wretchedness and acute misery are relentless. People affected feel desperately low and worthless, and this experience is accompanied by a sense of despair so profound that they do not believe the feelings will ever lift (Elder et al 2013).

Feelings of sadness and even intense grief, such as might be felt at the death of a loved one, are normal reactions to the various losses encountered by most people during their lives. Sadness and depression in such cases may be transitory, with the person moving through a grieving process and recovering successfully after the loss. Sometimes recovery after a significant loss does not occur and the person moves into a level of persistent and severe depression that does not resolve without professional assistance. This would be termed dysfunctional grieving. In some cases sadness, moderate and severe depression can occur without the person affected being able to identify a particular trigger for the low mood. Depression caused by biochemical imbalance is an example of this (Elder et al 2013).

Feelings of depression are so common that depression is sometimes known as the 'common cold' of psychiatry. It can occur at any age, even in very small children. Children with parents diagnosed with a depressive disorder have a higher risk of experiencing depression than others, and certain events may predispose young people to develop depressive symptoms (Keltner et al 2011). These events include:

- Loss of parents through divorce
- Death of other individuals close to them (e.g. grandparents, siblings, other relatives or friends)
- Death of a loved pet
- Move to a new neighbourhood or town
- Academic difficulties or failure
- Physical illness or injury that entails a stay in hospital.

Depression has a wide range of signs and symptoms but even so some people are able to hide their depression from others. Clinical Interest Box 39.8 lists the common signs and symptoms of depression. For some people depression may also be accompanied by anxiety. Some people experience alternating moods of depression and elation that can be disruptive to their lives. The periods of elation may be accompanied by significant increase in goal-directed activity and insomnia. Such conditions are categorised as bipolar disorders, whereas mood disorders that have only the one dimension of depression without periods of elation are termed unipolar (Evans & Brown 2012; Videbeck 2013).

Care of a depressed consumer is directed towards first addressing immediate safety needs in those at risk of self-harm or suicide. Suicide is the deliberate act of inflicting harm to one's self where the intention is to die. Self-harm, on the other hand, is self-inflicted injury (such as cutting, scratching or burning) where there is no intention to die. This may require hospitalisation and frequent or constant observation of those so seriously depressed as to be actively contemplating suicide. Antidepressant medication, when necessary, is started immediately, but the symptomatic relief is not generally achieved for at least several days, and possibly up to 4 weeks after therapy starts. Other specific interventions include consumer, family, group, cognitive and behavioural psychotherapy (Keltner et al 2011; Evans & Brown 2012). The major goals are to lift the consumer's mood, improve self-esteem, identify and reduce the impact of any major identified stressors, promote the development of constructive coping mechanisms, assist the consumer to regain interest and motivation in life and also to address any concurrent problems associated with physical health. General care involves:

- Establishing and maintaining a trusting relationship
- Helping the person, when the acute phase is resolved, to recognise and express emotions (e.g. through verbal and non-verbal communication)
- Helping the consumer to set realistic, achievable goals

## CLINICAL INTEREST BOX 39.8 Signs and symptoms of depression

Signs and symptoms of depression vary according to the severity of the low mood but may include:

- Non-verbal cues (sad facial expression, crying, slumped posture, lack of eye content, mask-like facial features)
- Disturbed sleep patterns (e.g. insomnia or sleeping for much longer periods than usual)
- Self-criticism and expressions of guilt feelings
- Low self-esteem that may result in thoughts of self-harm or self-destruction
- Indecisiveness and poor concentration
- Psychomotor retardation or marked reduced mental or physical activity (slow dragging gait, slowed speech pattern and slow, flat, lifeless, colourless verbal responses, lack of concern and apathy about maintaining personal appearance)
- Psychomotor agitation (some people with depression experience significant anxiety that may manifest as restlessness, pacing or constant walking or constant purposeless movements such as pulling at hair or wringing of hands)
- Appetite disturbance—marked loss of weight or weight gain
- Loss of energy
- Loss of sexual libido
- Headaches, chest pains, gastrointestinal disturbances and other physical manifestations
- Increased consumption of substances such as nicotine, alcohol and illicit substances
- Anhedonia (inability to feel any pleasure when participating in activities that previously were pleasurable)
- Delusions and/or hallucinations.

Particular signs that may be associated with depression in children and adolescents include:

- Frequent, vague, non-specific physical complaints such as headaches, muscle aches, stomach aches or tiredness
- Frequent absences from school or poor performance in school
- Efforts to run away from home, or talk of this
- Outbursts of shouting, complaining, agitation, unexplained irritability or crying
- Complaints of being bored
- Lack of interest in playing with friends
- Reckless behaviour
- Extreme sensitivity to rejection or failure
- Increased irritability, hostility or anger
- Difficulty with relationships
- Substance misuse
- Fear of death.

*(Keltner et al 2011; National Institute of Mental Health 2011; Varcarolis & Halter 2010)*

- Encouraging the consumer to establish and maintain social contact and interpersonal relationships
- Encouraging visits by family or significant others, to reduce any feeling of isolation
- Promoting physical health and wellbeing (e.g. adequate exercise, sleep and nutrition)
- Providing information concerning measures that may reduce and help manage stress
- Identifying existing coping mechanisms and coping resources
- Promoting recovery
- Assisting the consumer to develop and enhance constructive coping mechanisms, including decision-making and problem-solving skills (Jakopac & Patel 2009; Hungerford et al 2015; Elder et al 2013).

Table 39.5 outlines nursing interventions and care for the consumer with depression.

People who are depressed are very vulnerable and this may be, in part, why they often withdraw and isolate themselves. This can make it very challenging for the nurse needing to establish effective communication. Clinical Interest Box 39.9 provides some strategies for promoting effective communication with consumers who have depression.

Depression is a major problem in older adults and may also be accompanied by excessive worry, ill-placed guilt and anxiety. Symptoms of depression in the older age group are relatively common but often go undetected and untreated. This may be because sadness is considered a normal response to the losses associated with ageing, such as physical decline, loss of social role and loss of a spouse, and it may not be recognised when normal sadness and grief has developed into clinical depression requiring treatment. It is important to be aware that men over the age of 85 years have the highest suicide rate in Australia; exceeding all other age groups and is more than three times the national average (ABS 2011). In addition, the complexities of physical illness, the side effects of medication and the symptoms of dementia may combine with symptoms of depression, making diagnosis of what is happening complex and difficult (Keltner et al 2011). It is very important for nurses working with older consumers, particularly those with dementia, to be alert for, and report, changes such as unusual expressions of sadness, voicing the

**TABLE 39.5 | Key nursing interventions and principles of care for consumers with depression**

| Action | Rationale |
|---|---|
| Accept consumers as they are and focus on their strengths | People with depression have low self-concept; this is the best approach to promote the return of a more positive sense of personal worth |
| Promote the consumer's own decision making; minimise dependency | Indecisiveness is a symptom of depression and can mean that consumers struggle to make even the most basic decisions. The nurse needs to move the consumer towards independent decision making that is part of mental health |
| Avoid presenting consumers with decisions to make when they are not yet ready to make decisions for themselves | At the height of a depressive illness it is best to simply present situations to the consumers that do not require a decision; for example, 'It's time to come for lunch', 'It's time to have your shower', 'Here is a cup of tea' |
| Respond to hostility or anger therapeutically | Expressions of anger are often part of a depressive illness, possibly because the person has developed a previous pattern of containing any such strong feelings. Understanding the dimensions of the illness helps the nurse to focus on the issue at hand and assist consumers to move towards more appropriate ways of expressing and dealing with their feelings |
| Spend time (brief but frequent) with withdrawn and isolative consumers, even when this feels uncomfortable | Withdrawn consumers remain aware of their surroundings and, even if they do not acknowledge the presence of the nurse or communicate in any way, they can be reassured by that presence. Spending time with the consumer communicates the consumer's worth as a person. It may be that the consumer will learn to be comfortable with the nurse and eventually initiate dialogue |
| Involve consumers in activities in which they can experience success | People can feel good about themselves in many different ways. Accomplishment is one way to develop a sense of self-worth |
| Avoid reinforcing hallucinations or delusions | Confronting these symptoms tends to reinforce them. The best approach is for the nurse to state his or her view of reality and to begin discussing real people, situations and events |

*(Adapted from Keltner et al 2011)*

wish to die, decrease in appetite, reduced enjoyment, loss of interest in activities or other symptoms that may indicate the presence of depression. Depression is not a normal stage of ageing. Clinical Interest Box 39.10 lists some issues relating to the mental health of older adults.

## The consumer experiencing feelings of anger and hostility

Anger is a feeling experienced by most people at certain times. It generally occurs in response to fear, confusion or

### CRITICAL THINKING EXERCISE 39.3

Jason is a 23-year-old man recently admitted to the acute inpatient unit. Jason is studying a law degree at university. However, recently he has been preoccupied with reading books on the occult and demonology in the library. Jason recently broke up with his girlfriend of 4 years, Megan, because he couldn't trust her anymore. Jason confronted his mother Pam recently and accused her of tampering with his food, because he could smell it rotting, and became threatening and hostile towards her. Pam took Jason to their GP and he suggested an assessment by a mental health team. During this assessment Jason revealed that he no longer trusts his best friend Joey because he 'communicates with the devil', and that, despite being a high-achieving student, is currently failing. Jason describes hearing the voice of a demon, who tells him who he can and cannot trust. Jason describes seeing this demon 'lurking in the shadows' at times and he is frightened of these experiences. On one occasion the demon told Jason to hurt Pam; on another he told him to kill himself. Jason describes actively thinking about ways he could kill his mother, and then himself.

The staff assessing Jason decide he should be admitted to the mental health ward. Jason is prescribed 5 mg of olanzapine; however, he refuses to take it, becoming distressed and frightened, claiming staff are trying to poison him. The psychiatrist who examines Jason has made a preliminary diagnosis of schizophrenia.

1. Define the terms hallucination and delusion and identify where these phenomena are expressed in Jason's case.
2. A risk assessment is an integral role of the mental health nurse. What risks does Jason present with?
3. Identify four (4) ways the mental health nurse can encourage Jason to be adherent with his medication.

## CLINICAL INTEREST BOX 39.9 Strategies for promoting effective communication with consumers who have depression

### Acceptance

Spend time with the consumer and accept the person without judgment. People who have depression are not always able to express feelings and may express them through behaviour that is unusual or even bizarre. The nurse should be careful not to make or imply any criticism of the consumer's behaviour because people with depression have low self-esteem and are particularly vulnerable to feelings of disapproval that may be interpreted as rejection.

### Openness and honesty

Because people with depression are less able than others to tolerate disappointment, the nurse should be truthful at all times and never make promises that for any reason might not be kept. Nor should the nurse offer false reassurance.

It is important for the nurse to develop a trusting relationship with the consumer and this will only be achieved with honesty. For example, a consumer may wish to share something private with the nurse but not want the nurse to tell anyone else about what is disclosed. The nurse builds trust by telling the consumer that significant information will need to be shared with other members of the healthcare team. The consumer learns to trust the nurse as a professional whose main concern is shown to be the consumer's own best interest.

### Empathy

Any attempts to cheer up a depressed consumer may be perceived as a failure to understand their feelings or difficulties. Inappropriate approaches such as this may cause the consumer to withdraw further from interactions and may increase their isolation and depression.

Empathy means facilitating the consumer to express feelings of pain and inner distress and to respond in a way that indicates recognition and understanding of that pain and distress.

### Tolerance

People with depression may be unable to make even the simplest decision (e.g. where to sit, what clothing to select and put on). The nurse needs to understand how low mood slows physical as well as mental responses and that the psychomotor retardation is part of the illness, not a deliberate act. It is impossible for consumers with depression to 'shake themselves out of it' and it is not therapeutic to try to badger people with depression into activity. This is likely to result in further feelings of guilt and inadequacy in the consumer. Tolerance is also required for consumers with depression who experience psychomotor agitation.

Underlying anxiety in the depressed consumer may also manifest as hyperactivity or anger and hostility that may be directed towards the nurse. Consumers sometimes shock themselves at the hostile and sometimes hateful things they say to others during periods of depression. It is a normal response for the nurse to feel some frustration and irritation or even anger towards consumers at times, but the nurse must be mindful that the consumer's behaviour is an outward reflection of inner anguish and that to be therapeutic they must remain patient. To assist in this the nurse must reflect on, and implement, the strategies needed to maintain personal mental wellbeing. This may include discussing feeling responses to consumers with a colleague.

*(Keltner et al 2011; Shives 2011)*

frustration. Anger often occurs in response to the anxiety a person feels when a threat is perceived. Most people have little difficulty in handling mild anger, which is experienced as annoyance and usually subsides quickly. Feelings of anger, disappointment and frustration may be expressed verbally or non-verbally; for example, by cursing or kicking a car when it won't start. When a person is very frustrated, such as when they are unable to attain an important goal, anger may become more intense. A person experiencing intense anger may try to disperse the unpleasant feeling through an angry outburst or an act of aggression. Occasionally a person may be so consumed by feelings of anger that they become violent and pose a threat to themselves and to others nearby.

Nurses may encounter anger in the course of providing nursing care; for example, a person whose health is disrupted becomes frustrated, and frustration can lead to anger. Sometimes people express their anger through verbal or physical abuse towards others, including staff members. Therefore it is important that nurses are aware of the reasons why a person may be angry, of their own responses to outbursts of angry feelings and of how to help a consumer to express anger in an appropriate manner. Anger may be the result of various stressors. Some of the factors that may cause anger or aggression in people who are in hospital for any reason include:

- A feeling of loss of control and/or independence, particularly evident when the consumer has no insight into their illness and is compulsorily (or involuntarily) detained
- A sense of isolation from family and familiar environment
- A feeling of loss of identity or individuality

## CLINICAL INTEREST BOX 39.10 Mental health issues in older adults

- The older person is vulnerable to emotional and mental stress from many losses, including the loss of a spouse, loss of social roles and resources, decreased income and loss of status and socialisation associated with paid employment
- Physical health problems such as chronic illness, disability, visual problems, falls and incontinence
- Issues with polypharmacy
- Disorders common in the older population include depression, paranoid reactions and dementias
- Depression is the most common emotional disorder in the older population
- Paranoia may be related to depression and/or neurological disorders. It is also associated with sensory deficits and loneliness
- Of the dementias, the Alzheimer's type is the most common non-reversible dementia
- The risk of suicide increases with age, with men aged 85 and over being particularly vulnerable
- Family carers of people with dementia are more likely than other family carers to experience emotional health problems such as stress, exhaustion and depression

*(Byrne & Neville 2010)*

- Feelings of fear and discomfort because of inadequate privacy
- Anxiety about the possible outcomes of illness (e.g. altered body image).

Some of the specific risk factors leading to a potential for aggression in consumers with mental illness have been identified (Elder et al 2013) as:

- A diagnosis of an illness with paranoid features (paranoia can lead to fears that induce aggressive acts aimed at defending against a perceived threat; for example, the belief that someone is plotting against you or trying to harm or kill you can lead to lashing out at that person defensively)
- Substance misuse
- Deterioration in family and/or social relationships
- A previous history of aggression or violence and declared threats of violence
- Developmental history of exposure to aggression and violence
- Non-adherence to a medication regimen
- Failure to learn to delay gratification of wants (e.g. extreme frustration when need is not met immediately)
- Failure to learn alternative strategies other than aggressive responses
- Unresolved conflicts
- Hostility to authority
- Denial of aggressive behaviour
- Lack of remorse.

Aggressive outbursts may occur when a person is unable to find a solution to a problem that is causing fear, confusion or frustration. Aggressive action may be directed towards the person or object perceived as the source of the frustration, or at other persons or objects in the vicinity. Displacement is a defence mechanism whereby a consumer discharges pent-up feelings, such as anger, on a person or object other than the one that aroused the feelings (Halter 2014). Approaches for dealing with anger and hostile behaviour in the mental healthcare environment are outlined in Table 39.6. Nurses may apply the principles of these approaches, when necessary and appropriate, in any healthcare setting.

Preventing aggression and violence is important for the wellbeing of consumers and others. Assertive behaviour is one constructive way of dealing with anger. To be assertive is to stand up for oneself while taking into account other people's interests and feelings. It takes time to develop the ability to be assertive when people are in the habit of being subservient or responding to situations they are unhappy with by being aggressive. It is within the role of MHNs to conduct training for consumers who will be helped by developing assertiveness skills.

## The consumer who is at risk of self-destructive behaviour

Self-destructive behaviour is that which results in physical harm and, sometimes, in the person's own death by suicide. Self-destructive behaviour includes self-mutilation and any form of suicidal activity.

### Self-mutilation/Self-harm

Deliberate self-mutilation results from overwhelming mental distress and is the deliberate destruction of body tissue usually without conscious intent of suicide (Hungerford et al 2015). Self-harm may occur once or it may become repetitive. It may or may not be impulsive. It is a behaviour associated with a range of mental health disorders (Elder et al 2013) including:

- Childhood and physical and sexual abuse
- Schizophrenia
- Drug-induced psychosis
- Borderline personality disorder
- Eating disorders
- Cognitive impairment disorders
- Obsessive–compulsive disorder
- Post-traumatic stress disorder.

Self-harm may involve skin cutting, severe skin scratching or burning, head banging, self-biting, eyeball pressing, tearing out hair, self-punching or inserting dangerous objects into body orifices such as the vagina or rectum. It may involve skin carving (words, designs, symbols), bone breaking or interfering with healing by picking at wounds. Very rarely, extremely serious acts of self-mutilation occur, such as eye enucleation or amputating fingers, toes or genital organs. Other behaviours that may be considered self-destructive include involvement in unsafe sex, irresponsible gambling or spending, substance misuse, driving recklessly and binge

**TABLE 39.6 | Approaches for dealing with anger and hostile behaviour in the mental healthcare environment**

| Action | Rationale |
|---|---|
| Accept the consumer but make it clear that certain behaviours are not acceptable | This is a non-judgmental approach that informs the consumer that they are accepted as a person but that certain aspects of their behaviour are not appropriate |
| Acknowledge the person's anger and their right to their feelings | This demonstrates respect and acceptance of the consumer |
| Allow expression of the anger in appropriate safe ways; for example, voicing angry feelings verbally, discharging anger in non-destructive acts (e.g. not damaging property or person) | Anger is self-limiting and it may be better to let it run its course than to forcibly try to stop an angry person. Attempting to stop the person's expression of anger can restimulate the aggressive feelings and lead to a continuance of displayed anger |
| Try to remain calm (self-talk and relaxation techniques such as deep breathing and muscle relaxation can help with this). Provide psychological containment by staying in the same calm 'gear' and avoiding any tendency to retaliate or placate | Retaliation or trying to placate an angry person can stimulate the consumer to higher levels of aggression. Consumers need their feelings to be acknowledged and understood; retaliation and appeasing do not achieve this |
| Be aware of your body language—try not to communicate threatening non-verbal signals (e.g. keep your hands in a low position) and avoid trying to touch a consumer who is agitated | Raised hands may be interpreted as a threatening gesture, particularly by consumers who are experiencing paranoia, confusion or disorientation and such a gesture may be interpreted as indicating a failure to understand the consumer's feelings and point of view<br>Touching a person who is agitated may be interpreted as threatening, and consumers who are paranoid may already be experiencing heightened fear |
| Do not try to defend the person or situation the consumer is feeling angry about | |
| Set limits and be firm and consistent in treatment approaches. Encourage the consumer to take control by raising awareness of options at times of angry feelings (e.g. time-out, walking/talking with nurse, medication). The consumer should also be aware of the outcomes if self-restraint is not demonstrated | A consumer at risk of aggressive outburst is helped to remain in control if limits on what is acceptable are clear and alternative options for dealing with feelings are provided; for example, exercise, informing and seeking help from a nurse or other therapist when feelings are surfacing |
| Later, when the consumer is calm, assist to explore the immediate cause of the anger and anything that precipitated the aggressive response | Recognition of triggers can assist with problem solving |
| Help the consumer engage in problem solving and exploring alternative ways of handling their feelings | Engaging the consumer in solving their own problems is empowering because it informs the consumer that they can take responsibility for their actions |
| Be supportive and provide positive feedback when the consumer controls hostile or aggressive behaviour | Positive reinforcement is a way of helping people to modify unwanted behaviour |
| Accept that some anger may be displaced or projected on to you | The defence mechanisms of displacement and projection serve to reduce the anxiety and the threat to self, caused by the intense emotions. Understanding this helps the nurse to avoid taking the hostility personally |

**TABLE 39.6 | Approaches for dealing with anger and hostile behaviour in the mental healthcare environment–cont'd**

| Action | Rationale |
|---|---|
| Don't take unnecessary risks. If a person's anger is not subsiding but is in danger of escalating into destructive or violent acts, take whatever action is necessary to protect yourself and others (e.g. remove yourself and others from the area, seek assistance from others) | Nurses have rights in relation to workplace safety. Apart from the risk of personal harm to the nurse or others, the consumer who causes harm can later feel devastated by what has happened. Such an occurrence can be extremely destructive to the person's self-esteem and to the therapeutic process |
| Debrief with colleagues after the incident and seek any additional support that you feel you require | Dealing with aggression is challenging and can be frightening. Debriefing is a way of relieving the associated stress and can serve to identify ways for nurses to reduce risks and improve responses in the future |

*(Shives 2011)*

eating (Elder et al 2013; Varcarolis & Halter 2010). The reason for self-mutilation is not totally clear but various explanations are possible. It may be:

- A maladaptive coping mechanism that raises low self-esteem by denying helplessness or powerlessness
- A self-punishing act that helps relieve unconscious feelings of guilt
- Risk-taking behaviour that, when overcome, raises self-esteem
- A way to reconnect to feeling real and alive, as opposed to feeling empty or feeling nothing
- A way of releasing tension or anger
- Using physical pain to create distraction from emotional pain
- An unspoken request for nurturing and love
- A way of manipulating others.

Nursing skills for helping consumers manage self-harming behaviour include:

- Adopting an empathic and non-judgmental attitude
- Demonstrating support and using active listening
- Encouraging the consumer to share their thoughts and feelings about self-harm
- Helping the consumer to identify personal triggers and stressors
- Exploring with the consumer adaptive ways to cope with uncomfortable feelings
- Gaining the consumer's agreement that they will contact a staff member if they experience negative or overwhelming thoughts concerning self-harm
- Demonstrating a sense of calm and safety for the consumer
- Staying with the consumer and providing support if they are distressed
- Telling the consumer that you will spend time with them when they need emotional support
- Encouraging the consumer to engage in their usual activities and self-care where possible
- Maintaining a safe environment—removing harmful substances or objects from the consumer and the area
- Selecting a room that is close to the nurses' station in order to keep the consumer safe
- Providing safer means to experience physical pain that do not result in disfigurement, such as holding ice to a location on the body the consumer wishes to cut or harm
- Following the policies and procedures of the setting regarding observation and medication (Elder et al 2013).

## Suicidal behaviour

Suicide is an action where the intention is to result in self-inflicted death, as opposed to self-harm where the intention is to hurt one's self but not die. Self-destructive behaviour may result from any stress a person perceives as overwhelming, and is commonly associated with low self-esteem. When the sense of self-worth is extremely low, self-destructive behaviour reaches its peak and it is at this point that the risk of suicidal behaviour is likely. Suicidal behaviour implies a loss of the ability to see oneself as being of any value or worth at all (Elder et al 2013). Some of the risk factors for suicide are identified in Table 39.7.

Risk assessment is a crucial intervention in estimating a person's intent to self-mutilate or end their own life, and a formal risk assessment should be conducted whenever a mental state examination is conducted. It should be noted that the successful use of an assessment tool involves the ability to establish effective open and honest communication with the consumer, and expertise in the art of therapeutic communication is perhaps the most important component of the mental health nurse's contribution to care (see Chapter 8).

The first priority in dealing with a person who is at risk of, or exhibits, self-destructive behaviour is to protect the person from harm. All dangerous or potentially dangerous objects that could be used in an act of self-harm must be

**TABLE 39.7 | Suicide risk factors**

| Variable | Risk categories |
|---|---|
| Age | Risk generally increases with age but also at particular risk are young men and elderly men |
| Marital status | Higher risk in single, widowed, separated and divorced people. The death of a loved one is a particular risk factor in the older population |
| Gender | More common in men than in women (more women attempt suicide, more males succeed) |
| Physical health | Those experiencing chronic, debilitating, progressive or life-threatening illness<br>Alcohol and drug misuse/addiction<br>Sleep disorder/deprivation |
| Psychological health | Low self-esteem<br>Depression<br>Feelings of hopelessness<br>Feelings of loneliness and abandonment ('nobody cares')<br>Experience of significant loss<br>Unrelenting and distressing hallucinations/delusions<br>Command hallucinations (auditory hallucinations instructing the person to self-harm)<br>Impulsiveness, hostility and aggression<br>Bereaved by suicide |
| Social health | Social isolation/exclusion or sense of alienation<br>Poor level of social supports<br>Conflict with supportive others<br>Social upheaval (e.g. divorce, accommodation changes)<br>Unemployment<br>Poverty and poor living conditions (e.g. homelessness) |
| History | Suicide attempts in previous 12 months<br>Family history of suicide<br>Expressed intent<br>Evidence of planning (e.g. has given away possessions, made a will, said goodbyes)<br>Evidence of preparation; that is, has the means available (e.g. has a gun, has the pills)<br>Early recovery phase in severe depression |
| Previous suicidal attempts | |

*(Adapted from Ryrie 2000; Muir-Cochrane et al 2014)*

removed from the consumer's environment. This includes knives and other sharp implements, matches, glass, phone chargers, items of clothing such as belts, scarves or stockings or anything else that may be used by the consumer to inflict self-harm. Other approaches for dealing with self-harm and suicidal behaviour are outlined in Table 39.8. While it takes time and experience to become an accomplished mental health nurse, and the care and management of at-risk consumers requires particular expertise, the principles of care, when necessary and appropriate, may be applied by others in any healthcare setting to protect consumers.

Deliberate self-harm and suicide are complex issues, and a simple and brief overview has been provided here. As people with depression and self-harming tendencies may be encountered in every area of nursing, it is recommended that nurses explore the issues further by accessing psychiatric or mental health nursing textbooks and state government policies. See, for example, *Working with the Suicidal Person* (Department of Health (Victoria) 2010).

## The consumer who experiences hyperactivity

Hyperactivity can be a manifestation of a variety of mental health disorders, caused by the misuse of certain substances such as cocaine and amphetamines (Elder et al 2013) but is particularly associated with bipolar disorders. Bipolar disorders are a group of mood disorders that manifest with periods of depression and mania. The hyperactivity associated with mania is quite different to the normal exuberant activity engaged in by most people at various times. Hypomania is a clinical syndrome similar to, but not as severe as, mania which is sometimes termed hypermania (Sadock et al 2015). Previously people who experienced the mood cycles associated with bipolar disorders were said to have a manic depressive illness.

Mania is characterised by excitability, optimism, marked hyperactivity, talkativeness and a decreased need for sleep. The symptoms vary in intensity. In the milder form, people

## TABLE 39.8 | Approaches for dealing with self-harm and suicidal behaviour in the mental healthcare environment

| Action | Rationale |
|---|---|
| Engage in an open exploration of suicidal ideas, including the frequency and intrusiveness of the thoughts, the planning and motivation | Open exploration is an essential component of identifying the level of risk of self-harm. Any statement that alludes to self-harm (e.g. a threat or innuendo made by the consumer that they are thinking about harming themself should be taken seriously) |
| Assess the risk factors | A formal risk assessment should be conducted whenever any risk of self-harm is detected. Risk-minimisation strategies appropriate to the level of risk identified should be put in place (e.g. close observation, removal of objects deemed unsafe, contractual agreement for the consumer to report to the nurse when thoughts of self-harm are likely to be acted on). Mental healthcare agencies usually have specific guidelines and policies for management of consumers at risk of self-harm |
| Be with consumers in a calm, accepting and empathic manner | Facilitates open and honest communication and the development of a therapeutic relationship |
| Engage in therapeutic conversation that facilitates the safe expression of distress and the identification of the underlying issues and concerns | Helps the consumer to identify the factors (stressors) responsible for wanting to commit acts of self-destruction and will inform as to the measures that are appropriate to facilitate the healing of mental anguish Therapeutic silence is also powerful. Often remaining quietly with the consumer without speaking is a powerful tool |
| Recognise the opportunity for learning, personal growth and positive change as a potential outcome of the consumer's present experience | Recognising that positive outcomes are possible stimulates a sense of hope in the nurse, which can be relayed to the consumer. Hope and realistic optimism facilitate recovery |
| Work collaboratively with at-risk consumers, their significant others and other health professionals in assessing needs and planning care | Appropriate interventions may involve different areas of professional expertise (e.g. recreational therapist, psychiatrist, dietitian, psychologist). The consumer's significant others need to be aware of the strategies required to maintain the consumer's safety, and their involvement can be supportive for the consumer |
| An appropriately qualified person should negotiate a risk-minimisation plan with the consumer and significant others | Risk-minimisation plans usually involve a contractual agreement, and this needs to be firm and clear. Nurses are advised to work with experienced staff in relation to these before attempting to implement them |
| Be clear about the consumer's responsibility for their own safety within the context of the plan | Consumers need to understand that, within the contractual arrangement, control of the situation is theirs. This is empowering, but consumers also need to feel supported in managing their feelings |
| The care plan must be clear to all staff working in the consumer's environment (see Nursing Care Plan 39.1 as an example) | It is a team responsibility to support and protect the consumers and facilitate the success of the contractual arrangement |
| Be clear about the availability of support when a person feels unsafe, and ensure the person understands the boundaries that apply | The consumer needs to be clear about who is available and when they can provide support, and the type of support that is possible. This ensures that the risk of inappropriate dependency on staff is reduced and the consumer's sense of responsibility in the situation is reinforced |
| Mobilise social support | Social support is important in maximising the consumer's coping abilities. It can also assist the consumer to increase self-esteem (e.g. by promoting relationships with others). For consumers who are at risk but living in the community, arrangements may be made for another person to 'keep the means' (e.g. the consumer's medication), and for people to visit the consumer during times of the day when they are likely to be on their own |
| Engage in problem solving with the consumer | Helps maximise the consumer's constructive coping strategies and develop others |
| The nurse must be aware of personal and team responsibilities and accountability in relation to caring for at-risk consumers. | Consumer safety depends on staff fulfilling responsibilities. Responsibilities include knowing which consumers are demonstrating an increasing risk of self-harm (e.g. increasing alienation), and which are showing signs of improvement (e.g. smiling, interacting with others). The nurse should be aware that signs of improvement can be misleading |

*(Hungerford et al 2015; Elder et al 2013)*

can appear to have excess energy, they may present as the 'life and soul of the party', be able to work long hours and be very productive in work and leisure activities. If the symptoms increase to the most severe level, people may experience serious impairment in judgment that allows them to behave in ways not usually in keeping with their personalities. For example, a normally shy and quiet woman may become loud, dress in bright and gaudy clothing and become overtly sexually provocative; a normally sensible and frugal young man may run up huge and unmanageable debts on his credit card, drive his car at outrageously dangerous speeds and yell obscenities out of the car window as he narrowly misses other vehicles and pedestrians. Such dangerous and life-threatening behaviours may be of no concern to the affected person if they have psychotic symptoms, because delusional thoughts may make them believe that they are indestructible; for example, the young man above may believe that he is immortal because he is a new god come to save the world. Common symptoms associated with mania are summarised in Table 39.9. People who are experiencing the severe form of mania may need to be admitted to an inpatient unit for their own protection and for the protection of others.

Treatment includes firm limit setting, cognitive therapy, counselling and medication. Lithium (a mood stabiliser) is one drug that is effective in treating the symptoms of acute mania and in reducing or preventing recurrence of the mood swings associated with bipolar disorders. However, lithium and other drugs often cause unwanted side effects and levels in the blood require strict monitoring to prevent lithium toxicity. In addition, some of the feelings of elation and mania are enjoyed, so consumers are understandably not always willing to take the medications that stop the feelings so drastically and they may seek alternative ways of controlling the illness. Nursing interventions vary according to the level of mania and include:

- Maintaining consumer's safety and the safety of others
- Maintaining the consumer's biological normality (e.g. meeting rest, nutrition, fluid and elimination needs)
- Facilitating activities of daily living (e.g. meeting hygiene needs)

**TABLE 39.9 | Common symptoms associated with mania**

| Type | Symptoms |
|---|---|
| Affective (mood) | Labile, elation or euphoria<br>Expansiveness<br>Humorousness (witty)<br>Inflated self-esteem<br>Intolerance of criticism<br>Lack of shame or guilt |
| Physiological | Dehydration<br>Inadequate nutrition<br>Weight loss<br>Reduced need for sleep |
| Cognitive | Ambitiousness<br>Denial of realistic dangers<br>Distractibility and poor attention span<br>Flight of ideas (jumping from one train of thought to another without pause)<br>Grandiosity (e.g. delusions of grandeur)<br>Illusions<br>Lack of judgment and impaired decision making (e.g. unable to evaluate realistic danger and consequences of actions)<br>Looseness of associations<br>Delusions |
| Behavioural | Irritability/argumentativeness/aggressiveness especially if thwarted in achieving what is desired<br>Excessive spending when unemployed or broke and other forms of irresponsibility<br>Grandiose acts that may involve excessive risk taking<br>Increased motor activity and pressure of speech (extreme rapidity)<br>Impulsiveness (e.g. making important financial decisions with little thought)<br>Poor or bizarre personal grooming<br>May wear bright and ornate clothing (reflect elevated mood)<br>Sexual provocativeness and sexual hyperactivity that is often promiscuous<br>Excessive involvement in pleasurable activities without regard for negative consequences (e.g. swimming in dangerous conditions, unprotected sexual activity with strangers) |

*(Sadock et al 2015; Videbeck 2013)*

- Helping the consumer to regain and maintain self-control
- Preserving the consumer's dignity when behaviour is out of character and when it will be a source of embarrassment or humiliation when functioning more normally
- Reducing the amount of stimulation to which the consumer is subjected
- Providing a structured daily program that allows opportunities to expend energy in set activities (e.g. physical activity such as using an exercise bike or walking may help to drain excess energy)
- Promoting sleep and rest (which may require sedatives such as temazepam).

The overall goals of care are to help the consumer establish constructive coping mechanisms and increase the consumer's satisfaction gained from interaction with the world (Elder et al 2013). To do this the mental health nurse must establish and maintain a trusting relationship with the consumer. Attempting to do this can be challenging and frustrating for the nurse, partly because particular unusual speech patterns are common in people experiencing episodes of mania that impact on the ability to communicate effectively, particularly when consumers are in the acute phase of mania. The speech patterns associated with mania are listed in Clinical Interest Box 39.11.

Some of the factors that present challenges to nurses in developing therapeutic relationships are that the consumer may:

- Have a brief attention span
- Find it difficult to be still, and need to be in perpetual motion
- Find it difficult to listen to others and constantly interrupt
- Appear unaware of verbal and non-verbal cues indicating that others wish to speak
- Continue with a constant stream of speech that is sometimes unintelligible
- Have confused thinking, with thoughts racing one after the other (this makes it difficult for the consumer to make connections between concepts and so when speaking they may jump rapidly from one subject to another)
- Have diminished awareness of personal space boundaries and tend to invade the 'intimate zone' of others
- Have little understanding of how overpowering, excessive and confrontational their interactions can feel to others
- Test the rules and limits set for the therapeutic environment
- Be insistent on having their own way and may attempt to manipulate people, including the nurse, in order to achieve this
- Frequently insult staff or others, use foul or sexually explicit language, taunt and annoy others
- Be seductive towards the nurse (among others) (Elder et al 2013; Hungerford et al 2015; Halter 2014).

Management includes setting clear limits on behaviour while being supportive but firm. Setting limits involves reinforcing that it is the behaviour and not the person that is rejected. For example, it is preferable to say, 'That sort of language is not accepted in this unit', rather than, 'You are so crude speaking like that.'

## CLINICAL INTEREST BOX 39.11 Examples of speech patterns associated with mania

| | |
|---|---|
| Pressured speech | Rapid and accelerated speech that continues without pauses between words or sentences. The flow of rapid talking continues without regard to others who may be attempting to answer, intervene or add something |
| Clang associations | The stringing together of words that rhyme without regard to their meaning. Words are chosen for their sound, not their meaning. |
| Circumstantiality | Use of long irrelevant descriptions when trying to describe a person, situation or event. The account may include vast amounts of irrelevant and unrelated information and may include lots of repetition |
| Loose associations | Lack of a logical relationship between thoughts and ideas that renders spoken communication vague, unfocused (waffly) and diffuse (longwinded) |
| Flight of ideas | A nearly continuous flow of accelerated speech characterised by abrupt verbal skipping from topic to topic, usually based on chance associations between words |
| Tangentiality | Constantly diverging in mid-conversation to different and unrelated topics. When describing a situation, frequently losing the train of thought, and not completing descriptions of anything |

*(Shives 2011; Sadock et al 2015; Videbeck 2013)*

The nurse at all times needs to remain calm, speak clearly and explain what is required simply and firmly but in a caring manner. Staff should be mindful of not mirroring manic behaviour, ensuring they take note of the tone and volume of their voice. All staff must be aware of the limits and rules set for the consumer's behaviour, which must be constantly reinforced to assist the consumer to regain control of their behaviour. It must be remembered that behaviours that appear manipulative, fault finding or exploitative of others' vulnerabilities are the outward expression of inner turmoil, distress and often serious emotional need. Such behaviour is the consumer's way of trying to gain a sense of control at a time when they have no control of most aspects of their life; not even their own thoughts or feelings (Halter 2014). Table 39.10 provides some approaches for dealing with hyperactivity associated with the manic phases of bipolar disorders, but the principles apply to consumers experiencing excessive or uncontrolled hyperactivity from any cause.

Bipolar disorders and any disorder in which hyperactivity is a serious problem can be potentially devastating for consumers and their families. It is an important part of the mental health nurse's role to ensure that everyone affected understands about the illness causing the behaviour, is aware of what can and cannot be done to control the illness and what services and supports are available to help them to cope.

### CRITICAL THINKING EXERCISE 39.4

Jane is a 19-year-old unemployed woman who was brought into the emergency department by her mother after taking an overdose of drugs from the family medicine cabinet. She was found by her mother in her bedroom unconscious. Following treatment in the emergency department she was transferred to the inpatient psychiatric unit. She has recently separated from her boyfriend and her father has left to live interstate with a new partner. Identify the risk factors for suicide. What are the specific risks factors for Jane? Outline the approaches for dealing with self-harm and suicide in the inpatient setting.

## Consumers experiencing confusion or disorientation

A person may become confused or disoriented for a variety of reasons, including as a result of delirium, dementia or from the toxic effects of alcohol and some prescribed and non-prescribed drugs. The effect in each case is a significant marked change in cognitive abilities from the consumer's previous level of functioning. Cognitive functioning includes the mental processes of memory, reasoning, judgment, orientation, problem solving, decision making, the acquisition of knowledge and the ability to use and comprehend language. Some causes of cognitive dysfunction are reversible, others are not. Delirium, for example, is a syndrome that involves a disturbance to a person's state of consciousness, which is accompanied by changes in cognition, almost always due to an identifiable cause that can in most cases be rectified. Dementia, on the other hand, is a progressive, irreversible and disabling condition in which changes in cognitive function are caused by gradually increasing, permanent damage to the brain. The focus here is on caring for those with progressive dementia.

Dementia is one of the most common causes of confusion and disorientation, with over 280 000 people in Australia currently identified as having the illness. It is a disorder normally associated with older consumers but, although the risk of dementia does increase with age, more than 16 000 of those identified as having dementia are under age 65 (Alzheimer's Australia 2011). Alzheimer's dementia (AD) is the most common form of the illness, but all types of dementia share similar symptoms and require similar interventions. Dementia is associated with high rates of diagnosed co-morbid mental illness in residents of aged care facilities (affecting up to 44% of dementia sufferers) and in Australia dementia is the second leading cause of death (ABS 2015; Australian Government Department of Social Services 2015). The symptoms depend on the sequence in which areas of the brain are damaged by the disease process, so the progression of symptoms varies in different people. Symptoms change and increase in severity over the duration of the illness, which in the case of AD can be 3–20 years, the average span being 7–10 years (Alzheimer's Australia nd). Symptoms include:

- Gradual memory loss
- Increasing loss of language and communication skills
- Progressive decline in ability to perform routine tasks despite having intact physical functioning (in the early stages of dementia this may mean difficulty with coordination when preparing a meal or when shopping and handling money, or when driving a car. Later this extends to include difficulty with tasks such as dressing, eating and bathing)
- Impaired judgment, abstract thinking
- Difficulty in concentrating and learning new information or skills
- Changes in behaviour (e.g. wandering, incessant walking, constant repetition of words, confabulation)
- Changes in personality and mood (up to two-thirds of people with AD have symptoms of depression, and about 20% exhibit aggression)
- Hallucinations and delusions (hallucinations are experienced by about 16% of people with AD, delusions by about 30% and they are often paranoid in nature)
- Loss of initiative
- Altered sleep–wake patterns
- Loss of bladder and bowel continence (usually later stage) (Access Economics 2003).

### Caring for the consumer with dementia

Care interventions for a consumer with dementia are dependent on the consumer's abilities, and the focus of care should be on what the consumer can still do rather on abilities lost.

**TABLE 39.10 | Approaches for dealing with hyperactivity associated with bipolar disorders (manic phase)**

| Action | Rationale |
|---|---|
| Use a firm and calm approach | This helps promote a therapeutic relationship and is reassuring for the consumer and provides structure and control for a consumer who is out of control |
| Use short concise explanations or statements | A short concentration span and confused thinking make it difficult for the consumer to absorb complex information |
| Remain neutral, avoid power struggles and value judgments | Avoids provoking hostility or combativeness. Consumers can use inconsistencies and value judgments as justification for arguing and escalating mania |
| Maintain a consistent approach (e.g. provide a consistent and structured environment and keep expectations the same) | This provides the framework that assists the consumers to regain a feeling of control. Clear and consistent limits and expectations minimise the potential for consumers to manipulate staff or annoy others |
| Firmly redirect energy into appropriate and constructive channels, provide an outlet for physical energy in a non-stimulating environment (e.g. use of a punching bag in a quiet area) | Helps in establishing constructive mechanisms for coping with excess energy. Can help release pent-up hostility and relieve muscle tension |
| Decrease environmental stimuli whenever possible (e.g, avoid loud music, noises, bright lights, people) | Limits distractions that can provoke agitation and escalate mania |
| Provide structured solitary activities—tasks that take minimal concentration are best. Avoid groups and stimulating activities | Solitary activities are best until distractibility is settled and the consumer is able to comfortably tolerate being part of a group |
| Spend one-on-one time with the consumer, especially when psychotic or anxious | Provides reassurance and gives the message that the consumer is a worthwhile person. As mania and hyperactivity settle, provides time for exploration of issues |
| Encourage frequent rest periods<br>Provide high-calorie fluids and finger foods frequently throughout the day<br>On a daily basis, monitor the consumer's sleep pattern, food and fluid intake and elimination pattern (constipation is a common problem) | It is important that the consumer's physical wellbeing is maintained during the time they are not concerned with it themselves |
| Provide the consumer and the family with explanations and written information about the illness and the treatment plan (it is particularly important that the consumer and family understand the information concerning medication) | Information is important to promote compliance with treatment regimens and minimise the risk of recurrence of symptoms |
| Ensure consumer and family or significant others understand how to access the supportive services in the community | Knowing about community supports includes information about accessing help in a crisis, which can be reassuring. Information about support groups and activities aimed at prevention are helpful in promoting coping mechanisms and recovery |

*(Adapted from Varcarolis & Halter 2010)*

General care interventions are listed in Table 39.11 and in Clinical Interest Box 39.12. (See Chapter 15 for more information.)

Reality orientation is a form of rehabilitation used to orientate confused or cognitively impaired consumers by promoting or maintaining their awareness of person, time and place. It is recognised as unrealistic to expect to orientate people in the later stages of dementia to present time reality, but some of the principles of reality orientation are appropriate and helpful (Elder et al 2013). Helpful aspects include:

- Calling the consumer by their preferred name every time they are approached

## TABLE 39.11 | Information for nurses and for consumers with dementia and their family carers

| Information that nurses need to know | Information that nurses need to give people with dementia and their family carers |
|---|---|
| • Short-term memory loss is a primary symptom in the early stages of dementia of the Alzheimer's type. Memory loss later becomes global and affects short- and long-term memory<br>• Certain medications, especially in combination, can cause increased confusion and agitation<br>• Safety in the home and in healthcare settings is a primary concern because consumers with dementia are at increased risk of falls and other injuries from the combination of sensory effects, memory loss and age-related factors<br>• Consumers may be unable to communicate pain or emotional distress; the nurse needs to assess consumers regularly and monitor closely for physical and mental concerns, including concurrent depression, which can exacerbate the symptoms of dementia<br>• Sundowning syndrome (evening agitation associated with a busy time of day and resulting from consumer fatigue) may lead to challenging behaviours. Planned activities for consumers are helpful in preventing agitated behaviour at this time<br>• A structured environment with minimal changes is critical because it reduces consumer anxiety, confusion and agitation<br>• Consumers with AD may occasionally confabulate (attempt to fill memory gaps with unrelated information), which is not considered lying<br>• Consumers who confabulate may need gentle validation of their sense of what is true, or they may be gently redirected to another topic because confronting them with reality may result in confusion and distress<br>• Intake of nutritional supplements, herbs and over-the-counter medications may interfere with the consumer's prescribed medications<br>• Consumers cared for at home may resist outside help and place undue demands and stress on the family carer<br>• Stressors that can provoke consumer anxiety or confusion should be identified and modified or avoided as much as possible (e.g. loud music, cluttered rooms)<br>• Potential elder abuse may be a result of family carer strain, and consumers and carers need to be evaluated if abuse is suspected. Carers need to be made aware of all available supports and respite services in the community to reduce strain when people with dementia are cared for at home<br>• Access current resources available on the internet and in the library | • Teach consumers (in the early stages of the illness) and their families about the disorder and explain the progression of the illness and prognosis so that expectations are realistic. Consumers with dementia (especially those with young-onset disease) can choose and plan what they want to do with their lives in light of their prognosis, and can deal with any legal matters while cognition allows (e.g. make a will, advance directives)<br>• Teach the family carers actions and precautions to reduce the consumer's risk for falls or other injury<br>• Instruct the family how to observe for non-verbal signs of pain and discomfort (e.g. groaning, cold clammy skin, holding body part, changed vital signs)<br>• Teach the family about sundowning syndrome and offer strategies to reduce fatigue, confusion and agitation (sometimes family carers themselves discover helpful strategies that they can pass on to professional carers, as the 24-hour/day care they provide often makes them experts in dementia management and care)<br>• Teach the family about changes in condition (e.g. exacerbation of confusion, signs of depression) that are signs of health problems separate to dementia. Ensure awareness of who to contact for help and advice<br>• Teach strategies that promote the consumer's existing memory and connectedness with others (e.g. validation, reminiscence, environmental cues, familiar songs, pictures, pets, etc.)<br>• Ensure awareness of correct medication regimen, possible side effects and importance of following the medical officer's directions for administration<br>• Ensure awareness of discussing use of non-prescribed drugs (e.g. herbal remedies) with the medical officer to avoid side effects when combined with prescribed medications<br>• Suggest that the consumer remain under care of one medical officer to provide consistent care and clear medication regimen. This avoids the risks of adverse drug interactions from incompatible medications and polypharmacy (multiple medications)<br>• Teach the family about confabulation and stress that it is not lying, and that it is best to validate the person's belief of what is true. Stress that it can be distressing to challenge the person's view of reality. For example, if the person says they had egg, bacon and mushrooms for breakfast, it is best not to contradict them even if you are certain that they only had porridge<br>• Teach to identify stressors (anxiety triggers) in the home environment, and offer realistic solutions<br>• Explain the benefits of outside help when the help comes from skilled and reliable carers who can bond with the person with dementia<br>• Encourage the family carer to take advantage of respite and other services that will reduce the strain of caring for someone with dementia. Encourage family members to share the caregiving responsibilities<br>• Stress the importance of 'time out' for the family carer to recharge personal batteries, and the importance of maintaining their own health. This includes attendance to preventive strategies such as routine health checks, mammograms and flu injections<br>• Inform family carers about how to access current information via the internet and libraries, and from agencies such as Alzheimer's Australia (there are Alzheimer's information centres in many areas of Australia and New Zealand, many of which offer consumer and family carer support groups, among other services. Many also offer educational programs for family and professional carers) |

*(Adapted from Fortinash & Holoday Worret 2011)*

## CLINICAL INTEREST BOX 39.12 Interventions appropriate for consumers experiencing confusion or disorientation

Appropriate care for the confused or disoriented consumer includes:

- A safe, consistent, pleasant and familiar environment
- Freedom from physical/emotional/spiritual pain
- A calm, relaxed, caring and non-challenging atmosphere
- A stable and familiar staff
- Staff who have appropriate expertise and are compassionate
- Skilled communicators (expertise in communicating with cognitively impaired consumers)
- Frequent and gentle touch
- Tactful use of humour
- Frequent contact and interaction with staff/family
- Contact with pets if desired (especially the consumer's own pets)
- Opportunities to socialise
- A structured individualised routine (as close to the consumer's familiar routine at home as is possible)
- The presence of the consumer's own familiar belongings (e.g. personal objects)
- Therapeutic activities/programs to promote cognitive stimulation (e.g. reminiscence therapy, music therapy)
- Nutritious diet/adequate hydration, including pleasurable snacks
- Adequate periods of rest and sleep
- High standard of hygiene/personal grooming
- Effective use of well-maintained visual/hearing/sensory aids
- Adequate daily exercise
- Access to a pleasant and safe outdoor area
- Maintenance of treatments ordered by the medical officer.

*(Adapted from Fortinash & Holoday Worret 2011)*

- Stating your name each time you start an interaction with the consumer
- Maintaining a normal day–night cycle; for example, opening curtains and blinds during the day and closing them at night and encouraging the consumer to dress in their own clothes during the day, rather than in nightwear
- Leaving the furniture and the consumer's belongings in the same place, as rearranging objects in the environment adds to confusion
- Encouraging the consumer to wear their spectacles and/or hearing aids, as not wearing them adds to sensory confusion
- Maintaining a routine and a sense of order in daily activities
- Ensuring that the environment is designed to minimise confusion; for example, using distinctive colours or pictures on bathroom or toilet doors to help the confused person identify these areas, and ensuring adequate lighting in all areas to minimise the effect of shadows that might confuse perceptions of what is seen
- Using a notice board to display information about the date and place that is consistently maintained to give residents an opportunity to remain orientated to dates, times and important events.

Consumers who have temporary confusion or who are in the early stages of dementia and are seeking to maintain orientation to time and place may benefit from the following interventions:

- Telling the person the date and time each morning and repeating the information as appropriate during the day
- Having the day and date displayed in large bold letters on a board and having the person change it accordingly each day
- Reminding the person of holidays, birthdays and other special events
- Providing cues to reinforce verbal information; for example, clocks with clear and large numbers, large calendars
- Discussing current affairs; for example, items in the newspaper or on television news.

A key to providing quality care is to find a way to connect with consumers who have dementia. This is different to simply communicating, which can be one sided, with the nurse talking and the consumer largely passive. Connecting involves the nurse or other carer having to develop skills and spend time and effort establishing connection. The use of validation therapy, reminiscence and remotivation therapy promotes connection and these therapies are highly appropriate for use with consumers who have dementia (Varcarolis & Halter 2010). (How to communicate effectively with consumers who have dementia and the use of appropriate therapies such as validation and reminiscence therapy are outlined in Chapter 8.) Recreational, occupational and complementary therapies can also be therapeutic in promoting cognitive, sensory and physical stimulation and can provide opportunities for staff to connect with consumers.

### Managing challenging behaviours in confused consumers

Many of the behaviours that people with dementia exhibit are a direct result of the illness and so need to be considered as 'normal' symptoms of the illness, rather than abnormal behaviours. Behaviours that fall into this category include aimless wandering, becoming lost, muddled actions and conversations, disturbances in sleep–wake cycles and, especially with some particular types of dementia (e.g. Pick's disease), loss of emotional control and aggressive reactions (Elder et al 2013). Other behaviours, such as unusual outbursts of physical or verbal aggression, dressing or disrobing publicly or refusing to bathe, eat or attend activities previously enjoyed, can be due to a range of influences that can exacerbate the normal effects of the illness. The reason for the

behaviour—the core of the problem—may be related to a variety of issues including:

- A change in the environment (e.g. too noisy, too busy, causing feelings of being overwhelmed)
- The person's physical condition (e.g. too hot or cold, clothing uncomfortable, pain or discomfort)
- Hallucinations or delusions (may create fear and anxiety)
- Provocation by another resident
- The way a particular staff member interacts with the person (e.g. being loud or bustling or rushing the person).

Whatever the consumer's behaviour, it is important for the nurse to respond quietly, calmly, confidently and kindly. This kind of response is often enough to modify the behaviour. The use of psychotropic medications for managing challenging behaviour is best avoided because these agents tend to have little effect on problem behaviour associated with dementia, particularly of the Alzheimer's type, and they may cause serious side effects more difficult to deal with than the behaviour itself (Shives 2011). When behaviour is not acceptable the nurse should firmly let the person know that this is the case, and behaviour that is appropriate should be praised.

Care by staff who fully understand the effects of the dementia illness and have appropriate expertise in communicating with confused people is important to the consumer's sense of wellbeing, and it is clearly evident that disruptive behaviour is less likely in residential care settings when the principles of dementia care management are followed (Elder et al 2013). The appropriate interventions for consumers with challenging behaviour are outlined in Clinical Interest Box 39.13.

It should be noted that, while many of these principles apply to caring for consumers who are confused or

## CLINICAL INTEREST BOX 39.13 Nursing responsibilities for managing challenging behaviour

- Maintain a calm environment and respond to the situation calmly
- Remain neutral, do not attribute blame, never 'tell off' in a patronising manner or punish in any way
- Avoid the use of restraints, including chemical restraints; in particular physical restraints tend to increase agitation and confusion
- Try to identify the cause
- Observe and keep a record of when the behaviour occurs, the type of behaviour, the consumer's mood and where and with whom the behaviour occurs: this helps to identify triggers for the behaviour that in many cases suggest how the cause can be eliminated
- Assess the person
- Is there a physical or emotional trigger for the behaviour? Is the consumer or resident unwell, in pain, overtired, overstimulated, bored, anxious, embarrassed or feeling ignored, misunderstood or patronised?
- Is the consumer or resident reacting to an unpleasant incident or is the behaviour associated with:
  - A change?
  - A disturbing memory?
  - A particular person or occurrence?
  - A situation or request that is culturally inappropriate?
  - Delusions or hallucinations?
  - The memory of a traumatic past experience stimulated by the current situation?
- Consider all the facts together. Ask:
  - Does the behaviour always happen in the same place or in similar surroundings?
  - Is it new behaviour?
  - How was this situation (e.g. daily shower) managed when the consumer lived at home?
  - Does it occur with a particular person in particular circumstances?
  - Is it connected with a particular staff member, relative, friend or other resident?
  - What does the consumer say, if anything, about the behaviour?
  - Can the family carer provide any insights into the behaviour?
- Use a team approach to problem solving
- It may take time and several different ideas may need to be implemented before certain problem behaviours are resolved. If one nurse finds a successful intervention, this should be documented appropriately and shared with all team members.

### Redirection

Redirection involves distracting the consumer from the situation causing the behaviour. For example, the nurse may distract the consumer who is upset and shouting at another resident without obvious cause by saying, 'I don't know what's wrong but I think we should get away from here—let's go for a walk outside.' The consumer who is jumping up from the meal table and upsetting other consumers by saying 'this food is bad, it tastes like poison' may be directed if

## CLINICAL INTEREST BOX 39.13 Nursing responsibilities for managing challenging behaviour—cont'd

the nurse responds, 'I don't think things are right, come with me, you can leave that food, let's go and find something else to eat' or 'You'd better leave that, let's get something else to eat later on—can you come and help me water the plants outside and then we'll eat later?'

### Triggers

The following example is an illustration of how identifying a trigger can help to reduce challenging behaviour and how different strategies may need to be tried until a successful way of stopping the behaviour is found.

Mrs Lamb, 72, who has dementia and is living in a residential care facility, was generally happily confused but on some days would be very agitated, pace about, bang on tables and sometimes swear and shout out abuse such as 'get away, you cow' at the top of her voice. On these days she would often start crying for no apparent reason and the staff found it difficult to console her or to establish what was upsetting her. On the last two occasions of being so upset, she became physically aggressive and even succeeded in biting one of the nurses.

After keeping a detailed record of when and where the behaviour occurred it was realised that it was on certain days of the week that corresponded with when a particular nurse was on duty. This was a surprise, as the nurse was respected for her compassion and skill in dementia care nursing, but it was soon confirmed that the challenging behaviour was definitely triggered by the nurse's presence. It was only after consulting with Mrs Lamb's sister that the cause became clear. The nurse bore a close resemblance to a next-door neighbour who had reversed her car over and killed Mrs Lamb's much adored Labrador dog over 40 years previously.

The problem was discussed at a team meeting. It was decided that the nurse should not be responsible for Mrs Lamb's personal care and that she should attempt to reinforce her own identity with Mrs Lamb. When the nurse next came on duty she wore her hair differently and made a point over the next few weeks of consistently introducing herself and showing Mrs Lamb her name badge. She managed to tell Mrs Lamb about herself; she even used photographs of her family, her home and her holidays to assist the process of trying to reinforce her real identity. This seemed to be effective on most occasions, although Mrs Lamb sometimes continued to respond with agitation and aggression towards the nurse she believed had killed her pet dog.

Not knowing what else to do as Mrs Lamb one day yelled at her 'get out, dangerous bitch' the nurse quickly said, 'I'm so sorry, I was so careless, I never meant to hurt your dog. I am so sorry, please forgive me.' With this, Mrs Lamb acknowledged the apology with a firm quick nod of the head, walked to her chair and with a sigh sat down. This seemed to settle what for Mrs Lamb may have been unfinished business. The nurse continued to use this approach whenever Mrs Lamb was agitated and eventually the agitation and aggressive response to the nurse stopped.

*(Videbeck 2013)*

disoriented from causes other than progressive dementia, the approach for reversible confusion or temporary disorientation may include strategies to assist the person with progressive dementia to remain orientated to reality.

Dementia is one of the most complex and disabling illnesses. It presents huge challenges to nurses and to the many family carers who tend loved ones with dementia at home. Table 39.11 provides a summary of some of the information that nurses need to know and some of the information that nurses need to teach to family carers.

Dementia care, while not always acknowledged as such, is a specialty area of nursing, requiring a high level of integrated skills. It is predominantly a disorder of the elderly, who often have multiple other concurrent health issues that the nurse must be knowledgeable about. Dementia consumers are often not able to explain their feelings or their needs; the nurse therefore needs high-level observation and communication skills to provide quality care. The nurse also needs to be able to support the family carers of people with dementia, who are often devastated by what has happened to their loved ones.

Though this section has briefly highlighted some of the many issues relating to dementia care it is recommended that nurses undertake specialist courses to enhance their knowledge and skills in this area. Organisations such as Alzheimer's Australia provide up-to-date information relevant to people with dementia, their families and health professionals. All caring needs to be undertaken with an understanding of the legal and ethical issues that relate to mental health nursing. The next section adds some specific points to the general legal and ethical principles impacting on mental health nursing.

## LEGAL AND ETHICAL ASPECTS OF MENTAL HEALTH NURSING

The provision of healthcare for consumers suffering from mental health disorders is governed by government mental health Acts. Each Australian state and territory has its own Act and these Acts are periodically revised. The nurse who is involved in mental health nursing has a responsibility to be aware of the relevant current Acts in the geographical area of their employment. Information about legal issues may also be accessed from government departments responsible for the health of the community such as the Department of Health and Human Services (Victoria) or its equivalent in other states and territories.

**TABLE 39.12 | Steps and questions in ethical decision making**

| Steps | Relevant questions |
|---|---|
| Gathering background information | Does an ethical dilemma exist?<br>What information is known?<br>What information is needed?<br>What is the context of the dilemma? |
| Identifying ethical components | What is the underlying issue?<br>Who is affected by this dilemma? |
| Clarification of agents | What are the rights of each involved party?<br>What are the obligations of each involved party?<br>Who should be involved in the decision making?<br>For whom is the decision being made?<br>What degree of consent is needed by the patient? |
| Exploration of options | What other options exist?<br>What is the purpose or intent of each option?<br>What are the potential consequences of each option? |
| Application of principles | What criteria should be used?<br>What ethical theories are subscribed to?<br>What scientific facts are relevant?<br>What is the nurse's philosophy of life and nursing? |
| Resolution into action | What are the social and legal constraints and ramifications?<br>What is the goal of the nurse's decision?<br>How can the resulting ethical choice be implemented?<br>How can the resulting ethical choice be evaluated? |

*(Stuart 2001:208)*

Mental health Acts provide guidelines and directions regarding the provision of mental healthcare (e.g. criteria for determining criteria for compulsory admission to hospital), and regulations and requirements regarding the periodic review of consumers suffering from mental illness. The information here is based on the law as it relates to mental health consumers in the state of Victoria but the principles apply to laws across Australia.

## Legal issues relating to informal and formal admission

Treatment in a mental healthcare facility or by a community mental healthcare team may take the form of informal or formal admission. Informal (voluntary) admission is when a consumer chooses to receive treatment and is the most preferred modality of treatment. Treatment may be at personal request or based on the advice of family or a health professional, and the consumer is able to withdraw from treatment or leave the healthcare facility whenever they choose.

Formal (compulsory) admission is when the request for admission comes from a source other than the mentally ill person, who is deemed incompetent to make an informed decision. A consumer may be referred for admission if they pose imminent danger to themself or others or if they require treatment but are too confused or disorganised to seek voluntary admission. The consumer is examined by a number of healthcare professionals during the process of compulsory admission to ensure that they meet appropriate admission criteria, and that they cannot be treated in a least-restrictive environment. Carers are also encouraged to take an active role in the process.

In a crisis situation it may be a team of professionals based in the community, such as a crisis assessment and treatment team (CATT), that is called to assist. The team can request formal (compulsory) admission for a consumer.

As soon as a consumer no longer meets all admission criteria they must be discharged from their compulsory status, or what is termed formal detention. There are strict guidelines governing who should review formal consumers and how often they should be reviewed. Consumers have the right to appeal their detainment as a community mental health patient or an inpatient in a facility. Nurses working in the mental health field need to have a thorough understating of the mental health Act that relates to their state or territory.

## Treatment orders and issues of consent

Mental health consumers who are admitted compulsorily to a mental health service are sometimes treated under a community treatment order (CTO) or while living in the community. The CTO may require that the person lives in a particular place to facilitate treatment; the restricted community treatment order (RCTO) may stipulate which psychiatrist will provide treatment, where and how often treatment will be applied and how long the order will last. It may also stipulate other specific conditions under which the consumer may remain in the community while receiving treatment. All formal consumers, whether treated in the community or in a hospital, are legally obliged to accept recommended treatment, and treatment can be enforced against the consumer's will if necessary. Even though this is the case it is in everyone's best interest for formal and informal consumers alike to be given all relevant information connected with any treatment, and informed consent should be gained whenever possible. The right of formal and informal consumers to seek a second opinion must be respected.

The mental health Acts in each state and territory have clear guidelines concerning issues such as informed consent to treatment, the way treatments may be implemented (e.g. electroconvulsive therapy) and the use of restraint, including the use of seclusion as a therapeutic measure. It is an offence to restrain or seclude someone if it is not conducted within the requirements of the mental health Act applicable to where

the practice occurs, and the mental health service can be prosecuted and fined if an offence is committed.

### Legal issues and electroconvulsive therapy

Electroconvulsive therapy (ECT) is a prescribed treatment and as such it is regulated under the different mental health Acts and regulations in each state. The use of ECT is indicated when the consumer has an increased risk of suicide, has not responded to psychotropic medication or has had an adverse reaction to medication. It is also indicated when the consumer has had a previous history of a good response to ECT (Henderson 2011).

ECT involves the consumer being given a light general anaesthetic and muscle relaxant medication. A regulated electrical current is passed through the brain until a seizure occurs (a therapeutic fit). This is sometimes referred to as shock treatment. A course of ECT involves a series of treatments. Informed consent must be gained whenever possible for any form of treatment, but there are some issues specific to ECT.

Further information about ECT and the law can be located in the mental health Act for the relevant state or territory. References and websites for accessing legal information are provided at the end of this chapter.

## ETHICAL ISSUES AND DILEMMAS

Ethical issues and dilemmas abound in the area of mental health nursing. It is sometimes a challenge to balance the consumer's right to autonomy, the rights of others and the legal concepts relevant to nursing care. Some of the areas that may give rise to ethical concerns include:

- Informed consent/refusal of treatment
- Seclusion and other forms of restraint
- Consumer confidentiality versus the need to prepare/warn/protect other parties
- Consumer autonomy (self-reliance and choice issues) as opposed to paternalism
- Boundary issues in the nurse–consumer relationship.

Within these areas are situations that may give rise to the nurse experiencing conflicting or troublesome feelings. For example, enforcing medication or treatment that is refused, or needing to restrain a consumer by enforced seclusion, may give rise to feelings of guilt, concern or distaste. Or the nurse may be torn between a consumer's right to confidentiality and the importance of informing a family carer about a consumer's diagnosis, such as HIV (human immunodeficiency virus) infection, or of the risk of violence if the consumer has voiced threats when they do not want their diagnosis, feelings or voiced intentions revealed.

It can also be discomforting and confusing trying to balance establishing and maintaining a trusting and helping relationship while maintaining the appropriate professional boundary with certain consumers, and this can cause ethical dilemmas, particularly for nurses new to psychiatric nursing (Elder et al 2013). Nurses must practise within professional codes of practice and the law, and consistently remain aware of the ethical principles of beneficence (do good), non-maleficence (do no harm), autonomy (consumer self-determination) and those of justice, fairness and equity when caring for consumers. Whenever ethical concerns arise where the decisions about what to do are not clear, nurses should raise the issues and discuss them openly with colleagues. Nurses should take certain steps and consider the answers to particular questions when faced with ethical dilemmas. These suggestions are listed in Table 39.12. Nurses considering a career in mental health nursing are advised to access further information concerning ethical issues in mental healthcare.

### DECISION-MAKING FRAMEWORK EXERCISE 39.1

You are an Enrolled Nurse working in the acute mental health ward when the nurse in charge goes on her dinner break. Before she leaves, she tells you that she has already pre-prepared and signed for the medications for two consumers who wanted to wait until after dinner to have them. She hands you the medication keys, and tells you the medications are on the bench in the treatment/medication room. You have seen many staff do this, but have never been asked to do this yourself. This nurse has been working in this ward for over 10 years.

Using the decision-making framework:

1. Do you administer the pre-prepared medication to the two consumers? Why? Why not?
2. Consider the legal requirements of medication preparation and dispensing; is it acceptable to dispense medication you have not prepared/seen prepared?
3. How would you approach this situation with the nurse?

## Summary

Many Enrolled Nurses (ENs) may wish to follow a career in the specialty area of mental health nursing, and those who remain in other fields may be required to assist in the care of consumers experiencing mental illness; for example, when they are being cared for in general hospitals or in residential care facilities.

There is no clear dividing line between mental health and mental illness; rather, mental wellbeing is represented on a continuum and no one is entirely mentally unhealthy or fully mentally healthy at all times. The ability to remain mentally healthy depends on a wide range of interrelating factors, including those that are physiological,

*Continued*

## Summary—cont'd

psychological and sociocultural. There are many theoretical models to explain the development of mental illness, on which MHNs base their clinical practice. These include the biological (medical) model, psychological/psychodynamic, social/interpersonal, cognitive–behavioural and stress vulnerability/adaptation models.

Mental illness can be diagnosed and formally classified according to the presenting symptoms. A diagnosis can guide treatment but also places a label on the person that can be a source of stigma, which can be one of the most difficult aspects of mental illness for consumers to cope with. It is a primary role of the MHN to educate the public about mental illness to reduce stigmatising attitudes, which are in part based on historical factors.

Mental health nurses, who work as members of a multidisciplinary team, develop nursing diagnoses and focus care on the feelings of consumers and the behavioural manifestations of mental distress that they display. The development of a trusting, helping relationship is essential to being able to work therapeutically with mentally unwell consumers and in promoting the healing process. Assisting consumers to develop constructive coping mechanisms is an important component of the therapeutic relationship, as is supporting effective rehabilitation of consumers living in the community, where currently most mental healthcare takes place.

This chapter has not provided detailed information about mental illness but it has provided a brief overview of some issues and suggestions appropriate to the care of consumers who are anxious, depressed, aggressive, self-destructive, hyperactive or confused. The nurse interested in working in the wonderfully challenging area of mental health nursing is advised to access more information about manifestations of mental anguish, models of care and the legal and ethical issues that relate to this dynamic field of nursing.

## Review Questions

1. Explain what is meant by mental health.
2. What is mental illness?
3. Identify four (4) attributes that can be considered indicators of mental health.
4. Identify four (4) groups of people in society that are at particular risk of developing a mental illness and why.
5. Identify four (4) early warning signs of mental illness in children, in pre-adolescents and in adults.
6. Explain the primary characteristics of thought disorders, mood disorders and behavioural disorders and give an example of each.
7. How can nurses reduce stigma about mental illness?
8. Define the terms hallucination, delusion and confabulation.
9. Define the following four (4) terms and indicate when they are experienced: akathisia, anhedonia, anxiety and apathy.
10. Identify five (5) ways of assisting a consumer experiencing a panic attack.
11. Outline four (4) strategies for promoting effective communication with consumers who have depression.
12. Identify ten (10) interventions necessary to provide quality care for people with dementia in an aged-care residential facility. Consider the environment, the staff and nursing care activities.

### NURSING CARE PLAN 39.1

**Assessment:** First episode psychosis
**Issue/s to be addressed:** Disturbed thought process
**Goal/s:** To develop trusting relationship with staff
To be adherent with medication regimen resulting in improvement in mental state
For mental state to improve

| Care/Actions | Rationale |
|---|---|
| Establish rapport/therapeutic relationship with Jason | Jason will approach staff when feeling distressed and staff will implement distraction techniques |
| Promote need for prescribed medication through psychoeducation | Psychotropic medications have demonstrated efficacy in reducing distress and agitation of psychosis |
| Frequent MSE | Changes in MSE may be indicative of medication adherence and efficacy in medication. Alternatively, decline in MSE may be indicative of non-adherence to medication regimen and/or poor response to specific medication. |

## NURSING CARE PLAN 39.1—CONT'D

**Evaluation**

Jason has developed a trusting rapport with his primary nurse and seeks out staff when distressed.
While at times Jason demonstrates a mistrust of medication, he has remained adherent and his mental state has improved.
Daily MSE has indicated an improvement in psychotic symptoms indicating response to medication.
**Assessment:** First episode psychosis
**Issue/s to be addressed:** Reduced nutritional intake
**Goal/s:** To develop trust with Jason so that he is comfortable taking food from staff
To demonstrate adequate hydration/nutrition

| Care/Actions | Rationale |
|---|---|
| Staff continue to engage with Jason and develop a trusting rapport<br>> Have someone Jason trusts bring in food<br>> Observe Jason preparing his own food<br>> Medication adherence | If Jason trusts staff he may feel more secure in eating food from the unit. By not 'forcing' Jason to eat unit food, this may help alleviate his paranoia. |
| Monitor hydration/nutrition through observation of hydration levels and weight, in addition to observing eating/drinking behaviours | To ensure that Jason remains hydrated and is eating regularly |

**Evaluation**

Jason has developed a good rapport with staff on the unit and his paranoia reduced significantly when a friend was permitted to bring in food, including non-perishable items.
Jason has remained well-hydrated and nourished.

*(Jakopac & Patel 2009)*

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Alzheimer's Australia: www.alzheimers.org.au

Australian and New Zealand College of Mental Health Nurses: www.anzcmhn.org

British Psychological Society: www.bps.org.uk

Headspace http://www.headspace.org.au/

Mental Health Services in Australia https://mhsa.aihw.gov.au/home/

SANE Australia https://www.sane.org/

The Australian College of Mental Health Nurses http://www.acmhn.org/publications/standards-of-practice

The Department of Health, Mental Health http://www.health.gov.au/mentalhealth

World Health Organization (2015) http://www.who.int/topics/mental_health/en/

CHAPTER 40

# Nursing care in rehabilitation

*Sally Moyle*

## KEY TERMS

adaptation
choice
community
decision making
education
empowerment
independence
person-centred goals
team

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Recognise the terminology used in rehabilitation nursing to describe the individual's level of functioning
- Explain the philosophy of rehabilitation
- Outline the functions of each member of the rehabilitation team
- Describe the process of adjustment to disability
- Recognise a person-centred approach to nursing care of the individual who requires rehabilitation
- Develop a plan of care for a person experiencing disability within the context of their environment
- Examine the effects of interactions between the individual, carers/family, health professionals and community context in the rehabilitation process
- Demonstrate problem-solving skills appropriate to the discipline by identifying potential issues involved in assessment and nursing care for a person with a disability

## CHAPTER FOCUS

Rehabilitation is a dynamic process which, to be effective, must occur as a collaborative process involving all members of the rehabilitation team, of which the individual is the most important. Effective rehabilitation enables the individual to achieve optimal physical, emotional, psychological, social and vocational potential to maintain dignity and self-respect. Rehabilitation empowers the individual to make informed choices about healthcare and achieve a level of wellness that is acceptable to that individual. The rehabilitation nurse provides care, and employs education and supportive strategies based on rehabilitation philosophy, goals and concepts. Rehabilitation is a process of functional improvement that involves the individual, family, community and healthcare provider. Optimal function is achieved when the uniqueness and wholeness of the individual is recognised. The focus of this chapter is to introduce the nurse to the processes of rehabilitation and the many facets of rehabilitation that can be practised in any care setting.

## LIVED EXPERIENCE

I am just glad he is alive. I didn't think when he first had his intracranial haemorrhage we were going to get this far. Do you know that he always used to bring me a cup of tea every morning before he went to work? Well, now it is my turn to look after him.

**Sharon, wife to Glen, 48, who suffered an intracranial haemorrhage 5 months previously**

Rehabilitation is a complex process with a range of dimensions including: motivation; adaptation to change; coping with stress; adjustment to altered circumstances, body capabilities and/or appearance; and regaining independence and wellness.

## AIMS AND CHARACTERISTICS OF REHABILITATION

The basic aim of rehabilitation nursing is to limit the effects of disability and impairment in individuals with particular conditions. It begins with immediate care to minimise the effects of damage and to prevent complications in the stage immediately after an accident or the onset of illness. It continues through the time individuals are receiving restorative care and it often necessitates helping them to adapt to a permanently changed situation and a new kind of life. Rehabilitation nursing includes a wide range of activities that include working collaboratively with other members of a rehabilitation team to:

- Retrain physically damaged individuals to walk again
- Retrain cognitively damaged individuals to communicate effectively orally or in writing
- Help individuals adapt to impairment in a way that enables them to care for their own needs, such as showering, dressing and eating and using ordinary toilet facilities
- Promote individuals' abilities to manage ordinary everyday modes of travel
- Teach individuals how to put on, remove and care for different types of prosthetic appliances (e.g. an artificial limb or eye)
- Provide support to the individual and help them adjust emotionally to their change in function (Australasian Rehabilitation Nurses' Association (ARNA) 2009; Jester 2007; Nathenson 2012; Tyrrell et al 2012).

The rehabilitation process comprises the following stages:

- Assessment
- Goal setting: short, medium and long term
- Development of a plan to achieve goals
- Evaluation of progress (Australasian Faculty of Rehabilitation Medicine 2011; Jester 2007).

Rehabilitation also takes place in the area of mental health nursing and includes minimising impairment in function and preventing relapse in individuals who experience recurrent problems with mental ill health. Clinical Interest Box 40.1 indicates the main characteristics of rehabilitation.

Rehabilitation services can be delivered using a number of models of care including multidisciplinary and interdisciplinary teams, inpatient, outpatient, domiciliary and community-based rehabilitation services. All models include, to a varying extent, a **team** of people comprising the individual, their family, allied health and nursing professionals and specialist rehabilitation doctors, working collaboratively to achieve the individual's goals.

### CLINICAL INTEREST BOX 40.1 What is rehabilitation?

At its core, rehabilitation is about:

- Maximising a person's abilities and independence
- Restoring lost function
- Preventing new or further functional loss
- Working with other healthcare professionals

## Categories of individuals requiring rehabilitation

A person may experience a disability of acute or chronic onset at any stage of the lifespan. Those conditions requiring rehabilitation can be categorised as follows:

- Acute onset (e.g. cerebrovascular accident, head injury, myocardial infarction)
- Gradual onset/relapsing course (e.g. multiple sclerosis, rheumatoid arthritis, motor neuron disease, Parkinson's disease)
- Acute onset/constant course (e.g. spinal cord injury, burns)
- Gradual onset/progressive course (e.g. heart failure, some cancers, HIV, respiratory conditions) (Chang & Johnson 2013; Farrell & Dempsey 2013; Frontera 2010; Jester 2007).

Rehabilitation services have four target groups:

- Individuals who cannot go home from hospital without a return of, or improvement in, function
- Individuals discharged after an acute admission requiring continuing care as an outpatient
- People living with congenital or acquired disability or progressive illness with the goal of preventing the need for hospitalisation
- People who are ageing and experiencing the functional losses associated with multiple chronic diseases (Royal Australian College of Physicians 2011).

Rehabilitation programs may be developed and implemented for an individual who is experiencing any of the conditions listed in Clinical Interest Box 40.2.

In many situations complete rehabilitation is achieved; but in others complete recovery of function is not possible and the individual faces a permanent disability or impairment (see Chapter 41 for definitions of these terms). When this happens, individuals must be helped to accept, adapt to and compensate for the existing or progressive impairment to establish an optimal level of **independence** and quality of life. Clinical Interest Box 40.3 provides an explanation of the term **adaptation**.

People involved in rehabilitation include children, adolescents, adults or older people; therefore, it is important for the nurse involved in rehabilitation nursing to apply relevant theoretical knowledge of the social, physical and psychological stages of development (Jester 2007).

## The meaning of habilitation and rehabilitation

Habilitation, rather than rehabilitation, is a term that refers to the process in which a person who is born with an impairment is helped to achieve optimal independence and function by learning new skills that empower them to make choices and have degrees of control. Long-term habilitation programs are necessary for individuals born with conditions such as spina bifida, Down syndrome or intellectual or physical impairment.

One function of rehabilitation is to address long-term problems such as chronic health problems and degenerative diseases. Although there may be no cure for such conditions, a rehabilitation program can improve the quality of life. In this sense rehabilitation is directed towards the maintenance of optimal function and prevention of complications, or towards retaining the greatest amount of function and independence that the individual desires for as long as possible.

Rehabilitation begins at the onset of illness or accident and continues until it is decided by the individual, in consultation with the rehabilitation team, that the optimal level for that particular individual has been attained. The rehabilitation process may extend over a period ranging from a few weeks to several months or years.

Rehabilitation programs are conducted in a variety of settings, including acute care hospitals, specific rehabilitation institutions, day clinics, outpatient settings, the home and in the **community** (Crisp & Taylor 2012; Hoeman 2008; Kent et al 2014).

### CLINICAL INTEREST BOX 40.2 Conditions frequently requiring rehabilitation

- Spinal cord injury
- Cancer
- Burns
- Joint replacement
- Brain injury
- Multiple sclerosis
- Guillain–Barré syndrome
- Heart failure
- Myocardial infarction
- Alzheimer's and other dementias
- Parkinson's disease
- Airway disease
- Organ transplantation
- Renal impairment
- Psychiatric or emotional disturbances

*(Chang & Johnson 2013; Farrell & Dempsey 2013; Frontera 2010)*

### CLINICAL INTEREST BOX 40.3 Explanation of adaptation

Adaptation implies the ability to adapt oneself or to modify behaviour and expectations in line with changing circumstances. Adaptation is a mechanism that affects the whole being—physically, socially and psychologically—and is a necessary process of normal life. However, in times of trauma or when facing disability, individuals may find it beyond their capabilities to adapt to circumstances without professional assistance. For a clearer understanding of adaptation it is recommended that the reader refer to Sister Callista Roy's work *The Roy Adaptation Model* first published in 1984.

## PHILOSOPHY OF REHABILITATION

A philosophy is a broad statement of basic related principles, concepts and beliefs. A philosophy of rehabilitation offers a framework from which the rehabilitation process can be developed. Although rehabilitation teams devise their own philosophy, philosophies of rehabilitation are generally based on the premise that rehabilitation recognises the worth and uniqueness of the person as a valuable human resource, and that rehabilitation programs must be a major integral component of care offered by health services. Rehabilitation necessitates the participation and coordination of all health team members through constant communication with the individual and significant others to develop a comprehensive rehabilitation plan acceptable to and agreed to by the individual. The individual receiving rehabilitation must be viewed as an active team member, and the process must actively involve the family and significant others in the individual's life. By doing this the rehabilitation process adopts a person-centred approach.

Rehabilitation is concerned with the whole person and includes the sociocultural aspects of the person's life, sexuality, family and home, job, vocation, religion and community role. Rehabilitation aims to achieve the highest level of empowerment and independence possible for the individual and is person-centred and goal focused (Bright et al 2012; Chang & Johnson 2013).

### Person-centred goals and empowerment

Goal setting can be seen as a way to give control back to individuals and make empowerment real. As individuals reach goals the nurse must help the individual to realise that their achievements are due to their own abilities. The nurse can guide the individual so that they are empowered in **decision making**, taking control and accepting that progress is due to their own effort. This knowledge will help them maintain the motivation to continue to strive for more independence. Person-centred goal planning in individuals with spinal cord injuries has been found to facilitate increases in independence and gains in physical, social and psychological functioning (Byrnes et al 2012).

In healthcare, **empowerment** is defined as an educational process designed to help individuals develop the knowledge, skills, attitudes and self-awareness required to effectively assume responsibility for their health-related decisions. Empowerment is an approach that aims to establish the individual's autonomy and self-control and enables groups or individuals to change after being given the skills, resources, opportunities and authority to do so (Chang & Johnson 2013; Fernandez et al 2012). Traditionally, individuals have been regarded as passive recipients of care, with healthcare providers being considered the experts. This view differs from the modern paradigm of empowerment in which the individual should become an expert in their own healthcare. This approach allows individuals to acquire skills and knowledge for improving their overall health status and focuses on health promotion, individuals' abilities rather than disabilities and wellness rather than illness.

A partnership between team members and the individual transfers power and builds on the person's self-esteem and self-worth. Often individuals in rehabilitation experience feelings of poor self-esteem and a sense of worthlessness. They can be grieving for what they perceive as a loss of independence and lifestyle. **Person-centred goals** can assist in identifying what is important to that individual. The individual may not always set the goals at the level the team believes they should be able to achieve. It is not an effective use of resources if therapists aim for the individual to walk 100 metres if the person only wants to walk around the house or only wants to be able to walk to the letterbox. The goals must be realistic and the individual must have a desire to reach them. One of the most effective ways the nurse can empower the individual is to offer **choice**. Asking the individual what they would 'normally' prefer to do, and then allowing it to happen, is a step towards empowerment. The rehabilitation nurse should include the individual's own beliefs, wishes and goals in the delivery of care therefore goal setting should be a collaborative process between the individual and the healthcare team (Byrnes et al 2012; Fernandez et al 2012; Hoeman 2008).

The importance of the individual feeling in control of what is happening, what is being planned and of decisions that affect their life cannot be emphasised strongly enough. Person-centred rehabilitation is precisely that—rehabilitation planned together with an individual and their carers, families and friends, around their goals, needs and existing circumstances. There is great skill involved in empowering the individual. This sense of control is facilitated when the individual is involved in determining their own rehabilitation goals.

It is important for nurses working in the area of rehabilitation to keep in mind that throughout the process of rehabilitation the individual and the family are often facing markedly changed circumstances and may be struggling to adapt to what has happened. This may also be a time when an individual's choices may not be guided by rehabilitation-orientated goals and can lead to ethical concerns regarding risk of harm to the individual versus maintaining the individual's autonomy (Gill et al 2014; Hunt & Ells 2011).

## ADJUSTMENT TO DISABILITY

The process of adjustment as it relates to disability is similar to that in dying. (See Chapter 38 for more information on loss, grief and dying.) Disability involves loss and is accompanied by an adjustment process as the individual and significant others learn to come to terms with the disability and its implications. The grieving process will gradually occur as the impairment increasingly impacts on the individual's level of function (Boer et al 2014). The individual may experience loss of:

- Sensation
- Skin integrity
- A body part
- Ability to walk

**PROGRESS NOTE EXAMPLE 40.1**

| | |
|---|---|
| 31/10/2015 1400 hrs | Nursing: Individual seen crying in room after home visit. Individual states feeling 'I just don't think that I'll be able to cope at home even though everyone says I'm doing OK'. Individual stated she 'needs full assistance with showering and how can she get that help when she lives alone'. Individual is currently receiving assistance with putting her shoes and socks on, otherwise she is independent with PADLs. Individual reassured by nursing staff and is currently not crying. Discussed with occupational therapist and occupational therapist will do a PADL assessment with individual tomorrow morning and determine any discharge needs. |

***J. Smith*** **(Smith), EN**

- Use of an arm
- Bowel and/or bladder control
- Sexual function
- Ability to speak, read, write and comprehend
- Memory
- Ability to relate to other people and the environment
- Self-image, sense of self-worth, self-esteem, sexuality
- Independence.

The person whose disability has only occurred recently generally experiences four stages in adjustment during the rehabilitation process:

1. Acute disorganisation. The individual may express feelings of extreme anxiety, fear and disbelief that such an event has occurred.
2. Assessment. The individual begins to assess what has happened and begins to recognise and identify changes in function and ability. They may experience anger, depression, denial and bargaining. The individual may hope for a spontaneous recovery or a medical miracle, and tends to resist activities designed to help regain function from impairment (Spiess et al 2014).
3. Mourning. The individual continues to experience anger and depression; however, there is generally a new awareness of the losses involved. The individual begins to accept the changed probable future and no longer denies or ignores the disability. Eventually the individual begins to participate more fully in the rehabilitation program.
4. Re-entry. The individual resolves the depression of the mourning process and begins to experience more positive feelings about self and the future. They recognise that the disability does in fact exist and are keen to find means to adapt their personal lifestyle to the disability.

It is important for nurses to understand that each person will have an individual timetable for adjusting and adapting to living with a disability. Thus, while some people adjust in a relatively short time, others will take much longer. There is no normal period of time before a person finally accepts and adjusts to a disability. It must not be forgotten that the family also goes through a process of grieving and adjustment including experiencing feelings of overwhelming shock, helplessness, denial, disbelief, sadness, anger and anxiety (Watermeyer & McKenzie 2014). The rehabilitation team plays an important role as it supports the individual and family during the process of adjustment and adaptation. Progress Note Example 40.1 displays documentation of an individual who is having difficulty adjusting and displays anxiety in relation to their change in independence and level of function.

**CRITICAL THINKING EXERCISE 40.1**

Discuss how a person may express their emotions when coming to terms with functional decline, especially coping with the change in level of function and how this may be affecting a rehabilitation program.

**CRITICAL THINKING EXERCISE 40.2**

Discuss implications for an individual's family when caring for someone with functional decline and why it is important to include them in the individual's care.

## THE REHABILITATION TEAM

Effective rehabilitation involves person-centred care planning with the individual, family or significant others and the whole healthcare team. The special needs of the individual determine the fields of expertise that are represented in the rehabilitation team. An interprofessional team is required and consists of members from various disciplines, each with a vital role to play. Clinical Interest Box 40.4 identifies some of the people who might be included in a rehabilitation team. Which team members are included depends on the specific needs of the individual; for example, a non-English-speaking person would need an interpreter to be included.

### Members of the rehabilitation team

#### The individual

It is essential that the individual who requires rehabilitation be viewed as the pivotal team member. The other team members must help motivate the individual to be actively involved in the rehabilitation process, however slow it may be. Unless the individual is encouraged, a lack of motivation and cooperation with prescribed therapy may result. It is important that each small achievement is positively reinforced (e.g. recognised, praised or rewarded). At all stages of rehabilitation, the rest of the team must consider the individual's strengths and weaknesses and the social and cultural

## CLINICAL INTEREST BOX 40.4 Members of the rehabilitation team

- The individual
- The individual's family/friend(s) or significant other(s)
- Nurse
- Case manager
- Counsellor (possibly an expert in grief and loss counselling)
- Physiotherapist
- Occupational therapist
- Speech therapist
- Social worker
- Dietitian
- Podiatrist
- Prosthetist/orthotist
- Psychiatrist
- Psychologist
- Chaplain or other religious/spiritual support person
- Teacher/educator (essential for children undergoing long-term rehabilitation)
- Medical officer (often the team's clinical director)

*(Crisp & Taylor 2012; Farrell & Dempsey 2013; Nathenson 2012)*

influences that affect adjustment to disability (ARNA 2004). The team must be aware of how the individual perceives the illness and the impact of the disability that has occurred.

A disturbance of an individual's body image—for example, paralysis resulting from a cerebrovascular accident—is difficult to accept. The initial reaction is usually one of shock, followed by denial. As the individual gradually realises what has happened and that life may never be the same again, they may experience depression, anger or guilt (Umphred et al 2013). Self-esteem and self-worth are threatened (see Chapter 38). While there is inevitable dependency initially, the overall aim of rehabilitation is to help the individual regain optimal quality of life. The motivation of the individual is crucial, and it is essential that the individual be regarded as the most important team member, who must be encouraged to participate actively in all aspects of the rehabilitation process. The individual must be involved in planning the personal rehabilitation program with the team. The individual must learn in detail about the disability that has been experienced and ways of accomplishing the desired goals. The team must inform the individual as to what options are available so that the person can choose the best options for a successful outcome (Byrnes et al 2012).

### The family or friends

The family, or significant others, are recognised as a potential support system for the individual. Members of the family are evaluated to determine their ability to help with the rehabilitation process. All families, or significant others, cannot contribute in the same way or to the same degree. In some instances the individual can return home and receive excellent care and support, while in other situations the family may be unable or unwilling to help care for the person. As each situation presents different problems, individual evaluation is essential.

The family, or significant others, need to understand and/or be involved with the rehabilitative goals that the individual develops with the team, and the methods selected to meet these goals. Partners, family members or supportive friends need to understand that their greatest contribution may be to allow the individual to be as independent as possible. This may be difficult for them at times, as their natural instinct may be to assist and 'do for' their loved one. In addition, those supporting the individual can be instructed in how to assist with specific therapy, thus enabling them to feel that they are playing a vital role in rehabilitation.

It is important to understand that when illness or disability occurs, family life is interrupted and altered. The effects of illness have significant implications for the family as well as for the individual. Plans for the rehabilitation process should, therefore, also address the needs of the family as well as those of the individual (Lawrence & Kinn 2013). The nurse and the team must remember that a spouse or partner can become depressed if their loved one faces permanent lifestyle changes. It is important to inform the spouse or significant other that this is a normal reaction and encourage the person to seek assistance from a medical officer or team psychologist. Another concern with family occurs when ageing carers assisting relatives with disabilities in the home environment themselves become ill and are no longer able to provide care for their dependent relatives. People who have been cared for by their loved ones in the community for many years are sometimes suddenly faced with a crisis because that carer has become ill. This often limits the amount of support that the carer has for transition back into the community, and placement of the individual they cared for may be an issue if the carer cannot resume a level of functioning that enables a return to the role of carer.

### The nurse

Rehabilitation nursing is a speciality area of practice requiring specialised knowledge, skills and attitudes.

The skills of the rehabilitation nurse include:

- Communication
- Listening
- Facilitating
- Enabling
- Coordination
- Leading
- Collaboration
- Empowerment
- Liaison
- Advocation
- Educating
- Planning.

The goal of rehabilitation nursing is to assist people with disability and chronic illness to attain maximal functional ability, maintain optimal health, prevent and minimise disability and adapt to an altered lifestyle (ARNA 2009; Chang

& Johnson 2013). Goals of rehabilitation nursing include maximising:

- Potential
- Learning
- Ability
- Quality of life
- Family-centred care
- Wellness
- Culturally competent care
- Community reintegration.

Nurses are in a prime position to promote these things because they spend more time with the individual than any other member of the rehabilitation team, and therefore play a pivotal role in assessing, planning, implementing and evaluating care. A nursing assessment includes an evaluation of the extent to which the individual's physical and psychosocial needs are met.

In rehabilitation, a Registered Nurse (RN) makes a nursing assessment and develops a nursing care plan to meet the needs of the individual, taking into account the person's goals, both short and long term. An Enrolled Nurse (EN) provides care under the direction of the Registered Nurse. In many settings, nursing is the only component of the rehabilitation team represented throughout the entire 24 hours of each day. Nurses are therefore responsible for reinforcing the health education of other team members, such as the physiotherapist and occupational therapist, throughout this time, so that there is continuity of the rehabilitation program. The rehabilitation nurse's role includes preventing complications that would impede the restoration of optimal functioning; therefore, attention to potential problems as well as actual problems is necessary (ARNA 2004).

The effective rehabilitation nurse understands the short and long-term goals of the individual and the rehabilitation program. The nurse has a pivotal role in the multidisciplinary team and is aware of the need to liaise and communicate closely with all team members to achieve coordinated and effective outcomes for the individual. This often means that the nurse's role needs to be flexible and amenable to change. The nurse requires a full understanding of the role and function of each team member and needs to recognise when to refer to the expertise of others as the individual's needs indicate.

Individuals react and respond in various ways to personal health conditions and the rehabilitation program. The nurse must be able to assess accurately, monitor and educate the individuals and their significant others throughout the process, so that the individual's goals and the rehabilitation goals can be achieved successfully. The nurse works in a partnership with the individual, assisting them to make informed choices and have control over the process. At times the nurse might find it difficult to empower the individual, especially if they are despondent and in the early stages of denial. It is essential that the nurse takes time to build rapport and trust. Advocacy for the person is vital for this trust to develop. The nurse should be responsive to the individual's rights and be able to advocate for the individual in team discussions. The nurse's role involves being an educator, not only for the individual but also for the family, carers and other staff. This **education** will involve teaching rehabilitative techniques, preventing complications and promoting a healthy lifestyle. The nurse will act as a resource for information and clarification and know when to call in other professionals to assist.

Many clinical skills are employed when working as a rehabilitation nurse. Depending on the individual person, skills employed may include pain and continence management, preventing pressure areas, wound management and behaviour management. While the rehabilitation nurse needs to acquire excellent general nursing knowledge, there may be a necessity to refer to more advanced trained rehabilitation nurses specialising in neurological, orthopaedic, cardiac/pulmonary, oncology, renal, gerontic or paediatric rehabilitation nursing. The rehabilitation nursing team members between them commonly have a skill mix that meets the needs of the individual (Buzio & Pryor 2012).

Rehabilitation nursing takes place in any specialty or clinical environment where the aim is to maximise independence and minimise the impact of disability in individuals with particular impairments. Therefore, many nurses, including those who have not specialised in rehabilitation nursing, are involved in the rehabilitation process. However, should a nurse choose to make rehabilitation nursing a career focus, there are many different specialty areas of rehabilitation nursing, including orthopaedics, burns, spinal injury, head injury, amputation, cardiac and stroke rehabilitation (Farrell & Dempsey 2013).

## The case manager

The case manager can be of any discipline. It is fast becoming a very popular role for the rehabilitation nurse with advanced training. The case manager develops a formal, written, comprehensive needs assessment that includes a formal review of evaluations performed by other members of the rehabilitation team. The case manager assists the individual and the service provider in planning and program development that meets the individual's needs as identified and prioritised in the assessment. The case manager's role and function will vary depending on the practice setting. The case manager may be employed in an institutional setting such as a hospital or rehabilitation facility, or they may work in the insurance industry, such as the Transport Accident Commission or a health insurance organisation.

## The physiotherapist

Physiotherapists evaluate the individual's physical capabilities and limitations in a collaborative assessment process. The physiotherapist administers therapies designed to correct or minimise deformity, increase strength and mobility or alleviate discomfort or pain (Mulligan 2011). The physiotherapist has a person-centred approach. Treatments include the use of specific exercises, heat, cold, hydrotherapy and electrophysical therapy. A physiotherapist is also involved in educating the individual and their family or significant others and other team members in correct methods of positioning, transferring

and mobilising so that what is taught in therapy sessions can be carried over to day-to-day activities and reinforced by the nurse.

Physiotherapy will help with weak or tight muscles, stiff joints, poor coordination, balance, stair practice, walking and general fitness along with everyday functional activities such as rolling in bed, sitting, standing up and reaching forward/using hands.

### The occupational therapist

Occupational therapists are concerned with assisting the individual to achieve independent performance in the activities of daily living. They also assess the need for, and provide, adaptive devices, for example aids such as specially designed cutlery or making a splint for someone's hand so they can grasp their cutlery to feed themselves.

The occupational therapist usually assesses the individual's home in preparation for transition back into the community. This is done in conjunction with the individual and family on the pre-discharge home visit. Home modifications may be required to an individual's home to ensure the individual's safety and enhance their ability to mobilise and function as independently as possible despite any physical limitations. Equipment may need to be provided to ensure that the home environment is safe and conducive to the individual's independence level. Modifications may be minor, such as installation of a handrail, or major, such as structural alterations to enlarge space in a toilet and bathroom if a wheelchair or lifting machine needs to be accommodated. The occupational therapist may also be involved in teaching someone with memory problems strategies so that, for instance, they can remember to purchase everything they need at the supermarket (Chang & Johnson 2013).

### The speech pathologist/therapist

Speech pathologists, otherwise referred to as speech therapists, are also involved in the individual's goal-setting process. They are concerned with assessing, diagnosing and treating aphasia which encompasses communication and language disorders, such as the formation and perception of speech, the ability to articulate words and to understand and initiate speech, retraining reading and writing skills following a stroke or teaching someone how to speak after a traumatic brain injury (Chang & Johnson 2013). As part of the rehabilitation process a speech therapist may be required to assist a person to relearn communication skills. Communication deficits present a real problem for affected individuals, and much reassurance and counselling are often required. The individual who cannot speak may feel hopeless and frustrated. Often, depending on the area of brain affected by a cerebrovascular accident, the individual can understand fully but cannot articulate. Technical devices may need to be used to assist the individual to communicate with others. If both areas of the speech centre are damaged, global aphasia may occur, in which the person cannot speak or understand the spoken word. How to empower this individual is a very real challenge.

## CLINICAL INTEREST BOX 40.5 Videofluoroscopy—a diagnostic test to identify dysphagia

Videofluoroscopy is a modified barium swallow conducted by the speech pathologist and radiologist to determine the extent of dysphagia and to identify if the individual is at risk of aspiration. The test allows for the viewing of the oral cavity, laryngopharynx and cervical oesophagus. The person swallows small amounts of a liquid puree or solid mixed with barium. As the individual manipulates the bolus in the oral cavity and swallows, the fluoroscopic study is recorded on videotape. Videotaping of the swallowing study allows clinicians to have repeated viewing and slow-motion analysis.

*(Argolo et al 2013)*

A speech pathologist may also be involved in the management of an individual with dysphagia in which their swallowing abilities are impaired; for example, after a cerebrovascular accident. The speech pathologist liaises closely with the nurse, dietitian and family to achieve safe swallowing strategies for the individual. In consultation with the individual, a videofluoroscopy may be required to ascertain the extent of the swallowing deficit (see Clinical Interest Box 40.5). Often the individual and family will resist the strategy of thickened fluids to prevent aspiration; therefore, in-depth education and counselling are required so that informed choices, including a full understanding of the risks, can be made. Ultimately it is the individual's choice as to whether treatment strategies are followed.

### The social worker

Social workers are concerned with counselling and assisting individuals and their families who are experiencing personal problems as a result of illness or injury. A social worker acts as an advocate by liaising with existing community groups and resources, and assists the individual and the family to deal with social, domestic, financial and emotional implications of the illness or condition. The social worker engages in discharge planning and often accompanies the occupational therapist and individual on the pre-discharge home visit. The social worker communicates with the community services that may be required to assist the individual when discharged home or, if alternative placement is required, the social worker would assist in this process (Barber et al 2015).

Social workers assist individuals and their carers to deal with the emotional impact of illness, traumatic injury and disability and the adjustment to hospitalisation. Social workers help individuals and carers to adjust to life changes and challenges, deal with grief and loss, explore emotions, thoughts and behaviour, improve relationships and plan for the future.

Social workers provide counselling to individuals and families, assist individuals with financial, accommodation, legal and other problems, run groups to provide support

for carers, participate in discharge planning and link individuals to community support services for assistance post discharge.

### The dietitian

Dietitians are concerned with assessing nutritional needs and planning ways to meet those needs (Chang & Johnson 2013). As part of the rehabilitation process, the individual may require specific dietary restrictions or modifications, and a dietitian collaborates closely with the individual to plan an appropriate diet. The dietitian also plays an important role in ensuring that all those involved with the individual's care understand the importance of a specific diet for the person's recovery. Nutritional screening is also important for persons over the age of 65.

### The podiatrist

Podiatrists are concerned with assessing, preventing and treating disorders of the feet. As part of the rehabilitation process, an individual may be required to relearn how to ambulate; for example, after a cerebrovascular accident. In order to mobilise, the feet must be in good condition, with no skin lesions or nail disorders, and the podiatrist plays an important role in maintaining the health and integrity of the skin and toenails. In collaboration with the individual, the podiatrist determines appropriate footwear for safe mobilisation.

### The prosthetist/orthotist

Prosthetists are concerned with assessing an individual's need for prosthesis, such as an artificial limb. After assessment, a prosthetist designs and supplies an appropriate prosthesis. Generally a temporary prosthesis is provided and trialled before a permanent one is supplied. Modifications to an existing prosthesis may be made by a prosthetist who also checks at regular intervals to ensure that the prosthesis is meeting the individual's needs. Some individuals may need to be fitted with splints or braces to correct deformities or provide added support. Such mechanical devices are called orthoses, and include braces for the neck, arm or leg. These assist with mobilisation and improve the quality of life for individuals (Farrell & Dempsey 2013).

### The psychiatrist and psychologist

If the individual is experiencing a psychiatric or emotional problem, either a psychiatrist or a psychologist is generally involved in the rehabilitation process. A psychiatrist is concerned with the causes, prevention and treatment of mental, emotional and behavioural disorders. A clinical psychologist is concerned with the causes, prevention and treatment of individual social problems especially in regard to the interaction between the individual and the physical and social environment. A psychiatrist, clinical psychologist or neuropsychologist may be involved in the rehabilitation of an individual who is depressed as a result of the implications of the disability, or if behavioural problems result from the condition. The psychologist can also assist the rehabilitation team with strategies to manage individuals who have behavioural disturbances that impact on the day-to-day rehabilitation process. These disciplines can also assist the family or significant others if problems of coping and adaptation are identified. Depression can be common in the individual undergoing rehabilitation, especially individuals who have been hospitalised for a prolonged period of time; family members are also vulnerable to depression (Turner 2012).

### The clinical director (medical officer)

The clinical director is commonly a medical officer specialising in rehabilitation medicine and often the first member of the team to encounter the individual as a response to a referral for rehabilitation intervention. The medical officer is responsible for the medical and/or surgical management of the person and oversees the treatment that involves meeting the physical, emotional and social needs of the individual (Chang & Johnson 2013). These needs must be satisfied to successfully restore the individual's quality of life to maximum potential. The medical officer collaborates with all members of the team and is usually the team leader. They assess the individual's health status regularly and explain the diagnosis and prognosis to the individual and relatives. The medical officer often takes on the role of chairing the case conferences and other meetings, such as team and family meetings. Regular ward rounds are conducted by the medical officer, who also has an active educative role with team members, particularly for more junior medical members of the team.

## Case conferences and team meetings

These meetings are held at regular intervals and are the forum at which team members discuss the progress and problems of every individual who is undertaking rehabilitation. During these meetings the individual's short and long-term goals are discussed, with each member being aware of, and respecting, the roles of others in accomplishing these goals. Goals must be re-evaluated regularly with the individual, so that the individual and therapists can determine whether they are realistic and/or whether they have been accomplished. All goals should be set with specific time frames. Specific therapy goals are also set at these meetings. These therapy goals are compatible with the individual's goals but are usually broken up into smaller attainable sequences, with time frames; for example, John will stand for 3 minutes, with the aid of the tilt table, three times tomorrow; John will increase time on the tilt table in increments of 2–3 minutes until standing for 10 minutes three times a day.

Each team member explains to the other members the procedures and techniques to be carried out. The proceedings are documented in terms that are meaningful and valid for all persons concerned. The individual and/or family may or may not be present at the case conference, depending on the time limitations of the meeting and the individual healthcare facility's policy. Quite often a designated team member meets with the individual and family before or after the meeting to discuss and inform and assist in the decision-making process. Family conferences can be conducted aside from the case conference, when more time can be given to the concerns of the individual and their family.

## THE PROCESS OF REHABILITATION

The rehabilitation process involves assessing the individual's rehabilitation potential, planning and implementing an appropriate program and continuous evaluation of progress (Australasian Faculty of Rehabilitation Medicine 2011; Jester 2007).

### Assessment of rehabilitation potential

Assessment of the individual and a realistic evaluation of their rehabilitation potential is the first step towards planning a program. Assessment involves determining the individual's:

- Expected level of functional ability
- Readiness to participate
- Knowledge level
- Ability to understand expectations and instructions
- Self-efficacy
- Self-esteem
- Energy levels
- Priorities at any point in time (ARNA 2009).

In some instances assessment can be a relatively simple process, while in others it is more complicated. For example, it is comparatively easy to assess the rehabilitation potential of a healthy young adult with a fractured femur, while it is more difficult to make an assessment in an elderly person with diabetes who has experienced a cerebrovascular accident.

Assessment may take the form of observation, listening, interview, physical exam and consultation with other team members and/or family.

Assessment of each individual must take into account:

- The nature of the disability. Some conditions affect only isolated areas of the body, while others exert widespread effect. Some disorders cause progressive and diverse impairment of function
- The overall condition of the individual and their ability to cope with a rehabilitation program. There may be other existing conditions that could influence the choice of rehabilitation measures; for example, chronic conditions such as arthritis or emphysema may restrict the person's ability to engage in active exercise
- The motivation of the individual and the understanding of the situation. The individual's motivation should stem from a realistic acceptance of the situation and should not be the result of over-optimism or a refusal to acknowledge limitations
- The individual's home environment and the ability of the family or significant others to be supportive.

Physical and psychological assessment of the individual is performed to evaluate functional state, so that a suitable program involving both short- and long-term goals can be set (Farrell & Dempsey 2013). Assessment includes evaluating muscle function, range of joint motion, body alignment and posture, neurological function, cardiopulmonary function, mood and cognition. The assessment should identify both the abilities and the limitations of activities of daily living and mobility.

### CLINICAL INTEREST BOX 40.6 Ten variables assessed in the Barthel Index

1. Feeding
2. Bathing
3. Grooming
4. Dressing
5. Bowels
6. Bladder
7. Toilet use
8. Transfers
9. Mobility
10. Stairs

### CASE STUDY 40.1

**Jill's experience**

Jill, aged 35, was diagnosed with multiple sclerosis (MS) 3 years ago. She is married to David and has a 6-year-old daughter. She continues to work 2 days a week as an administration officer. Recently she fell and fractured her arm and needed to stay in hospital for rehabilitation. The nurse on night duty found Jill in the day room, unable to sleep. When she asked her what was keeping her awake she said 'nothing' but proceeded to cry.

What are some strategies the nurse could use to facilitate Jill discussing her feelings?

A number of tests can be used to assess functional ability and activities of daily living and include the Functional Independence Measure (FIM) and the Barthel Index. The FIM is an 18-item assessment used to measure the individual's ability to perform activities of daily living (ADLs) related to self-care, elimination, locomotion, transfers, communication and cognition. The Barthel Index measures the individual's ability to perform in relation to 10 domains of motor function (see Clinical Interest Box 40.6).

Assessment of concerns/alterations to sexual function should also be taken into consideration (see Case Study 40.1).

### Determining short- and long-term goals

Short-term goals of a rehabilitation program are those that may be achieved in a short period of time. For example, activities such as achieving a standing position, moving from a bed to a chair, managing meals independently, tying shoelaces or formulating a sentence may be set as short-term goals. Long-term goals are those that are expected to take much longer to accomplish and depend on success in achieving the short-term goals. These may include activities such as walking, managing to climb stairs, independence in the activities of daily living or returning to employment. An example of the use of goals within a plan of care to assist the individual in improving their health and level of function can be found in Nursing Care Plan 40.1.

## NURSING CARE PLAN 40.1

**Assessment:** Mr Smith has Parkinson's disease and needs full assistance with ADLs and all mobility. He is experiencing dysphagia and is on a soft diet. Sometimes in the morning when he is having breakfast in bed he experiences some trouble swallowing and often coughs. He is incontinent of urine and faeces and wears an incontinence pad. His skin around his groin is starting to become red and excoriated. He is only able to sit out of bed in his chair for short periods during the day due to fatigue and finds that when he sits out in the morning he is often too tired to sit out in the afternoon.
**Issue/s to be addressed:** His dysphagia and coughing, especially at breakfast.
His incontinence and consequent skin excoriation.
Fatigue management.
**Goal/s:** Mr Smith will not cough with his breakfast.
Mr Smith's skin will be intact and healthy, especially in his groin area.
Mr Smith will sit out of bed for 4 hours a day in increments of up to 1 hour. This will include in the afternoon.

| Care/Actions | Rationale |
|---|---|
| Mr Smith will sit out of bed for breakfast | To decrease the risk of aspiration when eating and to help with the motion of swallowing |
| Mr Smith will be toileted every 2 hours and skin care attended to his groin at this time | To decrease incontinence episodes and to protect his skin from breaking down |
| Mr Smith will sit out of bed for each meal, including morning and afternoon tea | This will give Mr Smith a timetable of sitting out of bed and ensure that he is resting between these times to assist with fatigue management |

**Evaluation**
Mr Smith will not cough with breakfast or with any meal.
Mr Smith's groin and skin integrity will remain intact.
Mr Smith will sit out of bed each day for a minimum of 4 hours.

*(Chang & Johnson 2013; Crisp & Taylor 2012)*

The value of setting goals is that both the individual and the team know what they are aiming for and will be able to identify when they have achieved a specific goal. As mentioned earlier, the individual and family assist in the development of the goals and this assists in empowering the individual and providing a degree of control. If realistic goals are to be set the entire rehabilitation team must be involved in the planning process and must meet frequently to re-evaluate the situation.

It may be difficult for an individual to maintain a high level of motivation and they may think that little progress is being made and that the set goals are unattainable. They may view the rehabilitation program as tedious, boring, exhausting or painful. As a result, they may become depressed and discouraged. The nurse may help by:

- Being empathic about the situation, which involves trying to understand how the person is feeling
- Emphasising what progress has been made and expressing honest confidence in the person's ability to make further progress
- Spending as much time as possible with the person, particularly during activities in which active encouragement is required
- Ensuring that the individual does not become overtired or attempt to exceed the limits prescribed. Encourage the individual to take one day at a time. Some days will be better than others
- Encouraging the individual to concentrate on achieving one goal at a time. An over-ambitious program may result in frustration and despair
- Encouraging the individual to express feelings. A relationship can be established by listening to the individual. This creates a sense of trust so that the person feels able to express concerns and feelings to the nurse (see Chapter 8).

**CRITICAL THINKING EXERCISE 40.3**

Discuss ways that may help someone regain empowerment during a time-limited rehabilitation phase.

# PLANNING AND IMPLEMENTATION

## Nursing aspects of rehabilitation

Based on goals set, a collaborative plan of action needs to be developed. The nursing activities involved will depend on many factors such as the individual's age, degree of independence and type of impairment. The overall purpose of rehabilitation is restoration of the individual to optimal functioning,

or to assist the individual to adjust to a disability after an illness or injury. As a member of the rehabilitation team, the nurse provides support and assists the individual to meet personal physical and psychological needs. Nursing care may include care of the skin, hygiene, nutritional care, continence, sexual health, activities of daily living, wound management, medication administration, mobility and transfers.

Regardless of the specific impairment, the philosophy and aims of rehabilitation remain the same. The nurse plays a key role in assisting the person to carry out the activities of daily living and must be aware that the ultimate aim is to achieve the goals that the individual has developed with the team. The achievement of personal goals that the individual has developed is one of the most important aspects of their rehabilitation.

For example, in a program developed for a person who has experienced a cerebrovascular accident and subsequent hemiplegia, one specific long-term goal may be that the person is able to dress themselves. For that goal to be achieved, short-term goals will be set, such as 'The person is able to sit up in a chair'. The occupational therapist will be involved in teaching dressing and undressing techniques, and the nurse should understand the techniques the person is using so that the teaching of the occupational therapist can be reinforced in day-to-day activity (see Case Study 40.2).

Continuity of care is vital for effective rehabilitation outcomes. The individual's day should be planned to maximise the rehabilitation process. It is also important that the nurse working with the individual is aware of the plan, and works with them to achieve their goals. There is a tendency to 'get the work done' and, rather than allowing the time for the individual to wash and dress themself, the nurse does it for them because it is quicker than supporting them to do it themselves. It is destructive to the rehabilitation process for the nurse to take over when an individual is attempting to dress themselves; for example, doing up the buttons on a shirt when a person is making slow progress may save the busy nurse time, but it undermines the importance of the individual's efforts and may deter them from trying in the future.

One important nursing function is to prevent the complications of immobility (Crisp & Taylor 2012; Farrell & Dempsey 2013; Kalisch et al 2014) which include:

- Decubitus ulcers
- Contractures
- Footdrop
- Venous stasis
- Pulmonary stasis
- Urinary stasis
- Constipation
- Postural hypotension
- Subluxation of a hemiplegic shoulder
- Psychological consequences such as boredom or depression.

(See Chapter 28 for more information concerning mobility.)

## Evaluation

Progress towards achieving goals needs to be reviewed regularly, and is a collaborative approach between the individual, family and all the team members. Evaluation of progress may take the form of individual self-reporting, physical measurements such as timed walking, range-of-joint movements, quality-of-life indices and team reports based on observation and interaction with the person. Based on this evaluation the individual's goals and action plan should be reviewed and amended as required.

## Aids to daily living

There are numerous devices to help a person with a disability perform the activities of daily living. Such devices are invaluable, as they make a degree of independence possible. For example, there are long-handled shoe horns to promote independence with dressing (Figure 40.1), long-handled brushes to promote independence with hygiene (Figure 40.2) and devices to promote independence with meals (Figure 40.3) and drinking (Figure 40.4). In addition to aids assisting with activities of daily living, aids are also available to assist with recreational and vocational activities such as sport wheelchairs, postural support devices including Hi-Lo seating and modifications to commonly used items such as footwear, electronic equipment and work spaces. Nurses should be familiar with the full range of aids available and should be capable of teaching the individual and their family the correct way to use them. A range of available aids is listed in Clinical Interest Box 40.7.

In Australia there are centres for independent living that provide a wide range of aids to assist with the tasks of daily living. A variety of community services is available to assist persons with disabilities to remain at home, including community health centres, day hospitals and day centres, drop-in

### CASE STUDY 40.2

Roger, an 88-year-old, lives by himself and has fallen over while gardening. He fractured his hip and required surgery. He was admitted to the rehabilitation unit 7 days after surgery for a reconditioning program.

He is on a combination of antihypertensive and cardiac medications. He requires the administration of aperients to keep his bowel actions regular. He suffers from occasional urinary incontinence and uses a pad at night. He is able to walk with a frame, and requires assistance with transfers, dressing his lower body and applying his anti-embolic stockings. He progressed well with his therapy and after a home visit identified modifications required for his bathroom which were attended to. He was ready to be discharged home 2 weeks after admission.

1. Outline the nursing plan of care you may be involved in for Roger.
2. List the rehabilitation team members involved in Roger's care and explain why they are included.
3. What education might Roger require before discharge?

**Figure 40.1** Long-handled shoe horn
*(Wellcome Photo Library)*

**Figure 40.2** Long-handled brush
*(Patterson Medical USA)*

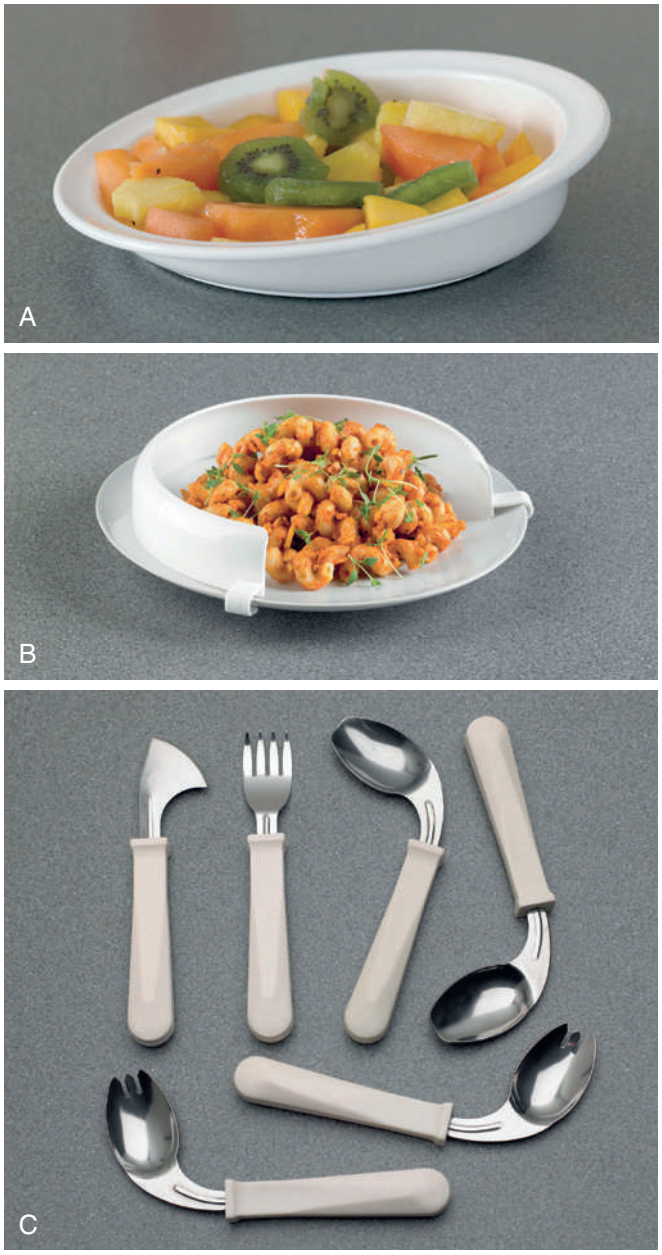


**Figure 40.3** Aids to promote independence with eating
A: Scoop dish B: Food guard C: Easy-hold utensils (knife blade cuts in both slicing and rocking)
*(Patterson Medical USA)*

centres, elderly/senior citizens clubs, self-help groups, home nursing services, home meal services and sheltered workshops. Nurses should be aware of the state/territory-specific social welfare services and agencies, most of which can be found in the telephone directory or through an internet search for community services in Australia.

## CULTURALLY RELEVANT CARE

Outcomes, interactions and responses are influenced by social and cultural factors. In rehabilitation, nurses can bridge cultural barriers to facilitate and improve outcomes. Family members or significant others are also interviewed to obtain accurate information as to pre-morbid functional status, personal interests, cultural considerations and discharge plans affecting the rehabilitation admission.

For those individuals from cultures different to that of the nurse, the nurse needs to take into consideration cultural influences—of their own and of the individual—on participation and decision-making. An Australian study that focused on the difficulties arising from cross-cultural care found that communication barriers were often a major

**Figure 40.4** Aids to promote independence with drinking

Tumbler with a special cut out for the nose allows the individual to drink without tipping the head back

*(Patterson Medical USA)*

## CLINICAL INTEREST BOX 40.7 Aids to independent living

- Suction devices fitted to kitchen utensils, backs of nail brushes, etc, for the benefit of a person with the use of only one hand
- Boards with spikes to hold fruit or vegetables to be peeled, or bread to be buttered
- Face washers in the shape of a mitten, with a pocket to hold the soap
- Long-handled tongs for a person who is unable to pick items up by bending or stooping
- Dressing sticks with one end covered by foam rubber to grip the sleeve or shoulder of a garment, making it easier to don and remove
- Various devices to enable socks and stockings to be put on
- Overlapping adhesive fastenings (e.g. Velcro) on clothing for people unable to manage other conventional types of fastenings
- Long-handled shoe horns to make bending or stooping unnecessary (Figure 40.1)
- Elastic shoelaces, which do not have to be untied when shoes are removed
- Cuffs which, when placed over the hand, hold a pencil, toothbrush or razor
- Easy-to-turn tap fittings
- Raised toilet seats
- Chairs with an ejector seat, which rises as the occupant leans forward
- Ramps to replace stairways
- Hand grips in bathroom and toilet areas
- Long-handled brushes to enable individuals to perform their own hygiene activities (Figure 40.2)
- Low-level fittings for occupants of wheelchairs (e.g. sinks, stoves, mirrors, light switches)
- Eating and drinking aids (Figures 40.3 and 40.4)
- Walking aids

factor contributing to non-adherence and non-participation in services and self-management strategies and, furthermore, these individuals were also disadvantaged in accessing health services (Haghshenas & Davidson 2011). See Chapter 10 for further information on culturally appropriate care.

While 65 years of age is traditionally used as the point where the term 'older aged' may be applied, in the non-Indigenous community, Indigenous people would regard a person over 45 years as an older person requiring aged-care services. The Indigenous population experiences significantly greater morbidity and premature mortality compared with non-Indigenous people (Ward et al 2014; Waugh & Mackenzie 2011). This is a result of, among other things, the increased prevalence of chronic conditions such as cardiovascular disease, diabetes, kidney disease, chronic respiratory disease and cancer. Chapter 11 gives the reader further understanding of Indigenous issues.

## DISCHARGE PLANNING

Discharge planning prepares the individual for the transition to another setting, such as from hospital to home. It is the link between hospitals, community-based services, organisations, families and carers. The elements of the discharge planning process should begin on the day of admission. The overall goal of discharge planning is to promote continuous healthcare services to meet the individual's needs (see Chapter 21). Effective discharge planning can decrease the chances that a person is readmitted to the hospital, can help identify care issues and needs and enable appropriate care plans to be developed.

Although discharge planning is a significant part of a person's overall care plan, frequently there is a lack of consistency in both the process and the quality of discharge planning across the healthcare system.

An effective discharge plan depends on the resources available to the individual who is being rehabilitated. Available resources include:

- The family or significant others—the individual's support systems
- Home care nursing
- Social and counselling agencies
- Volunteer community services
- Support and special interest groups; for example, those dealing with multiple sclerosis, diabetes, cancer, heart conditions, arthritis
- Medical supplies and equipment
- Adaptation of the home environment for safety and optimal independence.

The individual and the nurse, together with other team members, assist in coordinating and developing the discharge plan, using the steps of the nursing process to achieve the final plan. A discharge planner or continuing care coordinator is sometimes part of the hospital staff and functions as a consultant for the discharge planning process within a health facility, providing education and support to hospital staff in the development and implementation of discharge plans.

### CRITICAL THINKING EXERCISE 40.4

Discuss the possible roles and functions of the nurse in planning for discharge for an individual during inpatient rehabilitation.

### CRITICAL THINKING EXERCISE 40.5

Describe three (3) community services or other resources that could help to facilitate a successful community re-entry for a person post discharge from inpatient rehabilitation.

## Summary

Rehabilitation is a dynamic process in which individuals are helped to achieve optimal quality of life by increased function and independence, within the limits of their disability. A disability is any physical, mental, emotional or social impairment that limits a person's ability to carry out an activity in the usual manner.

Effective rehabilitation involves the individual, family or significant others and professional members of the healthcare team. As part of the rehabilitation team, the nurse plays a vital role in helping the individual to meet physical and psychological needs as independently as possible. The rehabilitation process empowers the individual to make informed decisions and choices about treatment modalities, care regimens and lifestyle options.

### DECISION-MAKING FRAMEWORK EXERCISE 40.1

You are working as an Enrolled Nurse within an orthopaedic rehabilitation ward and have been allocated 14 individuals to care for with a Registered Nurse under the organisational team nursing policy. This is your second week as an Enrolled Nurse and you have never worked in the healthcare system before. The Registered Nurse allocates you both seven individuals each. At the commencement of your shift all of your individuals are medically stable. During your shift you notice the health status one of your individuals declining. They have had a total hip replacement 5 days ago and are complaining of feeling lethargic, dizzy and generally unwell. You perform a set of observations on them and find they have a temperature of 38.8°C, their blood pressure is 88/60, heart rate is 109, oxygen saturation level is 96% and respiration rate is 20.

You report these findings to the Registered Nurse you are working with and state that you are unsure what to do as you have not had experience with individuals who are unstable before. You state that you do not know what to do next and do not feel confident providing care to this individual. The Registered Nurse tells you that this can often happen to individuals undertaking orthopaedic rehabilitation and asks you to decide on a plan of action and report back to her. You feel unsure of what you need to do and are worried about the individual's current health status.

Using the decision-making framework:

1. What would you do following this discussion with the Registered Nurse?
2. When you do not feel confident providing care for your individual, what should you do?
3. Who is accountable for the provision of nursing care when working within a team nursing model?

## Review Questions

1. What are the main goals of a rehabilitation program?
2. What are the stages of the rehabilitation process?
3. List three (3) methods of assessment the nurse could be involved in when a rehabilitation program is being planned for an individual who has experienced hemiplegia as a result of a cerebrovascular accident (stroke).
4. List three (3) ways a rehabilitation nurse can assist in empowering the individual who has lost the ability to speak but can understand.
5. List three (3) areas of health education that might be helpful for the rehabilitation nurse to provide for an older person who has recently been diagnosed with Parkinson's disease.
6. List four (4) roles within the rehabilitation team that the nurse may undertake.
7. List four (4) settings in which the rehabilitation nurse may function, and identify six (6) types of illness, condition or injury that individuals might experience in which rehabilitation would be essential.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Ability First Australia Disability Services: www.abilityfirstaustralia.com.au

Association of Rehabilitation Nurses (USA): www.rehabnurse.org

Australasian Faculty of Rehabilitation Medicine: www.racp.edu.au/page/racp-faculties/australasian-faculty-of-rehabilitation-medicine/

Australasian Rehabilitation Nurses' Association: www.arna.com.au

Enabled: www.enabledonline.com

National Rehabilitation Centre (USA): www.cais.com

New Zealand Rehabilitation Association: www.rehabilitation.org.au

# Nursing care: chronic illness and disability

*Vicki Blair Drury*

CHAPTER 41

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Describe how chronic diseases and disability are defined
- Identify factors that lead to an increase in long-term conditions
- Critically examine contemporary models of care for long-term conditions
- Apply a self-management approach to the management of individuals with long-term conditions and/or disability
- Identify factors that lead to disability
- Apply an understanding of normalisation and inclusion to the management of individuals with disabilities
- Acknowledge the important role family/carers play in supporting people with disabilities or chronic diseases
- Identify health promotion strategies that serve to reduce the incidence of disability and chronic diseases in society
- Identify the importance of educational supports and strategies that serve to reduce the impact of having a disability or chronic disease, including the benefits of early intervention

## KEY TERMS

chronic disease
disability
equity and access
health promotion
impairment
inclusion
independence
normalisation
self-management
social role valorisation (SRV)

## CHAPTER FOCUS

Chronic illness and disability affect people across the lifespan irrespective of race, gender or cultural group. However, some conditions are more prevalent in some cultures or races than others. Socioeconomic factors and education have been found to influence illness and mortality (Meara et al 2008) with socioeconomic inequalities evident for most of the chronic diseases (Glover et al 2004). Globally, ageing populations significantly affect the increase in chronic disease. Chronic diseases are now the leading causes of illness, disability and death in many countries (Mathers & Loncar 2006; Schmidt et al 2011; Wang et al 2005). Chronic disease, also known as long-term conditions, encompasses a broad spectrum of diseases. Comorbidity (i.e. the coexistence of two or more diseases together) is a common feature of chronic disease. Additionally, comorbid chronic diseases often share similar risk factors which act together to affect individual health status (Australian Institute of Health and Welfare 2014).

Although chronic disease and disability are often discussed together, not all people with chronic disease have a disability and not all people with a disability have a chronic disease. While chronic disease is often classified according to major disease groups and risk factors, disability is categorised according to severity.

Chronic disease is defined as a disease that lasts more than 3 months and for which there is no cure. Disability is considered to be a condition that in some way affects a person's ability to carry out day-to-day activities.

This chapter outlines the classification and causative factors of chronic diseases and disabilities. Models of care focus on normalisation and facilitating **independence** through individual empowerment. The theme throughout is the need for nurses and other allied health professionals to recognise and promote the importance of successful inclusion and acceptance into the community and to work towards improving the quality of life for all people with disabilities.

## LIVED EXPERIENCE

### Arthur's story

Arthur, 75, cares for his wife, Meg, who has motor neuron disease. Arthur retired from work and with family support moved to Queensland about 5 years ago where it was felt the climate would help Meg's condition. At first it was a hard move as his family returned to Melbourne and Arthur had to cope on his own. He has gradually adjusted, with the help of service providers, to manage Meg's condition, which has deteriorated; she is now paralysed and can only move her head. Swallowing food and drinking is becoming a real issue with concerns around Meg choking. She is no longer continent. Arthur sponge bathes her every weekday, assists her with toileting and all meals (which he prepares himself) and takes her out in her wheelchair, though this is getting harder to do.

Arthur admits to getting very tired at times but has no regrets—he feels the role of carer has improved him as a person. 'I am a different person because of caring for Meg; we have been blessed with three lovely children, nine fantastic grandchildren and now the great-grandchildren are on the way. We have had over 50 years of marriage,' he says. 'It's shown up different areas of my life that needed changing, like my impatience and quick temper. I've had to change and this has been hard. I think I'm a much more caring person, I can put myself in other people's situations, which I didn't always do before.'

When Arthur and Meg were offered more professional assistance with Meg's hygiene and meals, Arthur at first declined, although Meg expressed concern for him. Arthur responded, 'I want to do it; I feel I am repaying Meg for all the times I wasn't there for her and the kids in the early part of our marriage ... and I feel good because I do things for her I never thought I'd be able to do, and I've earned her love and respect and the respect of my kids now.'

**Arthur, age 75**

## CHRONIC DISEASE

Confusion often surrounds chronic diseases due to numerous definitions being used in the literature. **Chronic diseases** are also called long-term conditions, non-communicable diseases or lifestyle diseases in the literature. These definitions do not appropriately define chronic disease as some may be due to communicable factors such as cervical cancer and others are determined more by environmental factors rather than behavioural or lifestyle factors (World Health Organization (WHO) 2005). However, chronic diseases generally extend for a long period, progress slowly and have no cure. The Australian Institute of Health and Welfare (2012b:2) defines chronic diseases as being characterised by 'complex causality, multiple risk factors, long latency periods; prolonged course of illness and functional impairment or disability'. This definition clearly illustrates the complexity of chronic diseases.

WHO (2005) asserts that chronic diseases often start at a young age but take many years to evolve and that they require a long-term and systematic approach to management. Examples of chronic diseases include high blood pressure, heart disease, chronic obstructive pulmonary disease, diabetes, macular degeneration, glaucoma, tinnitus, some cancers, Parkinson's disease, Crohn's disease, epilepsy, schizophrenia, bipolar affective disorder, systemic lupus erythematosis and arthritis.

## PREVALENCE, CLASSIFICATION AND CAUSES OF CHRONIC DISEASES

WHO emphasises that chronic disease is now the leading cause of death globally even in countries where infectious diseases are widespread (WHO 2005). Eighty per cent of all deaths in middle- and low-income countries are now attributable to chronic diseases which are largely preventable (WHO 2005). Chronic disease impacts on the individual, the community and the country. Chronic diseases cause premature death, decreased quality of life and place financial burdens on families and communities. The impact of chronic disease globally is significant. It is estimated that unless countries unify and take action more than 388 million people will die from chronic disease in the next decade (WHO 2005). The impact of these deaths, many of them premature, on families, communities and countries will be significant.

Chronic diseases are often classified according to disease types with cardiovascular diseases (mainly heart disease and stroke), cancer, chronic respiratory diseases and diabetes being the main classifications. However, visual and hearing impairments and genetic diseases also account for a significant portion of the global disease burden (WHO 2005).

The causes of many chronic diseases are well known and reported widely in various media from medical literature to daily newspapers. The three most significant modifiable factors influencing chronic diseases are poor nutrition, lack of exercise and tobacco use. These factors affect blood pressure, lipid control, blood glucose and body mass index and, combined with non-modifiable risk factors of age and heredity, explain why there has been a global increase in chronic diseases (Figure 41.1) (WHO 2005).

## CONCEPTUAL MODELS OF CHRONIC CARE

Several models of care have been developed that focus on a broader framework integrating individual, community and organisational goals to manage chronic diseases. The most significant of these is the Chronic Care Model (CCM) developed by Wagner in 2001 (Bodenheimer et al 2002). This model remains the foundation of most chronic disease models today and identifies individuals' empowerment, self-management support and organising community and organisational resources to meet the individuals' needs as the key principles required to improve chronic disease management. Despite evidence that the model remains effective (Adams et al 2007; Coleman et al 2009; Tsai et al 2005) it was identified that it excluded health promotion and health prevention strategies which were viewed as integral to effective sustainable chronic disease management (Barr et al 2003). Expanded models of this framework have therefore evolved that include social determinants of health and the inclusion of health prevention strategies (Barr et al 2003; Epping-Jordan et al 2004).

WHO asserts that governments must take action to meet the increasing burden of chronic diseases and provide guidelines that countries can use to improve health service delivery and management of chronic diseases (WHO 2002). In 2002, WHO joined with the MacColl Institute to adapt the Chronic Care Model to a more globally appropriate model. The resultant framework was the Innovative Care for Chronic Conditions Model (see Figure 41.2) which focused on improving care for people with chronic conditions at three levels:

1. the macro level concerning policies and the environment
2. the meso level involving organisations and the community
3. the micro level comprising individuals and their families (Epping-Jordan et al 2004).

While each level of this framework is important, the macro level is essential for the development of programs and providing leadership at both the meso and micro levels. It is at this level that partnerships are developed and human and material resources are provided for the sustainability of programs (Sharma 2013). At the meso level it is essential to improve continuation of holistic care and facilitate healthcare and community organisations working together. At the micro level individuals need to be empowered and become active participants in their own care. Healthcare staff need to be informed and take on a supportive and educative role in care. Chronic disease self-management acknowledges that the person with a chronic disease must cope not only with the disease and the effects of the disease but also the impact on their quality of life (Drury & Aoun 2014). See Clinical

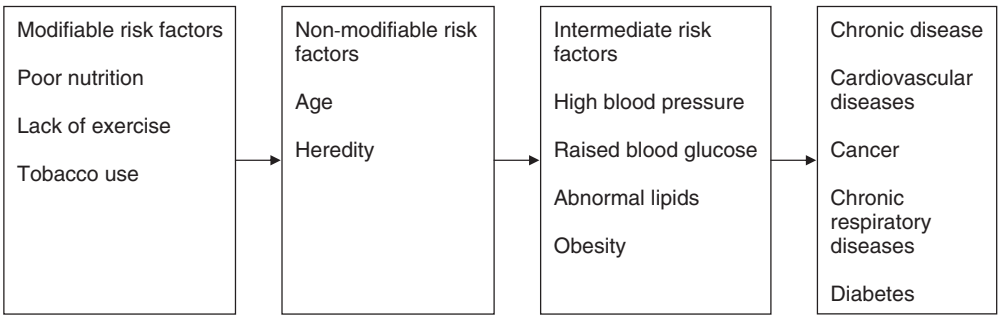


**Figure 41.1** Risk factors for chronic diseases
*(World Health Organization 2005)*

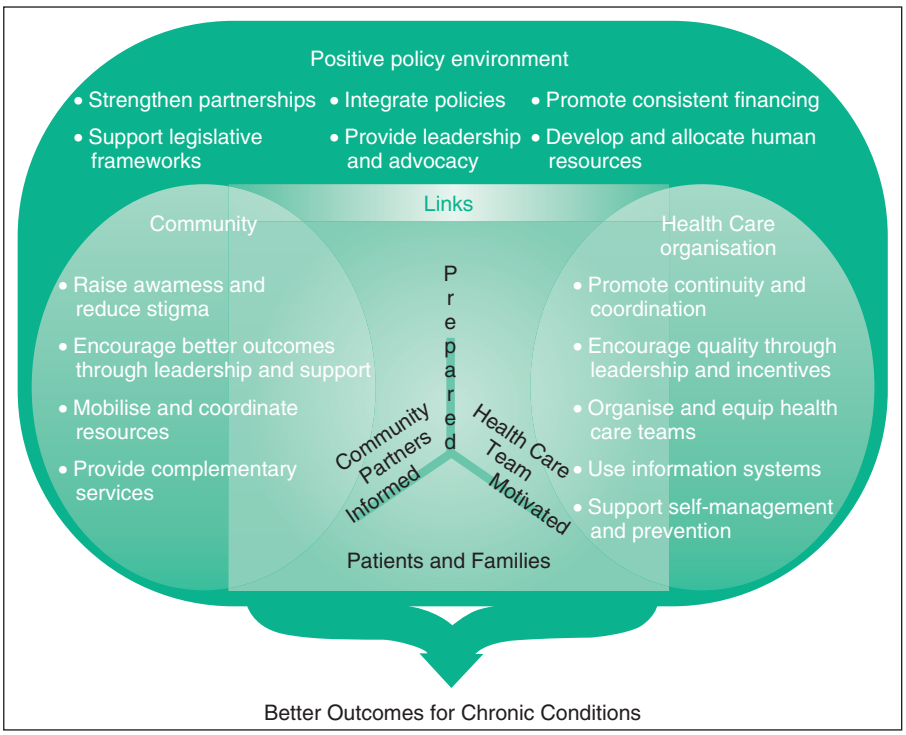


**Figure 41.2** Innovative Care for Chronic Conditions Model *(WHO 2002)*

Interest Boxes 41.1 and 41.2 for examples of adjustments and adaptations individuals with chronic disease face.

## DISABILITY

Historically the term **disability** was medically or diagnostically focused; however, over time this has evolved to one that is functionally focused, thus making an important distinction between two concepts—functional limitation and disability. Disability thus becomes something that occurs outside of a person, rather than something a person has. The functional limitation is influenced by numerous factors such as the environment, functional ability, age and life experiences. This new definition views disability as a matter of degree: the person is more or less disabled based on the intersection between the individual, their functional abilities and the many types of environments with which they interact.

WHO defines disabilities as 'an umbrella term, covering impairments, activity limitations and participation restrictions. An **impairment** is a problem in body function or structure; an activity limitation is a difficulty encountered by an individual in executing a task or action; while a participation restriction is a problem experienced by an individual in involvement in life situations' (WHO 2015).

## PREVALENCE AND CAUSES OF DISABILITIES

WHO estimates that around 15% of the world population has some form of disability with 2% having severe disabilities (WHO 2015). Mont (2007) asserts that disability and poverty are interwoven due to the impact poverty has on nutritional status, access to health services, living and working conditions and sanitation while, conversely, disabled people are often forced into poverty due to the challenges they encounter accessing education, health services and social activities. The global ageing population and the increase rise in chronic disease will further increase the number of people living with disabilities.

## CLASSIFICATIONS OF DISABILITY

Classifying disability is complex. Although it is acknowledged that all people with disabilities do not have the same desires nor confront the same challenges, policy makers and clinicians need a system of classification that enables the organisation of disabilities into categories, enabling the application of universal codes. These codes are then used for a range of purposes including tracking prevalence of disabilities, reimbursement of costs and assisting with making decisions about services. In Australia, disabilities are categorised according to the type and cause (Table 41.1), and according to the level of restriction incurred (Table 41.2). In addition, disabilities are described according to whether limitations or restrictions are sensory, physical, psychological or intellectual (Table 41.3) (Australian Bureau of Statistics 2009). Multiple or complex disabilities generally refer to the coexistence of two or more conditions; for example a physical and intellectual disability. In addition it has been found that many people with disabilities have comorbid chronic diseases (Fried et al 2004).

## CLINICAL INTEREST BOX 41.1 Phases of adjustment to living with a chronic disease

**Crisis phase**

- Sense of dismay and urgency to find treatment
- May use drugs and/or alcohol to cope
- Seek alternative interventions
- Blame self or others
- Fear and anxiety
- The goal of this phase is for the person to regain a sense of control. The healthcare team assists the person to manage physical and psychological symptoms and offers support. The healthcare team must help the person turn negative thoughts into positive thoughts and empower them to regain control.

**The stabilisation phase**

- Acute phase of the illness has passed and there is an awareness that this is now a chronic condition
- Friends and family may retreat
- Feelings of isolation and helplessness
- The goal of this phase is for the person to restructure their life. The healthcare team assists the person to understand what they can do and helps them achieve their goals.

**The reconstruction phase**

- Coming to terms with the chronic disease
- Learning to live with the consequences of the disease
- Heightened sense of control and empowerment
- Renewed sense of self.

**The integration phase**

- Accepting that the disease has provided positive life experiences
- Sense of pride in achievements.

*(Jason et al 1999; Fennell 2003)*

## CLINICAL INTEREST BOX 41.2 Adjustments and adaptations to living with a chronic disease

- Loss of roles
- Changes to health status
- Loss of identity
- Lifestyle changes
- Financial adjustments

*(Chang & Johnson 2014)*

## TABLE 41.1 | Classification of disability according to type and cause

| Type | Cause | Example |
|---|---|---|
| Inherited | Genetically transmitted | Down syndrome, spina bifida, muscular dystrophy |
| Congenital | Due to infection during pregnancy or injury to the fetus during or soon after birth | Cerebral palsy or a hearing impairment due to the mother being in contact with rubella during pregnancy |
| Acquired | Due to accidental or intentional injury | Brain injury due to trauma or fetal alcohol syndrome from maternal excess consumption of alcohol during pregnancy |
| Unknown origin | Cause unspecified | Some types of intellectual and behavioural disorders and some mental health conditions |

*(ABS 2009; 2012)*

## TABLE 41.2 | Classification of disability according to restriction

| Level of restriction | Example |
|---|---|
| Profound | A person is unable to perform self-care, mobility and/or communication tasks, or always needs assistance |
| Severe | A person sometimes needs assistance with self-care, mobility or communication |
| Moderate | A person does not need assistance, but has difficulty with self-care, mobility or communication |
| Mild | A person has no difficulty with self-care, mobility or communication, but uses aids or equipment |

*(ABS 2009; 2012)*

## The unique meaning of disability

Disability is a subjective experience. An injury to the leg that results in permanent inability to bend the knee or stand for long periods of time might be a serious anxiety-provoking disability for a person working as a nurse or a tradesperson. The impact of the same disability on an elderly person who lives alone and spends most of their time watching television and rarely going out of the house may be quite different. Many people learn to adapt so well with their disability that it becomes inconsequential. These people often say that they can do everything an able-bodied person can do; they just do it differently! A disability places a restriction or functional limitation on the person.

A disability, therefore, is not something that a person has but, instead, something that occurs outside of the person; the person has a functional limitation.

**TABLE 41.3 | Classification of disability according to area affected**

| Type | Example |
|---|---|
| Sensory | Visual impairment<br>Hearing loss |
| Physical | Arthritis<br>Paralysis due to spinal cord injury<br>Acute pain |
| Psychological | Schizophrenia<br>Dementia<br>Depression |
| Intellectual | Intelligence quotient or IQ score below 70 |

*(ABS 2009; 2012)*

## CONCEPTUAL MODELS OF DISABILITY

Conceptual models of disability have struggled for years with whether disability should be viewed through a medical lens or a social lens. In isolation neither of these models provided an adequate framework for supporting people with disabilities. In 2001 WHO endorsed the International Classification of Functioning, Disability and Health (ICF) which provides a framework for measuring health and disability at both individual and population levels. The new ICF definition of disability, referred to as the biopsychosocial model, evolves from the medical and social model and incorporates the idea that anyone might become disabled (WHO 2007). This new framework views disability not as something that a person has but as a functional limitation that occurs outside of the person. Disability occurs as a result of the interaction between a person, their functional ability and the environment. Therefore, a disability may be minimised by designing environments to accommodate varying functional abilities and providing individualised solutions.

In 2014 WHO global disability action plan 2014–2021 'Better health for all people with disability' was adopted by the World Health Assembly. This action plan, based on recommendations from WHO and the World Bank report on disability, has three aims:

*(i) to remove barriers and improve access to health services and programmes; (ii) to strengthen and extend rehabilitation, habilitation, assistive technology, assistance and support services, and community-based rehabilitation; and (iii) to strengthen collection of relevant and internationally comparable data on disability and support research on disability and related services.*

**(WHO 2014)**

### Adjustment

Adjustment to a disability is dependent on numerous factors, and most people also transition through a number of phases before accepting their disability (see Clinical Interest Box 41.3).

It is important to recognise that adjustment to disability may be short and relatively uncomplicated, but commonly it can be a long and difficult process involving extensive rehabilitation and a process of grieving (see Chapter 40). While individuals respond differently, it is helpful to recognise that in the initial period after illness or accident, when individuals are first facing disability, they may be extremely stressed. This stress may result in behaviours that the person does not usually display, including:

- Hostility or anger at themselves, their families or primary carers and the professional staff who aim to support them
- Rebelliousness (e.g. refusing care, refusing to get up or shower)
- Refusal to socialise, shunning visitors, even close family and friends (this may be due to embarrassment at changed appearance or abilities, or fear of rejection)
- Depersonalisation (avoiding or disowning self or parts of self, which may be demonstrated by a refusal to acknowledge, talk about or look at an altered body part such as a stoma, a stump or a burned area)
- Refusal to participate in activities (Thomas 1999). See Table 41.4.

**CLINICAL INTEREST BOX 41.3**
**Phases in adjusting to a disability**

**Shock**
- Feeling emotionless
- Sense of unreality

**Denial**
- A coping mechanism that allows the individual time to adjust
- This is not happening

**Anger**
- Withdrawal
- Isolation
- Hostility
- Self blame
- Grieve for loss of roles or changes to self-image

**PAcceptance**
- Does not mean the individual is happy with the status quo
- Accepts the disability
- Takes back control over life
- May benefit from speaking to others in similar situations

*(Cohen & Napolitano 2007)*

### Providing care for individuals and their families

Nurses may provide care for individuals with disabilities and their carers in any setting in which care is provided. These include:

- The person's own home
- Community houses
- Day or drop-in centres
- Day clinics
- Residential care facilities
- General hospitals

**TABLE 41.4 | Factors affecting adjustment to disability**

| Factors | Example |
|---|---|
| Length of time with disability | The longer a person has a disability the more likely they are to accept the limitation and adjust to the consequences of the disability (Chao et al 2010) |
| Amount and quality of support | Good social support is associated with better functioning (Müller et al 2012) |
| Acceptance of disability | Acceptance allows individuals to move into a phase of adjustment and reintegration (Cohen & Napolitano 2007) |
| Degree of impairment | The greater the impairment the more difficult the adjustment and acceptance |
| Emotional reactivity | Personal beliefs promote adaptation (Townend et al 2010) |
| Attitudes and behaviours of others | Stigma and non-acceptance by others affects the confidence and self-esteem of the person with a disability and may prevent acceptance of the disability (McLaughlin et al 2004) |
| Finding positive meaning in disability | Looking for a positive meaning in the negative experiences enhances positive coping (Dunn 2014) |
| Access and affordability of health services | Access to affordable service provision ensures better outcomes (Andrews et al 2001) |

- Rehabilitation units
- Schools or preschools
- Obstetric units (neonates born with a disability)
- Respite care accommodation.

Nurses may encounter individuals with a disability who are hospitalised for totally unrelated reasons; for example, a person who has epilepsy but is hospitalised because they need an appendectomy. Others may be in care to provide respite for a family carer (e.g. a person with multiple sclerosis or perhaps dementia) and some may have only just acquired the disability (e.g. hemiplegia as a result of a cerebrovascular accident or a spinal cord injury due to road trauma). This means that nurses need to adapt the ways they communicate with and respond to individuals according to the type of disability and the specific circumstances. Clinical Interest Box 41.4 provides some guidelines to aid the nurse caring for individuals with disabilities. Sometimes people with disabilities demonstrate behaviour that even experienced nurses find challenging to manage. There are often complexities involved in managing challenging behaviours—now more commonly known as behaviours of concern, and it is recommended that nurses refer to texts that deal specifically with this issue to enhance their knowledge and expertise. Chapter 39 provides some information on managing challenging behaviours.

## The move to community-based service provision

Historically people with disabilities were institutionalised, segregated from society and from their local communities and denied the rights of access to services and opportunities available to the rest of the population. People who entered institutional care facilities often remained there for their entire lives.

Australia went through a process of deinstitutionalisation in the mid-1980s. Although the process of deinstitutionalisation had started in the 1970s, it was with the release of the Richmond report in 1983 (Richmond 1983; Molony & Taplin 1988) that the process began in earnest. Richmond's recommendations included a government-funded system of community support underpinned by acute hospital services (if needed) and accommodation services. The findings from this report changed the provision of both mental healthcare and disability service provision, initially in NSW

### CLINICAL INTEREST BOX 41.4 Suggestions to aid relationships between nurses and individuals with disabilities

**Keep in mind that:**

- In many cases the individual and the family carer will know more about the disability than the nurse
- The person with a disability is the same as anyone else, just with particular needs associated with that disability
- Many difficulties that the person faces are likely to be more to do with societal attitudes than the disability itself
- It is best to concentrate on what the person can do rather than on the things they are unable to do
- It is best to let the person guide how and at what pace things should be done
- Self-responsibility should be handed over to people with disabilities as soon as they are ready

*Continued*

## CLINICAL INTEREST BOX 41.4 Suggestions to aid relationships between nurses and individuals with disabilities—cont'd

**When communicating:**

- Adapt your pace of communication to suit the other person and, when communication ability is impaired, allow time for responses
- Speak directly to the person—do not use another person (e.g. family carer) as a go-between
- Monitor how much input into the conversation the person with the disability has—be careful that you don't dominate the conversation
- Take the person's lead, pick up on what the person may prefer to talk about, or finds interesting or important. Be alert to signals and act on them; for example, in a person whose speech is impaired, eye movement towards an object may indicate that the object is wanted
- Ask the person what help is required; avoid automatically doing things for the person; do not insist on helping and do not assist without asking first
- Ask if unsure of how to behave towards the person; for example, if the person has an arm missing or has uncontrolled limb movements, how do they prefer you to place meals or other objects?
- Respond with understanding and goodwill if the person knocks something over or spills something; for example, a glass of water. Humour can also be helpful and, when used effectively, can minimise embarrassment
- Do not be overly concerned if you say something that feels inappropriate; for example, saying 'Do you want to hop into the shower now?' to a person who has a right leg amputation. Having a disability does not remove a person's sense of humour, and humour can relieve discomfort for both nurse and an individual
- Whatever the disability, always use age-appropriate language; for example, speak to the adult person with intellectual or cognitive impairment in the same manner as you would any other adult (Chapter 34 provides more information on communicating with people who have hearing, visual or cognitive impairment)

**Caring for people in wheelchairs:**

- Do not assume that the person in a wheelchair needs assistance
- Do not try to move the person or wheelchair without first gaining permission
- Do not hold on to the wheelchair unnecessarily. It is part of the person's body space and the person cannot step away from you
- Ensure you are familiar with how a wheelchair is pushed and manoeuvred before taking a person in a wheelchair out and about. This includes knowing how to get it up and down steps, how to tip it backwards, how to use the brake and how the armrests are removed (never lift a wheelchair by the arm rests—most are removable) and how it folds up. It is a useful exercise to practise pushing and manoeuvring a wheelchair with a person who does not have a disability sitting in it

**Promoting confidence:**

- Reinforce that people with disabilities have the same rights as other people in their community and in society as a whole
- Reinforce that they have the right to have a say in all decision making that concerns their lives, their treatment and their general wellbeing
- Reinforce that it is appropriate to be assertive and persistent in defending their rights, and to be firm but polite when defending their rights to things such as access, independence or privacy

**Encourage people with disabilities to:**

- Feel comfortable about asking for assistance when needed and avoid apologising for what they cannot do
- Feel comfortable in communicating in whatever way is appropriate for them, and about having to repeat things that are not understood or about asking other people to repeat or re-explain things that are unclear
- Understand that many people have little knowledge of disabilities (e.g. the realities of cerebral palsy), and be tolerant of and polite to people who are unsure of how to respond to them in social situations, or who offer help that is not needed
- Be prepared for times when they may feel anxious or depressed. Reinforce that such feelings are common and that help is available should they need it
- Try to create opportunities to instigate the person's contact with positive role models or others who have a similar disability. For example, it may be encouraging to a person who has recently become visually impaired to talk with a person who has adapted successfully to vision impairment. It may be helpful for people who are hearing impaired to meet with deaf people communicating avidly with sign language.

*(Ferris-Taylor 2003; Gething 1997)*

**TABLE 41.5 | National organisations in Australia concerned with the rights of people with disabilities**

| Organisation | Role |
|---|---|
| Australian Human Rights and Equal Opportunities Commission (HREOC) | A commission established in 1986 with specific objectives: to eliminate discrimination against people with disabilities and to promote acceptance and inclusion of people with disabilities into the community |
| Disability Services Australia | Range of services, including daytime activity programs and support with accommodation to help bridge the gap between school and adult life |
| Australian Council for Rehabilitation of the Disabled (ACROD) | National industry association for disability services, influencing government legislation and funding to promote quality services for people with disabilities |
| Action for Carers and Employment (ACE) | National body representing the many state and territory organisations that provide employment assistance and support to people with disabilities in the regular workforce |
| Australian Institute of Sport (AIS) | Activities include a program to coach elite athletes with disabilities |
| Australian Sports Commission | Promotes active lifestyle for all Australians, including those with disabilities. Activities include an education program to train teachers and community leaders to run sports and other outdoor events suitable for people with disabilities |
| Australian Sport and Recreation Association for People with an Intellectual Disability (AUSRAPID) | National sporting body that promotes equal access to sport and recreational programs for people with intellectual disabilities |
| Other organisations that promote inclusion in sporting activities include Australian Blind Sports Federation, Australian Deaf Sports Federation, Australian Sport and Recreation Federation, Disabled Wintersports Australia, Riding for the Disabled Association of Australia, Wheelchair Sports Australia | |

*(Australian Government 2015)*

and then throughout Australia. Subsequently other services such as foster care for children were also influenced by the findings.

During this process the asylum network was dismantled. The goal of deinstitutionalisation was not only to assist people with disabilities move into the community but also to develop new services to meet the changed needs thus created. For example, dispersed housing in the community has been shown to be a preferable alternative to large-scale institutions for improving the quality of life for people with disabilities (Queensland Government 2013). The process of deinstitutionalisation now forms the basis of the provision of care for people with disabilities. For people with disabilities, being part of the community is essential to their wellbeing and to improving their quality of life. Unfortunately, the process was not always smooth, particularly for people with severe and profound levels of intellectual disabilities or those with severe behaviours of concern (Bigby & Fyffe 2010; Clement & Bigby 2009) and while there is some contestation over the success of deinstitutionalisation there is also a significant body of evidence supporting the positive outcomes in relation to improved quality of life and independence (Cooper & Picton 2000; Milton 2006).

In Australia, despite the development of a national strategy to achieve **equity and access** for disabled persons, the systems available today continue to be 'fragmented, inequitable and under-resourced' (Queensland Government 2013:iii). Table 41.5 lists some of the national organisations in Australia that work to address issues concerning the rights of people with disabilities.

## THE PHILOSOPHY OF INCLUSION AND NORMALISATION

The concept of **normalisation** for people with disabilities is not new and has been discussed by governments and organisations for more than 30 years. The principle of normalisation stems from the work of Bengt Nirje (1969) and was further defined by Wolf Wolfensberger (1972; 1992) and identifies a basic philosophy that socially valued roles for people with disabilities should be supported and defended because their social roles as individuals are at risk of being devalued. Intrinsic to the concept of normalisation is the belief that all people are capable of growth and development (Brown & Smith 2012). Normalisation is not concerned with making everyone normal; rather the goals are to provide equitable access and services for people with disabilities. Wolfensberger asserts that normalisation should instead be called **social role valorisation (SRV)** as this is more inclusive and values the social roles held by an individual with a disability (Wolfensberger 2004). The key principle underpinning SRV is that if a person holds valued social roles, that person is more likely to receive from society the good things in life that are available to that society: these include home and family; friendship; being accorded

## CLINICAL INTEREST BOX 41.5 Implementation of normalisation and inclusion principles

### Education

Significantly increased integration of children with disabilities into mainstream schools.

### Arts, sports and recreation

Being inclusive in arts, sports or recreation is about providing a range of options to cater for people of all ages and abilities in the most appropriate manner possible. It is more than including people with disability in regular sport activities: it includes ensuring that an individual chooses to participate in a range of opportunities that take into account:

- their functional ability
- the sport in which they are participating
- the opportunities within their local environment
- their personal preferences.

Drama groups such as RAWCUS have provided ongoing opportunities for people with disabilities to fully participate in all areas of theatre production including international arts festivals (in 2008) as well as working with organisations such as the Melbourne Symphony Orchestra (in 2007).

### Employment

Access to employment has improved as a result of stipulated requirements and government schemes

Employers are required to modify workplaces to facilitate the employment of people with disabilities (e.g. purchasing special equipment, provide for wheelchair access) unless doing so causes unjustifiable hardship to the business

Government funding is available to assist with modifications to some business workplaces

Advertisements for jobs must not discriminate against or exclude a person with a disability from applying for the position provided that they have the ability to do the work.

### Transport

The Disability Standards for Accessible Public Transport 2002 (Transport Standards) are mandatory standards in Australia and are further supported by state legislation such as the Disability Services Act 2006 (Queensland). The Transport Standards cover premises and infrastructure and apply to public transport operators including bus, coach, train, taxi and aviation companies.

### Access to buildings

The Building Code of Australia stipulates that buildings must be designed to facilitate access and meet the needs of people with a range of disabilities. Requirements include:

- Doorways wide enough for people using wheelchairs
- Appropriate toilet space and facilities
- Minimum lighting to meet needs of visually impaired people and those who communicate by sign language or lip-reading.

### Entertainment

Captioning: in 1982 the Australian Captioning Centre was established to provide captioning services for hearing impaired people. Captioning on film or television provides written on-screen messages about what is being said and what sound effects or music are happening. Australian legislation requires that captions are provided for news, current affairs and prime-time television programs. In 2001 captioning was introduced in major cinemas around the country, but at the time of writing not all films were yet captioned.

dignity, respect and acceptance; a sense of belonging; an education; the development and exercise of one's capacities; a voice in the affairs of one's community and society; opportunities to participate; a decent material standard of living; at least a normative place to live; and opportunities for work and self-support. Clinical Interest Box 41.5 provides some examples of how the philosophical principles of **inclusion** and normalisation have been, or are still to be, implemented. (See Case Study 41.1.)

## CONTINUING CHALLENGES

Despite the many changes that have occurred in the past three decades there is still stigma attached to both chronic illness and disability. The more profound and obvious the disease or disability, the more significant the social barriers are (Willett & Deegan 2001). Many such barriers may impact significantly on the way people with disabilities perceive and feel about themselves (Green et al 2005).

## CASE STUDY 41.1

Grace is 42 years old. She was born with a brain injury as a result of birth trauma. Her parents have been her primary carers since birth. Grace requires a high level of physical assistance. For example, every day of her life her father has lifted her from her bed in the morning and carried her to a recliner chair in the lounge and later returned her to bed the same way. Each day her mother has prepared the food and assisted Grace with her meals. Because of the difficulties Grace has with chewing and swallowing her food, mealtimes have always been a lengthy process. Personal care routines such as showering and dressing are provided by her parents. Sometimes Grace resists and yells out. Grace is incontinent of urine and her parents fit her with disposable pads every morning and change them frequently during the day. They take care of the pressure areas that sometimes develop.

After leaving her special developmental school at 17 years Grace began attending a day centre 3 days each week. She was taken there in a community bus specially designed to accommodate her wheelchair. Activity at the centre revolved mostly around the staff meeting the hygiene, toileting, medication, mobility and nutritional needs of the two dozen or more people with severe or profound disabilities who also attended. The staff reported that Grace spent a lot of her time there simply dozing.

On the days she is at home Grace has many things surrounding her that give her pleasure. She has a box containing many different pieces of material. She enjoys the feel of the different textures, especially the velvet and silk. Other times she holds on to colourful toys and, although she has a profoundly limited vocabulary, she is able to express her pleasure in her favourite television programs and music. Grace also enjoys being with her mother in the kitchen and sitting on the outside veranda watching people walk past the house. Many of the neighbours greet her cheerfully.

Grace's parents have been anxious for some time about their future ability to care for her, but now Grace's mother has fallen and fractured her hip. Her father is exhausted and cannot manage to care for Grace alone. Grace has been admitted to a residential care unit, where most of the residents are elderly and have dementia. There is nowhere else available at the moment.

1. What might Grace's mother and father be feeling about this situation? What could be done to help them?
2. What might be the impact of this move on Grace? How might she be feeling? How can staff help ease the transition to her new accommodation and situation?
3. What other supports could you refer both Grace and her parents to?
4. What are Grace's rights? What are the risks of those rights being infringed?
5. What can staff do to ensure that her rights are not infringed?
6. How can staff create a stimulating and pleasurable environment for Grace?
7. What does social role valorisation or normalisation mean to Grace?

It is essential if these challenges are to be overcome that the first step is in educating healthcare professionals so that they can:

- Influence the physical and social environments in which people with disabilities live and work
- Educate the public so that people with disabilities are included
- Advocate to governments, service providers or councils for changes in the way current services are provided and suggest affordable improvements that provide easy access.

# APPROACHES TO MANAGEMENT OF INDIVIDUALS WITH CHRONIC CONDITIONS OR DISABILITIES

## Assessment

Assessment of the individual is integral to the development of effective nursing care plans. People with chronic conditions and/or disabilities should always be assessed holistically placing the person at the centre of the assessment. An example of a nursing care plan for an individual with chronic obstructive pulmonary disease has been provided as well as an example of an entry into progress notes (see Nursing Care Plan 41.1 and Progress Note Example 41.1).

A multidisciplinary approach to assessment is generally required. Depending on the age and type of disability the person is experiencing, assessment may involve a range of professionals including but not limited to teacher, doctors, occupational therapists, speech pathologists, social workers, psychologists and nurses.

The purpose of assessment is to identify the abilities, strengths and specific needs of an individual so that appropriate care may be planned. The overarching goal is to ensure support that allows the person to live life as near as possible to the way they desire. The assessment process should consider all aspects of the person's life including:

- Physical needs
- Health and medical needs
- Financial support
- Spiritual and emotional support needs
- Cultural needs
- Learning needs
- Behavioural support needs
- Need for meaningful work
- Recreation and leisure needs
- Transport issues

## NURSING CARE PLAN 41.1

Mr Smith is a 75-year-old man with chronic obstructive pulmonary disease. He lives at home with his wife but his breathlessness prevents him from exercising or actively participating in social activities. He has been showering and dressing himself and he has a motorised mobility aid for mobility. Due to an exacerbation of his condition and a chest infection he has been admitted to hospital. The Registered Nurse asks you, the Enrolled Nurse, to assist Mr Smith with showering and dressing and to evaluate his ability to perform this activity. Mr Smith tells you that he has been washing with a bowl for the past few weeks as his breathlessness has made it too difficult to shower.
**Assessment:** Impaired home maintenance related to intolerance to activity, decreased strength/endurance
**Issue/s to be addressed:** Able to perform activities of daily living—showering and dressing at home with assistance
**Goal/s:** Home evaluation by occupational therapist for home modifications such as rails; purchase of suitable chair for the shower; contact home nursing service and organise nursing assistance with showering and dressing.

| Care/Actions | Rationale |
|---|---|
| Educate Mr Smith on how to pace activities | Increased knowledge will lead to a change in behaviour |
| Assess the ability to perform the ADL | Mr Smith may only need assistance with some aspects of the ADL |
| Slow the speed that tasks are performed | Decreases activity intolerance |
| Stop and rest when tired or breathless | Decreases activity intolerance and allows for tasks to be performed using less energy |
| Pace your activities | Prevents fatigue |
| Sit on a chair or stool in the shower and when performing grooming activities such as shaving. Assess whether other assistive devices are needed | Use of assistive devices and chairs increases independence |
| Limit the use of products that may affect your lungs such as spray deodorants—use non-spray products instead | Some products may cause exacerbations of breathlessness |
| Assess the need for home care on discharge | Home care may maintain independence and help Mr Smith stay in his own environment for longer periods |

**Evaluation**

Mr Smith will be able to verbalise the understanding of appropriate measures to decrease breathlessness and fatigue when performing activities of daily living.

## PROGRESS NOTE EXAMPLE 41.1

| | |
|---|---|
| 21/10/2015<br>1500 hrs | Nursing: Mr Smith has had a comfortable day and was able to carry out all ADLs independently. He required one PRN dose of Ventolin this shift prior to lunch. His IV remains patent and the insertion site is free from signs of infection or extravasation. Mrs Smith came to visit and has asked to meet with the team prior to his planned discharged home in a few days. Mr Smith's treating team and medical officer have been informed of this request.<br>***K. Marter*** **(Marter) EN** |

- Accommodation needs
- Support networks (family and community)
- Impact of the person's environment.

The team may assess the individual using a variety of methods, such as observation, interviewing and testing. A checklist may be used to help identify activities that can be performed independently by the individual, and those for which assistance is required. When assessment is complete the team, collaboratively with the individual or family carer, can plan the care to be implemented following the principles of person-centred planning.

The extensive types of disability, and the fact that many individuals will have multiple disabilities, means that after the assessment process nurses may determine a broad range of nursing diagnoses for each person. Clinical Interest Box 41.6 identifies some common issues that need to be considered for a nursing assessment of individuals with disabilities. The list is by no means exhaustive and not in any particular sequence. The degree of relevance and nursing response will vary with each person and each situation.

## Planning and implementing care

Using the information obtained from the assessment process, a care plan or treatment plan is developed to meet the individual's needs. Central to development of a program is the concept of helping the individual to achieve as much independence as possible (Table 41.6). The aim of professional support is to facilitate the person living as independently as possible and assisting them to engage in activities that enhance their quality of life while encouraging them to develop effective interpersonal relationships and make informed choices.

## CLINICAL INTEREST BOX 41.6 Nursing considerations related to the needs of individuals with chronic disease or disabilities

**Psychological needs**

- Impaired adjustment
- Ineffective individual coping
- Self-concept disturbance (incorporating body image/self-esteem/role performance/personal identity)
- Hopelessness
- Powerlessness
- Altered sexuality pattern
- Impaired social interaction

**Physical needs**

- Impaired physical mobility
- Impaired verbal communication
- Self-care deficit (incorporating hygiene/dressing and grooming/toileting)
- Sleep pattern disturbance
- Altered patterns of elimination (incorporating urinary/bowel)
- Potential for impaired tissue integrity
- Potential for falls/injury

*(Lubkin & Larsen 2006)*

## Evaluation

Evaluation must be performed continuously to assess progress in achieving the goals of care. Continuous evaluation is also needed to identify whether there are potential risks that have not been considered previously and to confirm that safe, holistic care is maintained.

## Person-centred care

Person-centred care views individuals and their significant others as equal partners in the planning and provision of services. Unlike other models of care, this model places the person at the centre of their own care and also considers the needs of the caregiver (Cambridge & Carnaby 2005). The concept of person-centred care originates from the counselling approach developed by Rogers in the late 1940s. Rogers (1951) believed that all people have a personal responsibility and choice in decisions and that no one should make decisions for another person. Rather than give advice, the role of the clinician is to maintain an 'attitude of positive regard'; that is, be non-judgmental and supportive. More recently the inclusion of other strategies such as motivational interviewing have strengthened this model. Clinical Interest Box 41.7 outlines the principles of person-centred care and Table 41.7 provides a list of some of the core skills and knowledge required by nurses to support individuals to self-manage.

## TABLE 41.6 | Stages in the development of a care plan for a person with a disability or chronic disease

| Stage | Action |
|---|---|
| Identify a person's capabilities | What are the person's strengths and weaknesses?<br>What do they need assistance with?<br>Focus on what the person can do rather than what they cannot do |
| Establish common goals | Assist the person to set SMART goals:<br>• Specific<br>• Measureable<br>• Achievable<br>• Realistic<br>• Timely<br>Set small goals to develop a sense of achievement<br>Ensure family and significant others are aware of the goals |
| Identify and prioritise skills that need to be developed | What skills does the person need?<br>What resources are needed?<br>How can the family/significant others assist? |
| Determine the most effective teaching strategies | How will the person learn the new skills?<br>Experientially?<br>Practically?<br>Vicariously? |
| Determine the most effective interventions to meet social, educational and other needs | What does the person want to achieve?<br>How can this be achieved? |

## CLINICAL INTEREST BOX 41.7 Principles of person-centred care

- Develop a rapport and get to know the person and caregiver
- Responsibility and decision making is shared
- Individual's preferences are respected
- Provision of accurate and easy-to-understand information so that individuals can make informed choices
- Care is co-ordinated and integrated, working seamlessly to improve a person's outcomes
- The environment supports staff in the provision of person-centred care

*(Victorian Department of Human Services 2006)*

**TABLE 41.7 | Core knowledge and skills essential for healthcare professionals to provide self-management support**

| Skill | Ability |
|---|---|
| Assessment skills | Able to assess:<br>• Readiness for change<br>• Risk factors<br>• Support systems<br>• Self-management ability<br>• Strengths and weaknesses |
| Behaviour change skills | • Motivational interviewing techniques<br>• Understanding models of behaviour change<br>• Able to assist the individual with goal setting, problem solving and developing action plans |
| Organisational skills | • Able to work in multidisciplinary teams<br>• Applies evidence to practice<br>• Sound knowledge of community resources |

**TABLE 41.8 | Phases in the stages of change model**

| Phase | Description |
|---|---|
| Pre-contemplation | The individual does not intend to change behaviour within the next 6 months. In this phase the individual lacks motivation but also may lack the knowledge and skills to make any changes |
| Contemplation | During this phase the individual is considering making changes within the next 6 months; however, they are hampered by ambivalence and tend to focus on the barriers and challenges that will be encountered rather than the positive effects |
| Preparation | The individual is preparing to take action within the next month and has usually developed a plan and may already have initiated some actions |
| Action | The individual is actively taking action to modify and change behaviour. Relapse is a real concern at this stage and ongoing support is essential |
| Maintenance | The individual has made the changes and the risk of relapse is decreasing as time goes on. At this point the individual will usually state they are confident they can continue the new behaviour |

## Motivational interviewing and assessing readiness to change behaviour

In a model of care where the person is regarded as being an equal it is essential that the clinician does not 'tell a person what to do'. As previously mentioned, the role of the clinician is to support the person while encouraging the person to explore issues preventing behaviour change. Prochaska and DiClemente's model of behaviour change describes a process of behaviour change which occurs over time with individuals moving through five stages, from pre-contemplation to maintenance (Table 41.8) (Prochaska & DiClemente 1986). This model is a useful way of identifying whether a person is ready and motivated to modify or change behaviours (Norcross et al 2011).

Prior to moving to discuss a plan of action planning and interventions, the clinician should ascertain the individual's readiness to change. If the individual is not in the preparation or action phase then motivational interviewing strategies may be used to explore reasons preventing change.

### Motivational interviewing

Motivational interviewing (MI) strategies have become the 'gold standard' communication methods of working with individuals who are reticent to make changes considered necessary for optimal health (Britt et al 2004). Based on the principle that most people do not enter into relationships with clinicians motivated to make changes or modify their behaviour, the role of the clinician therefore is to assist the individual to explore their ambivalence about making the behaviour change (Drury & Aoun 2014). There are four phases in MI:

1. Engaging
2. Guiding
3. Evoking
4. Planning (Drury & Aoun 2014; Miller & Rollnick 2012; Rubak et al 2005).

See Table 41.9 for more detail.

Motivational interviewing may take a number of sessions and a considerable amount of time. Unfortunately in the real world clinicians do not always have unlimited time nor do individuals always return for appointments. Therefore it may be more useful to use brief motivational interviewing strategies as these are designed to be used in a single session of approximately 45 minutes. Using the same communication strategy as that used in MI the clinician works through seven stages to encourage the individual to explore ambivalence (Rollnick et al 1992):

1. Build rapport—establish a therapeutic relationship and encourage the individual to openly share. Be non-judgmental and empathetic. This may help you to understand whether the person plans to make any

**TABLE 41.9 | Phases in motivational interviewing**

| Phase | Clinician's role |
|---|---|
| Engaging | Assess the individual's stage of change using OARS:<br>• Open-ended questions<br>• Affirmations<br>• Reflective listening<br>• Summarise the discussion |
| Guiding | Explore the attitudes and values held by the individual<br>Encourage the individual to identify costs and benefits of changing or not changing behaviour<br>Assist with goal planning and set goals that are measurable and achievable in a short space of time |
| Evoking | At this stage the individual is motivated to change behaviour<br>Ask the individual to identify reasons for making the change and then reinforce the change with these statements<br>Affirm all positive action<br>Encourage the individual to reflect on the change |
| Planning | Identify and set measurable and achievable goals |

changes and where they are in the stages of change model
2. Open the discussion—allow the person to discuss their concerns by inviting them to tell their story. Use open-ended questions and probing to elicit further information
3. A typical day—ask the person to describe a typical day to you from the time they get up in the morning. This often helps the individual identify and explore issues that are a problem or triggers for behaviours that need changing
4. The good things and the less good things—encourage the person to talk about the good things and the less good things. The terminology here is important as speaking of the less good things rather than concerns allows the person to identify problem areas without feeling that these behaviours are being labelled as problematic. Use open-ended questions to probe further and affirmation when the person identifies good coping skills.
5. Provide information—avoid giving advice. Ask if the person would like information about specific issues and provide it if wanted. Use reflective listening and paraphrase to ensure you heard the correct message
6. The future and the present—this strategy can be used if the person is concerned about a particular behaviour. Ask the person how they would like things to be different in the future
7. Explore concerns—this essential step is where you listen to the person and facilitate them thinking about changing behaviour.

A goal-directed and focused type of counselling approach, both MI and brief MI require training and practice. It is essential that any clinicians using this approach have received appropriate training from a qualified person and receive adequate supervision while they become proficient in its use (Madson et al 2009). Referral to clinicians trained in MI should be organised if ability to provide competent MI counselling is outside the clinician's scope of practice.

## Self-management for individuals with chronic diseases and/or disability

The origins of self-management of chronic disease are in Lorig's seminal work with arthritis sufferers in the USA in the 1970s. **Self-management** is a theory-based approach to healthcare that recognises the central role played by the individual in health promotion, disease prevention and successful management of illness. It is the ability to manage the disease process, the emotional consequences of living with the disease and the changes that occur to daily living as a consequence of the disease. Evidence in the literature shows that education programs incorporating self-management skills can enhance health outcomes (Bodenheimer et al 2002). Self-management is both a process whereby training is provided to people with chronic illness and an outcome which indicates when people with chronic health problems achieve the skills and knowledge to manage the medical, emotional and role aspects of their illness (McGowan 2005).

Previous development of many self-management programs has focused on the major chronic illnesses existing in industrialised societies; for example, arthritis, diabetes, chronic obstructive pulmonary disease and heart disease. In more recent times, however, there has been a move to facilitate self-management principles into programs for people with disabilities with evidence suggesting statistically significant positive outcomes (Drury et al 2012; Girdler 2006). Disease self-management programs can be delivered to groups or individuals by health professionals or lay people, via face-to-face format or interactive technology such as the internet or telephone. Each of these methods of delivery requires healthcare professionals to learn new skills and refine existing skills (Mensing & Norris 2003).

Integral to self-management is the support and advocacy provided by healthcare professionals that empower the individuals to make informed choices and actively participate in the management of their disease or disability. This involves a partnership between the person and the healthcare provider where the person is the manager of the daily consequences of the disease and the healthcare professional is the coach (Drury & Aoun 2014). This model is similar in principle to person-centred care whereby the healthcare professionals share information with the person and caregivers, understand the

person's values and goals and help them to create a care plan that meets their goals. Holland et al (2010) suggests that self-management support involves three steps:

1. Defining the issues or problems
2. Setting goals and developing problem-solving strategies
3. Active sustained follow-up.

The main difference in this model is that the person is acknowledged as being the expert in managing their disease and the healthcare professional is the expert in the disease and disease process. Thus the person takes an active role in determining care and setting goals. Bodenheimer et al (2002) described the role of the healthcare professional as providing support to the person by assisting them to make informed choices, set their own goals and develop problem-solving skills.

Experts in self-management programs suggest that core knowledge and skills essential for healthcare professionals to provide self-management support can be centred on assessment and behaviour change skills and organisational strategies (see Table 41.7) (Australian Government Department of Health and Ageing & Flinders University 2009).

Establishing a rapport with the person and eliciting information about their challenges and successes are components of effective self-management support (Battersby et al 2008; Harvey et al 2008; Lorig 2000; Packer et al 2008; Vancouver Coastal Health 2008). Assessing the individual for readiness to change and exploring the consequences of current behaviour and any ambivalence towards change are the first steps in self-management support (Drury & Aoun 2014).

Ambivalence is at the core of change and it is essential to acknowledge that not all people are ready or willing to change. The role of the healthcare professional is not to tell the individual they must change but rather help them explore their ambivalence and behaviours, provide information and help them understand their lifestyle and concerns in the hope that they will become intrinsically motivated to make changes. The interpersonal relationship that develops must provide the individual with a safe and supportive place to do this.

### CRITICAL THINKING EXERCISE 41.1

Maria is a 45-year-old overweight woman diagnosed 5 years ago with non-insulin-dependent diabetes. She is a stay-at-home mother with three teenage children and a husband who works shift work. Initially treatment was with an oral hypoglycaemic agent and diet; however, this was poorly adhered to and her blood glucose levels escalated. On examination she has a small ulcerated area on the side of her foot. She appears anxious but in a hurry and tells you she has to get home as the children are due home from school. She tells you she feels like a failure and is ashamed of having diabetes. As the nurse in the clinic you realise you have limited time to effectively explore her issues with her.

What brief motivational interviewing strategies might you use that could get Maria to consider the consequences of her behaviour?

## Provision of services

The federal, state and territory governments in Australia fund a range of services for people with disabilities and their family carers, including:

- Family support services such as respite care and community-based respite care
- Domiciliary support, such as help with cleaning, house and garden maintenance and Meals on Wheels
- Personal care support
- Home modification and provision of equipment
- Independent-living skills programs
- Pre-vocational training, vocational placement and employment support
- Social support, including recreational and culturally specific activities
- Community-based accommodation and support; for example, support available to people with a disability living at home or in other accommodation in the community
- Counselling in the areas of sexuality
- Education and training for carers, individuals and their families
- Behaviour management programs and specialised training in this area
- Specialist assistance from professionals such as psychiatrists, psychologists, speech therapists and occupational therapists
- Case management (both short and long term), providing individual support, advocacy and monitoring
- A person's disability allowance
- Carer's allowance (small regular financial payment to assist with additional expenses).

These services aim to assist people with disabilities to achieve as much independence as possible by promoting and supporting family and community acceptance and involvement, by providing sufficient support services and by offering a range of accommodation options.

As highlighted earlier, there is now much greater acceptance of the importance of family living and of participation in community life than previously. The wellbeing and the quality of life of people with disabilities depends on recognition and acknowledgement of their rights, promotion of community acceptance and the implementation of programs that appropriately promote education, provide training for employment, develop independent skills in activities of daily living and promote enjoyment of life. Professional support is primarily directed towards enabling a person with a disability to achieve as much independence as possible, through interventions and by providing support that promotes independent living and vocational capacities. Planning and implementation of appropriate educational and vocational programs is performed on an individual basis and takes into account any associated physical, sensory or emotional effects of the disabilities.

Basic principles that should guide the provision of services include:

- A collaborative approach between health professionals: the individual and the family should be consulted to decide what is needed, what will be of most help and how that help should be implemented for maximum benefit
- Identification of the individual's and family's strengths and capabilities
- Recognition and validation of emotions, needs and concerns.

These principles should be kept in mind when assessing, planning, implementing and evaluating care.

## CAREGIVERS OF PEOPLE WITH CHRONIC DISEASE OR DISABILITY

Family and carers of people with chronic disease and/or disabilities are often expected to provide care and support 24 hours a day. Unlike nurses, family carers do not get breaks between shifts or get to go home after finishing their work. Even when respite is available, the responsibility is permanent, 7 days a week, often lifelong and often falling primarily on one family member (Starke 2011).

For many the responsibility begins with the birth of a child with a chronic disease such as cystic fibrosis or a disability such as a hearing impairment. Parents in this situation are faced with an unplanned lifetime of giving full-time care that interferes with their ability to give as much time as they would like to their other children or to conduct their lives as previously planned. They are faced with coping with the situation as they deal with the grief associated with lost expectations about their baby and the future. For others it begins at the stage of life when caring responsibilities are expected to reduce; for example, the parent caring for an adolescent offspring who has an acquired brain injury or has developed serious mental illness. Caregiving responsibilities may also begin in older age when a spouse develops a chronic disease such as chronic obstructive pulmonary disease or dementia.

Families caring for adolescents face particular challenges impacting on daily life: internal factors such as changing family roles and relationships and external factors such as service discontinuity, where forfeiting of a desired option may be necessary. Also, teenagers with intellectual disabilities (ID) have significantly more health problems than the rest of the population and many encounter difficulties accessing the services they need (Bhaumik et al 2011). Challenges such as these mean that family routine in the adolescent years is dynamic rather than static. Families use multiple strategies to accommodate these challenges, which are underpinned by their beliefs, values and resources. Professionals working with families caring for an adolescent with disability need to be aware of these in order to support families effectively to sustain a meaningful family routine during the adolescent years (Schneider et al 2006). Some professionals find the families they support considering or actually relinquishing the care of the person to the state (Nankervis et al 2011). The professional must ensure the family has an understanding of the ramifications of this decision.

### The impact of caring: lifestyle changes and loss

Whenever the carer role begins, it is often associated with great lifestyle changes and many losses, including:

- Loss of the ability to continue with a career or paid employment
- Loss of income and financial security
- Loss of status and socialisation that often accompanies a paid work position
- Lost hopes and dreams of what the future will bring
- Loss of freedom and socialisation
- Loss of a normal or expected relationship (e.g. loss of companionship or a sexual partner when physical and cognitive functioning are profoundly affected) (Funnell 1998).

Despite the seriousness of their situation, many people caring for family members with disabilities gain pleasure, a sense of satisfaction and feelings of personal fulfilment from the role they have undertaken.

The grief associated with loss cannot be ignored and one of the greatest and most difficult challenges confronting people with long-term conditions or disabilities is coming to terms with the loss. Often, despite the losses being significant, the grief surrounding them will largely go unnoticed. The person themselves may not be aware that they are grieving as they struggle to manage the complexities of their new life. Although it is acknowledged that people experience loss in unique and individual ways, the common responses to loss identified by Kübler-Ross in her seminal work are applicable to the loss and grief experienced in chronic illness and disability (Kübler-Ross 1969). These stages are denial, anger, bargaining, depression and acceptance. These stages help us understand where a person may be in relation to accepting and living with their chronic illness or disability but they are not prescriptive; that is, not everyone experiences all stages and the stages are not always linear. Grief and loss is a unique experience. Individuals experiencing these emotions need support from a range of health professionals. To help the person move forward and develop positive coping strategies professional counselling may be critical at this time. Referral to a general practitioner, a psychologist or a counsellor should all be considered at this stage.

### Support for primary (family) carers

It is essential that nurses and other professionals acknowledge and credit family carers as having the primary caregiving role, and carefully assess how to best enable and facilitate their ongoing coping abilities. Some family carers prefer to cope independently; some prefer a regular visit from a nurse or other team member; others may view such visits or other interventions as an invasion of privacy (Starke 2011). Some simply need the reassurance of having a contact to call when information or assistance is needed. Others need a significant amount of support when supporting people with complex health needs or in managing challenging behaviours (Thompson et al 2007). The amount and type of support may vary

in terms of its frequency or intensity but whenever and whatever services are implemented they should be determined in collaboration with the primary carer. There are key times when additional services or support may be needed. These include:

- At the time of diagnosis or identification of a disability
- During the care of a preschool child with a disability
- When educational needs and the person's potential need to be determined or reviewed
- Before transition from child to adult services or from adult to aged care services
- When the person is unwell
- When the primary carer is unwell
- When the person's general functioning declines and care needs increase (Wake 2003).

The opportunity for primary carers to take short-term breaks through the use of respite services should be integrated into care planning. Even though such breaks do not resolve the stresses and strains of full-time caring, they may have a positive influence on the ability of the primary carer to continue the carer role in the long term. However, some family carers feel guilty about putting a dependent loved one into respite care, and choose not to take much-needed breaks. Even so, demand for respite services sometimes exceeds supply (Nankervis et al 2011).

One of the significant issues facing primary carers is what will happen to the dependent loved one if they should get sick or die. This is particularly worrying for parents who have spent a lifetime caring for dependent children with limited service support. As resources and services experience higher demand with shrinking budgets, families often carry the added burden of planning for ongoing care, in particular in the area of accommodation, because of the ongoing shortage of appropriate accommodation for people with disabilities.

Whenever possible, individuals, families and carers need to develop a plan in advance to ease this worry, but this can be a complicated matter. The current shortage of suitable accommodation options for young people already results in young people with disabilities living in aged care facilities. This situation is not likely to improve in the near future. In future years the current older generation of family carers will need to relinquish care of adult children with disabilities and thus demand for appropriate accommodation and care will increase significantly. There is a very real possibility that, unless action is taken now, many people with disabilities will be left without a suitable home and without appropriate care and support. It is essential that professionals such as nurses continue to advocate for appropriate resources for people with disabilities. In addition, based on the assessment of the family needs made by the nurse, grief counselling for the family and caregivers may help relieve caregiver burden and compassion fatigue.

Caring for people with profound or multiple disabilities is challenging. The nurse needs to make an informed assessment of needs, plan sensitive and timely interventions and demonstrate respect for the individual. It is also of vital importance the nurse acknowledges and shows empathy for the role of the primary carer. These attributes are at the heart of excellent nursing care for people with disabilities.

## HEALTH PROMOTION: DISABILITY PREVENTION

While much can be done to improve the lives of people with disabilities, it is equally as important to minimise disability in the community as much as possible. Several **health promotion** strategies have been implemented with the aim of reducing the number of people who are born with or acquire a disability (see Clinical Interest Box 41.8).

Prevention of disability needs to be a priority. Currently there are an estimated 4.2 million people in Australia (18.5% of the population) who live with one or more limitations to functioning (Australian Institute of Health and Welfare 2012a). It is difficult to determine exactly how many of these disabilities were preventable; however, it is known that many of these injuries occur in preventable situations such as traffic accidents, or are sporting injuries, or are due to the misuse of illicit substances.

Many of these causes of acquired brain damage, and some other congenital or acquired disabilities, could be minimised by health and safety education programs and/or programs

### CLINICAL INTEREST BOX 41.8 Strategies for health promotion/ disability prevention

- Vaccinations: promoted to prevent serious illness that can lead to a range of impairments; for example, vaccination against the rubella virus is important because maternal rubella in the early stages of pregnancy can cause congenital abnormalities
- Road safety campaigns and 'Swim Safe Stay Safe' campaigns: aimed to reduce the number of disabilities caused by road, diving and near-drowning accidents
- Safe sex campaigns: aimed to reduce the incidence of AIDS and other disabling disorders
- Safety in the workplace and safety in the home programs: aimed to reduce avoidable injuries to employees, children and adults
- Anti-smoking campaigns: aimed to reduce the physical impairment caused by damage to the lungs and other organs by smoking
- Education of pregnant mothers about the dangers of smoking to the unborn infant: aimed to reduce the risk of brain damage and intellectual disabilities in children. Education programs for pregnant mothers have also focused on the importance of healthy nutrition and the elimination of alcohol and other drugs
- 'SunSmart' campaigns: aimed to reduce disability caused by skin cancer

that promote and support a healthy lifestyle. An important role for nurses, particularly those working in community settings, is the prevention of additional illness in people with disabilities by ensuring their ongoing access to routine health screens. This is sometimes difficult, perhaps due to a physical disability preventing a person achieving the correct position for a particular health screen, such as a mammogram or a Papanicolaou test (Pap smear), or a person with an intellectual disability giving consent for these procedures. This does not mean that health screening should be put in the 'too hard basket'. Consultation between medical officers, radiographers, physiotherapists, nurses and especially the person with the disability is needed to establish a way in which tests can be successfully managed.

## ABUSE AND ADVOCACY

Unfortunately despite all the information and support available for caregivers, people with disabilities and chronic diseases are still subject to abuse, neglect, exploitation and risk. There are legislative frameworks such as the International Convention on the Rights of Persons with a Disability and the Disability Discrimination Act that exist to protect these people against abuse. As healthcare professionals it is our responsibility to know and understand the legislation we work under. It is also essential that people with disabilities understand their own rights. If you have concerns regarding a person in your care you should refer the issue to a more experienced staff member.

## Summary

Chronic disease and disabilities are becoming more common as societies globally confront the challenges of ageing populations. The impact of a chronic disease and/or disability on an individual's life may vary from mild to profound. Experiences are subjective and the meaning of impairment is unique to each person.

Although the focus of service provision for people with chronic diseases and/or disabilities has shifted from institutionalised and acute care to community-based primary care, allowing many to live independently or semi-independently in their own environments, there is still a long way to go before service provision meets need.

The philosophy of person-centred care where the person is supported to self-manage and provided with the resources and support to make informed choices means that nurses and other healthcare professionals must take on the role of support and advocate. This support role provides advice, assessment and access, empowering people to take control.

In this chapter we have provided a brief overview of chronic disease and disability focusing on normalisation and individual empowerment.

### DECISION-MAKING FRAMEWORK EXERCISE 41.1

You are the EN allocated to care for Mr Smith. During a conversation he voices his concerns regarding the future for himself and his wife due to his illness. He is worried his condition is getting worse and he doesn't know how his wife would cope if he was to die. He asks you for advice and wants to know if you can talk to his wife too.

1. How would you approach this scenario?
2. What suggestions could you make to allay Mr Smith's fears and support him?

## Review Questions

1. Identify the ways in which disabilities may be classified.
2. Define the terms medical model, social model and biopsychosocial model of disability.
3. Define the levels of restrictions that are used to categorise the assistance needs of people with disabilities.
4. Explain what is meant by the terms 'social role valorisation' and normalisation.
5. Identify the nursing considerations related to caring for a person with chronic condition.
6. Identify actions that can help prevent chronic conditions.
7. List the principles of person-centred care.

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Alzheimer's Australia: www.alzheimers.org.au

Australian Department of Health and Aged Care: www.health.gov.au

Human Rights and Equal Opportunities Commission: www.hreoc.gov.au

Kidsafe—the child accident prevention foundation of Australia: www.greenweb.com.au/kidsafe

Multiple Sclerosis Australia: www.msaustralia.org.au

National Disability Services: www.nds.org.au

United Nations: www.un.org

Australian state government websites

www.adhc.nsw.gov.au/

www.dhs.vic.gov.au

www.communities.qld.gov.au/disability/

www.disability.wa.gov.au/index.html

www.dhs.sa.gov.au

www.dhhs.tas.gov.au/disability/

www.nt.gov.au

www.dhcs.act.gov.au

New Zealand government website

www.health.govt.nz/our-work/disability-services

# Nursing in the acute care environment

*Michelle Hall*

CHAPTER 42

## LEARNING OUTCOMES

After the completion of this chapter, and with further reading, students should be able to:

- Define the key terms
- Discuss the increased scope of practice for Enrolled Nurses and the impact this has on clinical practice
- Identify the impact of acute health problems on the individual and family
- Describe nursing interventions to support healthcare of individuals with acute health problems
- Demonstrate critical thinking and problem-solving approaches in undertaking individual care
- Develop nursing care plans for the individual with acute health problems
- Understand the use of clinical pathways

## KEY TERMS

acute renal failure
cellulitis
clinical pathway
deep vein thrombosis (DVT)
diverticulitis
Guillain–Barré syndrome
pulmonary embolism (PE)
scope of practice
sepsis

## CHAPTER FOCUS

Traditionally, Enrolled Nurses (ENs) worked in the aged care setting. With increasing scope of practice, ENs are now moving into new clinical areas. Enrolled Nurses now work in nearly all nursing disciplines and have become valued, skilled members of the team. However, increasing the scope of practice of ENs has not been without problems. Working in the acute care environment brings new challenges for the Enrolled Nurse; these are explored in this chapter.

Also explored in this chapter are clinical pathways. An understanding of clinical pathways is critical for all nurses and as the scope of practice expands for ENs it is of utmost importance that the EN develops an understanding of these crucial tools for practice.

## LIVED EXPERIENCE

I work in a busy diagnostic imaging department. One day an individual was brought down to the nuclear medicine department for a VQ with a suspected PE; she had had an emergency caesarean the day before and was clinically obese. We placed her on the table and put an oxygen saturation monitor on her, which was protocol. She was already on 2 L of oxygen via nasal prongs as she was having dyspnoea and desaturation. As we commenced the scan her oxygen saturation started to decrease; she was experiencing more dyspnoea but the doctors present did not want to stop the scan. The Registered Nurse (RN) asked me to increase her oxygen to 4 L and I tried to comfort her, while asking the nuclear medicine technologist to call another nurse from my department for assistance. She arrived and went to get the crash cart. All the while the individual's oxygen saturations were decreasing: she was becoming tachycardic and tachypnoeic. The doctors present, who were radiologists, not the woman's treating unit, refused to allow us to make a medical emergency team (MET) call. As the individual's condition continued to decline in front of us, the RN and I decided to override the doctors and make a MET call. As soon as she left the room to make the call, the individual went into cardiac arrest. We commenced CPR immediately and called a code blue. The team arrived and took over. The individual was transferred to the ICU but passed away 2 days later. What I learnt from that experience is to trust your instincts: make the MET call early—better to call it and not need it. If the MET call had been made earlier the individual might have survived.

**Laura Spence, EN**

# SCOPE OF PRACTICE

The healthcare system is under increasing pressure due to an ageing population, an increase in chronic diseases and advancing medical technologies (Parkinson & Parker 2013). In every health setting there is a shortage of nurses, which is due in part to an ageing workforce and an increased demand by nurses and other health professionals to work part time (Graham & Duffield 2010). In order to overcome this shortage, the traditional roles of both Registered Nurses (RN) and ENs are developing rapidly. The RN role has traditionally been viewed as that of the assessor, planner and evaluator of care, while the EN worked under the direct supervision of the RN (Eagar et al 2010). But in recent years both the RN and the EN **scope of practice** have been expanded. This includes the creation of the nurse practitioner role for RNs and the ability for ENs to now administer medications, including via the intravenous route (be aware that this is different in each state and territory). This increase in scope of practice has been met with resistance from both inside and outside the nursing profession. ENs report feeling undervalued and that the expanded scope of practice is not supported within the profession itself (Jacob et al 2014). Both RNs and ENs agree that there is a lack of role definition, leading to confusion and uncertainty regarding roles (Change & Handcock 2003 cited in Phillips et al 2014). The National Safety and Quality Health Service (NSQHS) Standards have attempted to address this issue, stating that 'individuals with delegated responsibilities are supported to understand and perform their roles and responsibilities' (Australian Commission on Safety and Quality in Health Care (ACSQHC) 2012:16). The aim of the Standards is to improve individual safety and quality of care provided. Hospitals, in accordance with the NSQHS Standards, should provide staff with professional development that supports improvements within scope of practice (ACSQHC 2012).

All nurses must work within their scope of practice and as an active member of the interdisciplinary healthcare team. In recent years the importance of team work in the acute care setting has been emphasised. Effective teams can lead to better outcomes for individuals receiving care in health organisations and fewer medical errors. Communication is the key for effective team work (Bajnok et al 2012; McKinlay & Pullon 2014). Refer to Chapter 8 for more information regarding communication in the healthcare setting.

# WHERE IS ACUTE CARE DELIVERED?

## Hospital care

Acute care is defined as any care that is provided in 'a hospital or other healthcare facility providing healthcare services to individuals for short periods of acute illness, injury or recovery' (ACSQHC 2012:7). When discussing acute care most people will automatically assume care takes place in a hospital and in many cases this is where care commences. For many individuals suffering an acute illness their first encounter with healthcare will be in the emergency room. In 2013–14, 7.2 million people presented to public hospital emergency departments. From these, 2 million people were admitted to hospital (Australian Institute of Health and Welfare (AIHW) 2014). Once admitted to a hospital varied outcomes can result. For some individuals their condition will be treated and they will be discharged home, with or without outpatient follow-up. Others will require admission to hospital and may require surgery, admission to an intensive care unit (ICU) or high-dependency unit (HDU) before reaching a ward. (For more information regarding care of the individual requiring surgery see Chapter 43.)

To improve quality of care, improve health and lower financial cost it is essential the individual transitions effectively through the healthcare system (Vecchio 2013). This is regardless of where primary care occurs.

ICUs care for critically ill or injured individuals who have various illnesses (O'Connor 2010). The care is usually one nurse to every individual and involves invasive monitoring and care and treatments not available on general wards (Martin et al 2010). In 2006, there were 181 intensive care units in private and public hospitals in Australia and New Zealand (Martin et al 2010). In Australia the majority of ICUs are classified as general; however, as outlined in Table 42.1, ICUs can be classified by type.

**TABLE 42.1 | Classifications of ICUs**

| Type | Description |
|---|---|
| General ICU | Those that care for both medical and surgical individuals |
| Combined ICU | Combined ICUs where an ICU is combined with an HDU and/or coronary care unit |
| Paediatric ICU | Specialises in care of paediatrics |
| Neonatal ICU | Specialises in care of neonates |
| Speciality ICU | Examples are cardiothoracic, neurological or oncology |

*(Martin et al 2010)*

HDUs provide a level of care between ICU and the general wards (Gould et al 2010). Most hospitals will also have high-dependency units, either as stand-alone wards or, more commonly, dedicated rooms on each ward. HDUs work as a step down from ICU for those individuals who no longer require the invasive monitoring of an ICU but are not yet ready for a general medical or surgical ward. The aim of HDUs is to reduce the workload of ICUs by reducing the incidence of ICU admissions (Gould et al 2010).

The majority of individuals with an acute illness will spend some time in a hospital on a general ward. Although referred to as general, the majority of wards in hospitals are specialised. The specialties include respiratory, cardiovascular, cardiopulmonary, neurological, burns, oncology, haematology, gastrointestinal, renal, trauma, surgery and paediatrics. When an individual is admitted to acute care, the aim is always to allocate a bed on the most appropriate ward; however, with bed shortages this is not always possible.

## Home care

For some individuals care in the home is appropriate, even during an acute illness. Post-acute care providers are essential to assist hospitals in reducing unnecessary hospital admission (Butcher 2013). In some Australian states this can be delivered via the Hospital in The Home (HITH) service or Royal District Nursing Service (RDNS). In both cases, delivery of care is in the individual's home instead of hospital. HITH was introduced in some states of Australia in 1994 (Department of Health, Victoria 2014). When an individual is treated under HITH the individual is regarded as an inpatient of the hospital and remains under the care of the home unit doctor of the hospital (Department of Health, Victoria 2014). Individuals admitted to HITH receive the same treatment they would receive if they were to remain an inpatient but have the benefit of being at home; this has been shown to result in better outcomes, such as reduced risk of hospital-acquired infection (Department of Health, Victoria 2014).

Many hospitals have now introduced HITH due to the cost benefits and the enhanced ability to better manage beds as individuals can be discharged earlier (Department of Health, Victoria 2014). To be eligible for HITH the individual must be clinically stable, have appropriate home support, live in a suitable environment, be willing to be treated by the HITH team and be suitable for treatment at home (Department of Health, Victoria 2014). The most common reasons for referral to HITH include intravenous antibiotics for cellulitis, genitourinary tract or respiratory tract infection, anticoagulation therapy and chemotherapy (Department of Health, Victoria 2014).

The Royal District Nursing Service (RDNS) was first introduced to Australia in 1885 (RDNS 2011). The RDNS differs from HITH in that the individual will not be considered an inpatient of a hospital. It is an independent, not-for-profit organisation that funds its service from state government funding in some states of Australia, and individual fees, donations, sponsorship, corporate partnership and fundraising (RDNS 2011). Nurses working in the home care setting have

to be prepared for the unexpected and be able to provide care in unconventional settings, sometimes at the kitchen table (Skott & Lundgren 2009).

## IMPACT OF ACUTE ILLNESS

### The individual

No matter where an individual is admitted they are the centre of care (Ferguson et al 2013). Acute illness can occur suddenly and have devastating and long-term consequences. Once the individual is diagnosed with an acute illness, there can be an increase in subsequent hospitalisations, which may be due to complications or ongoing manifestations of the initial illness (Williams et al 2010). This, of course, negatively impacts on an individual's quality of life. While they are in hospital it is important for them to be involved and engaged in their own care. Participating in making healthcare decisions and receiving education regarding their current condition encourage the individual to take on responsibility for their own health during their course of stay and on discharge (Ferguson et al 2013). Involving the individual in decisions related to their care is included in the NSQHS Standards. Individuals must be respected and engaged in the care they receive. The Standards state that hospitals must start 'implementing processes to enable partnership with patients in decisions about their care, including informed consent to treatment' (ACSQHC 2012). The NSQHS Standards emphasise the importance of including the individual in all aspects of care.

Adequate communication during hospital admission is essential. Communication is extremely important to ill individuals and assists in developing a therapeutic relationship (Ferguson et al 2013). Refer to Chapter 8.

Once discharged after an acute illness many individuals will have ongoing physical and psychological issues related to their hospital admission. These issues can be related to the stress that an acute illness causes. When diagnosed with an acute illness individuals have to deal with being in a foreign environment, the illness itself, physical or traumatic injury, feelings of mortality, fear, pain and the unknown impact this illness will have, not only on their own life but also the lives of their loved ones (Kelly & McKinley 2010). Post-discharge individuals may report fatigue, weakness, ongoing pain, sleep difficulties, nightmares and flashbacks which can all lead to mood changes and impact on the individual's ability to cope with their new-found lifestyle (Kelly & McKinley 2010). After an acute illness individuals may find that their role and responsibilities in the family have altered; they may be more dependent on others, which is a big adjustment to make and which can lead to feelings of resentment (Kelly & McKinley 2010). See Case Study 42.1.

### The family

When the nurse is caring for an acutely ill individual, they must take care to include the family. Family members play a critical role in the care of an individual. For most cultures family is central to caregiving—illness is a family affair. Family members as non-formal, untrained caregivers are an important part of the healthcare team. Family members can assist with the care of an ill individual in many ways. From assisting with activities of daily life (ADLs) to running errands, family members can assist nurses caring for their loved one (Bhalla et al 2014).

It is essential to develop a relationship based on trust with both the individual and their family. To do this the nurse must actively listen to the individual and involve the individual and family in care planning. Encouraging family presence can also build a trusting relationship (Mastro et al 2014). Involving the individual and family in care recognises the knowledge and expertise that the individual and family may have regarding their illness (Ewart et al 2014). It is important to remember that with chronic illness often the individual and family will be more knowledgeable than the nurse. Communication is essential when individuals are admitted to hospital. Effective communication can reduce complaints from both the individual and family members (Ewart et al 2014).

The family of an acutely ill individual should not be expected to take on all the care the individual requires (Ewart

### CASE STUDY 42.1

**Rebecca's acute care experience**

About 2 years ago Rebecca started experiencing intense headaches which culminated one day in her passing out at work. She worked as a nurse and her nurse unit manager put her in a wheelchair and took her around to the emergency department of the hospital that she worked in. This was the beginning of 2 months of being admitted and discharged from hospital five times. She had all the tests done—MRI, CT, blood test and even a lumbar puncture—but no doctor could tell Rebecca why her head felt like it was going to explode. When admitted to the wards, she felt that once the nurses realised that they were caring for a fellow nurse, they treated her differently from other individuals. Treatments didn't get explained as it was assumed that she understood what was happening. No one explained to her the reasoning behind all the tests she was having. For Rebecca, one of the scariest experiences was when she had a drug reaction; she thought she was going to die.

On her last admission one of the nurses looking after her suggested she see an osteopath and get her back and neck looked at. Rebecca took her advice and achieved some relief. Two years on and what started as an acute episode has turned into a chronic pain issue. Rebecca has had to change jobs and work part time as the chronic pain causes her constant exhaustion. This has had a major impact on her life and she has had to modify her lifestyle to manage the pain she experiences every day.

What impact may Rebecca's illness have on her life?

et al 2014). The family should be used in conjunction with nursing staff, not instead of. Additionally family members should not be made to feel guilty if they cannot or do not wish to take part in care (Ewart et al 2014). For those family members who wish to assist with the care of a loved one the physical and emotional toll must be recognised (Bhalla et al 2014).

Historically, nurses and medical officers have not been good at predicting what the family needs and therefore the family's needs may not be met (Davidson 2009). When an individual is unexpectedly admitted to hospital, the family may display physical, emotional and behavioural responses to situations based on personal coping mechanisms and feelings for the ill relative (Vandall-Walker 2010). It is a highly stressful time characterised by feelings of fear and anxiety caused by disruptions and changes to family relations (Davidson 2009). To help families during this time of high stress it is important to communicate expected healthcare outcomes and to keep open the lines of communication. Families reported less satisfaction with the care their loved one received when there was a lack of communication from both nursing and medical staff (Davidson 2009).

For the family of an acutely ill individual the journey really only continues once the individual has been discharged home. For many families this means taking on the care of the individual with or without the help of community-based services. Roles in the family can be reversed, with children becoming the carer. There can be financial hardship, which adds to the stress that carers face. Studies show that partners who become carers are exhausted, excessively overprotective, burdened, anxious and suffer from the effects of ill health (Dougherty & Thompson 2009). On a more positive note, stress for the family and individual is at its greatest at time of discharge and will decline over time (Dougherty & Thompson 2009). See Case Study 42.2.

### CRITICAL THINKING EXERCISE 42.1

You are looking after an individual who has been admitted post a myocardial infarct. He is recovering post coronary artery bypass graft surgery. The individual is the main income earner in his family and has three young children at home.

1. Identify physical issues for this individual.
2. Identify psychological issues for this individual.
3. List appropriate ongoing care including allied healthcare that this individual will require.

### CASE STUDY 42.2

**Rebecca's acute care experience: the family's perspective**

When Rebecca started experiencing headaches I thought nothing of it; she has suffered from migraines since a young age. Then suddenly they escalated and she had to be admitted to hospital multiple times. I cannot explain the sense of helplessness I felt as her mother. I felt I should have been able to make it all better. It was very frustrating that the doctors could not give us any answers; they didn't listen to her when she said it wasn't a migraine. One of the worst moments for me was receiving a phone call from my sister who was visiting Rebecca when she had the drug reaction. My sister thought Rebecca was going to die. Another moment that stands out for me was being ordered from her room as nurses rushed in. No one told me what was going on. I found out later she had been given too much morphine and had a dangerously low respiratory rate. Two years on and I am proud of how Rebecca deals with the pain; most people have no idea that she has pain every day. It is lucky that I am a casual worker so I can take time off when Rebecca needs to be taken to hospital; I don't know what would happen if I had to work full time.

**Lisa, mother of Rebecca**

What impact will Rebecca's illness have on her family?

## ACUTE DISORDERS

The following acute disorders are ones that have not been covered in other chapters.

### Cellulitis

**Cellulitis** is an acute, localised bacterial infection of the dermis and subcutaneous tissue. Cellulitis is an umbrella term used for any acute non-necrotising dermis and hypodermis infections. Cellulitis in more severe forms can include tissue necrosis (Lasschuit et al 2014). Individuals with ulcers or wounds are more at risk of developing cellulitis due to bacteria being able to enter the skin (Nazarko 2012). One-third of people diagnosed with cellulitis are misdiagnosed, resulting in unnecessary exposure to antibiotics. Common disorders misdiagnosed as cellulitis include vascular eczema, lymphoedema and lipodermatosclerosis (Nazarko 2013). Refer to Chapter 29 for more information on skin integrity and wound care.

#### Clinical manifestations

Clinical manifestations of cellulitis include localised swelling, redness and pain. The skin can be red, hot and tender to touch. Often there is a distinct border between normal and affected skin. It is good practice to mark this border with a permanent marker to enable you to observe the spread of infection. Up to 40% of individuals diagnosed with cellulitis will also develop systemic signs of infection such as fever, chills, vomiting, malaise and sweating. Cellulitis commonly develops in the lower extremities with only one limb affected. It is rare for an individual to develop cellulitis in both legs. The individual may also present with enlarged lymph glands in the groin and lymphangitis (Lasschuit et al 2014; Nazarko 2012).

## CLINICAL INTEREST BOX 42.1 Risk factors in the development of cellulitis

- Venous insufficiency or stasis
- Lymphoedema
- Surgery
- Diabetes mellitus
- Malnutrition
- Substance abuse
- Presence of another infection
- Compromised immune system
- Trauma
- Intravenous drug use
- Radical mastectomy with axillary dissection

*(Farrell & Dempsey 2013)*

### Risk factors

Risk factors for developing cellulitis involve both systemic and local factors. Systemic risk factors of cellulitis include: obesity, diabetes, cancer, hepatic cirrhosis and past history of cellulitis. Local factors that increase the risk of developing cellulitis include: chronic limb oedema, surgical resection of lymph nodes, saphenous venectomy and acute or chronic skin breaks. Skin disruption may be caused by trauma, ulceration, dermatitis or toe web intertrigo (Lasschuit et al 2014). Human and insect bites have a high risk of causing cellulitis (Eron 2009). (See Clinical Interest Box 42.1.)

### Pathophysiology

Cellulitis usually occurs due to a break or lesion on the skin that allows microorganisms to invade the body. In some cases there is no identifiable skin break or lesion (Nazarko 2012). The most common bacterial infections that cause cellulitis include: β-haemolytic streptococci, mainly the *Streptococcus pyogenes* group followed by *S. aureus* and occasionally Gram-negative bacilli (Lasschuit et al 2014). The cellulitis infection can spread due to the production of a substance known as hyaluronidase (spreading factor). This substance is produced by the causative agent and breaks down fibrin networks and other barriers that normally localise infection (LeMone et al 2013). Complications of cellulitis can include subcutaneous abscesses, sepsis, post and streptococcal nephritis and, in extreme cases, death (Nazarko 2013).

### Medical management

The medical management of cellulitis when the infection is mild includes treatment with oral antibiotics, including an antibiotic that is effective against *Streptococcus* species and *S. aureus.* Antibiotics such as dicloxacillin/flucloxacillin, cephalexin or clindamycin should be considered.

For severe cases and those which do not respond to oral antibiotics within 48 hours treatment should include intravenous antibiotic. On average individuals diagnosed with cellulitis will require 3.5 days of intravenous antibiotics.

The decision to change from intravenous to oral antibiotics will be made based on the individual's clinical condition. For most individuals oral antibiotics will need to be continued for 1 to 2 weeks (Lasschuit et al 2014; Nazarko 2012). Non-steroidal anti-inflammatory drugs can also be prescribed to reduce pain and inflammation (Napierkowski 2013).

### Nursing care

When caring for the individual with cellulitis the nurse should instruct the individual to elevate the affected area above the heart (Farrell & Dempsey 2013). Warm, moist packs should be applied to the area every 2 to 4 hours; care must be taken in individuals with decreased sensory perception to ensure burns do not occur (Farrell & Dempsey 2013). Cellulitis can result in damage to the lymphatic system which can cause chronic oedema or lymphoedema (Riches & Keeley 2012).

### Individual education

Individual education for cellulitis has an emphasis on prevention of future episodes (Farrell & Dempsey 2013). Refer to Chapter 6 for more information on providing education to individuals.

## Venous thromboembolism

Venous thromboembolism (VTE) is an umbrella term that includes both deep vein thrombosis (DVT) and pulmonary embolism (PE) (Harvey et al 2013; Donner & Johnson 2014). VTE is a common medical complication, causing significant mortality and morbidity (Rajasekhare & Steiff 2013; Kahn 2009 cited in Donner & Johnson 2014). It is commonly asymptomatic and misdiagnosed (Abdou et al 2011). It is estimated that VTE will occur in 10–40% of all individuals admitted to hospital on general medical wards, and 40–60% of all individuals who undergo major orthopaedic surgery (Duff et al 2013). In Australia it is estimated that 17 000 new cases of VTE are diagnosed each year (Skinner 2013). Refer to Chapter 19 for more information on venous thromboembolism assessment.

### Risk factors

VTE risk factors include advancing age (those over 75 years old), cancer (history of or current), past history of VTE, obesity, varicose veins, hormone therapy, chronic heart failure and bed rest. Medical conditions that increase the risk of developing VTE include congestive heart failure, severe respiratory disease, acute medical illness that leads to immobility, active cancer, previous VTE and admission to critical care units. Individuals who have undergone hip or knee surgeries, trauma or major injury are also at risk of developing VTE (Abdou et al 2011).

### Deep vein thrombosis

**Deep vein thrombosis (DVT)** is a thrombosis in the deep veins of the body, usually involving the lower extremities (Donner & Johnson 2014; Streiff et al 2014). Most DVTs occur in the distal veins of the calf. They can extend proximally into the veins in and above the knee (Donner &

Johnson 2014). DVT is a leading factor in preventable hospital mortalities. When a DVT occurs in a lower extremity mortality rates are 13–21%. This rises to 48% when the DVT has occurred in an upper extremity. In 20% of individuals who develop a DVT, the thrombus will detach from the site, migrating in the blood stream to the lungs, causing a PE (Meguid 2011; Streiff et al 2014).

## Clinical manifestations

A diagnosis of DVT can be difficult to make as the clinical manifestations can be similar to other diseases such as cellulitis. Clinical manifestations of a DVT may include unilateral oedema, pain, localised warmth and erythema (Meguid 2011). When an individual presents with these symptoms a Wells score will be obtained. This score rates the likelihood that the symptoms are the result of a DVT based on past medical history and physical examination (Meetoo 2013). (For information on prevention of DVTs see Chapter 28.)

## Risk factors

Risk factors, including pathological factors, associated with DVT are shown in Clinical Interest Boxes 42.2 and 42.3. It is estimated that individuals over 40 who are admitted to hospital will have two or more risk factors for developing a DVT (Meguid 2011; Donner & Johnson 2014).

## Pathophysiology

A thrombosis can develop when there are changes in the vessel walls, changes in blood flow or changes in blood composition. These three conditions are known as Virchow's triad. Changes in blood flow are usually a result of immobility. Changes in blood composition are in the form of hypercoagulability which can be due to inflammation, malignancy or tissue damage. DVTs most often occur in the lower extremities (Meguid 2011; Meetoo 2013; Streiff et al 2014).

## Diagnostic tests

If a DVT is suspected, a blood test known as the D-dimer can be performed. This detects fibrin breakdown that is present in the blood post thrombus formation. The test is used for negative predictability only, meaning that a negative result indicates no DVT, while a positive will result in further tests being carried out (Walter et al 2014). If a positive D-dimer occurs the individual may then be sent for an ultrasound—the most appropriate and accurate test for diagnosing a DVT (Zierler 2004 cited in Donner & Johnson 2014). When sending an individual for ultrasound to determine the presence of a DVT the nurse must ensure that the individual can change their own position and be able to tolerate the pressure used during the scan as this can be quite firm. It is also important to alert the diagnostic imaging department if the individual has a wound or cast which may impact on the technician's ability to complete the scan (Zierler 2004 cited in Donner & Johnson 2014).

## Medical management

Prevention of DVT is crucial. To achieve this:

- Early ambulation post surgery is required
- Individuals should be advised to stay hydrated, wear lose clothing and exercise their calf muscles (Meguid 2011).

Once the diagnosis of DVT is made, treatment needs to commence immediately. Traditionally individuals were put on bed rest as the assumption was that movement would dislodge the thrombus and lead to a pulmonary embolism (Anderson et al 2009). The current treatment regimen includes a combination of anticoagulation therapy and thrombolytic therapy with the aim of preventing the thrombus from growing or fragmenting (Scarvelis & Wells cited in Donner & Johnson 2014).

### CLINICAL INTEREST BOX 42.2 Risk factors associated with DVT

- Surgery
- Increased age
- Family history
- Thrombophilia
- Cancer
- Myocardial infarct
- Ischaemic cerebrovascular accident
- Chronic obstructive pulmonary disease
- Heart or respiratory failure
- Pregnancy
- Hormone therapy including the oral contraceptive pill and hormone replacement therapy
- Acute inflammation disorders
- Obesity
- Bed rest
- Immobilisation of extremities
- Varicose veins
- Trauma
- Central access catheters

*(mayoclinic.org/diseases-conditions/deep-vein-thrombosis/basics/risk-factors/con-20031922; Crisp et al 2013)*

### CLINICAL INTEREST BOX 42.3 Pathological risk factors associated with DVT

- Previous DVT
- Inherited hypercoagulable states
- Cancer
- Sepsis
- Obesity
- Nephritic syndrome
- Polycythaemia vera
- Myeloproliferative disorders
- Vitamin deficiencies
- Heparin-induced thrombocytopenia
- Acute myocardial infarction
- Neurological disease causing paralysis

*(Meguid 2011)*

Individuals with a DVT will usually be commenced on a dual therapy treatment plan with:

- Parenteral or oral anticoagulants, usually in the form of vitamin K antagonist (VKA)
- Low molecular weight heparin (LMWH).

These should be commenced as soon as possible after diagnosis.

It is important to note that LMWH is porcine-derived and therefore some people may refuse its use based on religious or cultural grounds (Donner & Johnson 2014). One-third of all individuals diagnosed with a DVT will go on to develop post-thrombotic syndrome (Kahn 2009 cited in Donner & Johnson 2014). Post-thrombotic syndrome is usually caused by venous reflux and venous hypertension. These complications are a result of damage by the DVT to valves in the leg. These valves usually aid in the return of blood to the heart. This is a significant complication that affects the individual's quality of life, causing ongoing pain, heaviness and swelling in the affected leg (Kearon 2003 cited in Donner & Johnson 2014). Between 5% and 10% of individuals will develop severe post-thrombotic syndrome which can lead to venous leg ulcers (Kahn 2009 cited in Donner & Johnson 2014).

### Nursing care

When caring for the individual with a DVT the nurse must monitor the individual for potential complications of treatment such as bleeding and thrombocytopenia. The nurse should also maintain individual comfort by elevating the affected extremity, applying compression stockings and administering analgesia; these all help to increase circulation (Farrell & Dempsey 2013). The affected leg should be assessed every shift for signs of skin breakdown to enable early intervention. The individual must also be monitored for signs of PE (see below) (LeMone et al 2013). Gradual compression stockings should be used when an individual is diagnosed with a proximal DVT. These stockings exert pressure on the limbs, reducing the risk of fluid seeping from superficial veins into surrounding tissue. Gradual compression stockings have been found to reduce the risk of developing post-thrombotic syndrome from 54.0% to 25.2% (Donner & Johnson 2014).

### Individual education

Prior to discharge inform the individual that they need to report any unusual bleeding to their doctor. For women, menstrual bleeding may be slightly increased: they should contact their doctor if it increases significantly. Men should shave with an electric razor to reduce the risk of cuts, and soft-bristle toothbrushes should be used. Contact sports should be avoided while taking anticoagulation drugs (LeMone et al 2013). The effectiveness of VKAs can be impacted by many factors including diet, alcohol consumption, other medications and gastric issues (Glee 2011 cited in Donner & Johnson 2014).

## Pulmonary embolism

**Pulmonary embolism (PE)** is a major cause of mortality and morbidity (Walter et al 2014). Between 5% and 10% of all hospital deaths are caused by PE (Abdou et al 2011). Ten per cent of PEs will cause death within 1 hour of symptom development (Meguid 2011). PEs are the leading cause of preventable hospital deaths each year. They are the third most common cause of vascular death (after myocardial infarction and stroke). DVT is the cause of 95% of PEs (Walter et al 2014). The risk factors associated with the development of a PE are very similar to those for a DVT (see Clinical Interest Box 42.2). Refer to Chapter 25 for more information on respiratory assessments.

### Clinical manifestations

The clinical manifestations of PE may include chest pain, chest wall tenderness, palpitations, back and shoulder pain, upper abdominal pain, syncope, haemoptysis, dyspnoea and painful respirations (Skinner 2013).

### Pathophysiology

PE involves obstruction of a section of the pulmonary artery tree by a thrombus or embolism (Sheares 2011). This thrombus or embolism forms in the venous system or right side of the heart (Farrell & Dempsey 2013) and commonly originates in the leg or pelvic vein (Sheares 2011).

### Diagnostic tests

Diagnosis of PE can be difficult because of the non-specific symptoms that are manifested (Walter et al 2014). If the clinical manifestations indicate the possibility of PE (Skinner 2013), a D-dimer test may be ordered; if this test is positive more investigations are required to confirm the diagnosis (Walter et al 2014). Table 42.2 outlines investigations for diagnosis of PE.

In recent years the computed tomography pulmonary angiogram (CTPA) has replaced pulmonary angiograms in the diagnosis of PEs.

### Medical management

The best treatment for individuals at risk of developing a PE is prevention (Farrell & Dempsey 2013). Many hospitals now require all individuals to have a risk assessment performed on admission. Those deemed at high risk for DVT or PE are commenced on a prophylaxis regimen, such as enoxaparin (Duff et al 2013). This is usually given twice a day subcutaneously and may continue even after discharge (Rogers 2010). Once a diagnosis of PE is made the individual will be classified as either high or low risk for developing complications.

High-risk individuals are those who are haemodynamically unstable. Haemodynamically instability occurs when the PE causes vasoconstriction and reduces cardiopulmonary function. Treatment of PE will depend on the individual's risk for complications. For haemodynamically unstable individuals treatment aims to restore pulmonary arterial flow. This is achieved by using thrombolytic therapy with such medications as:

- Streptokinase
- Urokinase
- Recombinant tissue plasminogen.

**TABLE 42.2 | Investigations for diagnosis of pulmonary embolism**

| Investigation | Rationale |
|---|---|
| Chest x-ray | May be normal but may also show atelectasis, pleural effusion, hypovascularity or peripheral lobe infarcts |
| Arterial blood gases | May show that the individual has hypoxaemia and hypocapnia or they may be normal |
| Ventilation-perfusion scan (VQ scan) | A ventilation-perfusion scan involves injection via an intravenous line and inhalation by the individual of a contrast agent. The lungs are scanned at different angles and a comparison made of the percentage of ventilation and perfusion in each area; a hypoperfused area indicates the presence of a PE |
| Pulmonary angiogram | Allows for direct visualisation of a thrombus or embolism in a pulmonary artery branch and so is the most accurate diagnostic test for PE. However, while pulmonary angiogram is considered the most accurate, it is not cost effective or easily performed |
| Computed tomography pulmonary angiogram (CTPA) | CTPA has replaced pulmonary angiograms in the diagnosis of PEs. This type of CT evaluates slices as narrow as 1.0 mm, allowing for accurate visualisation of a PE by enabling visualisation of the pulmonary arteries. The main disadvantages of the CTPA are that the individual must be transferred to a diagnostic imaging department as the CT is not portable and the individual must be injected with contrast, which can cause allergic reactions and is contraindicated in individuals with renal impairment and those taking metformin |

*(Skinner 2013; Walter et al 2014)*

**TABLE 42.3 | Emergency management of pulmonary embolism**

| Management | Rationale |
|---|---|
| Nasal oxygen | Relieves hypoxaemia and respiratory distress |
| Insertion of intravenous lines | Prepares for medication administration |
| ECG | Provides continuous monitoring for arrhythmias and right ventricular failure |
| Medications | May include digoxin glycosides, diuretics, enoxaparin, heparin and anti-arrhythmic agents. Sedatives may be administered to relieve anxiety |
| Blood tests | Include serum electrolytes, full blood count, haematocrit and arterial blood gases |
| Indwelling urinary catheter | Inserted to monitor fluid output |
| Mechanical ventilation | Used if the clinical assessment and investigations warrant it |

*(Farrell & Dempsey 2013)*

The medications are given intravenously, meaning they will have systemic effects on the individual. This increases the risk of adverse bleeding events. Thrombolytic therapy is recommended to run over 2 hours to reduce the risk of adverse bleeding events (Walter et al 2014). This is a medical emergency which will cause death in 50% of individuals who develop it (Walter et al 2014). See Table 42.3 for emergency management of PE.

For haemodynamically stable individuals with PE treatment involves the provision of a VKA, usually in the form of warfarin. This is used in conjunction with a LMWH. Heparin should be commenced first. VKA therapy can begin on the first or second day of heparin administration and both therapies should continue for 5 days. During this time the individual's international normalised ratio (INR) is monitored. INR has target range of between 2.0 and 3.0. The individual will need to remain on VKA treatment for around 3 months (Walter et al 2014). See Table 42.4 for considerations for the treatment of PE in special populations.

## Nursing care

The management of a PE depends on the severity of the individual's condition. The nurse initiates interventions aimed at improving respiratory and vascular status; these interventions include oxygen therapy and elevation of lower extremities (Farrell & Dempsey 2013). Anti-embolic stockings or intermittent pneumatic leg compression devices may be used to decrease venous status (Donner & Johnson 2014). When caring for the individual with a PE the nurse must monitor for signs of bleeding and only essential venepunctures are performed. The individual's pain and anxiety must be managed, with medication if necessary. Vital signs should be monitored every 2 hours, increasing when deterioration is noted (Farrell & Dempsey 2013).

## Individual education

The individual will require education regarding adherence to medication regimens. This will include anticoagulants therapy

**TABLE 42.4 | Considerations in special populations for the treatment of PE**

| Type | Risk | Treatment |
|---|---|---|
| Incidental PE (asymptomtic patients). Most are small and located in segmental and subsegmental vessels | Unknown due to location | Controversial, particularly if cardiopulmonary reserve is satisfactory and there is no evidence of concomitant DVT |
| Subsegmental PE | No increased risk of adverse outcomes when isolated subsegemental emboli are detected | Risk of bleeding due to anticoagulation may outweigh benefit<br>No clear guidelines<br>Most will be treated |
| Perioperative management of anticoagulation in individuals with PE | Conventional treatment may not be an option due to risk of bleeding during surgery | VAK should be stopped 2–3 days prior to procedure when moderate risk of bleeding, 5 days when high risk<br>Should be commenced 12–24 hours postoperatively providing haemostasis is maintained |
| PE in pregnancy | Leading cause of pregnancy-related mortality in the developed world<br>Diagnosis is difficult due to overlap of symptoms with those of pregnancy and the need to limit radiation exposure | VKA, especially warfarin, are teratogenic and can cause congenital abnormalities<br>LMWH or UFH both do not cross the placental barrier. Both can cause maternal haemorrhage, heparin-induced thrombocytopenia and heparin-induced osteopenia |
| PE and cancer | VTE affects approximately 15% of all cancer patients<br>Second leading cause of death in cancer patients | LWMH treatment is recommended as it is considered safer than VKA<br>Recommended long-term use of LMWH to decrease reoccurrence |

*(Walter et al 2014)*

education (see 'Individual education' for DVT above) and information regarding follow-up appointments and blood tests (LeMone et al 2013).

### CRITICAL THINKING EXERCISE 42.2

You receive handover from the morning nurse on one of the individuals you are caring for who is expected to be discharged this afternoon. The individual is a 39-year-old female admitted with a DVT who has responded well with treatment and will be transferred to HITH care. The nurse handing over to you reports that this morning the individual complained of slight back and shoulder tip pain which was resolved with paracetamol. All paper work has been completed and the individual is waiting for her discharge medications before she can leave. When you enter the individual's room, you find her pale and complaining of dyspnoea and chest pain.

1. What is your first action going to be?
2. What do you think has happened?
3. What sign did the morning nurse miss?
4. What diagnostic tests need to be done?

## Diverticulitis

It is estimated that up to 40% of people over the age of 60 have diverticulosis, a disease where pouches, known as diverticula, develop in the bowel wall, usually in the sigmoid colon (Tadlock et al 2013). **Diverticulitis** occurs when there is infection or inflammation of the diverticula (Reddy & Longo 2013).

### Clinical manifestations

Individuals with diverticulitis will present with left lower quadrant abdominal pain, abdominal tenderness, increased white blood cells counts and fever (Wolf 2012).

### Risk factors

The risk of developing diverticulitis increases with age. Other risk factors include reduced fibre intake and increased red meat consumption (Wolf 2012).

### Pathophysiology

Diverticula usually develop at a weak spot in the muscle wall, allowing the inner layer of the wall to balloon outwards. For the majority of people with diverticulosis, the diverticula cause no problems; however, some will go on to develop diverticulitis. Diverticulitis occurs when diverticula are either eroded by pressure or faecal matter becomes trapped, leading to infection (Tadlock et al 2013). The damage can range from mild to severe. Perforation can occur, allowing bowel matter to leak into the abdomen causing abscess formation (Reddy & Longo 2013). The pathophysiology for this happening for

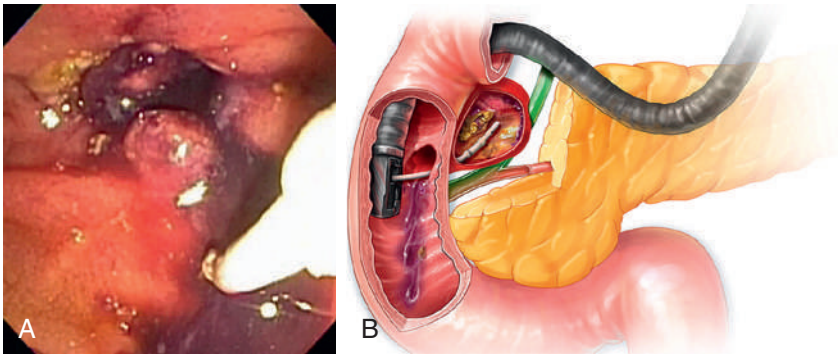


**Figure 42.1** Treating diverticulitis with endoscopic therapy
*(Salah & Faigel 2014)*

some and not all people with diverticulosis is not known but research suggests that chronic inflammation may be the cause (Lipman 2011).

Figure 42.1 shows how diverticulitis is treated with endoscopic therapy.

### Diagnostic tests

For individuals presenting with signs and symptoms as outlined above, diagnosis of diverticulitis is achieved via abdominal CT with contrast, as it will enable visualisation of infection, as well as any perforations and abscesses.

### Medical management

Treatment of diverticulitis involves broad-spectrum antibiotics, usually metronidazole and ciprofloxacin, and a liquid diet. For some individuals who develop an abscess that fails to respond to antibiotic therapy a drain tube may need to be inserted into the abdomen to drain the infected fluid. For some individuals who suffer repeat attacks, surgery to remove the affected area of bowel may be the only option as bowel function can be permanently diminished due to scarring, narrowing and loss of normal contractions (Tadlock et al 2013; Reddy & Longo 2013; Wolf 2012).

### Nursing care

As the individual with diverticulitis is at risk for bowel perforation, vital signs must be monitored 4 hourly or more frequently if clinically required. The abdomen should be assessed at the same time, measuring girth, auscultating bowel sounds and palpating for tenderness. Any changes must be immediately reported to the doctor as they may indicate spread of infection. The individual will rest in bed with limited activity to promote healing. Pain relief is paramount so the individual should be assessed frequently for pain (LeMone et al 2013).

### Individual education

On discharge individuals need education on diet. A high-fibre diet is required to reduce complications. The individual may benefit from a consultation with a nutritionist or dietitian, for which the nurse can make a referral (LeMone et al 2013).

## Guillain–Barré syndrome

**Guillain–Barré syndrome** (GBS) is a rare acute inflammatory autoimmune disorder that is characterised by rapid and progressive neuromuscular paralysis. Guillain–Barré syndrome often occurs after an individual has had an infection in their body. In severe cases, Guillain–Barré syndrome can cause paralysis of the respiratory nerves, leading to ICU admission (Hsieh et al 2013). The pathophysiology of GBS is demyelination of nerves, most commonly peripheral nerves, by antiganglioside antibodies which attack the Schwann cells of the myelin sheath. This causes diminished nerve conduction which results in severe weakness and often paralysis (Zhang et al 2013).

Individuals with GBS will initially complain of decreased function, weakness and decreased sensation in their arms and legs, with or without pain. This rapidly develops into muscle weakness, commencing distally then travelling to proximal with decreased reflexes and sensations. Individuals with GBS will also show abnormalities in their cerebrospinal fluid and nerve conduction studies (Derksen et al 2014). For some individuals the disease progression will stop there; they will experience difficulty walking but will be able to be discharged to home. Others will progress to total paralysis. It is estimated about 30% of individuals with GBS will require mechanical ventilation because of respiratory dysfunction and up to 13% will die from the syndrome. The most common causes of death from GBS are respiratory failure, pneumonia, cardiac arrest and autonomic dysfunction.

Treatment of GBS is supportive. Individuals diagnosed with GBS may be treated with IVIg or plasma exchange therapy (van den Berg et al 2013). Over time the Schwann cells will re-myelinate and most individuals can expect a full recovery (Schub et al 2011). Post recovery many individuals will suffer from ongoing severe fatigue (Drenthen et al 2013). When assessing the individual with GBS the nurse should monitor airway and breathing, refer to speech pathology, maintain the individual as nil by mouth until otherwise ordered, ensure adequate analgesia, perform pressure area care and take steps to reassure the individual.

## Acute kidney injury

**Acute kidney injury** (AKI), previously known as **acute renal failure**, is defined as a rapid decline in kidney function causing a rise in serum creatinine and/or blood urea nitrogen levels with or without a decrease in urine output. The decrease in renal function can be over hours to days (Bellomo et al 2012; Obermüller et al 2014; Tolwani 2012). It can be a common complication in critical areas with as many as 35% of all critically ill individuals developing AKI (Berry & Clatworthy 2012). For the majority of cases of AKI there is an underlying problem which, if identified and treated early, can prevent the development of AKI. The most common causes of AKI are sepsis, acute tubular necrosis and prerenal stasis. AKI can also be a result of urinary tract infections and hydronephrosis (Podoll et al 2013). Acute tubular necrosis is often caused by a reduction of systemic blood pressure or renal blood flow (Berry & Clatworthy 2012) and results in ischaemia or nephrotoxic injury to the tubules (Tolwani 2012).

### Clinical manifestations

AKI is typically asymptomatic until kidney function has declined significantly (Bellomo et al 2012). AKI can have effects on other body systems such as the cardiovascular, respiratory, hepatic and neurological systems (Lameire et al 2012). The individual can rapidly become critically ill, showing symptoms of lethargy, nausea, vomiting and diarrhoea. The individual may exhibit signs and symptoms of dehydration, their breath may smell of urine, they may complain of a headache and muscle twitching and may even develop seizures (Farrell & Dempsey 2013).

### Risk factors

Individuals at risk of developing AKI include those with diabetes mellitus, cardiovascular disease, chronic liver disease, cancer and anyone who has undergone complex surgery. Some medications are also known to be nephrotoxic. These include iodine- and gadolinium-based contrast mediums used in diagnosis procedures (Lameire et al 2012) and medications such as cisplatin and aminoglycosides. It is important to identify any potential nephrotoxic medications to discontinue their use. Around 20% of AKI cases are caused by medications. In hospitalised individuals sepsis is the most common cause of AKI (Bellomo et al 2012).

### Pathophysiology

ARF can be classified into three categories: prerenal failure, intrarenal failure and postrenal failure (Lameire et al 2012).

- Prerenal failure is the result of hypoperfusion of the kidneys. Hypoperfusion of the kidneys leads to a decrease in the glomerular filtration rate. Renal hypoperfusion may be the result of volume depletion from hypotension, hypovolaemia or cardiac insufficiency and significant renal vascular stenosis or thrombosis (Lameire et al 2012) (Figure 42.2)
- Intrarenal failure results when there is damage to glomerulus, vessels or kidney tubules. This is most often due to prolonged prerenal causes (Figure 42.3), infections and toxins that result in inflammation or injury (Yaklin 2011)
- Postrenal failure is caused by obstruction, which may be a result of renal calculi, strictures, thrombosis, benign prostate hypertrophy, malignancies and pregnancy (Figure 42.4). The obstruction causes pressure to increase in the kidney resulting in injury to the kidney (Lameire et al 2012).

### Diagnostic tests

Diagnosis of AKI is based on the individual's history, clinical presentation and kidney function. When an individual is suspected of having AKI there are many investigations that may be ordered. These include:

- Urinalysis
- Blood tests (including urea, creatinine and electrolytes, full blood examination, coagulation status, virology for hepatitis B and C and HIV)
- Renal ultrasounds
- CT, MRI
- Renal biopsy (Bellomo et al 2012; Lameire et al 2012; Podoll et al 2013).

The individual with AKI will have a decreased glomerular filtration rate, increased serum creatinine and may or may not have oliguria (Obermüller et al 2014).

### Medical management

The investigations required depend on the individual and the results of the health assessment (Murphy & Byrne 2010). Once a diagnosis is made the medical aim is to:

- Restore chemical balance
- Prevent complications to allow the kidney to repair itself.

There is no specific pharmacological management for AKI. Many traditional treatments with medications have now been found to be ineffective in the treatment of AKI. This includes the use of dopamine and loop diuretics (Negi & Shigematsu 2012). If there is a known cause it is treated and eliminated. For some individuals dialysis is required (see Chapter 31). In critically ill individuals with AKI requiring dialysis mortality is 40–70%. The individual with AKI may require:

- Fluid resuscitation
- Oxygen support
- Haemoglobin replacement (Bellomo et al 2012).

When providing fluid replacement therapy the individual must be monitored via a fluid balance chart and vital signs for fluid overload. Timely reversal of known causes of prerenal and postrenal failure can lead to recovery with no ongoing effects. If the cause of AKI is not promptly reversed permanent kidney damage can result (Lameire et al 2012), potentially leading to chronic renal failure (Bellomo et al 2012).

### Nursing care

When caring for an individual with AKI the nurse needs to closely monitor fluid balance. This can be done by commencing the individual on a strict fluid balance and daily weighing

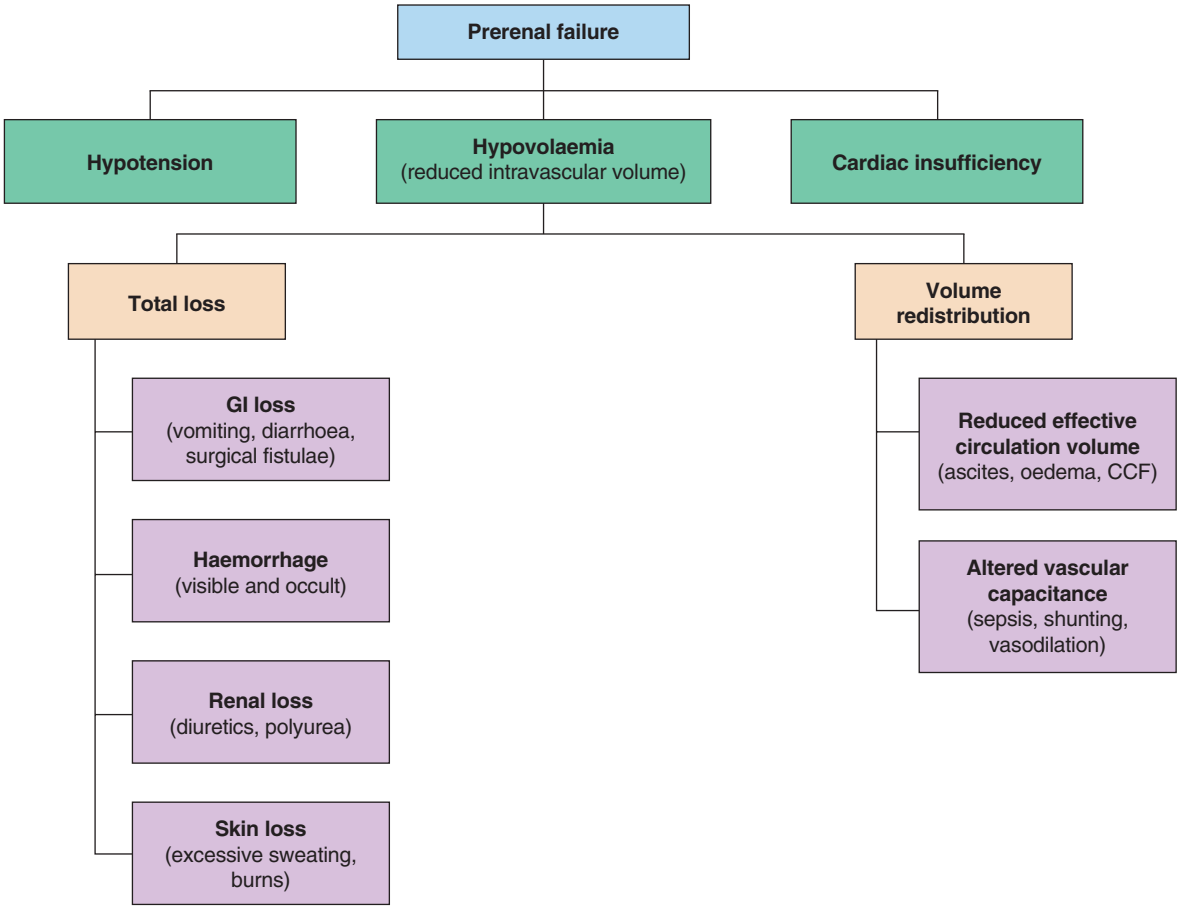


**Figure 42.2** Causes of prerenal failure
*(Blakeley 2008)*

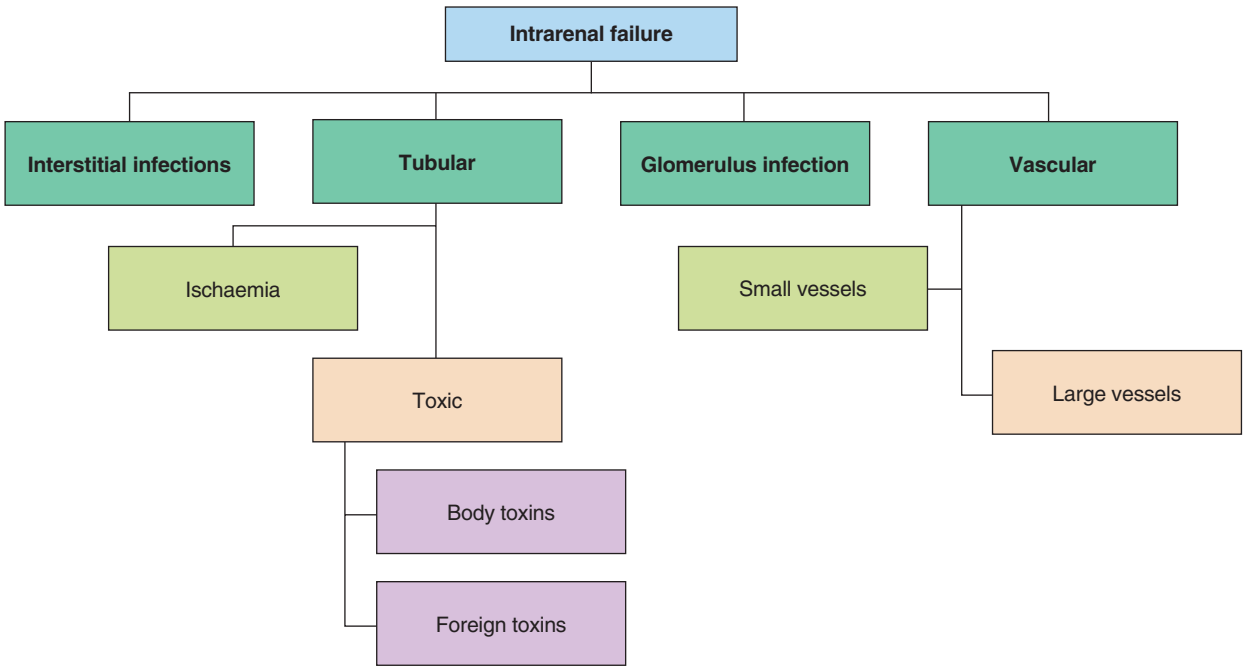


**Figure 42.3** Causes of intrarenal failure
*(Blakeley 2008)*

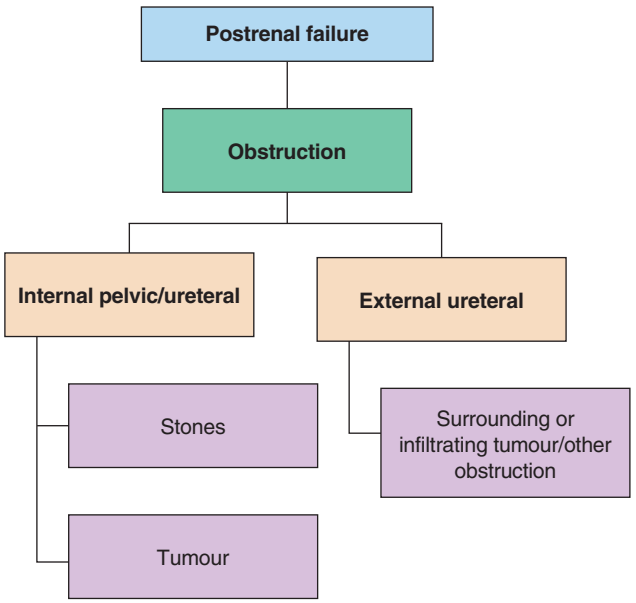


**Figure 42.4** Causes of postrenal failure

*(Blakeley 2008)*

regimen, ensuring that the individual is weighed at the same time on the same scales and in the same clothes every time. The nurse should also monitor the individual for signs of oedema and any difficulty in breathing (Lameire et al 2012). Individuals with AKI are at increased risk of infection and skin breakdown; therefore, the nurse should ensure asepsis when caring for these individuals and meticulous skin care to prevent skin breakdown (Farrell & Dempsey 2013).

### Individual education

The individual with AKI needs education to identify complications of fluid volume excess such as increased weight or oedema. Educate to avoid nephrotoxic agents for at least 1 year post ARF. The individual will need to avoid stress and infection (LeMone et al 2013). (See Table 42.5.)

**TABLE 42.5 | Differences between acute renal failure and chronic renal failure**

| | Acute renal failure | Chronic renal failure |
|---|---|---|
| Health history | Recent presentation of acute illness | Long duration<br>History of kidney disease or a history of a causative factor |
| Clinical examination | Hypotension, oedema/fluid overload | Generally not diagnosed until substantial kidney damage has occurred<br>Anaemia, cachexia and grey colouration of the skin may be present |
| Creatinine<br>Calcium<br>Haemoglobin | Increased values<br>Usually normal<br>May be normal or low | Stable measurements<br>Low in untreated disease<br>Will show chronic anaemia |
| Renal ultrasound | Often normal<br>When due to obstruction, hydronephrosis may be evident | May show scars from reflux nephropathy<br>Kidneys may be enlarged when the individual has diabetes, amyloidosis, chronic hydronephrosis or polycystic kidney disease |

*(betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/Kidney_failure; Crisp et al 2013)*

## Sepsis

**Sepsis** is a life-threatening condition caused by a systemic inflammatory response to infection (Miller 2014). Severe sepsis can occur when organ dysfunction or disuse hypoperfusion results from the sepsis infection (Dellinger et al 2013). When sepsis occurs the body's response to infection causes damage to tissues and organs which can lead to shock, multiple organ failure and death. Early detection of sepsis is crucial to enable treatment to commence and decrease the risk of severe sepsis and septic shock. All healthcare professionals play a role in the early detection of sepsis (Daniels & Robson 2013). Recognising the deteriorating individual is included in the National Safety and Quality Health Service Standards. The Standards state that healthcare professionals must adopt 'processes to support the early identification, early intervention and appropriate management of patients at increased risk of harm' (ACSQHC 2012:18). Mortality from sepsis remains high—30% of individuals diagnosed with sepsis will die within 1 month and 50% within 6 months (Buck 2014). For a diagnosis of sepsis to be made the individual must have a known infection and systemic inflammatory reaction syndrome (SIRS) (see Clinical Interest Box 42.4).

Sepsis can be caused by many different infections. The most common infections that lead to sepsis are urinary tract infections and pneumonia. While the majority of infections that lead to sepsis are bacterial infections, fungal infections can also be the cause (Daniels & Robson 2013). Refer to Chapter 7 for more information on infection control.

### Clinical manifestations

Clinical manifestations include fever, peripheral oedema, hypotension, tachycardia, tachypnoea, severely altered mental state and hot flushed skin (Daniels & Robson 2013).

### Risk factors

Risk factors for the development of sepsis include cauterisation, invasive devices, certain surgery, urinary tract

## CLINICAL INTEREST BOX 42.4 SIRS

For a diagnosis of systemic inflammatory response syndrome (SIRS) to be made the individual must display two or more of the following:

- Temperature >38°C or <36°C
- Heart rate >90/min
- Respiration rate >20/min

SIRS can be present without an infection; however, sepsis can only be diagnosed when SIRS and an infection are present

*(Adapted with permission from Schub & Schub 2011b. © 2011, EBSCO Publishing, Inc)*

**TABLE 42.6 | Signs of organ failure**

| Body system | Clinical manifestation |
|---|---|
| Neurological | Decreased mental alertness |
| Urinary | Acute oliguria |
| Endocrine/ metabolic | Hyperglycaemic without the presence of diabetes |
| Respiratory | Tachypnoea, hypoxaemia |
| Gastrointestinal | Paralytic ileus, no bowel sounds |
| Circulatory system | Decreased cardiac output, decreased perfusion/BP |

infections, appendicitis, diverticulitis, Crohn's disease, cholecystitis, renal disease, prostatitis, meningitis and complicated obstetric delivery (Schub & Schub 2011a). Older adults, children and immunosuppressed individuals are at an increased risk of sepsis progressing to severe sepsis and septic shock (Schub & Schub 2011b).

## Pathophysiology

Sepsis develops when the body is unable to contain a localised infection, enabling the infective agent to enter the bloodstream. The associated SIRS can impair the clotting cascade, causing systemic inflammation, vasodilation and capillary leakage which contribute to hypotension and can lead to organ failure (Whitehead 2010). Sepsis can develop into severe sepsis. Severe sepsis involves all the clinical features of sepsis but has the added complication of organ dysfunction (Dellacroce 2009) (see Table 42.6). When an individual is diagnosed with severe sepsis there is a 30–35% chance of death (Whitehead 2010).

One of the major complications of severe sepsis is hypotension. When an individual remains hypotensive in spite of adequate fluid resuscitation, the individual has progressed into septic shock (Dellacroce 2009). Septic shock is a life-threatening condition, with 1400 people worldwide dying each day (Gerber 2010). After diagnosis of septic shock, 30% of individuals will die within the first month and 50% within 6 months (Gerber 2010).

## CASE STUDY 42.3

**Septic shock**

Melissa, a 26-year-old female with acute myeloid leukaemia, was admitted to the ward. She had undergone a bone marrow transplant, which had yet to take and she was neutropenic. She started spiking temperatures of 38°C or more. As per protocol the medical officer ordered blood cultures every time this happened, which kept coming back negative. This continued for 2 days before she deteriorated very suddenly and was taken to the ICU in septic shock. A chest x-ray showed she had developed a fungal infection in the left lower lobe of her lung, and this was suspected as the causative agent. The medical officers made the decision to remove the affected lobe of lung to remove the source of infection. The individual spent over a month in the ICU before returning to the ward and another 4 months on the ward before she could be discharged.

What are some ongoing issues that you can identify that Melissa may face?

## Diagnostic tests

It is recommended that all individuals at risk of developing sepsis have routine screening to enable early intervention and treatment if infection occurs. This can lead to improved clinical outcomes for individuals diagnosed with sepsis. Early identification can also decrease the risk of sepsis progressing to severe sepsis, which has worse outcomes for individuals. As soon as sepsis is suspected blood cultures should be taken, ideally prior to the commencement of antimicrobial therapy (refer to Clinical Skill 42.1: Venepuncture). Blood cultures should be taken prior to the commencement of antimicrobial therapy only when this will not lead to a delay in the commencement of treatment. Both aerobic and anaerobic blood culture collection bottles must be used. Ideally two sets of blood cultures should be obtained prior to the commencement of antibiotic therapy. The blood cultures can be taken at the same time if drawn from two different sites (percutaneously and all vascular access devices). The cultures should be taken from all lumens of central and peripheral lines. Obtaining blood cultures prior to commencement of antibiotics is important to confirm infectious agents.

Once confirmation of infection has occurred antibiotic therapy can be scaled back to enable a more targeted approach. It is important to note that in as many as 50% of individuals diagnosed with sepsis and severe sepsis blood cultures will be negative. This is more likely to occur when antimicrobial treatment has commenced. For the majority of individuals who have negative blood cultures, the sepsis and severe sepsis will be caused by bacteria or fungi. Cultures from other sites including urine, cerebrospinal fluid, wounds, respiratory

## CLINICAL SKILL 42.1 Venepuncture

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Disposable gloves<br>Tourniquet<br>Vacutainer access device/2–23 g needle and syringe/ butterfly 21–23 g with Vacutainer attachment<br>Pathology test tubes<br>Sharps container<br>Alcowipes<br>Gauze square or cotton ball<br>Tape<br>Pathology form and pen |

| **Skill activity** | **Rationale** |
|---|---|
| Perform hand hygiene<br>Explain procedure to the individual<br>Verify individual's identity against the pathology form | Prevents cross-infection<br>Reduces anxiety/apprehension and gains individual's trust and cooperation<br>Reinforces consent of individual |
| Collect equipment | Ensures all equipment ready for procedure |
| Place tourniquet about 15 cm above intended puncture site (above the elbow or wrist joint) and clip ends together and tighten firmly, so that two fingers can fit under comfortably<br>Palpate the distal pulse to ensure the artery not occluded | Helps to distend vein<br>Prevents discomfort due to tourniquet being too tight<br>Helps prevent complications |
| Locate the vein by palpating using the index and middle fingers of your non-dominant hand<br>Ask the individual to open and close their hand to increase dilation of the vein<br>Once the vein is located, release tourniquet<br>Perform hand hygiene and don gloves<br>Reapply tourniquet | Palpating for the vein enables assessment of the vein through touch (bouncy and full of blood)<br>Facilitates filling of the vein and distension<br>Facilitates refill of the vein<br>Prevents cross-infection |
| Cleanse the area with an alcowipe and wait 30 seconds for the area to dry<br>Insert the needle tip into the vein by stabilising the vein, stretching the skin taut<br>The needle should be parallel to the vein and above it with the angle of insertion approximately 15–30 degrees<br>Once the tip of the needle is in the vein attach the tubes one by one to the Vacutainer (or gently pull plunger back on syringe) and fill each tube with blood<br>Releasing of the tourniquet may be required for certain blood tests to prevent haemolysis | Prevents the introduction of microorganisms and ensures proper antiseptic preparation of skin<br>Enables the smooth entry into the vein and prevents the vein from moving around<br>Going in too deep can lead to puncturing the vein through and causing a haematoma<br>Haemolysis can interfere with an accurate result |
| Once the required tubes are filled and the tourniquet released, support the insertion site with the gauze or cotton ball (do not push down) and withdraw the needle<br>Apply pressure to the puncture site and ask the individual to continue putting pressure on the site if able | Prevents discomfort to the site<br>Prevents excessive bleeding and a haematoma from forming |
| Label and sign the tubes of blood and verify the individual's details<br>Sign the pathology form and place form and tubes in the required pathology bag | Abides by organisational guidelines and ensures the correct results for the correct individual<br>Enables proper transporting of tubes |
| Check the puncture site to ensure the bleeding has stopped and change the gauze/cotton ball if required and apply tape<br>Inform individual to notify you if any further bleeding, pain at the site or a haematoma forms | Prevents complications from the procedure |

| CLINICAL SKILL 42.1 Venepuncture—cont'd | |
|---|---|
| Dispose of the equipment in the appropriate waste receptacle ensuring the sharps are placed in the sharps container<br>Perform hand hygiene | Abides by infection prevention policies and procedures<br>Prevents needlestick injury<br>Prevents cross-infection |
| Send blood specimens to pathology in a timely manner<br>Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical officer | Ensures blood tests are as fresh as possible for accurate results<br>Appropriate care can be planned and implemented |
| *(Crisp & Taylor 2013; Phillips & Gorski 2014; Centers for Disease Control and Prevention 2011; Tollefson et al 2012)* | |

secretions or other sources of body fluid which may harbour infection should be obtained prior to commencement of antibiotics only if doing so will not cause significant delay in antibiotic administration.

Diagnostic imaging studies should also be performed in order to detect a potential source of the infection. Once a source of infection has been identified a sample should be obtained for a more targeted treatment regimen. In addition the source of infection can be drained which improves the likelihood that treatments will work (Dellinger et al 2013).

## Medical management

The European Society of Critical Medicine in conjunction with the International Sepsis Forum and the Society of Critical Care Medicine have developed 'The Surviving Sepsis Campaign' (Surviving Sepsis 2015). The aim of the campaign is to decrease mortality and morbidity associated with sepsis by providing health professionals with guidelines for the early recognition and treatment of sepsis (Kent & Fields 2012).

Treatment of sepsis should begin within the first hour of diagnosis. Treatment includes commencing broad-spectrum antibiotics and/or antifungal agents within 1 hour of diagnosis.

Once the causative pathogen has been identified antimicrobials must be reassessed to provide a more targeted approach to treatment. Antimicrobials must be assessed daily to ensure the individual is responding to treatment and to determine when medications can be reduced. This is essential to decrease the likelihood that the affected individual will develop resistance to or toxicity from the treatment. Antimicrobial treatment will typically be required for 7–10 days. Some individuals will require longer antimicrobial treatment if they are not responding adequately (Dellinger et al 2013).

Oxygen therapy should be commenced at high doses to stabilise oxygen saturations (Steen 2009). Studies have shown that there is no difference in individual outcomes when fluid resuscitation is performed with colloid solutions in comparison with crystalloids (normal saline).

Fluid resuscitation for individuals with sepsis or severe sepsis should be commenced using crystalloids within 1 hour of diagnosis (Guidet et al 2012) (refer to Clinical Skill 42.2: Central venous access device management). The aim is to maintain blood pressure greater than >100 systolic blood pressure (SBP). When crystalloids are not adequate to maintain the individual's blood pressure albumin should be commenced (Delaney et al 2011). In some cases fluid resuscitation will not be enough to maintain the individual's blood pressure. When this occurs additional medications will be required to cause vasopressin. The first-line drug for vasopressin is noradrenaline with the aim of achieving a mean arterial pressure of 65 mmHg. If noradrenaline is not enough to maintain blood pressure, adrenaline can be given. For certain individuals (those with no bradycardia or who have a low risk of tachyarrhythmias) dopamine may be used as an alternative to noradrenaline (De Backer et al 2012). Any individual who requires vasopressors in order to maintain blood pressure will require an arterial line (Dellinger et al 2013). See Table 42.7 for supportive therapies used in severe sepsis and Clinical Interest Box 42.5 for central venous access device information.

### DECISION-MAKING FRAMEWORK EXERCISE 42.1

You are performing a ward round with the RN you have been allocated to work with. One of the individuals under your care has an IV medication due to be given. The individual has a CVC which is being used to give IV medications. You are new to this ward and have never cared for a CVC line or given medications via one. While you have the required knowledge to give the medication you do not have the confidence to do so. The RN you are working with insists that hospital policy is that you, as an EN, can administer medications via a CVC. You have not had time to look up the policy.

Using the decision-making framework, determine if you are able to give this medication.

## CLINICAL SKILL 42.2 Central venous access device management: dressing, removal and medication administration

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Sterile gloves<br>Disposable gloves<br>Sterile dressing pack<br>Occlusive dressing<br>Chlorhexidine in alcohol solution 70%<br>Sterile bungs/caps<br>Stabilisation device<br>Extra sterile gauze squares<br>Suture remover<br>Specimen container<br>Waste bag |

Refer to Clinical Skill 24.7 Administration of intravenous medications: infusion and bolus (p 600) for medication administration

| **Skill activity** | **Rationale** |
|---|---|
| Perform hand hygiene<br>Explain procedure to the individual<br>Verify individual's identity<br>Check organisation's policies and procedures | Prevents cross-infection<br>Reduces anxiety/apprehension and gains individual's trust and cooperation<br>Reinforces consent of individual<br>Abides by organisation's policies and procedures |
| Collect equipment | Ensures all equipment ready for procedure |
| Open a sterile dressing pack and place any additional equipment within easy reach | Prevents cross-infection<br>Prevents the introduction of microorganisms |
| **Dressing change**<br>Don disposable gloves and gently peel back old dressing towards the insertion site, anchoring the catheter<br>Remove stabilisation device (if PICC line)<br>Inspect for signs of infection<br>Measure length of catheter from the insertion site to the tip | Prevents cross-infection<br>Prevents the dislodgement of the catheter<br>Used generally on PICC lines<br>Assesses for complications, which may need further management<br>Identifies external catheter migration |
| Remove gloves, perform hand hygiene (as per policy) and don sterile gloves<br>Cleanse skin with chlorhexidine in alcohol solution and ensure catheter is cleaned also with the solution<br>Wait for alcohol to dry<br>Place stabilisation device onto skin in the correct place (if PICC line)<br>Apply occlusive dressing over the catheter insertion site including the stabilisation device (if PICC line)<br>Note: If changing bungs/caps on the central line refer to policy and procedure | Prevents the introduction of microorganisms and ensures asepsis<br>Prevents cross-contamination<br>Ensures full antisepsis has been achieved<br>Secures the catheter to prevent dislodgement<br>An occlusive dressing allows the area to breathe by preventing moisture under the dressing, preventing infection<br>Allows monitoring for any signs of infection |
| **Catheter removal**<br>Confirm medical order for removal of central catheter<br>Position the individual in a supine position<br>Don disposable gloves and gently peel back old dressing towards the insertion site, anchoring the catheter<br>Remove stabilisation device (if PICC line)<br>Inspect for signs of infection | Abides by legal and organisation guidelines<br>Reduces the risk for air embolism during catheter removal<br>Prevents cross-infection<br>Prevents the dislodgement of the catheter<br>Used generally on PICC lines<br>Assesses for complications, which may need further management |

## CLINICAL SKILL 42.2 Central venous access device management: dressing, removal and medication administration—cont'd

| | |
|---|---|
| Remove gloves, perform hand hygiene (as per policy) and don sterile gloves<br>Cleanse skin with chlorhexidine in alcohol solution and ensure catheter is cleaned also with the solution<br>Wait for alcohol to dry<br>Remove any sutures<br>Ask the patient to perform the Valsalva manoeuvre (breathing in and out a couple of times and then inhaling and holding)<br>Place a piece of sterile gauze over the insertion site and gently remove the catheter from the vein in one smooth motion, leaving the gauze in situ once removed<br>Place the tip of the catheter on the sterile field of the dressing tray<br>Check the site for any bleeding or exudate and place a piece of sterile gauze over the site covering it with an occlusive dressing<br>Note: If the tip is to be sent to pathology, cut the tip with sterile scissors and place tip in a sterile specimen container<br>Sign and label container and complete the pathology form correctly | Prevents the introduction of microorganisms and ensures asepsis<br>Prevents cross-contamination<br>Ensures full antisepsis has been achieved<br>Reduces the risk of air embolism during catheter removal<br>Do not force catheter, as it may break apart. If any resistance, stop the procedure, cover with a sterile dressing and inform the nurse in charge/doctor<br>Reduces the risk of contamination<br>Prevents post-removal air embolism and the introduction of microorganisms<br>The doctor may want to test for any microorganisms |
| Place individual into a comfortable position and ask the individual to inform you of any difficulty breathing, pain or oozing from the site<br>Dispose of equipment in the correct waste receptacle and perform hand hygiene | Promotes comfort<br>Prevents complications<br>Abides by infection prevention policies and procedures<br>Prevents cross-infection |
| Monitor individual for any adverse effects<br>Report and document all relevant information correctly in the healthcare record. Communicate abnormal findings to the Registered Nurse/medical office | Appropriate care can be planned and implemented |

*(Crisp & Taylor 2013; Phillips & Gorski 2014; Centers for Disease Control and Prevention 2011; Tollefson et al 2012)*

## CLINICAL INTEREST BOX 42.5 Central venous access device (CVAD) management

For individuals with severe illness CVADs are essential for their treatment (Johansson et al 2013). CVADs are small, flexible tubes that are inserted into the superior vena cava (Chong et al 2012). They are inserted to provide long-term vascular access and can be used for blood sampling, total parenteral nutrition, chemotherapy and long-term antibiotics (Nayeemuddin et al 2013).

As with any procedure, insertion of a CVAD has associated risk factors including arterial puncture and infection (Nayeemduddin et al 2013). Once inserted the main risks are to patency of the tube (Bolton 2013) and catheter migration (Gabriel 2013). To prevent tube blockage it is important to flush the tube adequately after access (refer to hospital policy). To decrease the risk of catheter migration it is essential that the CVAD is secured appropriately (Gabriel 2013). The CVAD site must be monitored regularly for signs of infection.

There are three main types of CVADs: PICC lines, tunnelled CVCs and implantable ports.

Each hospital will have different policies and procedures regarding the care of CVADs. As an EN it is important that you understand your scope of practice with CVADs. Some hospitals will not allow ENs to care for individuals with CVADs. Other hospitals will allow an EN to care for an individual with a CVAD but not manage the CVAD and others will allow the EN all responsibility for the CVAD. Hospital policy will also differ on which types of CVADs ENs can manage.

Refer to Chapter 24 for more information on medication administration.

**TABLE 42.7 | Supportive therapies for severe sepsis**

| Therapy | Rationale |
|---|---|
| Blood product administration | Red blood cell administration required when haemoglobin <7.0 g/dL<br>Fresh frozen plasma and antithrombin therapies NOT to be used<br>Platelets to be used prophylactically when results are <10 000/mm$^2$ |
| Immunoglobulins | Not recommended for use |
| Mechanical ventilation for sepsis-induced acute respiratory distress syndrome (ARDS) | Individual will be cared for in the ICU<br>Head of the bed should be elevated to 30–45 degrees to decrease the risk of aspiration |
| Sedation, analgesia and neuromuscular blockade | Sedation should be kept to a minimum for mechanically ventilated individuals<br>Neuromuscular blocking agents should not be used in individuals without ARDS |
| Glucose control | Insulin to be commenced based on blood glucose levels<br>Blood glucose levels to be taken every 1–2 hours until stabilised |
| Renal replacement therapy | When renal failure has occurred haemodialysis will be required |
| DVT prophylaxis | Daily clexane or other preventative medication injections are required<br>TED stocking to be applied if possible |
| Stress ulcer prophylaxis | Administration of a proton pump inhibitor for individuals with known risk |
| Nutrition | Oral or enteral feeding as tolerated<br>Low dose feeding in the first week<br>Intravenous glucose and enteral nutrition is recommended rather than using total parenteral nutrition (TPN) |

*(Dellinger et al 2013)*

### Nursing care

The best treatment for sepsis is prevention, which all nurses must aim to achieve by being diligent with handwashing and the use of aseptic technique and standard and additional precautions. Goals of care should be discussed with both the affected individual and their family. Many individuals with multiple organ failure will not survive. In some cases the involvement of the palliative care team is required (Dellinger et al 2013).

## CLINICAL PATHWAYS

A **clinical pathway** is best described as a multidisciplinary, locally approved plan of care for an individual based on guidelines and, wherever possible, evidenced for a particular individual group (Duffy et al 2011).

The clinical pathway was introduced in the 1980s in the US to meet the needs of healthcare professionals and improve quality of care for individuals (Duffy et al 2011). The main aim is to encourage standardisation of care for all individuals (Neuman et al 2009) with similar requirements throughout a specific time frame by providing clinical standards and expected outcomes (D'Entermont 2009; Neuman et al 2009).

The development of clinical pathways combines an evidence-based approach with local policy and procedure and current practice to develop a process map which in turn is developed into a pathway. The pathway enables less variation and more transparency in individual care (Baker et al 2012). In Australia, The National Safety and Quality Health Service Standards recommend the use of clinical pathways. They recommend that clinical pathways are developed using best practice guidelines (ACSQHC 2012).

Clinical pathways are most advantageous when individual outcomes are predictable, thus ensuring that the individual receives relevant clinical interventions and assessments (Allen et al 2009). While clinical pathways cannot be used for all individuals, in 80% of cases a clinical pathway is indicated (Duffy et al 2011). Pathways provide a daily care plan for the individual, and include guidelines on assessment, treatment, activities of daily living, nutrition, education, referrals to be made and discharge planning (D'Entermont 2009). An example care plan has been provided in Nursing Care Plan 42.1.

## NURSING CARE PLAN 42.1

**Assessment:** Imbalanced nutrition, less than body requires related to ongoing nausea and vomiting, anorexia and dietary restrictions
**Issue/s to be addressed:** Weight loss
**Goal/s:** To stabilise individual's weight within 1 month

| Care/Actions | Rationale |
|---|---|
| Commence food chart | To monitor individual's nutritional intake |
| Commence daily weight | To monitor individual's weight |
| Provide anti-emetic medication 30 minutes prior to meals | To prevent nausea and vomiting during meals |
| Refer to nutritionist | To advise individual on dietary requirements |
| Encourage small, frequent meals | To increase calorie intake throughout the day |
| Encourage high-energy drinks | To increase calorie intake throughout the day |

**Evaluation**

After 1 month the individual's weight should have stabilised.

## PROGRESS NOTE EXAMPLE 42.1

| | |
|---|---|
| 09/06/2015<br>1430 hrs | Nursing: Individual is day 3 of 7 for antibiotic treatment for right lower leg cellulitis. Individual is alert and orientated. Pain 4/10 in right lower leg. Analgesics provided as per medication chart, nil further complaints of pain. Temp 37.0, HR 78, BP 126/78. Right lower leg remains swollen, nil further progression of cellulitis—refer to wound chart. Individual showered with minimal assistance this am. Tolerating FWD and fluids. All medications provided as per medication chart. Individual currently sitting out of bed with right leg elevated. For physio and OT review tomorrow.<br>***F. Daly* (Daly) EN** |

The novice nurse can find pathways especially helpful by providing a guide as to what is expected of the individual on any given day (D'Entermont 2009). However, it is not just the novice nurse who benefits from clinical pathways; even the most experienced nurse will encounter individual conditions they are unfamiliar with and the pathway will enable them to provide the most appropriate care for these individuals.

Clinical pathways can form all or part of the individual's medical records (Duffy et al 2011). At the end of a shift, providing there has been no variation from the pathway, the nurse responsible for the individual's care signs off that all expected outcomes and interventions have been met. When a variation from the plan has occurred the nurse is expected to document this in the individual's progress notes. An example of an entry into progress notes has been provided in Progress Note Example 42.1.

Studies have shown that clinical pathways improve individual outcomes, promote decision making and may lead to shorter hospital stays and reductions in readmission (Allen et al 2009). Shorter hospital stays are achieved as clinical pathways act as an organisational device by encouraging proactive interventions and the use of relevant resources for the individual (Allen et al 2009). However, not all individuals are appropriate for clinical pathways. Clinical pathways are not effective when care needs to be flexible, such as with the care of the individual post cerebrovascular accident (Allen et al 2009). Clinical pathways can never replace professional clinical judgment (D'Entermont 2009).

## Summary

This chapter has presented some common and not-so-common conditions the Enrolled Nurse may encounter when working in the acute, aged or community care sectors. It has explored the area of acute care provided in venues other than hospitals and presented an introduction to clinical pathways. There are many acute conditions the Enrolled Nurse will come across, in various settings, and this introduction, along with further reading, provides a general introduction to a broad range of conditions that may be seen in acute settings.

## Review Questions

1. You suspect your individual had cellulitis. What are the common sites the infection originates from?
2. What are the two (2) conditions that are included under the term venous thromboembolism?
3. Identify the major risk factors associated with the development of a DVT.
4. What does a positive D-dimer test indicate?
5. Outline the treatment of an individual who has been diagnosed with a pulmonary embolism.
6. Describe diverticulitis.
7. List the clinical manifestations of diverticulitis.
8. What is a preceding factor for the development of Guillain–Barré syndrome?
9. Explain the pathophysiology of Guillain–Barré syndrome.
10. Provide a cause of each stage of acute renal failure.
11. What two (2) conditions must be present for a diagnosis of sepsis?
12. Where are the common sites that a sepsis infection originates?
13. Define the term clinical pathway.
14. What is the main aim of clinical pathways?
15. For what individuals are clinical pathways most appropriate?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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CHAPTER
43

# Nursing in the perioperative care environment

*Karen Stilo*

## KEY TERMS

anaesthesia
intraoperative
perioperative
postoperative
preoperative
surgery

## LEARNING OUTCOMES

At the completion of this chapter, and with further reading, students should be able to:

- Define the key terms
- Describe the nature of the operative experience and outline the phases it entails
- Describe the individual care roles of the perioperative nurse
- Describe the general physiological, psychological and local responses to surgical intervention
- Describe the various classifications of surgical procedures
- Define informed consent and discuss the role of the nurse in ensuring consent
- Assist in planning and implementing preoperative and postoperative nursing care for the individual who requires surgical intervention

## CHAPTER FOCUS

Perioperative nursing encompasses the care of an individual who is undergoing a surgical procedure. Care takes place from the time the decision is made to have surgery, through to recovery from the procedure. Throughout the perioperative period it is essential that there is a flexible multidisciplinary team approach to ensure continuity of individual care from admission, throughout the surgical experience to recovery at home. It is important for the nurse to be familiar with the types of surgery an individual is likely to undergo in order to plan and implement adequate and individualised care and to provide appropriate psychological support. 'The care encompasses safe and effective management in collaboration with other healthcare team members; the nurse also safeguards the individual's integrity by acting as an advocate for individuals during their perioperative experience' (Hamlin et al 2009).

This chapter provides an overview of the perioperative period, which comprises the preoperative, intraoperative and postoperative phases as well as the specific physiological and psychological support that each phase requires.

## LIVED EXPERIENCE

I remember feeling very nervous and scared for my daughter, Emily (4 years old), when she had to have her tonsils removed. When we arrived at the operating theatre from the ward I expected to have to leave her there, and I was dreading the upset that would cause us both. The nurse in the waiting area was very kind and understanding; she explained everything and got me dressed in a white covering, shoe covers and a cap, which made Emily laugh. I was allowed to stay with Emily in the actual operating room right up until she was asleep, and was called from the ward as soon as she was in recovery. My face was the first she saw when she woke up. This made a scary situation so much easier for Emily and for me; they even put an IV wrapped in a bandage on Emily's teddy bear!

**Brooke 2015**

# PERIOPERATIVE CARE

The individual's experience of **perioperative** care is divided into three phases. Both Registered Nurses (RNs) and Enrolled Nurses (ENs) may work in any or all of the roles during the phases described below. These phases are fully described later in this chapter:

1. Preoperative phase
2. Intraoperative phase
3. Postoperative phase.

Perioperative nurses are RNs and ENs who fulfil the roles of circulating nurse (scout), instrument nurse (scrub), anaesthetic and postanaesthesia recovery nurse (see Table 43.1). The responsibilities of these nurses are specialised and multifaceted. The principal aim is to ensure that holistic, clinically effective, evidence-based care and support is given to the individual throughout their perioperative experience. The perioperative nurse provides this care alongside other members of the multidisciplinary team, in an environment that is challenging, changing and fast paced. The nurse acts as the individual's advocate and provides continued and effective communication with the individual, their significant others and the surgical team. The nurse undertakes efficient assessment and intervention, maintains accountability for their own practice, documents care and emphasises individual safety in all phases (Crisp et al 2013; Hamlin et al 2009).

In Australia professional standards, guidelines and policy statements for perioperative nursing are set by the Australian College of Operating Room Nurses (ACORN). ACORN's ongoing focus is the improvement, standardisation, education and support of perioperative nursing care (Hamlin et al 2009).

# SURGERY

Undergoing surgery is an experience that is unique to the individual; a person faces numerous stressors when confronting surgery. The anticipation of having a surgical procedure may incite fear and anxiety. Some individuals associate having surgery with pain, disfigurement, loss of independence and even death. It is important for the perioperative nurse to quickly establish rapport with individuals, listening to them so that their concerns are heard and relieved. What individuals all have in common is the fact that in the perioperative environment they are at their most vulnerable and reliant on the skills and knowledge of the multidisciplinary team to achieve an optimal outcome.

## The purpose of surgery

**Surgery** is performed for a variety of reasons:

- Diagnostic—surgical exploration that allows the surgeon to confirm a diagnosis; tissue may be removed for further diagnostic testing
- Ablative—excision or removal of a diseased body part
- Constructive—restores lost or reduced function resulting from congenital abnormalities
- Reconstructive—restores appearance or function to tissues that are traumatised or malfunctioning

**TABLE 43.1 | Role responsibilities of the perioperative nurse**

| | |
|---|---|
| Anaesthetic nurse | • Collaborate and assist the anaesthetist during preparation, induction, maintenance and emergence phases of the anaesthetic<br>• Anticipate and provide equipment/supplies for routine and emergency anaesthetic procedures<br>• Assist the individual to maintain a clear airway<br>• Individual assessment and monitoring<br>• Assessment/documentation of fluid balance<br>• Assist with individual transfer and positioning before and after surgery<br>• Individual advocate, especially when anaesthetised<br>• Evaluate effectiveness of planned care<br>• Collaborate with PACU staff to provide individual care |
| Circulating (scout) nurse | • Anticipate the needs of the surgical team before/during surgery<br>• Monitor any breach in aseptic technique and initiate corrective action<br>• Perform the surgical count with the instrument nurse<br>• Correct handling and labelling of surgically removed human tissue and implanted items<br>• Advocate for the anaesthetised individual<br>• Documentation of intraoperative nursing care |
| Instrument (scrub) nurse | • Prepare the instruments and equipment needed in the operation<br>• Anticipate the needs of the surgical team before/during surgery<br>• Adhere to and maintain aseptic technique throughout the procedure<br>• Monitor any breach in aseptic technique and initiate corrective action<br>• Perform the surgical count with the circulating nurse<br>• Correct handling of surgically removed human tissue and implanted items<br>• Documentation of intraoperative nursing care |
| Postanaesthetic nurse | • Individual assessment and airway management<br>• Individual observation and monitoring<br>• Perform resuscitation<br>• Management of acute pain, nausea and vomiting<br>• Management of the individual's fluid balance<br>• Documentation of nursing care during the immediate postoperative period<br>• Prompt acting on and reporting of aberrant changes in the individual's condition to anaesthetist/surgeon<br>• Provision of a comprehensive individual handover to the nurse caring for the individual in the receiving unit |

*(Hamlin et al 2009)*

- Cosmetic—performed to improve the individual's personal appearance
- Palliative—alleviates or reduces the intensity of disease symptoms; will not cure the disease (Crisp et al 2013).

## Classifications of surgery

Surgery is classified under the descriptors of risk and urgency. The classification of the surgery for each individual may change during the course of the disorder, depending on the time lapse between identification of the need for surgery, any increase in symptoms and the time surgery occurs (see Table 43.2).

## Responses to surgical intervention

There is a degree of risk with any surgical procedure. Various factors and conditions increase an individual's risk during surgery. Knowledge of the risk factors allows the nurse to appropriately plan individual care. Some of these risk factors include:

- Age—very young and very old people are at risk during surgery due to their physiological status being immature or declining (see Table 43.3)
- Nutrition—the need for adequate nutrition is intensified by surgery; normal tissue repair and resistance to infection is dependent on sufficient nutrients
- Obesity—the bariatric (obese) individual is at an increased surgical risk due to reduced ventilatory and cardiac function. Diabetes, hypertension, coronary artery disease and congestive heart failure are common in the bariatric population. They are also susceptible to wound infections and poor wound healing due to the structure of fatty tissue which contains deficient blood supply
- Fluid and electrolyte balance—the body responds to surgery as a form of trauma: the more extensive the surgery the more severe the stress. The degree of fluid and electrolyte imbalance is influenced by the severity of the stress response evoked.

### Physiological responses

In response to surgical invasion, the body mobilises defences to maintain homeostasis. Most of these mechanisms are

**TABLE 43.2 | Classifications of surgery**

| | | |
|---|---|---|
| Risk | Major | Increased degree of risk if complicated or prolonged<br>Vital organs involved<br>Potential for large blood loss<br>Postoperative complications more likely |
| | Minor | Usually involving small amount of risk<br>Fewer complications likely |
| Urgency | Emergency | Surgery to preserve the individual's life, body part or body function |
| | Elective | Category 1: urgent cases, surgery within 30 days for a condition that could quickly deteriorate<br>Category 2: semi-urgent, surgery within 90 days for conditions of pain, dysfunction or disability unlikely to deteriorate quickly to an emergency<br>Category 3: non-urgent, surgery within 180 days for conditions causing minimal pain, dysfunction or disability and which do not have the potential to become an emergency |

*(Adapted from Department of Human Services 2009). © State of Victoria)*

generally favourable to survival and healing. If, however, the mechanisms are prolonged or uncontrolled, they may contribute to the development of complications. Table 43.4 outlines the physiological responses to the stress of surgery.

### Local responses to tissue injury

After injury, local inflammatory reactions occur to promote healing. A surgical incision, even though created under sterile and controlled conditions, still constitutes injury or insult. The inflammatory response begins with the creation of a surgical wound, and the normal sequence of tissue replacement and wound healing must occur to ensure tissue recovery. The physiology of wound healing involves a specific sequence of events and is discussed in Chapter 29, as are influences on healing and the specific care of wounds.

### Psychological responses

As a result of psychological stress related to surgical intervention, the individual may experience changes in mood and/or behaviour, including:

- Anxiety, which may be related to the procedure itself, or to associated factors, including changed social circumstances, loss of independence or privacy, separation from family/support people, financial hardship or prolonged recovery time
- Depression
- Fear of anticipated pain, concern of mutilation or decreased function, dread of death, panic of waking up under anaesthetic
- Grief associated with loss of health or a body part, self-image change, altered function or presence of a scar
- Anger
- Impaired judgment
- Reduced willpower
- Inability to concentrate and/or remember
- Intolerance of noise and other stimuli
- Emotional unpredictability
- Aimless non-productive activities.

See Table 43.6 (p 1247) for information about medications with special implications for the surgical client.

## PREOPERATIVE CARE

The **preoperative** phase begins when surgical intervention is first considered, and ends when the individual is transferred to the operating table. This phase may be of short duration if the individual is taken directly to an operating room from the emergency department or transferred soon after admission to a surgical unit. The duration depends on a number of factors, such as the amount of time required to prepare the individual adequately for surgery. The preoperative phase may begin with the individual as an outpatient in a designated pre-admission clinic, where preoperative investigations are undertaken prior to the individual's procedure. In Australia it is now common practice for an individual, depending on the type of surgery to be performed, to be admitted for same-day surgery. In this instance the individual is admitted in the early or late morning depending on the time of the operation or procedure. The individual is prepared for and undergoes surgery, is recovered from the anaesthetic, is cared for in the day surgery unit (DSU) after the procedure and is discharged home on the same day. Individuals undergoing surgery who will require inpatient care are also, in most cases, admitted through the DSU as a day of surgery admission (DOSA). DOSA individuals are taken to theatre from the DSU and are taken to the ward from the recovery room. DOSA individuals require comprehensive preparation and teaching about home recovery. Follow up at home (often by telephone) must be available for continuity of care to occur. Day-stay surgery is suitable for less complex surgical procedures or invasive techniques for which some anaesthesia is required (e.g. endoscopy). These units are staffed by both RNs and ENs.

Day surgery is now well established throughout Australia, in both the public and the private sectors. Currently up to 60% of all procedures are undertaken as day patient procedures. At present, day surgery is widely practised in over 240 freestanding day surgery centres. Many large public hospitals and over 320 private hospitals around Australia have designated DSUs in place (Australian Day Surgery Council 2004).

## TABLE 43.3 | Physiological factors that place older adults at risk during surgery

| Alterations | Risks | Nursing implications |
|---|---|---|
| **Cardiovascular system** | | |
| Degenerative change in myocardium and valves | Reduced cardiac reserve | Assess baseline vital signs<br>Recognise the longer time period required for heart rate to return to normal following stress on the heart, and evaluate the occurrence of tachycardia accordingly |
| Rigidity of arterial walls and reduction in sympathetic and parasympathetic innervation to heart | Alterations predispose individual to postoperative haemorrhage and rise in systolic and diastolic blood pressure | Maintain adequate fluid balance to minimise stress to the heart<br>Ensure blood pressure level is adequate to meet circulatory demands |
| Increase in calcium and cholesterol deposits within small arteries; thickened arterial walls | Predispose individual to clot formation in lower extremities | Instruct individual in techniques for performing leg exercises and proper turning<br>Apply elastic stockings, sequential compression devices (SCDs)<br>Administer anticoagulants as prescribed by healthcare provider<br>Provide education regarding effects, side effects and dietary considerations |
| **Integumentary system** | | |
| Decreased subcutaneous tissue and increased fragility of skin | Prone to pressure ulcers and skin tears | Assess skin every 4 hours; pad all bony prominences during surgery<br>Turn or reposition at least every 2 hours |
| **Pulmonary system** | | |
| Decreased respiratory muscle strength and cough reflex (Thomas & Adcock 2014) | Increased risk for atelectasis | Instruct individual in proper technique for coughing, deep breathing and use of spirometer. Ensure adequate pain control to allow for participation in exercises. |
| Reduced range of movement in diaphragm | Residual capacity (volume of air left in lung after normal breath) increased, reducing amount of new air brought into lungs with each inspiration | When possible, have individual ambulate and sit in chair frequently |
| Stiffened lung tissue and enlarged air spaces | Blood oxygenation reduced | Obtain baseline oxygen saturation; measure throughout perioperative period |
| **Renal system** | | |
| Decreased renal function, with reduced blood flow to kidneys | Increased risk of shock when blood loss occurs; increased risk for fluid and electrolyte imbalance (Thomas & Adcock 2014) | For individuals hospitalised before surgery, determine baseline urinary output for 24 hours |
| Reduced glomerular filtration rate and excretory times | Limits ability to eliminate drugs or toxic substances | Assess for adverse response to drugs |
| Reduced bladder capacity | Increases the risk for urgency, incontinence and urinary tract infections (Thomas & Adcock 2014) (sensation of need to void often does not occur until bladder is filled) | Instruct individual to notify nurse immediately when sensation of bladder fullness develops<br>Keep call light and bedpan within easy reach<br>Toilet every 2 hours or more frequently if indicated |

**TABLE 43.3 | Physiological factors that place older adults at risk during surgery—cont'd**

| Alterations | Risks | Nursing implications |
|---|---|---|
| **Neurological system** | | |
| Sensory losses, including reduced tactile sense and increased pain tolerance | Decreased ability to respond to early warning signs of surgical complications | Inspect bony prominences for signs of pressure that individual is unable to sense<br>Orient individual to surrounding environment<br>Observe for non-verbal signs of pain |
| Blunted febrile response during infection (Thomas & Adcock 2014) | Increased risk of undiagnosed infection | Ensure careful, close monitoring of patient temperature; provide warm blankets; monitor heart function; warm intravenous fluids (Thomas & Adcock 2014). |
| Decreased reaction time | Confusion and delirium after anaesthesia; increased risk for falls | Allow adequate time to respond, process information and perform tasks. Perform fall risk screening and institute fall precautions. Screen for delirium with validated tools. Orient frequently to reality and surroundings |
| **Metabolic system** | | |
| Lower basal metabolic rate | Reduced total oxygen consumption | Ensure adequate nutritional intake when diet is resumed, but avoid intake of excess calories |
| Reduced number of red blood cells and haemoglobin levels | Ability to carry adequate oxygen to tissues is reduced | Administer necessary blood products<br>Monitor blood test results and oxygen saturation |
| Change in total amounts of body potassium and water volume | Greater risk for fluid or electrolyte imbalance occurs | Monitor electrolyte levels, and supplement as necessary<br>Cardiac monitoring (telemetry) as needed |

*(Potter & Perry 2013:1259)*

The advantages to the individual and their relatives include considerable reduction in cross-infection risk compared with individuals who remain in hospital; decreased risk of thromboembolism associated with early ambulation; less anxiety for the individual as an overnight stay in hospital is avoided, particularly in the case of children for whom minimal separation from parents is beneficial, and for the older individual who may become disoriented when subjected to unfamiliar surroundings for extended periods of time. The individual will have a quicker return to normal activities with less time off work and less stress for their relatives, saving time, travel and in some cases the need for accommodation to visit an inpatient in hospital (Australian Day Surgery Council 2004; Timmins & McCabe 2009).

Another trend is that overall length of stay in hospital after surgical procedures is decreasing. With this practice of earlier discharge comes the implication that individuals may go home with complex medical and nursing needs and will require suitable follow up with visiting nurses, or involvement in a 'Hospital in the Home' or a 'Rehabilitation in the Home' program. See also Chapter 40.

The overall aim of preoperative preparation is to ensure that the individual is in the best physical and psychological condition possible before undergoing surgery. It is essential to gather appropriate data concerning the individual's health status through the taking of baseline observations and a detailed and accurate nursing history. Nursing assessment is based on the data collected and includes the identification of actual and potential problems that may be faced by the individual throughout any phases of the perioperative period. Although certain aspects of preoperative preparation are similar for most surgical procedures, other factors are specific, depending on the individual's condition and the type of operation to be performed. (See Nursing Care Plan 43.1.)

Preoperative preparation generally consists of:

- Providing information
- Teaching activities (e.g. deep breathing and coughing techniques and leg exercises)
- Examination of the individual by the anaesthetist and surgeon
- Performing laboratory tests and diagnostic studies
- Gaining the individual's informed consent

**TABLE 43.4 | Physiological responses to the stress of surgery**

| Response | Purpose |
|---|---|
| Increased peripheral vasoconstriction and blood coagulation | Prevents excessive blood and fluid loss |
| Increased rate and strength of heart beat, and dilation of the coronary arteries | Maintains cardiac perfusion and oxygenation |
| Increased reabsorption of sodium ions from the kidneys, causing retention of sodium and water | Maintains blood volume, blood pressure and cardiac output |
| Decreased peristalsis in the gastrointestinal tract | Reduces metabolic activity which is non-essential in the short-term emergency |
| Relaxation of smooth muscle that promotes dilation of the bronchioles | Improves gas exchange and tissue oxygenation |
| Increased breakdown of protein | Increases the availability of amino acids for repair of tissues |
| Proliferation of connective tissue | Promotes wound healing |
| Increased circulation of glucose and mobilisation of stored fat | Provides required energy |
| Increased basal metabolic rate | Provides required energy and nutrients for the tissues |

## NURSING CARE PLAN 43.1

**Scenario:** Thea, 36 years old, is a recent arrival in Australia from Yemen. She is booked for a cone biopsy of the cervix due to a Pap smear result showing moderate changes. When she arrived it was apparent that she was severely distressed and fearful. With careful questioning it became clear that Thea believed she was having a much more invasive surgery that would result in her feeling she would no longer be a functioning woman.
**Assessment:** Preoperative emotional/psychological assessment
**Issue/s to be addressed:** Anxiety, fear of surgery related to misinformation/misunderstanding and cultural issues
**Goal/s:** Individual to verbalise reduced anxiety, a clear understanding of, and acceptance/informed consent to, the surgical procedure

| Care/Actions: | Rationale: |
|---|---|
| Encourage individual to verbalise cause of anxiety<br>Explain and describe in simple terms the exact nature of the surgical procedure using diagrams if required | To ensure the understanding of the nurse assessing her in the waiting area<br>To enhance communication and aid in the understanding and informed consent of the individual |

**Evaluation**
Preoperatively with follow up in PACU.

- Preparation of the individual both psychologically and physically.

## Providing information

Initial assessment of each individual's knowledge base should be undertaken, even if the person's past surgical experiences are extensive. The individual needs to be informed about all pre- and postoperative procedures and care because knowledge and understanding promote feelings of being in control, and a sense of control helps to relieve anxiety. The information given to individuals and, as appropriate, to their significant others should include:

- Preoperative procedures to be performed and the reasons for them; for example, restriction of food and fluids, cessation of smoking or preparation of the operation site
- Immediate preparation; for example, insertion of an intravenous (IV) cannula, the administration of pre-medication and the induction of anaesthesia, and what sensations may be experienced

- Details of the recovery phase in the postanaesthetic care unit (PACU) before returning to the ICU, HDU, DSU or the ward
- Postoperative situations to be expected; for example, the presence of an IV infusion or wound drain, and why these are necessary
- Postoperative activities; for example, deep breathing and coughing, early mobilisation and why they are important
- Anticipated pain or discomfort, and options for how this will be managed
- Any additional information specific to the operation to be performed.

The information must be provided in such a way that the individual can understand it, and it should be repeated if necessary. This is essential, as anxiety about hospitalisation and/or the surgical procedure may influence the individual's ability to process and retain information. The most helpful teaching program is designed so that all individuals receive the same information.

## Teaching activities

Preoperative teaching (see Clinical Interest Box 43.1) can help to reduce anxiety and stress, and teaching specific activities that the individual can undertake to promote their own recovery gives them a positive role to play. In some cases the individual may visit a specialty postoperative area; that is, an intensive care unit (ICU) as familiarity with environments that will be encountered during or after surgery may help reduce the stress associated with the surgical experience.

### CLINICAL INTEREST BOX 43.1 Teaching activities

- Deep breathing and coughing techniques to facilitate gas exchange and expectoration of accumulated mucus. The individual assumes a sitting position and takes several deep breaths followed by a short breath and cough. Alternatively, the individual may be taught to take a deep breath, hold it for 2–3 seconds then cough several times while exhaling. The individual will be taught to support any wounds with hands, or by splinting with a pillow, to reduce pain and facilitate deep breathing
- Leg exercises performed to stimulate blood circulation and enhance venous return to reduce the risk of a DVT. The individual is instructed how to bend the knees and contract the hamstring and quadricep muscles, then to dorsiflex and plantarflex the feet (see Chapter 28)
- Moving and changing position helps to prevent complications such as skin breakdown and DVT. The individual will be informed of any special equipment, or techniques that will be required for movement, and of any restrictions to movement

### CRITICAL THINKING EXERCISE 43.1

Identify the preoperative information and teaching you would provide for an individual who is having endoscopic surgery to remove his gallbladder (cholecystectomy).

## Physical examination

The anaesthetist and a medical officer each perform a thorough physical examination of the individual. The anaesthetist pays particular attention to the individual's cardiovascular and respiratory systems to evaluate the general level of function and to identify any problems that may cause difficulty during induction or maintenance of anaesthesia, such as an upper airway abnormality, which may make placement of an endotracheal tube difficult, or a spinal condition which may hinder regional anaesthesia. Loose or prosthetic teeth will be identified and noted on the admission chart. The anaesthetist also evaluates possible sites for peripheral or central venous cannulation. After assessing the individual, the anaesthetist may prescribe any preoperative medications deemed necessary to be administered prior to surgery.

## Laboratory tests and diagnostic studies

Laboratory tests and diagnostic studies help detect any risk factors or possible issues. Specific tests and studies performed depend on the individual's condition and on the nature and complexity of the operation. Ideally, diagnostic tests are carried out with sufficient time before the scheduled procedure to allow for correction of any detected problems.
Tests can include, but are not limited to:

- Blood type and cross-match, for procedures in which significant blood loss is anticipated or possible
- Arterial blood gas and pH, to check respiratory function and oxygenation
- Blood urea nitrogen, to check renal function
- Full blood examination (FBE)
- Prothrombin and/or plasma thromboplastin time, clotting factors, especially if the individual has been on anticoagulant therapy
- Serum electrolytes, including sodium and potassium levels
- Liver function studies
- Chest x-ray
- Electrocardiogram
- Pulmonary function studies
- Urinalysis.

## Medical history

Individuals will present at the ward for admission, with varied health and illness backgrounds. Some may have chronic illness, others a recent diagnosis that may or may not be related to the reason for this surgical admission. Many existing disorders will have an impact on the individual's recovery

**TABLE 43.5 | Medical conditions that increase the risks of surgery**

| Type of condition | Reason for risk |
|---|---|
| Bleeding disorders (thrombocytopenia, haemophilia) | Increase risk of haemorrhaging during and after surgery |
| Diabetes mellitus | Increases susceptibility to infection and impairs wound healing from altered glucose metabolism and associated circulatory impairment. Stress of surgery often causes increase in blood glucose levels |
| Heart disease (recent myocardial infarction, arrhythmias, congestive heart failure) and peripheral vascular disease | Stress of surgery causes increased demands on myocardium to maintain cardiac output. General anaesthetic agents depress cardiac function |
| Obstructive sleep apnoea | Administration of opioids increases risk of airway obstruction postoperatively. Individuals will desaturate as revealed by drop in $O_2$ saturation by pulse oximetry |
| Upper respiratory infection | Increases risk of respiratory complications during anaesthesia (e.g. pneumonia and spasm of laryngeal muscles) |
| Liver disease | Alters metabolism and elimination of drugs administered during surgery and impairs wound healing and clotting time because of alterations in protein metabolism |
| Fever | Predisposes individual to fluid and electrolyte imbalances and may indicate underlying infection |
| Chronic respiratory disease (emphysema, bronchitis, asthma) | Reduces individual's means to compensate for acid–base alterations. Anaesthetic agents reduce respiratory function, increasing risk for severe hypoventilation |
| Immunological disorders (leukaemia, acquired immune deficiency syndrome (AIDS), bone marrow depression and use of chemotherapeutic drugs or immunosuppressive agents) | Increase risk of infection and delayed wound healing after surgery |
| Abuse of street drugs | Persons abusing drugs sometimes have underlying disease (HIV, hepatitis) that affects healing |
| Chronic pain | Regular use of pain medications often results in higher tolerance. Increased doses of analgesics are sometimes necessary to achieve postoperative pain control |

*(Potter & Perry 2013:1258)*

from surgery, and surgery may have an impact on the severity or management of the existing disorder. See Table 43.5 for an outline of common medical conditions that may increase the risk of surgery. The nurse needs to be aware of the potential challenges to an optimal recovery for these individuals, in order to plan and implement effective care in all phases of the perioperative experience. The nurse also needs to be aware of the effect that the individual's medications for these medical problems may have on their ability to cope with the stresses of surgery and recovery. See Table 43.6.

## Informed consent

Before an operation is performed, the individual must give informed consent which should be freely given without coercion. Informed consent involves the surgeon providing the individual with enough information to understand the nature and consequences of the proposed procedure and informing the individual about the facts and possible risks relating to the surgery concerned, in terms that ensures understanding by the individual. The individual then consents, in writing, to have the operation. The surgeon and the individual must both sign a consent form, an important part of the documentation process that formalises the individual's agreement to undergo surgery. The nurse is not responsible for obtaining the individual's consent, but the nursing role includes checking that informed consent has been obtained and making appropriate notifications if this is found not to be the case. In some agencies, nurses are asked to witness

**TABLE 43.6 | Medications with special implications for the individual undergoing surgery**

| Drug class | Effects during surgery |
|---|---|
| Antibiotics | Antibiotics potentiate (enhance action of) anaesthetic agents. If taken within 2 weeks before surgery, aminoglycosides (gentamicin, tobramycin, neomycin) may cause mild respiratory depression from depressed neuromuscular transmission |
| Antiarrhythmics | Antiarrhythmics (e.g. beta-blockers such as metoprolol (Lopressor)) can reduce cardiac contractility and impair cardiac conduction during anaesthesia |
| Anticoagulants | Anticoagulants, such as warfarin (Coumadin), alter normal clotting factors and thus increase risk of haemorrhaging. Discontinue at least 48 hours before surgery. Aspirin is a commonly used medication that alters clotting mechanisms |
| Anticonvulsants | Long-term use of certain anticonvulsants (e.g. phenytoin (Dilantin) and phenobarbitone) alters metabolism of anaesthetic agents |
| Antihypertensives | Antihypertensives, such as beta-blockers and calcium channel blockers, interact with anaesthetic agents to cause bradycardia, hypotension and impaired circulation. They inhibit synthesis and storage of noradrenaline in sympathetic nerve endings |
| Corticosteroids | With prolonged use, corticosteroids, such as prednisone, cause adrenal atrophy, which reduces the body's ability to withstand stress. Before and during surgery, dosages are often temporarily increased |
| Insulin | Individuals' need for insulin changes after surgery. Stress response and intravenous (IV) administration of glucose solutions often increase dosage requirements after surgery. Decreased nutritional intake often decreases dosage requirements |
| Diuretics | Diuretics such as furosemide (Lasix) potentiate electrolyte imbalances (particularly potassium) after surgery |
| Non-steroidal anti-inflammatory drugs (NSAIDs) | NSAIDs (e.g. ibuprofen) inhibit platelet aggregation and prolong bleeding time, increasing susceptibility to postoperative bleeding |
| Herbal therapies: ginger, ginkgo, ginseng | These herbal therapies have the ability to affect platelet activity and increase susceptibility to postoperative bleeding. Ginseng is reported to increase hypoglycaemia with insulin therapy |

*(Potter & Perry 2013)*

consent forms, but the act of witnessing only verifies that this is the person who signed the consent, and that it was given voluntarily. It does not relate to the individual's actual knowledge or understanding of the procedure. (More information on informed consent is provided in Chapter 2.)

## Psychological preparation

To minimise anxiety and prepare the individual psychologically for the proposed procedure, the nurse must ensure that all relevant information is provided. People generally experience anxiety when they are facing the unknown, and anxiety is usually reduced somewhat when accurate and relevant information is supplied. The nurse must ensure that the individual and the significant others are given opportunities to ask questions and to express any concerns they may have. It is important for the nurse to recognise that procedures that seem relatively minor or routine may not appear that way to individuals or to their significant others. The prospect of any surgical intervention raises many fears about body image alteration, loss of control, pain or even the possibility of death. Some of the many factors that the individual may be worried about include:

- What will happen while they are unconscious
- Whether the surgeon will start the operation before the anaesthetic is effective
- Fear of experiencing severe pain
- Length of hospital stay
- Who will care for their family or pets
- How long it will be before it is possible to return to work.

The family or significant others may also be worried, especially if the diagnosis is questionable or the outcome of the surgery is difficult to determine. If they choose to remain in the hospital while the operation is being performed, the

nurse should ensure that they know where the waiting area is located and where they can obtain refreshments. If they prefer to remain at home they should be given an indication of what the notification process is; for example, if the surgeon will contact them after the procedure and at what time, and whom and when they can call to obtain information.

### Providing cultural safety

Providing healthcare, not only for individuals but for members of minority ethnic groups whose care is defined and influenced by social disadvantage, is a concept defined as cultural safety (Hamlin et al 2009).

The traditional values and religious beliefs of members of Indigenous groups in Australia and New Zealand are emphasised in the literature on this concept, also referred to as cultural competence. An example of this is outlined by Hamlin and colleagues (2009) in a case study on a Māori individual's wish to have an amputated limb returned to him and his family for burial, rather than sent for destruction as is the usual practice.

This requirement is not unique to Māori people, so nurses and other healthcare members in the perioperative environment need to be mindful of the policy and procedure for similar cases and be aware that there is usually a system in place for meeting most of the traditional beliefs of many cultures. 'It is important that nurses display cultural competency in their professional practice' (Kralik & van Loon 2011). This competency can be evidenced by a sensitivity to varied beliefs and values in all areas of healthcare and a willingness to accommodate these wherever possible.

Another example is the requirement for modesty in Muslim women. There are various degrees of dress requirements while in the presence of males other than family members, with some women adopting robes that cover all but the eyes, others allowing only the face to be visible, while most keep limbs covered. 'The requirement for modesty can affect healthcare as some patients may be reluctant to expose their bodies for examination or to expose areas not directly affected' (Queensland Health and Islamic Council of Queensland 2010).

With knowledge of the likely traditional or religious beliefs affecting some individuals, and some forethought, most of these beliefs can be accommodated in the perioperative environment. The responsibility for arranging any accommodations lies with all the stakeholders, from the individual to the ward staff and those working in the operating room. Case Study 43.1 provides an example of how traditional or religious beliefs should be accommodated.

### CASE STUDY 43.1 CULTURAL CASE STUDY

A Muslim woman was admitted to the holding bay of a public hospital prior to undergoing an elective gastroscopy/colonoscopy for diagnostic purposes. She arrived wearing a head covering over her hospital issue gown and a long-sleeved gown over that.

The ward staff indicated that she was unwilling to expose her hair or her limbs in public.

The perioperative nurse was happy for the individual to wear her scarf as long as she wore a paper cap over the top to which the individual was agreeable.

The (female) anaesthetist was able to reassure the individual that she would insert an IV access for the sedation into the back of her hand and therefore not expose her arms. The individual agreed that, should an emergency occur, she consented to exposure of other areas, like her chest, to allow resuscitation.

Problems occurred when the individual realised that she would have to expose her genital area to both the male scout nurse and the male gastroenterologist for the purposes of the colonoscopy. She stated that she expected that female staff only would be present in the theatre.

A female scout nurse was available from another theatre; however, the male gastroenterologist was the only one present on the day. The individual refused the procedure and was discharged to return another time when staffing could be arranged to suit.

1. Could this situation have been avoided? How?
2. Was the situation handled appropriately? If not, explain why not.
3. Identify some interventions that could be made to improve cultural understanding in the perioperative environment and better prepare patients and staff for the perioperative experience.

## Physical preparation

Ideal surgical conditions include an individual who is haemodynamically stable, with no current clinical infection, and with well-controlled pre-existing medical conditions. Depending on the individual's condition and the type of operation to be performed, specific measures may be implemented to minimise or eliminate any identified risks. For example, an individual with breathing problems may be required to undergo active therapy such as incentive spirometry (inhalation into a specially designed spirometer, to achieve maximum inspiratory capacity and reduce risk of pulmonary consolidation) or elimination of pulmonary secretions by postural drainage (the use of positioning to drain secretions from specific segments of the lungs). An individual with dehydration or poor nutritional status may be admitted for some time before surgery so that fluid and nutritional deficiencies may be corrected. A specific diet may be prescribed, such as low fibre before bowel surgery. A person with potential for infection may be administered prophylactic antibiotics prior to the operation. Other preoperative measures may include comprehensive preparation of the gastrointestinal tract and preparation of the skin (see Table 43.7).

Physical preparation may also include cessation or modification of certain medication administration; for example, aspirin and other anticoagulant drugs. Cessation of smoking should also be encouraged.

**TABLE 43.7 | Physical preparation for surgery**

| Preparation type | Method and rationale |
|---|---|
| Gastrointestinal | Fasting: to empty the stomach and prevent aspiration of stomach contents during anaesthesia. Individuals undergoing procedures under local anaesthetic may still be requested to fast in case a general anaesthetic needs to be used. Long-term fasting (over more than 6 hours) will ensure a clear operative view of the internal bowel for open and endoscopic procedures. Fasting status of individual ensured by nurse |
| | Bowel cleansing: orally taken preparations (Picolax, Fleet) will ensure the bowel is clear for gastrointestinal and some gynaecological procedures. Reduces contamination in open bowel procedures and allows clear view for colonoscopy and sigmoidoscopy. Bowel preparation undertaken by individuals at home prior to admission unless an inpatient where the nurse will ensure application of preparation |
| | Enema: may be required for individuals suffering from depressed gastrointestinal activity to prevent postoperative constipation |
| Skin | Shower: individuals will be requested to shower before surgery; the nurse will ensure this for inpatient as part of the surgical preparation. Some surgeons require that the shower be performed using antibacterial preparations |
| | Removal of hair: clipping, razoring or shaving of hair near the operative site is done as near as possible to the time of surgery, usually in the operating room, to prevent bacterial colonisation due to possible skin scratches. Some authorities state that, unless hair is thick enough to interfere with the surgery, it is preferable to leave it intact. Hair removal is performed by the surgeon, the technician or the nurse |
| | Antiseptic prep: when individual is anaesthetised, and prior to draping, the operative site and beyond is painted with an antiseptic skin preparation of the surgeon's choice. Skin preps may have an aqueous or alcoholic base and are applied by the scrub nurse or the surgeon using sterile gauze pads |
| Medication | Individual's own: the surgeon or anaesthetist may have temporarily discontinued some or all medications, or adjusted dosages. Otherwise, medications should be given as normal with a minimal amount of water |
| | Preoperative: some medications may be ordered for some individuals. These may be to reduce anxiety (rarely prescribed), reduce secretions (salivary, gastric, bronchial), open airways (pre-anaesthetic for COPD individuals) or to provide local constriction of vessels for haemostasis (ENT cases). The nurse needs to be alert to any medications, such as sedation, that should not be given prior to giving instruction to individual, or gaining consent |

*(Rothrock 2015)*

## Preparation of the individual immediately prior to surgery

Although preparation during the 1–2 hours preceding an operation may vary slightly depending on the individual and type of operation, preparation generally involves various standard procedures. These include:

- Measuring and documenting height and weight. Knowledge of the individual's weight (mass) enables drug dosages based on body weight to be calculated accurately. It is also useful for comparison as progress is monitored postoperatively, especially in relation to assessment of fluid balance status
- Measuring and documenting vital signs. Any deviation from previous results must be reported immediately and documented, as abnormalities may result in postponement of the operation. These preoperative measurements serve as a baseline for comparison as the individual's progress is monitored postoperatively
- Urinalysis, which is generally performed and documented. Any abnormalities must be reported immediately. As the kidneys excrete most drugs from the body, any sign of kidney dysfunction is significant
- Ensuring that the individual is not wearing any nail polish, lipstick, talcum powder or other cosmetics that could interfere with assessment of skin colour (pallor and cyanosis) or circulatory and oxygen saturation status
- Ensuring that jewellery, hairpins, prosthetic devices, spectacles, contact lenses or hearing aids are removed

and stored safely. Spectacles and hearing aids are usually worn to the operating room then removed and kept for the individual in recovery. Each healthcare agency has its own policy regarding the wearing of wedding rings and earrings; for example, these may be left on and secured in position with adhesive tape. This is to prevent loss of the jewellery or damage to the individual if jewellery is caught or dislodged in the course of the surgery

- Whether any dentures or plates are left in the individual's mouth depends largely on the anaesthetist's instructions. Usually dentures are left in situ, but partial plates or bridges are removed before surgery, as they may be dislodged during endotracheal intubation. It is important to check the presence of any loose teeth for the same reason.
- Attending to general hygiene and comfort needs by ensuring that appropriate clothing is worn and assisting the individual to dress if necessary. Generally a plain cotton open-back gown with tie-tapes is worn. A disposable paper cap is also worn to cover the individual's hair, and some facilities also provide disposable paper undergarments worn under the gown.
- Checking that the individual's identification bands (usually two) are correct and in situ. In some agencies a red identification band is worn if the individual has any known allergies. It is also important to check all documents that will accompany the individual to the operating room.

### Documentation

Each healthcare facility has its own preoperative forms and checklist. Usually, these checklists will require checking by the ward nurse, the operating room receiving nurse (holding bay or anaesthetic nurse) and the PACU (recovery room) nurse.

Included for checking on these lists are the other documents that are necessary to remain with the individual such as consent form, x-rays, medication charts, postoperative orders and others. See Clinical Interest Box 43.2 for an example of such a checklist and Clinical Interest Box 43.3 for information about paediatric individuals in the preoperative environment.

## INTRAOPERATIVE PHASE

Perioperative nurses undertake a variety of roles within the operating suite. These include circulating (scout) nurse, instrument (scrub) nurse, anaesthetic nurse and recovery room (PACU) nurse (see Table 43.1). The circulating nurse is responsible for the documentation and management of all accountable items opened onto the sterile field. The scout supports the instrument nurse by being aware of the requirements of the surgical team and makes certain all supplies are deposited on to the surgical field aseptically. The circulating nurse performs the surgical count with the instrument nurse, and undertakes other responsibilities including individual positioning, individual safety issues, specimen collection, provision of equipment and being the communication link between theatre staff and those outside. The role of circulating or instrument nurse may be undertaken by an EN or RN. The instrument nurse is the one who assumes primary responsibility and accountability for all items used during the surgical procedure. The instrument nurse sets up all sterile instruments and supplies, and hands instruments to the operating team anticipating their needs. Nursing practices and interventions in the **intraoperative** phase also include establishing personal contact and supporting the individual emotionally in the highly technical environment of the operating room. Protocols relating to the promotion of individual safety are another area of paramount importance, as during surgery, and particularly under anaesthesia, individuals are unable to protect themselves from many sources of possible harm.

All personnel who enter the theatre complex wear clean scrub outfits, hair covers and shoe covers, with additional sterile gowns, gloves, masks and eye protection during procedures. Strict surgical asepsis is mandatory throughout the surgical area, and all persons in the operating room must be alert to possible contamination of sterile items. Staff must consider their responsibilities in relation to the spread of infection and restrict or modify working if they have an upper respiratory or skin infection (ACORN 2014). (See Chapter 22 for further information on the control and prevention of infection, surgical scrub and surgical asepsis.)

Anaesthetic and PACU nurses are often referred to as perianaesthesia nurses. The anaesthetic nurse provides primary support to the anaesthetist and the individual immediately prior to the surgical procedure by carrying out individual assessment and preparation, assists the anaesthetist during intubation and the administration of the anaesthetic, helps during the operation and assists with waking the individual from the anaesthetic. The anaesthetic nurse works under the direct supervision of the anaesthetist and is responsible for the preparation of the required equipment, monitoring and pharmacology. Immediately following the procedure the individual is transferred to the PACU where they are cared for by the PACU/recovery room nurse. The PACU nurse is responsible for airway assessment and management, individual observations, identification and prompt correct action in case of surgical or anaesthetic complications. Postoperative pain and nausea management, accurate documentation of care and administration of medication as ordered are also roles of the PACU nurse. All these roles work collaboratively, with the individual roles dependent upon each other to work as a multidisciplinary team that aims to provide evidence-based best practice and optimal individual outcomes (ACORN 2014).

The anaesthetic nurse will notify the DSU or the ward that theatre is ready for the individual. The individual is brought to a preoperative holding bay or anaesthetic room where it is identified that they are the correct individual, any allergies are highlighted, fasting status is determined and the consent form is checked. The anaesthetist will insert an intravenous (IV) cannula and may give the individual some

## CLINICAL INTEREST BOX 43.2 Sample preoperative checklist

UR number _____

Family name _____

First name _____

DOB _____

Address _____

_____

_____

Phone _____

NOK/contact _____

Phone _____

YES NO

ALLERGIES

If yes, please affix RED sticker here _____

DETAILS: _____

_____

_____

_____

| Items to be checked, please tick ✓<br>*Do not leave blank spaces* | Ward | Holding bay | PACU |
|---|---|---|---|
| Fasted Yes _____ No _____ | | | |
| From _____ | | | |
| Consent completed and signed | | | |
| Jewellery Removed _____ Taped _____<br>Other _____ | | | |
| Correct ID tags × 2 | | | |
| | | | |
| Dentures Yes _____ No _____ | | | |
| In | | | |
| Out | | | |
| With individual | | | |
| Other _____ | | | |
| X-rays | | | |
| Site marked (if applicable) | | | |
| Spectacles Yes_____ No_____ | | | |
| With individual | | | |
| Other _____ | | | |
| Hearing aid/s Yes_____ No_____ | | | |
| With individual | | | |
| Other _____ | | | |
| Other prosthesis _____ | | | |
| Individual history | | | |

*Continued*

## CLINICAL INTEREST BOX 43.2 Sample preoperative checklist—cont'd

| | | | |
|---|---|---|---|
| Anaesthetic chart | | | |
| Intraoperative/count sheet | | | |
| Operation report | | | |
| Postoperative orders | | | |
| Fluid chart/orders | | | |
| PACU notes | | | |
| Signature of nurse | | | |

## CLINICAL INTEREST BOX 43.3 Preoperative preparation of a child

- Young children are usually placed first, where appropriate, on the surgical list for the day, to prevent extended fasting and added anxiety
- Children need to be informed as to what is happening, in lay terms, to the level of the child's understanding
- Children are encouraged to bring a favourite toy with them to theatre to alleviate some anxiety; the toy may be used to explain procedures and/or have a dressing applied to the same site as the child's area for surgery
- Waiting time in the holding bay should be as brief as possible
- One parent or guardian is encouraged to accompany the child into the theatre to provide support until anaesthetised
- Where possible, if a child is traumatised by the prospect of IV insertion, the child may initially receive a gas induction, with IV insertion done when unconscious
- To alleviate distress it is helpful to have a parent or guardian waiting to be called to PACU to be present when the child wakes
- Young children and babies can usually have food or drink as soon as they are awake after a minor procedure. A distressed baby will usually settle well with a bottle upon awakening
- Children should be recovered in PACU in an area precluding a view of other, adult individuals who may have had major surgeries

medication to relax them; they are then transferred into the operating room and onto the operating table. ECG, blood pressure and oxygen saturation monitoring is applied, the individual is positioned, padding to prevent injury to nerves and to minimise pressure over bony prominences is strategically placed and safety straps secured to maintain the individual's position. Draping and preparation for surgery commences, ensuring the correct operation site is prepared.

It is important that the individual is correctly positioned according to the procedure being performed. Surgical positioning is an activity commonly performed by the technician, anaesthetic nurse, circulating nurse and, often, the surgeon and anaesthetist to ensure that the position is appropriate for the procedure and safe for the individual. Common positions used for surgery with potential risks outlined are illustrated in Table 43.8.

## Induction of anaesthesia

In most cases, an operative procedure requires some degree and type of **anaesthesia**, but not all procedures require a full general anaesthetic. There are different means by which anaesthesia can be achieved. Factors influencing the choice of anaesthetic include the nature of the surgery (length and complexity of operation), the individual's status (pre-existing medical conditions), anatomical and physiological conditions and, to some degree, individual preference. Anaesthetics can be classified as general anaesthetics, regional anaesthetics and local anaesthetics.

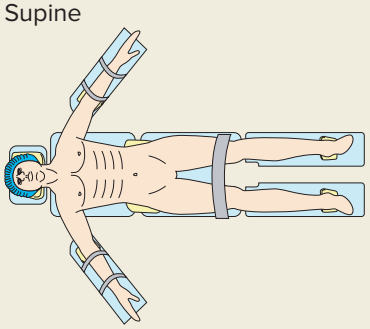
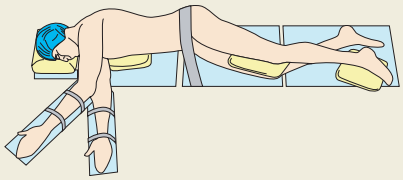
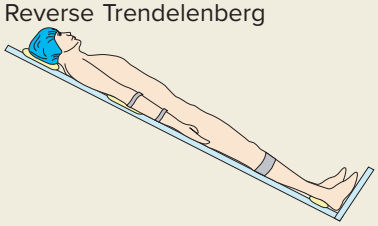
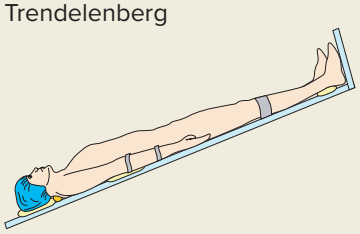
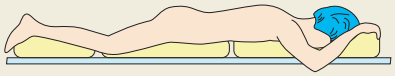
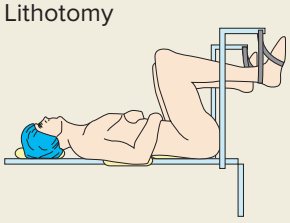
### General anaesthetic

General anaesthesia promotes unconsciousness, absence of sensation, loss of reflexes and muscle relaxation. Administration is primarily by IV injection, inhalation or a combination of both. The four components of general anaesthesia are amnesia, analgesia, muscle relaxation and unconsciousness. Ventilation during general anaesthetic is separated into spontaneous or controlled. Individuals whose ventilation is controlled have usually been administered muscle relaxants.

The three phases of general anaesthetic are induction, maintenance and emergence:

1. Induction—begins when the anaesthetic agents are administered and ends when the individual is ready for positioning, prepping or incision. Intubation occurs during this phase
2. Maintenance—continues from the end point of induction until the procedure is nearly complete. This

## TABLE 43.8 | Common positions for surgery

| Position | Possible surgical procedures/rationale | Pressure risks and other health and safety concerns |
|---|---|---|
| Supine  | Open and laparoscopic, abdominal, renal and pelvic surgery<br>Upper and lower limb surgery<br>Thoracic surgery<br>Allows clear, safe access for surgeon and anaesthetist | Back of head, elbows, sacrum, heels need gel pads to prevent pressure injury<br>Risk of overextension of arms at axilla with potential for nerve damage |
| Lateral  | Thoracic surgery<br>Lower limb surgery<br>Spinal surgery<br>Dorsal and buttock surgery<br>Allows clear, safe access for seated surgeon | Elbows, hip, knees and ankles. Gel pads required, with pillow/gel pad placed between knees. Padded back support and padded straps required to keep in position.<br>Risk of movement/fall if not secured properly, risk of injury from metal supports if not padded/covered |
| Reverse Trendelenberg  | ENT and head and neck surgery<br>Breast surgery<br>Allows clear, safe access for surgeon and anaesthetist<br>Head up tilt provides best view for surgeon, arms may be taped to the sides for better access | Back of head, elbows, sacrum, heels need gel pads to prevent pressure injury<br>Foot support or raised legs to prevent slide<br>Risk of overextension of arms at axilla with potential for nerve damage<br>Anaesthetic (BP) implications with head raised for long periods |
| Trendelenberg  | Open and laparoscopic lower abdominal and pelvic surgery<br>Allows clear, safe access for surgeon and anaesthetist<br>Uses gravity to help clear the area of upper abdominal organs and structures | Back of head, elbows, sacrum, heels need gel pads to prevent pressure injury<br>Shoulder support to prevent slide<br>Risk of overextension of arms at axilla with potential for nerve damage<br>Anaesthetic (BP) implications with lowered head and compressed diaphragm |
| Prone  | Spinal surgery<br>Dorsal and buttock surgery<br>Lower limb surgery<br>Allows clear access for surgeon | Head/face, elbows, hips, knees, feet need gel pads as in diagram to cushion and allow for expansion of chest<br>Implications for anaesthetist with access to airway<br>Care to be taken to ensure ventral body parts are correctly placed |
| Lithotomy  | Vaginal surgery/procedures<br>Urinary/renal surgery/ procedures<br>Perineal surgery<br>Anal/rectal surgery/procedures<br>Allows clear safe access for seated surgeon | Back of head, elbows and sacrum<br>Require gel pads, lithotomy stirrups<br>Padded at knee and foot<br>Risk of overextension of arms at axilla with potential for nerve damage<br>Risk of overextending legs at the hip, causing nerve damage |

*(Bouyer-Ferullo 2013)*

phase is sustained with titrated doses or continuous infusion of IV drugs, or inhalation of anaesthetic gas
3. Emergence—begins when the individual starts to emerge from anaesthesia and ceases when the individual is ready to be transferred from the operating room to PACU. Extubation is usually carried out during emergence.

### Regional anaesthetic

Regional anaesthesia is a form of local anaesthesia; it results in loss of sensation to an area by blocking the conduction of nerve impulses to and from specific sites in the body. The anaesthetist injects an anaesthetic agent around nerves, thereby anaesthetising the area those nerves supply. The effect is dependent on the type of nerve concerned. Sensory (pain) nerves are more readily blocked than motor nerves, so some movement may remain. With these methods of anaesthesia the individual is often awake during the procedure, but the area targeted for surgery is without sensation.

With regional anaesthesia there is no loss of consciousness; therefore, considerations should be made for the fact that the individual can still feel pressure and hear sound. The nurse must be sensitive that the environment is quiet and therapeutic, with no unnecessary conversation about the individual, their diagnosis or the procedure being performed. Dependent on the operation being performed the anaesthetist may administer mild sedation to relieve anxiety or dull the individual's awareness of their surroundings. Regional anaesthesia is administered by infiltration and local application, including:

- Spinal (intrathecal) anaesthesia: an injection of local anaesthetic into the cerebrospinal fluid (CSF) within the subarachnoid space at the lumbar level. The extent of anaesthesia can be from the xiphoid process down to the feet. Spinal anaesthesia is frequently used for surgical obstetrics, lower extremity, lower pelvic and lower abdominal procedures
- Epidural anaesthesia: local anaesthetic is injected into the epidural space, via an inserted catheter allowing a continuous infusion or intermittent boluses to be delivered. Epidural anaesthesia is frequently used in obstetric procedures and for postoperative pain relief
- Caudal block anaesthesia: injection of a local anaesthetic into the caudal (sacral) portion of the spinal canal
- Peripheral nerve block anaesthesia: injection of a local anaesthetic into a specific site, such as the brachial plexus, to block a group of sensory nerve fibres.

### Local infiltration

Local infiltration anaesthesia is the injection of an anaesthetic solution into the tissues at the incision site. Loss of sensation occurs at a targeted site; for example, a skin lesion or a wound requiring sutures. Local anaesthesia is commonly used for minor procedures in DSUs or consultants' surgeries. Surgeons may infiltrate local anaesthetic to an operative area to enhance postoperative pain relief.

Anaesthetic agents may also be applied topically, as a cream, spray or drops applied to the skin or mucous membranes. Common local anaesthetic agents for infiltration, injection or for topical use include lignocaine, bupivacaine and procaine (Crisp et al 2013).

## Safe surgery

### Universal protocol

To ensure that individuals receive the correct operation on the correct site at all times, checkpoints and checklists are in place. The World Health Organization has adopted a three-step process called the Universal Protocol to be used to prevent error (WHO 2009) (see Clinical Interest Box 43.4).

### Count protocol

The counting of surgical instruments and other accountable items is a practice that has changed vastly in fairly recent times. While some agencies may have variations on a theme, it is desirable that they follow the guidelines set out in the ACORN Standards. *Standard S3: Counting of Accountable Items Used during Surgery* (2014) sets out step-by-step procedures related to counting items and dealing with incorrect count situations. Included in this standard are recommendations that those who document the addition of an item, or insertion of an item, are also responsible for ensuring the removal, or out-counting of said item. It also recommends that, in the event of an incorrect count, the individual remain in theatre, under anaesthesia if possible, until the count is correct. This may need to be determined with the use of x-ray to either confirm or totally disprove the presence of an accountable item left in the individual. This standard, along with agency-led protocols, is designed to prevent scenarios such as those set out in Critical Thinking Exercises 43.2 and 43.3.

# POSTOPERATIVE CARE

After completion of the operation the individual is transferred to PACU, which is located within the operating theatre complex. The individual is accompanied by the anaesthetist who will hand over to the PACU nurse the individual's general condition, the operation performed, the type of anaesthesia used for the procedure and any complications encountered during the surgery and anaesthesia. Immediate assessment of the individual's airway, heart rate, respirations, temperature and oxygen saturations are performed and recorded and blood loss is noted. Once these initial observations have been made it is essential to systematically assess the individual, either head to toe or by systems: central nervous system (CNS), cardiovascular system (CVS), respiratory system (Resp), gastrointestinal tract (GIT), urinary function, wounds, drain tubes, fluid management, skin integrity and pallor. The individual is not transferred back to the ward until fully awake, conscious and alert, motor and sensory functions have begun to return, vital signs are stable, pain is controlled and there are no immediate complications from the anaesthetic or surgery. A verbal handover is given by

## CLINICAL INTEREST BOX 43.4 Safe surgery

| | |
|---|---|
| **Step 1** | **Verification**<br>Consists of verifying the correct individual, site and procedure at every stage from the time a decision is made to operate to the time the individual undergoes the operation |
| **Step 2** | **Marking**<br>The Universal Protocol states that the site or sites to be operated on must be marked. This is particularly important in case of laterality, multiple structures (e.g. fingers, toes, ribs) and multiple levels (e.g. vertebral column) |
| **Step 3** | **Time out**<br>The 'time out or 'surgical pause' is a brief pause before the incision to confirm the individual, the procedure and the site of operation. It is also an opportunity to ensure that the individual is correctly positioned and that any necessary implants or special equipment are available.<br>The Joint Commission stipulates that all team members be actively involved in this process. Any concerns or inconsistencies must be clarified at this stage. The checks during the time out must be documented, potentially in the form of a checklist, but the Universal Protocol leaves the design and delivery to individual organisations |

recovery room staff to day surgery or ward staff receiving the individual, including any allergies, anaesthetic, analgesic and antiemetic drugs administered, details of the procedure, postoperative orders, as well as any other information relating to the individual's condition.

## Preparation of the individual's day surgery or ward environment

While an individual is in the operating suite, the day surgery or ward nurse prepares the individual's bed area ready for their return. As discussed earlier, in many agencies it is common practice for individuals to be transferred to theatre on their beds. The remaining linen, including the top bedclothes, are folded into a pack and stored in the bed area, which enables them to be unfolded over the individual quickly and with minimal disruption on return to the ward. Generally, one pillow is placed at the head of the bed, and the remaining pillows are placed in a convenient location in the room (see Chapter 23 for more information on making an operation or surgical bed). If the individual is a day surgery individual they will return to the DSU on a trolley. The

## CRITICAL THINKING EXERCISE 43.2

An individual who underwent a septoplasty procedure had a throat pack inserted by the anaesthetist which was documented on the intraoperative count record by the nursing staff. The anaesthetist did not record that the throat pack was inserted. The pack was not documented as being removed at the final count. Neither the instrument nurse nor the circulating nurse checked to confirm removal.

When the individual arrived in the postanaesthetic recovery unit the anaesthetist was questioned by the circulating nurse as to whether he had remembered to remove the throat pack—he had not. The individual was checked immediately. The individual was questioned by the anaesthetist as to whether they felt any discomfort in the throat and replied that no discomfort was felt. When a visual check was done there were no signs indicating the presence of the pack. The individual had no respiratory distress at this time and was quite comfortable. The situation was explained fully to the individual and their family. The individual had their throat x-rayed but no pack was observed, so an upper abdominal x-ray was ordered and it revealed the pack in the individual's stomach. The pack was removed via gastroscopy (Department of Human Services 2008a). What procedure was not followed to allow this event to occur? Whose responsibility was it to ensure removal of the pack was documented? Whose responsibility was it to check the documentation before the individual was sent to PACU?

## CRITICAL THINKING EXERCISE 43.3

An individual underwent a laparotomy for ulcerative colitis surgery. During the skin closure it was identified by the instrument nurse that an artery forcep was missing. The nurse told the circulating nurse and other members of the surgical team. A thorough search of the operating room environment failed to find the instrument. Subsequently an x-ray was taken in the postanaesthetic recovery unit where the artery forcep was revealed in the abdominal cavity. The individual was returned to the operating room where the artery forcep was retrieved (Department of Human Services 2008b). What procedure was not followed in this scenario? Whose responsibility was it to ensure that the forcep was accounted for before removal of the individual to PACU? Is it ideal that an individual be returned to theatre after reaching PACU? If not why not?

furniture in the room should be arranged to provide easy access for equipment; for example, the bed may be positioned away from the wall, and the over-bed table and locker should be positioned away from the bedside. The equipment required in the room will depend on the type of operation that was performed, but generally includes:

- Oxygen and suction apparatus
- IV therapy pole

### CASE STUDY 43.2 ELECTIVE HYSTERECTOMY

Mrs Jones, 45, is an elective category 3 individual who is to undergo an open hysterectomy. The surgery has been recommended as she has suffered with increasing blood loss and a lowering of Hb over the past 2 years, due to fibroids in the uterus.

She will return to the ward with an IDC in situ and a PCA (patient-controlled analgesia) unit.

1. What is the longest time Mrs Jones should have waited for her surgery?
2. What effect could an extended wait have on her health status?
3. Describe some fears or anxiety Mrs Jones may have in regard to her surgery.
4. Identify a psychological issue Mrs Jones could face in regard to body image, self-esteem.
5. What are likely to be the problems and potential problems for Mrs Jones immediately on return to the ward?
6. What nursing interventions could be implemented to prevent or reduce these problems?

- Postoperative assessment forms (e.g. a chart for frequent observations)
- Equipment for assessing the individual's vital signs
- Covered emesis bowl
- Hangers or holders for drainage bags.

Case Study 43.2 explores a scenario of preparation for post-surgical care.

### CRITICAL THINKING EXERCISE 43.4

You are asked to prepare a room for the return of an individual from surgery after an abdominal hysterectomy. The individual will have IV therapy and may have a urinary catheter and a wound drain in situ.

1. What supplies do you need?
2. How would you arrange the room?
3. When the individual returns to the ward, how often will you need to take vital signs?

What else will you assess? How often will you conduct these other assessments?

## Immediate general postoperative care and assessment

When individuals are transferred back to the DSU or the ward, an appropriate position is selected depending on their condition and the type of operation. Initially, this is often a lateral position, to promote a clear airway while the individual is still recovering from the anaesthetic (see Chapter 23). The upper bedclothes are placed over the individual to promote maintenance of body temperature and comfort. If an IV infusion is in progress, the bag of solution is suspended on a pole or stand, and the infusion is assessed to determine whether it is flowing at the prescribed rate. The individual's arm, in which the IV cannula is inserted, is positioned so that there is no obstruction to the tubing. Any drainage bags, such as urinary or wound-drainage bags, are placed in a holder or hanger and positioned to facilitate drainage by gravity.

Early postoperative assessment of the individual involves monitoring and reporting (see Chapter 19):

- Level of consciousness—although some drowsiness and disorientation is normal after a general anaesthetic, it should be possible to rouse the individual by verbal stimuli or touch. Orientation to person, place and time gradually return. Inability to rouse the individual should be reported immediately. After local or regional anaesthesia it is important to monitor for the return of normal sensation and movement to the anaesthetised area. Generalised restlessness should also be reported as it may be due to a change in the level of consciousness or may be associated with pain, discomfort, respiratory difficulties or haemorrhage. It is important during the early postoperative phase that details of the individual's condition and diagnosis should not be inappropriately discussed as the individual may be able to hear, even if not fully awake
- Colour—report any significant changes to the individual skin colour (extremely pale or cyanosed)
- Vital signs—any deviation from previous readings of temperature, pulse, respirations, oxygen saturation or blood pressure is reported immediately. If ordered, oxygen therapy is administered and monitored
- Presence of discomfort or pain—as individuals recover from the effects of anaesthetic, they may begin to feel pain. The level of pain experienced may vary according to the type of anaesthesia used; for example, after a spinal anaesthetic the operative area may still feel relatively numb until several hours after the procedure. The presence of any discomfort or pain must be assessed and reported immediately so that appropriate pain-relieving measures can be implemented
- Wound dressing—in the immediate postoperative period, assessing for haemorrhage is a major responsibility of the nurse. Both the dressing and the bed linen under the individual should be checked for evidence of haemorrhage; an increase in blood staining on the dressing, or a sudden increase of blood in a drainage tube or bag, must be reported immediately. Body cavities that have had a surgical pack inserted (nasal or vaginal packs) also require close observation
- Urinary catheters—if the individual has an indwelling catheter, the nurse must monitor the urinary output carefully. Absence of, or decreased amount of, urinary output must be reported; similarly, any unexpected presence of blood in the urine needs to be documented and reported.

See Table 43.9 for a quick reference guide to immediate care. Progress Notes Example 43.1 also shows how an entry in progress notes may be documented.

**TABLE 43.9 | Immediate general postoperative care and assessment**

| | |
|---|---|
| ABC | Level of consciousness |
| | Recovery position or semi-Fowler's unless otherwise ordered |
| | Airway support—check laryngeal mask in situ/Guedel airway |
| | Oxygen applied via LMA or Hudson mask |
| | Note colour, warmth of skin |
| | Document on arrival then at 10-minute intervals |
| Vital signs | Automatic monitoring, BP, HR, $O_2$ sats, ECG |
| | Temperature—require warm air blanket? |
| | Note reportable rates (on anaesthetic chart or postop orders) |
| | Document on arrival then at 10-minute intervals |
| Wound/s | Dressing dry and intact |
| | Change/support dressing as required |
| | Document on arrival then at 10-minute intervals |
| Drains | Wound drainage, amount, consistency |
| | Tubes unkinked, bottle attached to bed |
| | Patency of drain bottles/on suction? |
| | Indwelling urinary catheter—amount and colour |
| | IDC tube unkinked, bag attached to bed |
| | Document on arrival then at 10-minute intervals |
| IV | Gravity feed or pump |
| | Correct fluid/orders |
| | Infusion on correct rate |
| | Document on arrival and when required for change |
| Pain | Start any ordered opioid analgesia infusion when conscious state allows |
| | Pain assessment/scale |
| | Ensure adequate analgesia orders |
| | Position to enhance comfort |
| | Document on arrival and when required for change |

*(Hamlin et al 2009)*

## Subsequent postoperative care

The overall aim of the **postoperative** nursing phase is the return of the individual to an optimal level of functioning and independence. Postoperative care is directed towards assisting the individual to meet specific needs for oxygenation and circulation of blood, comfort, nutrition and fluids, elimination, movement and exercise, hygiene, psychological support, protection and safety. Nursing Care Plan 43.2 identifies the importance of continuously assessing vital signs and the need for early frequent detection of postoperative complications.

## PROGRESS NOTES EXAMPLE 43.1

| | |
|---|---|
| 25/06/15<br>1430 hrs | Nursing: Mr Sheerhan returned to the ward at 1345 post R TKR. IV in situ L hand, IDC in situ, on morphine infusion at 1 mg per hour. Dressing dry and intact. Mr Sheerhan was alert and orientated. Observations within normal limits. Pain score after arrival was 7/10. Phone order for bolus IV morphine gained via Dr Williams, who will review client at 1500 and write up phone order. Bolus administered at 1415 as per medication order. Mr Sheerhan's pain score was 4/10 at time of writing.<br>***M. Smithson*** **(Smithson) EN** |

## NURSING CARE PLAN 43.2

**Scenario:** Mary White, an 85-year-old woman, has returned to the ward post surgery for a Right Total Knee Replacement (TKR). An ex-smoker who occasionally suffers with bronchitis, she is an otherwise fit and well individual.
**Assessment:** Postoperatively
**Issue/s to be addressed:** Respiratory depression related to anaesthesia and subsequent narcotic pain relief
Pain due to surgical wound/incision
Potential for wound infection due to surgical incision
**Goal/s:** Early detection of hypoventilation
Pain to be of a level acceptable to the individual
Prevent infection and promote wound healing

| Care/Actions | Rationale |
|---|---|
| Record respiratory rate (specify) and maintain clear airway | Early detection of respiratory depression, ensures unobstructed airway |
| Position individual in accordance with postoperative orders/needs | Enables optimum chest expansion |
| Perform pain assessment on return to ward and at regular intervals (e.g. each time vital signs are recorded) | Timely detection of potential need for any PRN pain relief |
| Report unrelieved pain to RN and monitor effects of analgesics administered | Identifies any potential need for revision of medication type or dose |
| Assist individual to a more comfortable position | Appropriate positioning enhances general comfort and reduces pain |
| Dressing to remain intact until (specify date) | Reduces the potential for contamination in the early healing stages |
| Redressing to be performed as ordered using aseptic technique | |
| Observe wound for signs of infection. Report indications of infection promptly | Early detection of signs of infection allows for prompt medical intervention |
| Monitor temperature 4/24 and report elevation promptly | Increased temperature can indicate an infection |

**Evaluation**

Every 30 minutes for 4 hours then as general observations and as required.
With observations and as required.
At first dressing change and at dressing changes thereafter, with general observations.

### Assessing respiratory and circulatory needs

In the initial postoperative period, the frequency with which the individual's vital signs are monitored depends on their condition. Generally, vital signs are assessed and documented every 30 minutes for the first 4 hours, then 1 hourly for 4 hours, then every 2–4 hours if the condition is satisfactory. If the individual's condition is unstable, observations may be monitored more frequently for a longer period of time. (See Chapter 20 for the early warning signs indicating a deteriorating individual.) Assessment is also made of colour and breathing to observe for the signs of any respiratory tract complications. Mucus secretions can accumulate, leading to pneumonia, bronchitis or atelectasis. Throughout the postoperative recovery, the individual is also at risk of thrombophlebitis and pulmonary embolus. During this period deep breathing, coughing and, if possible, leg exercises and early ambulation are encouraged to decrease the possibility of the above complications occurring. See Clinical Skill 43.1 on pre- and postoperative exercises.

### Comfort needs

Individual comfort can be promoted by ensuring that a suitable position is assumed. Unless contraindicated, the individual is encouraged and assisted to assume a semi-upright position. This position promotes adequate lung expansion, and assists urinary or wound drainage by gravity. Pillows are

## CLINICAL SKILL 43.1 Pre- and postoperative exercises

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Pillow/rolled towel<br>Tissues<br>Rubbish bin |

| **Skill activity** | **Rationale** |
|---|---|
| Provide health education pre- and postoperatively to individuals regarding early mobilisation, repositioning, lung expansion exercises, secretion clearance techniques and limb exercises by effective communication skills and demonstration. | |
| **Deep breathing (D/B)** | Improves pulmonary function<br>Prevents pneumonia, atelectasis and other post-operative complications<br>Uses the diaphragm and abdominal muscles to fully ventilate the lungs<br>Normal breathing pattern can change and become shallower after chest or abdominal surgery, after general anaesthesia or when an individual is inactive |
| Assess normal breathing pattern | Note depth, rate, volume for baseline data |
| Assess individual's risk of postoperative complications by reviewing individual's history, past medical history, history of respiratory diseases, vascular disease, previous thrombosis, medications, history of occupation and smoking and any complications previously from anaesthetic | General anaesthetic (GA) predisposes individuals to respiratory problems due to lungs not being inflated fully; cough reflex is suppressed during surgery, thus secretions collect within airway passage. Post-surgery a decrease in lung volume requires a greater effort to cough. Inadequate lung expansion has potential for common complications such as pneumonia/atelectasis.<br>If individual has known history of respiratory disease it is more likely that complications may occur<br>Smoking damages cilia and increases mucus secretions<br>GA and immobilisation result in decreased contraction in lower extremities which promotes venous status |
| Assess individual's ability to cough/huff/D/B, observing movement of shoulders and chest wall or use of accessory muscles | Reveals maximum potential for chest expansion and ability to cough/huff/D/B<br>Serves as baseline data to perform activity |
| Explain the importance to recovery and physiological benefits of postoperative exercises to individual/significant others | Information allows individual to understand why they are important and allows individual to 'take charge' of information |
| Demonstrate to individual/significant others and instruct individual how to attend to exercises | |
| **Deep breathing (diaphragmatic breathing)**<br>Assist/instruct individual into comfortable semi-Fowler's to Fowler's sitting position or to stand | Upright position facilitates diaphragmatic excursion |
| Stand or sit facing the individual, close enough so individual can hear and see you | Allows individual to observe breathing exercises |

*Continued*

| CLINICAL SKILL 43.1 Pre- and postoperative exercises—cont'd | |
|---|---|
| Instruct individual to place palms of hands across from each other, down and along lower borders of rib cage, place tips of 3rd finger lightly together | Position of hands allows individual to feel chest and abdomen move as the diaphragm descends |
| Demonstrate to individual and watch individual do same | Ascertain individual is giving you their full attention<br>Allows individual to observe breathing exercises |
| Instruct individual to take a slow deep breath inhaling through the nose, instructing individual to feel middle fingers separate during inhalation | Slow deep breath prevents hyperventilation<br>Inhaling through nose warms and humidifies air |
| Demonstrate and watch individual attend to this step | Allows individual to observe breathing exercises |
| Explain to individual they should feel normal downward motion of diaphragm during inspiration<br>Explain that abdominal organs descend and chest wall expands | Explanation and demonstration focus on normal ventilatory movement of chest wall. Individual has understanding of how diaphragmatic breathing occurs and feels |
| Watch the individual is not using chest and shoulder muscles | Using ancillary shoulder muscle and chest muscles increases energy expenditure |
| Instruct individual to hold slow deep breath for 2–3 seconds and slowly exhale through the mouth | Allows for gradual expulsion of air |
| Explain middle fingertips will touch as chest wall contracts | Individual has understanding of expansion of lungs and how it feels |
| Repeat whole process together | Allows individual to observe slow rhythmic breathing patterns |
| Instruct individual to practise so they can be observed | Repetition of exercises re-enforces learning and correct techniques |
| Instruct individual these exercises will need to be attended to post surgery 10 times 2/24 | Regular deep breathing prevents postoperative complications |
| **Controlled coughing**<br>Maintain upright position<br>Nurse to demonstrate skill<br>Demonstrate/instruct individual on placing pillow/rolled-up towel over wound/invasive devices with the palm of hand with gentle pressure<br>Take 2 slow deep breaths in through the nose, hold for 2–3 seconds and exhale through the mouth on the third breath instead of exhaling cough from bottom of lungs. Ensuring cough is deep and not clearing the throat. Repeat. Inspect expectoration and record | Slow expulsion of air frequently initiates the coughing reflex, which facilitates expectoration of mucus and prevents hyperventilation<br>Clearing throat does not remove mucus from deep in airways<br>Coughing uses abdominal and accessory respiratory muscles<br>Splinting supports the incision and surrounding tissues and reduces pain during coughing |
| **Leg exercises** | |
| **Leg exercises**<br>Observe individuals closely for respiratory difficulty, chest pain and general discomfort<br>Decreased muscle mass, degenerative changes in joints and degenerative tissue changes can result in limited range of motion | Maintains blood circulation<br>Stimulates blood circulation, thereby preventing thrombophlebitis and thrombus formation<br>Exercise offers the potential to improve circulation, wound healing outcomes and functional and emotional wellbeing<br>Physical activity reduces the risk of falls and injuries |
| Expose the individual's legs by untucking the sheets at the foot of the bed and folding the sheets to the middle of the bed | Folding sheets back halfway exposes individual's legs to perform exercises, but maintains privacy |

## CLINICAL SKILL 43.1 Pre- and postoperative exercises—cont'd

| | |
|---|---|
| **Calf pumping**<br>Dorsiflexion and hyperextension of ankles<br>Have the individual:<br>1. Flex ankles and raise toes toward head, stretching posterior calf<br>2. Hold for a count of 2<br>3. Relax<br>4. Repeat 5 times then proceed to other foot<br>Perform every hour | Calf muscle pump improves venous return<br>The calf muscle pump is the primary mechanism to return blood from the lower limbs to the heart. During exercise, the calf muscles (gastrocnemius and soleus) contract and compress the intramuscular and deep veins, raising venous pressure and propelling blood in the deep venous system to flow towards the heart, while the one-way valve function prevents reflux, thereby preventing blood from pooling. When the gastrocnemius and soleus muscles contract, they expel more than 60% of venous blood into the large popliteal vein |
| **Foot circles**<br>Have the individual:<br>1. Point the toe and raise the leg slightly off the bed<br>2. Use the great toe to trace a circle in the air, first to the right and then to the left<br>3. Repeat 5 times and then proceed to the other foot<br>Perform every hour | Moving the ankle joint assists the calf muscles to pump venous blood back up to the heart |
| **Leg lifts**<br>Have the individual:<br>1. Lie on back or in a semi-sitting position, and raise the leg off the bed<br>2. Hold for count of 5<br>3. Lower leg to the bed<br>4. Repeat 5 times then proceed to other leg<br>Perform every hour | Stimulates blood circulation by contracting the hamstring and quadriceps muscles<br>Helps prevent circulatory problems, such as thrombophlebitis, by facilitating venous return to the heart. Also decreases postoperative 'gas pains' |
| **Quad exercise**<br>Have the individual:<br>1. Lie in a comfortable position<br>2. Press knee into the bed, relax, repeat<br>3. Press knee into the bed, lift leg straight, off the bed, hold, gently lower leg, repeat | Stimulates blood circulation by contracting the hamstring and quadriceps muscles<br>Helps prevent circulatory problems, such as thrombophlebitis, by facilitating venous return to the heart. Also decreases postoperative 'gas pains' |
| While the individual is performing the exercises, assess the person for signs of exertion or discomfort | Assessment alerts nurse if exercise activity needs to be stopped |
| At the completion of the exercises, assist the individual to a position of comfort and replace the covers | Repositioning promotes comfort |
| Return the bed to a low position, ensure the wheels are locked | Repositioning bed promotes individual safety and prevents falls |
| Place the call light within reach. | Call light facilitates communication |
| **Repositioning/ turning in bed** | Turning periodically and alternately facilitates better inflation of the uppermost segments of the lungs |
| Instruct an individual who has right-sided incision to turn to the left side of the bed as follows:<br>Flex the knees<br>Splint the wound/invasive devices by holding the left arm and hand or a small pillow or folded towel over the site | Minimises pressure against the incision and reduces pain |
| Instruct individual to assume supine position, place left hand over incision/invasive devices<br>Keep the left leg straight, flex the right knee over the left leg, hold onto the bed rail with right hand and pull as you roll towards left side | Puts less pressure on the side with the pain/incision |

*Continued*

| CLINICAL SKILL 43.1 Pre- and postoperative exercises—cont'd | |
|---|---|
| Special aids such as a trapeze are available on most beds; these should be taught to individual as required | Specific medical procedures may require the use of aids |
| Document the exercises performed, the number of repetitions, reports of pain or discomfort, any observations of physiological intolerance to the activity<br>Record date and time of procedure<br>Include description of secretions and amount expectorated | Informs all healthcare professionals and allows for planning and implementation of care; provides data for instructional follow up |
| *(Ali et al 2012; Brasher et al 2003; Cassidy et al 2013; Clarke et al 1996; Hunt 2006; O'Brien et al 2012; Rebeiro et al 2014; Rice & Johnson 1984; Australian Commission on Safety and Quality In Health Care (ACSQHC) 2012)* | |

arranged to provide adequate support without restricting movement. If the individual is unable to move independently, the nurse must assist the individual to change position every 2 to 4 hours. Regular administration of analgesia and assessment of pain levels, the prevention of nausea, tension on the surgical wound and bladder distension will all help to provide individual comfort. With adequate comfort and pain relief the individual is able to rest and perform postoperative activities and exercises, all of which act to enhance recovery.

## Nutritional and fluid needs

Because of the effects of stress and general anaesthesia on the gastrointestinal tract, in the initial postoperative period the individual may experience nausea and/or vomiting and be unable to tolerate oral fluids or food. Food and fluids are generally withheld until normal gastrointestinal functioning has returned, as made evident by the presence of bowel sounds and the passing of flatus. Until this has occurred, the individual receives fluids and nutrients intravenously. In some instances eating and drinking are contraindicated for an extended period, or the individual may require extensive nutritive therapy to rebuild tissue after the trauma of surgery. In such cases, hyperalimentation using parenteral nutrition may be indicated (Chapter 30). Depending on the procedure and anaesthetic used, some individuals may be able to tolerate sips of fluid within a short time. If sips of fluid are tolerated and there are no contraindications, individuals progress to free fluids, then to a normal diet. Day surgery individuals are encouraged to eat and drink once they are fully awake and can tolerate sips of water.

## Elimination needs

Generally, early ambulation and the intake of adequate fluids stimulates micturition. Some individuals may experience difficulty in passing urine; for example, due to pain or the embarrassment or difficulty of having to use a bedpan or urinal. It is important to observe urinary output on an ongoing basis. If retention of urine or inadequate emptying of the bladder occurs, it may be necessary for the individual to have a urinary catheter inserted. The need for catheter insertion is based on data collected using bladder scanning techniques, and medical orders following consultation. To re-establish normal bowel function the individual is encouraged to ambulate as soon as possible and to consume adequate fluids and dietary fibre, although, as described above, oral fluids and food are initially withheld until normal intestinal peristalsis returns.

## Movement and exercise needs

Postoperative exercises are started soon after the individual's return to the ward. The nurse should encourage deep breathing and coughing and leg exercises to be performed at 2- to 4-hourly intervals. These exercises are best continued until the individual is fully ambulant. Mobility and activity are gradually increased as the person's condition improves. Initially, postural hypotension and dizziness may be experienced when getting out of bed. Allowing the individual to gradually raise their head position, then sit on the edge of the bed and dangle their legs, then after a few minutes assisting them to get out of bed slowly, generally reduces these symptoms (Christensen & Kockrow 2010). The individual should be encouraged to ambulate a little more each day and should be informed of the benefits of ambulation.

Ambulation:

- Facilitates deep breathing and thus prevents respiratory complications
- Stimulates the circulation of blood, thus preventing vascular complications
- Improves muscle tone and strength
- Aids in the elimination of waste from the bladder and bowel
- Reduces the risk of skin breakdown and decubitus ulcer formation
- Improves morale.

See Clinical Skill 43.1 on pre- and postoperative exercises.

## Hygiene needs

Until the individual is able to fully attend to their own personal hygiene needs, the nurse assists. Once the individual has recovered from the major effects of the anaesthetic, the face and hands are washed, hair is brushed and mouth care provided. The individual is assisted to get dressed into their own nightwear, and any soiled or damp bed linen is changed. In the initial postoperative period when the individual is not having any oral fluids, frequent mouth care should be

provided preventing dryness, soreness or cracking of the tongue and lips. When able, the individual is encouraged to resume responsibility for personal hygiene needs. The nurse may be required to assist with a shower or bath and should be available to supervise activities to promote safety.

### Psychological needs

Psychological support is provided by keeping the individual informed, allowing expression of concerns about progress, change of body image and impact of surgery on lifestyle, and by encouraging visits from family and friends. Self-esteem is enhanced with increasing independence and should be encouraged—by allowing resumption of responsibility for own personal care, without endangering safety or recovery, the individual may feel more empowered. Whenever possible, the individual should be given a choice in care and in timing of activities and events. It is important that the individual understands the expected time-scale to full recovery and how any problems will be managed should they arise. All procedures and activities and their rationales should be fully explained. The nurse may need to help the individual and significant others to develop effective coping strategies. Coping methods may include:

- Obtaining additional information to deal with a situation more effectively
- Trying out various ways of solving a problem, to see which one is most helpful
- Talking over a problem with someone who has been in a similar situation
- Engaging in an activity that is relaxing and of interest, such as reading or listening to music.

### Protection and safety needs

In the postoperative period the nurse must implement measures to protect the individual from hazards in the environment. This is essential both initially, when conscious state may still be compromised and the ability to respond is diminished, and later, when changes in function may require individual adjustments when carrying out activities of daily living.

## Wound care

Care of a surgical wound is directed towards promoting healing and preventing infection. Chapter 29 provides in-depth information on general wound healing and management; in this chapter we discuss specific wound management for surgical wounds.

Wounds are described as healing by first, second or third intention:

- First intention healing occurs when wound edges are brought together; for example, a sutured surgical incision. Granulation tissue is not obvious
- Second intention healing occurs when wound edges cannot be brought together; for example, a gaping wound. Granulation tissue fills in the wound until re-epithelialisation takes place and a large scar results
- Third intention healing occurs when wound closure is delayed for a few days so that an infected or contaminated wound can be debrided. Closure of contaminated wounds is usually delayed until all layers of wound tissue appear healthy, usually within 4–10 days.

### Influences on wound healing

Healing is governed not only by the condition of a wound itself, but also by factors intrinsic to the individual, pertaining to the health status of the individual. External factors may also contribute to delayed wound healing, or failure of a suture line. Table 43.10 sets out some internal and external factors that create risk for optimal, timely wound healing.

Wound healing generally takes place within 7–10 days, although the time for normal healing depends on several factors:

- The extent of tissue damage
- The amount of stress and tension placed at the incision
- The extent to which the wound edges have been approximated
- The individual's age and general condition.

**TABLE 43.10 | Influences on wound healing**

| Influencing factor | Intrinsic/internal | Extrinsic/external |
|---|---|---|
| Position of wound | Stoma site draining bowel contents<br>Perianal proximity<br>Incision in area of movement (e.g. joint) | Excessive strain on the incision resulting from inappropriate or over-activity |
| Condition of wound | Infection, pus or dead tissue present will inhibit complete healing | Dressing treatment, hygiene measures |
| Nutritional status | Lack of adequate intake of required nutrients, including vitamins, and adequate hydration will delay or prevent complete healing | |
| Blood circulation | Poor circulation reduces the supply of oxygen and nutrients necessary for healing to the site | Restrictive dressings, plaster casts, positioning of wound site |
| Immune status | Advanced age, autoimmune disorders or drugs, other disorders (e.g. diabetes) | Proximity to other contagious individuals<br>Infection control measures |

*(Crisp et al 2013; Marieb & Hoehn 2012)*

## Promotion of healing

To promote healing, a range of general measures may be implemented. These include:

- Maintenance of adequate nutritional status. Provision of a diet that contains adequate kilojoules, protein, vitamins C and A, iron and zinc
- Promoting adequate oxygenation of the tissues. Deep breathing and coughing exercises and early ambulation to promote full lung expansion will enhance oxygenation of the blood
- Encouraging adequate blood circulation to the area, promoting transport of substances required for healing and combating infection. Adequate blood volume can be maintained by ensuring sufficient fluid intake and a suitable level of exercise and mobility can stimulate circulation
- Restricting movement of the area in the early stages of healing. If strain is placed on a wound, the newly formed granulation tissue may tear. The surgical wound area should be stabilised, rested and supported.

## Wound management

(See Chapter 29.) Surgical wounds are covered with specific dressings when the individual returns to the ward. These dressings are usually left intact until the individual is reviewed by the surgeon. If leakage appears on the original dressing it is important to reinforce the dressing and report and document the leakage immediately. If wound drainage is present and copious and potential exists for skin excoriation, a drainage bag or pouch may be placed over the wound to protect the skin. Before application of the pouch, an adhesive skin barrier such as a pectin wafer is placed on the surrounding skin. The pouch is placed over the draining area and secured to the barrier using gentle digital pressure. The principles of application and care relevant to a wound drainage pouch are similar to those that apply to stomal appliances. Several factors must be considered in the selection of surgical dressings, such as the individual's skin condition, allergies, the type and site of the wound, the amount of wound exudate and the availability of various dressings.

## Dressing changes

In relation to a closed surgical wound, when and how often dressings are changed depends on the surgeon's orders, the healthcare facility's protocol and on the type of dressing used. The ideal surgical wound has edges that are well approximated and secured, and tissue layers that have also been appropriately sutured. Often an adhesive film dressing with a central non-adherent pad (Airstrip, Cutifilm) will be used to cover a sutured incision. The individual's apprehension may be high at the time of initial dressing removal, and may be related to the size and appearance of the wound and issues concerning scarring. The nurse needs to provide appropriate support at this time. Once the original dressing has been removed and the wound inspected, it may be ordered that the wound remains uncovered, or perhaps that wound edges be given simple reinforcement and support with hypoallergenic strips of paper tape (Steristrips). If a dressing is to be changed, sterile equipment and aseptic techniques are used to prevent cross-infection, even though the wound has been surgically closed (see Chapter 29).

## Drainage tubes

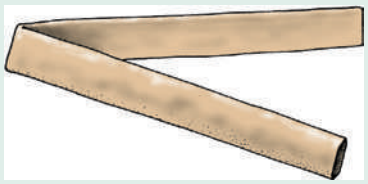
At the time of the operation, the surgeon may place a drainage tube through a separate 'stab' incision near the principal wound. A drainage tube acts to promote healing by providing an exit for blood, serum and debris that may otherwise accumulate and result in postoperative swelling, pain or infection and abscess formation. The type of drainage tube inserted depends on the site and extent of the wound. A drainage system may be covered with an adhesive collection bag (i.e. non-suction drain), may be connected to intermittent suction or may be a self-contained disposable drainage system that supplies its own vacuum suction.

When a non-suction drainage tube (e.g. Penrose or Yates drain) is inserted, a sterile safety pin is usually passed through the tubing just above skin level to prevent the drainage from slipping back into the incision. A gauze dressing is placed between the pin and the skin. Alternatively, the drainage tube may be secured in position by one or two sutures. An absorbent dressing may be placed over the drainage tube to collect exudate, or a pouch or bag may be applied to the surrounding skin for drainage collection.

A closed-wound drainage system consists of tubing sutured at the skin edge and connected to a vacuum suction unit (e.g. Survac, Redivac, Provac, Exudrain). The unit is always positioned below wound level to promote drainage by gravity. There should be no kinks in the system or excessive tension on the tubing. Using standard infection-control precautions, the container is emptied as necessary. The vacuum in the container needs to be re-established each time the container is emptied, following the manufacturer's instructions. An absorbent dressing may be used to protect the drain exit site. While the system is in situ, it is important to observe both the system and the individual. Although it is important to observe the amount and nature of the drainage, it is also important to observe the individual's pain levels in relation to the drainage tube and the skin condition surrounding the tube, and to monitor the individual's temperature for early signs of infection. (See Clinical Interest Box 43.5.)

It is the nurse's role to observe and note the location of any drainage tubes, the character of drainage and, if there is a collection device, to measure and document the volume of the drainage. Any sudden change in the amount of drainage, or leakage at the tube entry site, should be reported, as this may indicate a blockage in the drainage tube or bleeding (Crisp et al 2013). Individual education regarding the drainage system and its workings is essential. The length of time a drain tube remains in situ depends on several factors, such as the nature of the surgery, the anatomical area involved and the amount of drainage. It is expected that initial drainage is bloodstained (perhaps heavily), and that over subsequent days the drainage will become lighter and more serous.

## CLINICAL INTEREST BOX 43.5 Common surgical drain tubes

| Common surgical drain tubes | Nursing implications |
|---|---|
| Jackson-Pratt® Wound Drainage<br> <br>*(Courtesy of Cardinal Health. © 2007 Cardinal Health. All rights reserved)* | Soft, squared tubing with holes; is totally inserted into wound<br>Bulb that creates a gentle suction when squeezed before opening clamp<br>Ensure suction is not lost; re-apply by clamping off tubing, detach, squeeze bulb, hold, then re-attach before unclamping tubing<br>Usually secured by a suture, except in some orthopaedic cases<br>Do not twist drain when removing—it is not round within the wound, despite the shape of the external tubing |
| Survac<br> <br>*(© Surimex)* | Pre-vacuumed bottle with tubing that then attaches to a semi-rigid, perforated tube that is inserted into the wound<br>A trocar is often used to insert the inner tubing, which is then usually sutured in place at the skin<br>Ensure suction is present by observing the green, concertina button on the top of the bottle; this should be depressed when patent<br>Lost suction can be re-established using clamps and wall suction |
| Penrose drain<br>  | Very pliable, soft drain relying on passive, non-suction drainage<br>Sometimes sutured as well as secured with a safety pin. Check carefully to identify the presence of a suture<br>Drains into an absorbent dressing or wound drainage bag |

Prior to removal of a non-suction drainage tube the nurse may be asked to rotate and shorten it a small amount each day for several days, preventing the body tissues becoming adhered to the tube, and to promote healing from beneath to the skin surface. The technique for shortening a tube should follow the employing agency's procedure manual. Suction drain tubes are removed without prior shortening. Removal of a drain tube involves removing all retaining sutures, rotating the tube, then steadily and gently withdrawing it, minimising discomfort. If the tube is attached to a suction device, the nurse must discontinue suction before removal of the tube, as per agency policy or manufacturer's directions. Generally, suction is discontinued to avoid damaging the tissues as the tube is being withdrawn, and to decrease pain. The amount of total drainage postoperatively must be documented on the individual's fluid balance chart and the time of removal should also be recorded.

### Sutures and clips

When surgery has been completed, the operative area is closed in separate layers, that is, organ, muscle, fat and skin. The wound edges are approximated and held together by sutures, clips or staples. Usually a single line of sutures or clips is sufficient for skin closure. In some instances, tension (large, reinforced) sutures are also required to ensure closure and to provide additional support for the wound. Suturing methods include intermittent and continuous. With intermittent (interrupted) suturing, the surgeon ties and cuts each individual suture. Continuous suturing is a series of sutures with only two knots; one at the beginning and one at the end

of the suture line. The manner in which the suture crosses and penetrates the skin determines the method of removal (see Chapter 29).

When healing has progressed well, sutures, clips and staples are removed, usually within 7–10 days after insertion. However, this is dependent on the area of the body involved and the vascularity of the area. The wound is checked for union of the edges before sutures or clips are removed. Sometimes alternate sutures or clips are removed one day, and those remaining removed the next day. The most important principle in suture removal is never to pull the visible portion of a suture through underlying tissue, as pulling the exposed portion of the suture through tissues may lead to infection. It is also important to ensure that all sutures have been removed, and that there is no opportunity for retention of suture material. The nurse may be required to perform this procedure if it is within the specified role and function and institutional policy permits.

Sutures are generally removed using a disposable sterile blade or stitch-cutter, and staples or clips are removed using a sterile staple extractor/remover. It is easiest to lift the suture at the knot, raise it up off the skin, and cut the suture as close to the skin as possible. Ensure safety with the stitch-cutter by cutting away from the individual and pulling out the suture to the side opposite to where it was cut. Supporting the skin edges with forceps may be appropriate. It is not always necessary to cleanse or swab the suture line before suture removal. This is indicated if there is dried blood or exudate present or if sutures are hard to see. Cleansing the incision gently with gauze swabs and normal saline may be necessary after suture removal if oozing has occurred as a result of the removal. Agency guidelines and standard precautions should always be followed when undertaking such procedures.

## Postoperative discomforts and potential complications

During the postoperative period the nurse must assess the individual for the manifestations of various discomforts associated with surgical intervention and potential complications. The nursing care plan should include any actual and potential problems, the goals, objectives or expected outcomes of the planned interventions and nursing measures to prevent, minimise or manage them. The nurse must know how to prevent complications and recognise the onset of discomforts or complications. Any manifestations or changes must be reported immediately. Table 43.11 lists some postoperative discomforts and potential problems.

### CRITICAL THINKING EXERCISE 43.5

Mrs Marcello, an otherwise well 83-year-old woman, is admitted after a fall for repair of a fractured hip. Outline the possible postoperative complications that might be seen in the older individual undergoing this type of surgery and what you, as an EN, can do to help minimise the risks of complications occurring with Mrs Marcello. Identify the discomforts and difficulties Mrs Marcello is likely to experience in the first 24 hours after surgery, and outline the nursing interventions you will implement to assist her.

## Preparation for discharge

Discharge planning commences in the preoperative phase and is continually reviewed throughout the postoperative period until the individual is discharged from the healthcare facility. The nursing care plan during this time is developed and implemented with the ultimate goal of returning the individual to an optimal level of functioning and independence. Before discharge the person and/or their significant others should understand how to meet any specific postoperative needs (see Chapter 21). The nurse may be required to demonstrate any techniques that are to be performed at home, such as dressing changes.

The nurse must ensure that the person knows how to care for any wound that is present, whether there are any dietary or activity restrictions, whether any special exercise program is to be followed and if and how prescribed medications are to be administered. The person should be informed of the date and time to visit the surgeon for a postoperative check. It may be necessary to notify the domiciliary nursing service if the individual requires ongoing assistance; for example, wound care.

The day surgery individual is discharged once they have fully woken from anaesthetic, have tolerated diet and fluids and have voided. They are discharged into the care of a friend or family member, as they are unable to drive, drink alcohol or be left alone for the next 24-hour period. The DSU nurse will contact the individual the next day to follow up on their progress and answer any concerns they may have.

## TABLE 43.11 | Postoperative discomforts and potential problems

| Condition | Manifestations | Causes | Prevention | Management |
|---|---|---|---|---|
| Nausea and/or vomiting | Pale, cool, damp skin. Sensation leading to the urge to vomit<br>Vomiting | Effects of anaesthetic agents, inadequate preoperative preparation, apprehension, sensitivity to medications | Adequate preoperative preparation (e.g. fasting; withholding oral fluids and food until gastrointestinal function has returned) | Withholding oral fluids and food, administering anti-emetic medications, promotion of physical and psychological comfort |
| Abdominal distension | Sharp abdominal pains, swollen abdomen, inability to pass flatus | Increased production of gas in the intestines and reduced peristalsis, causing stasis of the bowel contents | Early ambulation | Encouraging ambulation; passage of a rectal tube to release flatus |
| Paralytic ileus | Abdominal pain and/or distension, no passage of flatus, nausea and vomiting | Absence of intestinal peristalsis related to the trauma of surgery, especially handling during bowel surgery | Withholding oral fluids and food until normal gastrointestinal function has returned | Insertion of nasogastric tube and aspiration of gastric contents; withholding of all oral fluids and food; administration of fluids intravenously; early mobility as able |
| Urinary retention | Suprapubic discomfort or pain, suprapubic distension, inability to void; bladder ultrasound confirms urinary volume | Pain, micturition reflex depressed by anaesthetic agents (especially spinal or epidural), anxiety or fear of pain | Early ambulation, relief of anxiety and pain | Encourage increasing ambulation; assistance to assume a natural voiding position; providing sensory stimulation (e.g. the sound of running water); ensure adequate fluid intake; catheterisation if other measures fail |
| Constipation | Abdominal discomfort and distension, 'gas' pains, nausea | Disruption of normal diet; reduced mobility; reduced fluid intake; depressive effects of anaesthetic agents and/or medications, especially narcotics, including codeine | Early ambulation, return to diet high in fibre as soon as possible, ensure adequate fluid intake | Increase dietary fibre and fluid intake, encourage increasing ambulation, administration of stool softeners or rectal suppositories if necessary |
| Pain | Restlessness, 'guarding' the wound, verbal expression of pain, pale damp skin, rapid pulse | Tissue trauma, anxiety | Provide adequate analgesia, promote physical and psychological comfort | Provide psychological support; promote physical comfort (e.g. positioning); administer adequate analgesic medications |

*Continued*

**TABLE 43.11 | Postoperative discomforts and potential problems—cont'd**

| Condition | Manifestations | Causes | Prevention | Management |
|---|---|---|---|---|
| Shock | Hypotension; weak rapid pulse; restlessness; pale, cool damp skin; diminished urinary output | Reduction in the volume of circulating blood, physiological reaction to trauma | Avoid and relieve pain and fear, prevent reduction of circulating blood volume | Restoration of blood volume to normal, relieve pain and/or anxiety, administer oxygen, administer prescribed medications, maintain normal body temperature, place the individual in the recumbent position, possibly elevate feet |
| Haemorrhage (a): reactionary | Bleeding (obvious or concealed) within the first 24 hours after surgery; manifestations of shock | Dislodgement of clots from the cut ends of small blood vessels, or displacement of a ligature from a large blood vessel, as the blood pressure returns to normal | | Arrest the bleeding. Combat shock. Individual may need to return to the operating room to have the haemorrhage arrested |
| Haemorrhage (b): secondary | Bleeding that occurs 7–10 days after the operation | Infection that weakens blood clots or erodes blood vessel walls | Prevent infection | Treat infection, arrest the bleeding, combat shock |
| Hypoxia | Tachycardia, tachypnoea, pallor or cyanosis, lethargy and decreased responsiveness, confusion, agitation | Ventilations depressed by anaesthetic agents or medications, resulting in poor oxygenation of the blood, airway obstruction | Maintain a clear airway, promote adequate lung ventilation, administer oxygen if necessary, monitor vital signs frequently | Promote adequate oxygenation and tissue perfusion |
| Atelectasis (lung collapse) | Diminished breath sounds, increasing dyspnoea, pyrexia | Collapse of a portion of the lung due to obstruction of part of the bronchial tree (e.g. a plug of mucus or inhaled secretions or vomitus) | Maintain a clear airway, encourage regular deep breathing and coughing exercises, early ambulation | Promote adequate lung expansion, administer oxygen if necessary, administer prescribed medications |
| Pneumonia | Dyspnoea and cyanosis, pyrexia, tachycardia, limited chest expansion on the affected side(s) | Accumulation of secretions in the lung(s) | Maintain a clear airway, encourage regular deep breathing and coughing exercises, incentive spirometry, early ambulation | Promote adequate lung expansion, administer oxygen if necessary, administer prescribed medications |

**TABLE 43.11 | Postoperative discomforts and potential problems—cont'd**

| Condition | Manifestations | Causes | Prevention | Management |
|---|---|---|---|---|
| Thrombophlebitis | Calf tenderness; pain in the leg, perhaps increased when the foot is dorsiflexed; oedema and inflammation of the leg; pyrexia | Venous stasis related to inadequate mobility, reduced volume of circulating blood or damage to the veins by pressure or injury | Encourage leg and foot exercises; early ambulation, and use of anti-embolic stockings; avoid pressure on back of legs (i.e. no crossing legs); administration of prescribed anticoagulants; ensure adequate fluid intake | Anticoagulant therapy, bed rest with legs elevated, anti-embolic stockings applied, perhaps administration of fibrinolytic substances |
| Pulmonary embolism | Sudden onset of dyspnoea, severe chest pain, and cyanosis; urgent desire to defecate; sudden circulatory collapse and death | Blockage of one of the pulmonary arteries by a blood clot, air or fat | Prevent the development of deep vein thrombosis, administration of prescribed anticoagulants, maintain normal blood volume | Administer oxygen and prescribed medications (anticoagulants), emergency resuscitation if required, emergency embolectomy may be performed |
| Wound infection | Pain, tenderness, redness and swelling around the wound, purulent wound discharge, pyrexia, tachycardia | Invasion of the wound by pathogenic microorganisms | Practise aseptic techniques, using sterile equipment | Administer prescribed medications (e.g. antibiotics, analgesics); prevent cross-infection |
| Wound dehiscence (breakdown or rupture of wound closure) | Leakage of haemoserous fluid from the wound, separation of wound edges, with appearance of loops of intestine at abdominal wound surface | Poor tissue healing, which may be related to malnutrition, obesity, anaemia, wound infection, premature removal of sutures or clips, or stress on the unhealed incision (via excessive coughing or straining) | Prevention, management of malnutrition and anaemia, delay removal of sutures and clips until there is good union of wound edges, avoid stress on incision | Combat shock; cover wound with sterile moist saline dressing; do not attempt to reinsert intestinal loops; provide psychological support; prepare the individual for return to theatre |

*(Rothrock 2015)*

## DECISION-MAKING FRAMEWORK EXERCISE 43.1

You are an Enrolled Nurse who has recently commenced employment in a surgical ward after many years working in a rehabilitation environment. You are asked to collect an individual who is post surgical from the PACU and take him back to the ward under your care.

When you arrive at the PACU you find that the individual has had a percutaneous intravenous central catheter (PICC) inserted in the OR. The postop orders include 2-hourly flushes with normal saline. You have never managed the care of a PICC and have not completed any facility-based competency training in PICC management. The ward operates using the team model for nursing care and you are working with a Registered Nurse sharing a load of eight individuals.

Using the decision-making framework:

1. Do you accept this individual as part of your allocation?
2. What strategies could you use to manage this situation?

## Summary

Surgery is a form of intervention whereby the surgical team operates to remove, repair, reconstruct or replace body tissues or organs. Surgical procedures may be classified as elective, essential, emergency, diagnostic, exploratory, curative, palliative, major or minor. Surgery imposes physiological stress on all the body systems, and psychological stress on the individual and their significant others. Perioperative nursing encompasses the provision of a wide variety of nursing functions related to the individual undergoing surgery and throughout their perioperative experience. Preoperative care is directed towards ensuring that the individual is in the best possible physical and psychological condition to undergo surgery. Preoperative care involves providing information, teaching activities, physical examination of the individual, the performance of laboratory tests and diagnostic studies, checking that informed consent has been obtained and preparing the individual physically and psychologically. The types of anaesthetic used during surgery are classified as general, regional or local. General anaesthetic agents are administered intravenously or by inhalation and promote unconsciousness, analgesia, amnesia and muscle relaxation. Local, or regional, anaesthetic agents are administered through infiltration or by topical application; their action blocks the conduction of nerve impulses to and from specific sites in the body.

Intraoperatively, the nurse, in varied roles, delivers holistic care to the individual while following procedural guidelines set by the agency and other professional bodies. These guidelines and standards are the result of ongoing research and outline best practice in the perioperative environment. Postoperative care includes: the immediate care of the individual emerging from anaesthetic; the preparation of each individual for their return to the ward or DSU; immediate assessment of the individual's condition, and assisting individuals to meet their needs for oxygen and blood circulation; comfort, nutrition and fluids, elimination, movement and exercise, hygiene, psychological support, protection and safety. Care of a surgical wound is directed towards promoting healing and preventing infection. Wound management may involve dressing the wound, care and removal of any drainage tubes and removing sutures or clips. Throughout the postoperative period the individual is prepared for discharge with the ultimate goal of returning to an optimal level of wellness, functioning and independence.

## Review Questions

1. List five (5) different reasons for surgery.
2. What are four (4) significant factors that can affect the degree of risk in an individual facing major surgery?
3. Identify six (6) possible psychological responses you may find in an individual with diabetes who is facing a below-knee amputation of their left leg.
4. Outline what is involved in the preoperative preparation of a surgical individual and identify ten (10) items on the preoperative form that you should check.
5. Identify three (3) types of anaesthesia.
6. What action would you take if an individual's surgical wound dressing was damp with blood?
7. What action would you take if, 6 hours after returning to the ward after surgery, an individual's urinary catheter drainage was 20 mL?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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CHAPTER
44

# Nursing in the emergency care environment

*Jennifer Jennings*

## KEY TERMS

advanced life support (ALS)
basic life support (BLS)
cardiac output
cardiopulmonary resuscitation (CPR)
code blue (medical emergency)
medical emergency team (MET)
modified early warning scores (MEWS)

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define key terms
- State the aims and principles of emergency nursing care
- Recognise and overcome the barriers that can keep nurses from acting in an emergency situation
- Identify and act upon emergency situations according to organisation policy and procedure and within legal and professional requirements
- Apply a problem-solving framework in consultation/collaboration with the Registered Nurse to plan appropriate nursing management strategies
- Identify and respond to the early signs and symptoms of the deteriorating individual
- Assist the Registered Nurse with providing the initial emergency management of the individual until medical support arrives

## CHAPTER FOCUS

This chapter provides a form of knowledge support to equip the Enrolled Nurse with the theoretical concepts and skills required to recognise and respond to emergency situations and utilises the decision-making framework to facilitate the delivery of safe person-centred care. The literature reports that the characteristics of individuals in Australia and internationally are changing. Acute care hospitals now have an increasing percentage of individuals with complex problems who are more likely to be or become seriously ill during their hospital stay (Needleman 2012). The clinical condition of an individual can change at any time; the key is to recognise and respond in a timely manner. In the healthcare facility the nurse is primarily 'on the front line' and usually the one who is the first responder so must be equipped with the skills and knowledge to react appropriately and initiate care until help arrives. The chapter also prepares the Enrolled Nurse to make sound clinical judgments and work as part of a team to provide the best possible care to the individual and family/significant others. There is additional emphasis on the recognition of variations or deterioration in the individual's condition to enable the Enrolled Nurse to respond appropriately and effectively. Concepts introduced include the use of early warning systems (EWS), when to initiate a **medical emergency team** (MET) call and calling a **medical emergency** or **code blue**. Emergency response intervention including **cardiopulmonary resuscitation** (CPR) and basic life support (BLS) are also addressed. Importantly, effective inter/intraprofessional communication is essential and the mnemonics ISBAR—identification, situation, background, assessment and request—and AMPLE—allergies, medications, previous history, last meal, event—which are the handover tools used by paramedics are used to demonstrate effectiveness when communicating and reporting vital information.

## LIVED EXPERIENCE

Being assertive in activating a MET call can make you feel very apprehensive, but the ward nurse just knew the individual was in trouble. I recall one of my colleagues recounting a story of being told by a more senior staff member that, 'The MET team are not going to be happy that you called them.' My personal experience of being a critical care trained nurse and part of a MET team is quite the contrary—when the ward staff call a MET we are there to provide additional support and it is definitely not a bother. A delay due to indecision can result in a MET turning into a code blue. Therefore, when a person deteriorates on a ward that is not a critical care environment, the nurses are first on scene to initiate emergency care. It is our responsibility to ensure that we arm our ward nurses with the skills and knowledge to confidently recognise and respond. Education and simulation activities support the decision-making framework and encourage students to use clinical judgment and critical thinking skills to provide the best possible outcomes for individuals in our care.

**Nicholas Williams, Enrolled Nurse**

# INTRODUCTION

The key elements required to appropriately recognise and treat a deteriorating individual include accurate and timely documentation of vital signs. The ability to interpret vital sign recordings and act quickly on trends of deterioration, as well as reporting, effective communication, management, teamwork and prioritisation of skills assist with better outcomes for the person.

In the clinical ward recognising alterations to the individual's physiological status requires the nurse to have sound knowledge of physical assessment, vital signs in a range acceptable for the individual and awareness of when to respond to alterations in the individual's condition (McDonnell et al 2013). Enrolled Nurses practise under the direction and delegation of a Registered Nurse or nurse practitioner to deliver nursing care and, accordingly, the Enrolled Nurse must work within the policies and procedure guidelines of their organisation. The Enrolled Nurse has a unique opportunity to contribute to the care of the individual with complex medical conditions. Ongoing education based on current evidence allows the Enrolled Nurse to recognise, communicate and assist the multiprofessional healthcare team in providing timely effective care to the individual.

## Aims of emergency care

1. To preserve life
2. To protect the unconscious person
3. To prevent further deterioration
4. To relieve pain
5. To promote recovery.

## Where do emergencies occur?

Emergencies can take place anywhere: the ward area, perioperative unit, radiology and, of course, the emergency department. The outcome of the emergency situation is dictated by numerous factors including recognition and timely response, the experience of attending staff, coordination and communication.

## Early recognition and response to a medical emergency

An emergency is a situation requiring immediate action. Recognising an emergency is the first step in responding. What

happens next may be determined by the following factors that will help you recognise the at-risk or deteriorating ward individual:

- Intuition: 'gut feelings' tell you to observe, look closer and ask questions
- Knowing the individual: ensure that you read the history, the previous shift notes and perform a baseline assessment of the individual
- Pattern recognition: look at the graphical charts and look for subtle changes in trends
- Physiological changes: in most instances these occur gradually.

The key is to ensure that a thorough assessment and a full set of vital signs are performed and documented, and that changes, however slight, are reported to senior staff.

Remember that every time you see an individual you perform some sort of assessment that may include evaluation. Always think DRSABCD (**D**angers, **R**esponsive, **S**end for help, open **A**irway, normal **B**reathing, start **C**PR, attach **D**efibrillator). This process allows you, as the Enrolled Nurse, to continually assess the individual in both the long and the short term. Evaluation brings you back to the beginning of the assessment (see Clinical Interest Box 44.1).

Ask yourself the following questions:

- Has the nursing intervention worked?
- Is there anything else I can do for this individual?
- Does the individual need further intervention?

All nursing assessments and evaluations must be documented and reported to a senior staff member.

## Individual assessment

The assessment process consists of:

- Primary survey—airway, breathing, circulation, disability, exposure and 'don't forget glucose'
- Secondary survey—a thorough systematic assessment, head to toe
- Recording vital signs—temperature, heart rate, respiratory rate, blood pressure and oxygen saturation and pain level.

## Reporting deterioration

- The decision about calling: recognising clinical deterioration and knowing who to call and when to call for help
- Early warning score: knowledge of early warning score systems and hospital protocol

## CLINICAL INTEREST BOX 44.1 Summary of guidelines for responding to an emergency situation

### First person present

1. Assess the area for danger
2. Check the individual for response and conscious state
3. If the individual is unresponsive call for assistance, press the emergency bell to summon help
4. Assess the airway, clear obstructions and perform airway-opening manoeuvre
5. If available/suitable correctly size and insert an oropharyngeal airway
6. Check for normal breathing. If unresponsive and not breathing normally, commence CPR with 30 chest compressions followed by two ventilations
7. Attach a defibrillator as soon as possible and follow its prompts. Ensure that the compressions are not interrupted while attaching the defibrillator
8. Continue CPR until the medical team arrives or signs of life (responsiveness, starts moving and normal breathing) return.

### Second person present

1. Dial switchboard and state:
   - > Type of emergency (e.g. code blue medical)
   - > Location of the emergency: ward, room and bed number
   - > Identity of person who initiated the emergency call
2. Collect the emergency trolley
3. Connect bag-valve mask and attach high-flow oxygen
4. Assist with CPR
5. Commence documentation
6. Prepare an intravenous infusion
7. Draw up the resuscitation drugs
8. Prepare equipment needed for intubation of the individual
9. The nurse unit manager or senior nurse will:
   - > Provide additional personnel if required
   - > Coordinate telephone communications
10. Staff shall provide information and support to friends/relatives of the individual who are present.

*(Australian Resuscitation Council 2016a)*

| | | |
|---|---|---|
| **I** | IDENTIFY<br>Identify self, name, position, location<br>Identify who you are talking to<br>Identify individual: name, age, sex, location | |
| **S** | SITUATION<br>State Purpose<br>"The reason I am calling is …" | If urgent<br>Say so |
| **B** | BACKGROUND<br>Provide relevant information<br>Relevant history<br>Relevant examinations including vital signs & MEWS<br>Relevant test results<br>Current management | |
| **A** | ASSESSMENT<br>State what you think is going on<br>"I think the problem is … or …"<br>"I don't know what the problem is but I am concerned" | |
| **R** | REQUEST /<br>State request<br>"I would like you to …" | READ BACK<br>Repeat instructions<br>"You would like me to …" |

**Figure 44.1** ISBAR communication tool

*(Adapted from Aldrich et al 2009)*

- Communication and language: use of ISBAR to communicate information rapidly in a logical concise sequence (Hammond et al 2013) (see Figure 44.1).

### CRITICAL THINKING EXERCISE 44.1

**ISBAR tool practice**

Mr Thomas Andrews is 54 years old with a medical history that includes hypercholesterolaemia and hypertension. You find him collapsed on the floor of his room. He had complained of dizziness earlier that morning after getting up to go to the bathroom. There is no evidence in his progress notes that his concerns have been addressed or investigated and there are no recent vital signs charted. His admission notes state that he was admitted the previous day for stabilisation of his blood pressure.

1. Using the ISBAR tool, practise writing a handover with the information provided.
2. What other information do you need to complete the ISBAR tool?

## Managing deterioration

Initiate treatment by performing the initial stabilisation and calling for help. Making treatment decisions will depend on the Enrolled Nurse's scope of practice as this varies from state to state. It may include initiating **basic life support** (BLS).

## Barriers to instigating action

Barriers to instigating action can include:

- Being unsure of what to do: lack of knowledge of signs and symptoms that could signal deterioration
- Being unfamiliar with hospital policies related to calling MET or calling a medical emergency (code clue)
- Nurses feeling uncertain about whether they are doing the right thing in calling the MET
- Checking with other nurses: while seeking confirmation the individual deteriorates further
- Waiting for observations to deteriorate: this is a knowledge deficit related to early warning scores (EWS), the parameters of vital signs or a lack of familiarity with the individual and their baseline vital signs
- Being unable to communicate: language barriers or unable to articulate concise systematic information, unaware of ISBAR.

Clinical Interest Box 44.2 outlines the criteria for all MET teams.

# RECOGNISING AND RESPONDING TO AN EMERGENCY

## Primary care

Recognising an emergency is the first step in responding to an emergency, and giving prompt emergency care saves lives. To be able to provide emergency care you must think and act and communicate in a systematic and coordinated manner, continually assessing and adjusting to changes in the individual's status (Kerr et al 2014). The first person on the scene recognises and responds to the emergency and delivers first aid (Bogossian et al 2014; Australian Commission on Safety and Quality in Health Care (ACSQHC) 2012).

## Secondary care

The next stage involves continual assessment, care management and interventions which may require clinical skills such as cardiac monitoring, ECG interpretation, airway

## CLINICAL INTEREST BOX 44.2 Calling criteria for medical emergency teams used in Australia

Important note: Criteria for calling a medical emergency team (MET) for adult individuals has been developed to assist clinicians to identify individuals at risk. The criteria indicated are the minimum calling criteria. Sites may choose to apply more stringent calling criteria; always refer to the hospital's policies and procedures guidelines (Department of Health 2014).

### MET call criteria—adults

**Airway**

- Difficulty breathing

**Breathing**

- RR <8 or >30 per min
- $SpO_2$ <90% despite $O_2$ 6 L via Hudson mask

**Circulation**

- HR <50 or >130 beats per minute
- Systolic BP <90 mmHg
- Chest pain—new or unrelenting chest pain

**Disability**

- Acute change in consciousness level
- Seizure

**Other**

- Staff member is worried about an individual condition

management, fluid resuscitation and haemodynamic monitoring (ACSQHC 2012).

## CHANGES IN VITAL SIGNS

Vital sign measurement is at the centre of the care we deliver to individuals placed in our care. Changes in vital signs are key indicators of individuals who are at risk of deterioration (Cardona-Morrell et al 2015). Physiological signs that indicate deterioration include the respiratory rate, heart rate and blood pressure, level of consciousness and oxygen saturation (Cardona-Morrell et al 2015). Failure to interpret or inaccurate measurement of vital signs also place individuals at risk of deterioration. Lack of education, training and experience have also contributed to adverse events (Odell 2015). In order to detect changes the Enrolled Nurse must have a sound knowledge of the normal ranges of these physiological measurements (see Chapter 20).

### Modified early warning scores

The idea behind **modified early warning scores** (MEWS) is to improve individual outcomes by detecting and acting upon early signs of deterioration in individuals (So et al 2015) (see Tables 44.1 and 44.2 and Figure 44.2). This will be achieved, in part, through the implementation of the MEWS system that:

- Identifies trends and changes in the individual observations
- Ensures that timely review of the individual occurs and appropriate treatment is provided
- Improves the accuracy of documentation of the individual observations (ACT Health 2007).

A MEWS is calculated each time a set of observations is performed (see Clinical Interest Box 44.3). If a trigger score

**TABLE 44.1 | How the MEWS chart works: MEWS calculation**

| MEWS score | 3 | 2 | 1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| Respiratory rate (breaths per minute) | ≤8 | | | 9–20 | 21–30 | 31–35 | ≥36 |
| $SpO_2$ (%) | ≤84 | 85–89 | 90–92 | ≥93 | | | |
| Temperature (°C) | ≤34 | 34.1–35 | 35.1–36 | 36.1–37.9 | 38–38.5 | ≥38.6 | |
| Heart rate (beats per minute) | ≤40 | | 41–50 | 51–99 | 100–110 | 111–130 | >130 |
| Blood pressure | See Table 44.2 for criteria | | | | | | |
| Sedation score | | | | 0–1 | 2 | 3 | 4 |
| Urinary output (mL/hr) for 4 hours or for 24 hours | <80 <480 | 80–119 480–714 | | 120–800 720–4800 | >800 >4800 | | |

*(Adapted from ACT Health 2007)*

## TABLE 44.2 | Explanation of blood pressure for MEWS criteria

### Additional considerations

| Usual blood pressure | | 190 | 180 | 170 | 160 | 150 | 140 | 130 | 120 | 110 | 100 | 90 | 80 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Current blood pressure | 200s | 0 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 4 | 5 | 5 |
| | 190s | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 |
| | 180s | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 |
| | 170s | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 3 |
| | 160s | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 | 2 |
| | 150s | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 2 |
| | 140s | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| | 130s | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | 120s | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 110s | 3 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 100s | 3 | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| | 90s | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 0 |
| | 80s | MET 4 | | | | MET 3 | | | | MET 2 | | 1 | 0 |
| | 70s | | | | | | | | | | | MET 1 | |

*(Adapted from © ACT Health 2007)*

MET, medical emergency team; MEWS, modified early warning scores

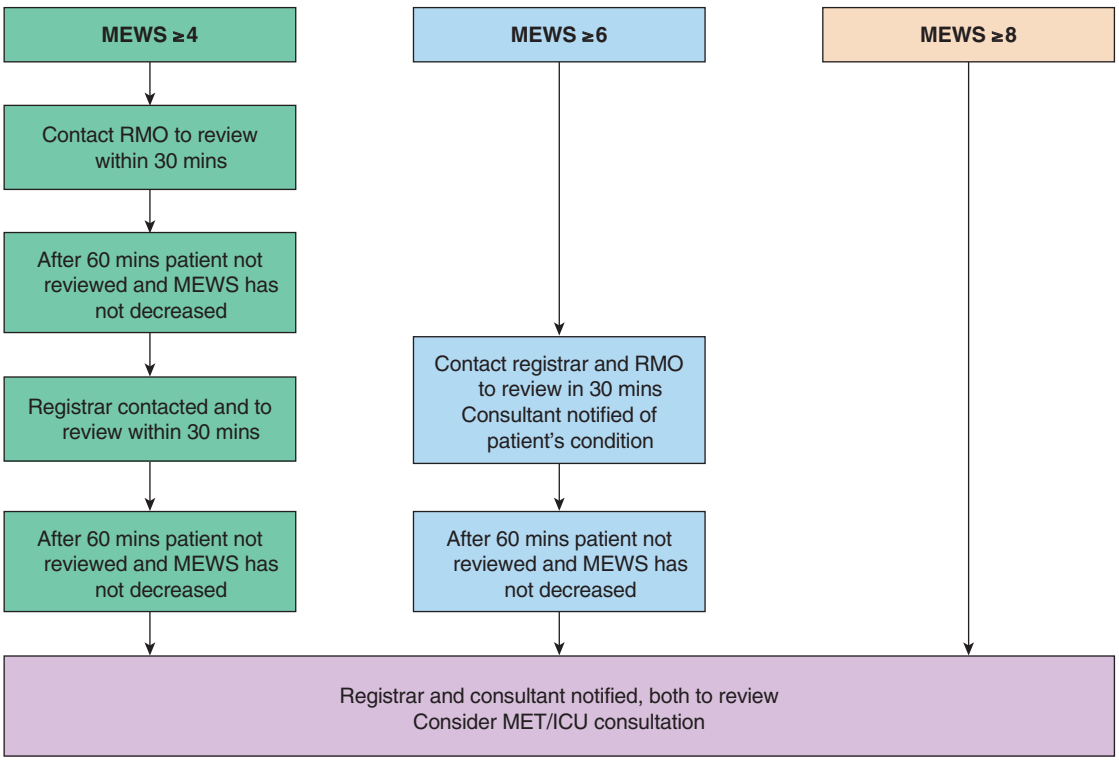



**Figure 44.2** MEWS flow chart using notification guidelines, ACT Health

*(© ACT Health 2007)*

## CLINICAL INTEREST BOX 44.3 Modified early warning scores (MEWS)

- MEWS does not replace calling the medical emergency team (MET)
- If the individual meets the MET criteria a code blue/MET should be called as per hospital MET protocol
- MEWS, EWS systems may vary from one healthcare facility to another
- Ensure you are familiar with the provider's policies and procedures

*(© ACT Health 2007)*

of 4 or greater is reached the activation protocol is initiated. Observations to be recorded include temperature, pulse, blood pressure, oxygen saturations ($SpO_2$), respiratory rate, sedation score and urine output.

Other recommendations of the protocol include that the nurse caring for the individual should report clinical changes when clinical deterioration, other than that assessed by the MEWS criteria, occurs or when sound clinical judgment would suggest that notification is in the best interests of the individual. If the Enrolled Nurse is at all uncertain, consultation with a senior staff member should occur.

## Systematic approach to assessment

One of the crucial steps in providing emergency care is proper assessment. Without timely and accurate assessment the chances of survival decrease. It is very important that individual assessment is conducted in a systematic manner. This is to insure that life-threatening injuries are given immediate intervention to increase the chances of survival. The best way to do that is to start with the following:

### A = Airway

The airway must be assessed for signs of obstruction; for example dentures, vomitus or a foreign body. To effectively assess the airway a jaw thrust or chin lift must be performed to allow for good visualisation and to open the airway. The mouth is opened and turned downwards to allow any foreign bodies or fluid to drain using gravity. Visible material can be removed using the fingers. The finger sweep is the accepted method for removing foreign bodies from the airway (Australian Resuscitation Council (ARC) 2016b).

### B = Breathing

Assessment of effective breathing includes: monitoring the rate, depth and sound of the respirations; looking for the rise and fall of the chest; listening for sounds of the individual breathing and feeling for the individual's breath on the side of the nurse's face; observing for any chest deformity. Use of percussion and auscultation may be appropriate.

### C = Circulation

In almost all emergencies, consider hypovolaemia to be the main cause. Check capillary refill time, which should be less than 3 seconds; look at colour of hands and fingers; assess limb temperature; count and palpate central pulses (rate, quality, regularity and equality); check blood pressure measurement. An appropriately accredited Registered Nurse or medical officer will insert an intravenous cannula, take bloods and administer intravenous fluids.

### D = Disability

Rule out common causes of unconsciousness such as hypoxia or recent administration of sedative or analgesic drugs; review and treat ABCs, check pupils and check level of consciousness (see Clinical Skill 44.1).

### E = Exposure

Examine individual thoroughly; expose the body fully, respecting dignity and minimising any heat loss. Always ensure personal safety. Carry out an initial assessment then reassess. Treat life-threatening problems at each stage before moving on to the next stage. Assess and evaluate effects of any treatment.

### F = Fluids

Include a review of the individual's vital signs chart; be sure to confirm that all your assessment findings have been recorded and making sure that all information is charted accurately; for example respiratory rate and fluid balance including any IV fluids administered and urine output.

### G = Glucose

Ensure the individual's glucose level has been measured and recorded; look for signs of hypoglycaemia and the associated symptoms that may include confusion, decreased consciousness level and skin that is sweaty or clammy.

Report immediately to Registered Nurse if the blood glucose level is below 3 mmol/L or 3–5 mmol/L with decreased conscious state as glucose should be administered.

### H = Holistic

Involving other specialties used within your hospital and health service will improve the individual's standard of care and hospital experience, and create a holistic approach to healthcare in the emergency environment. Speciality teams have proven themselves very effective in reducing mortality and morbidity rates.

# BASIC LIFE SUPPORT

Basic life support (BLS) is a temporary measure providing myocardial and cerebral oxygenation until **advanced life support** (ALS) personnel and equipment are available (ARC 2013). Early detection of an individual's physiological deterioration and prevention of cardiac arrest are now key strategies recognised for individual survival rates in hospitals.

BLS includes airway management skills, rescue breathing techniques, external cardiac compressions and use of the

## CLINICAL SKILL 44.1 Cardiopulmonary resuscitation/basic life support

**Review and carry out the standard steps for all clinical skills/interventions**

| **NMBA Decision-making Framework considerations:** | **Equipment:** |
|---|---|
| 1. Am I educated?<br>2. Am I authorised?<br>3. Am I competent?<br>If you answer 'no' to any of these, do not perform that activity. Seek guidance and support from your teacher/a nurse team leader/clinical facilitator/educator. | Airway equipment (bag valve mask, pocket mask)<br>Personal protective equipment (goggles, gloves, gown)<br>Resuscitation trolley (if available)<br>Automated external defibrillator |

| **Skill activity** | **Rationale** |
|---|---|
| **Danger**<br>Recognise an emergency situation<br>Identify potential/real dangers<br>Ensure area is safe<br>Follow infection control procedures relevant to workplace (personal protective equipment (PPE))<br>Identify correct manual handling procedures | Ensures the environment is safe to attend basic life support for self and others involved, including the individual<br>Appropriate PPE minimises safety issues |
| **Response**<br>Assess individual's conscious status by appropriate tactile and verbal stimulus (using a simple command, i.e. grabbing and squeezing the individual's shoulders firmly)<br>Identify whether the individual is rousable or unconscious | Assesses whether the individual is conscious or unconscious, and CPR is commenced appropriately<br>Using simple commands and not shaking the individual will help maintain spinal precautions and help prevent any further injuries |
| **Send**<br>Identify how to trigger the alarm within the workplace<br>Describe the local clinical emergency response system protocols<br>Note the time<br>Identify the explicit relevant numbers used within the workplace for emergencies<br>If in a community setting, call emergency services | Allows support to be activated and provides assistance and help with the individual.<br>Allows for expert support to arrive quickly |
| **Airway**<br>Assess airway for obstruction<br>Clear airway (describing different methods, i.e. suction/head turn, or roll individual on to their side. Maintain C-spine precautions)<br>Perform chin lift, jaw thrust or head tilt manoeuvre to open airway | Assessing airway and removing debris allows for a patent airway and ensures oxygen/rescue breaths can effectively be administered to individual |
| **Breathing**<br>Maintain open airway<br>Assess breathing for maximum 10 seconds<br>Look, listen and feel technique performed<br>Look for chest rise and fall<br>Listen for outflow of air from mouth and/or nose<br>Feel outflow of air and chest movement | Minimises the amount of time to assess individual's breathing, decreases the amount of down time and oxygen-poor system. Reduces risk of hypoxia<br>Look, listen and feel technique is easy to perform and assesses breathing simultaneously |
| **CPR**<br>For effective chest compressions the individual should be placed in a flat position, with hard surface underneath<br>Commence compression using both hands on the centre of the chest<br>Correct hand position, one hand in centre of chest (heel of the hand) and the other hand on top<br>Maintain correct posture/alignment. (Arms straight and shoulder over chest, using hips as pivot point)<br>Perform cardiac compression to one-third of the chest depth with a rate of 100/min | To provide effective cardiac compressions, hand placement is essential<br>One hand over the other, arms straight and shoulders over chest will decrease the risk of fatigue and create a greater chance of completing CPR for 2-minute cycle. One hand wrapped around the dominant wrist is preferable<br>Compressions to one-third of the chest allow for effective pressure on the heart to pump blood around the body and deliver oxygen to vital organs |

*Continued*

## CLINICAL SKILL 44.1 Cardiopulmonary resuscitation/basic life support—cont'd

| | |
|---|---|
| At 30 compressions, give 2 rescue breaths (1 second per breath) using appropriate workplace equipment. If unwilling/unable for perform rescue breaths, continue chest compressions only<br>Demonstrate appropriate mask positioning, showing good seal (2-person technique if required)<br>Maintain cardiac compressions/rescue breaths at a ratio of 30:2<br>Demonstrate or state when the person performing compressions should be rotated (every 2-minute cycle, when 2 or more rescuers or signs of fatigue) | A ratio of 30 compressions to 2 breaths maintains sufficient oxygen in the blood stream to be pumped around the body<br>Proper mask positioning will ensure full delivery of oxygen or rescue breaths<br>Be aware of fatigue, as need to complete deep chest compressions or 100 compressions per minute |
| **Defibrillation**<br>(Note: if an automated external defibrillator (AED) is available in your workplace and this skill is relevant to your role, proceed to this step. If defibrillation is not included in your role skip this step and proceed to communication)<br>Attach defibrillator as soon as able, turn on and follow voice prompts (as per defibrillation instruction manual)<br>Communicate safety considerations—pad placement (not over pacemaker), individual unconscious, not in contact with fluid, chest clear and dry (shave and dry chest before applying pads firmly if good contact required between pads and individual), pads rolled onto chest, remove metal/medication patches<br>Demonstrate correct pad placement, sternum right parasternal 2nd intercostal space, apex: mid-axillary 6th intercostal space. Or anterior–posterior positioning<br>If shock advised: scan the environment and individual for danger, ensure all persons are clear of individual and environment, verbalise before about to shock individual. State safety considerations (oxygen removed, nil contact with metal, and individual is unresponsive at time of shock delivery)<br>Safely administer shock (as per instruction manual)<br>When safe immediately recommence CPR post-delivery of shock<br>Continue to follow voice prompts until help arrives | Immediately attach the defibrillator when able (while CPR is in progress) to determine if individual needs to be shocked. This allows for greater outcome the sooner the shocks can be administered. Attaching the defibrillator allows the responder/machine to quickly identify a shockable rhythm. Rapid defibrillation is associated with long-term survival<br>Understanding the safety consideration for persons involved and the individual will unsure minimal risk of potential injuries/dangers<br>Correct pad placement ensures the shock(s) are delivered more effectively<br>Consider safety precautions—environment is clear, persons involved are clear, oxygen is removed—to minimise the risk of potential risks/dangers. Oxygen removal also reduces risk of fire/explosion during defibrillation<br>Recommence CPR when safe post shock delivery to minimise the amount of time between effective CPR applications |
| **Communication**<br>Communicate to rapid response/advance life support/ambulance team (communication tools)<br>State when it is appropriate to cease basic life support/CPR (response of life, medical officer pronounces time of death, physically impossible to continue, danger stopping any further rescue attempts)<br>Communicate progress with relatives/significant others where appropriate | Effective communication to further support services will help continue effective treatment of the individual<br>Understanding when it is appropriate to cease CPR/basic life support will avoid unnecessary length of CPR, decreased chance of injury to persons involved |
| Record and document in healthcare record onset of arrest, medication and other treatments given, procedure performed and individual's response | Informs all healthcare professionals of what occurred and allows for appropriate care to be planned and implemented. Accurate documentation is informative and supports the implementation of ongoing planning and care |

*(ARC and NZRC Guideline 2010; Grantham & Narendranathan 2012; Hazinski et al 2010; Mokhtari Nori et al 2012; Rebeiro et al 2014; Salins & Jansen 2011; Soar et al 2010)*

automatic external defibrillator (which was designed for those with minimal training) (ARC 2013). The Australian Resuscitation Council (ARC) recommends that all first responding emergency personnel, whether medical officers, nurses or non-medical personnel, should be authorised, trained, equipped and directed to operate a defibrillator if their professional responsibilities require them to respond to persons in cardiac arrest.

According to the ARC (2013), healthcare facilities have a duty of care to ensure staff maintain a level of competence that is appropriate to their role and scope of practice. Consequently all staff with direct individual contact should have access to regular resuscitation education appropriate to their expected skills and scope of practice and this should be offered on a yearly basis (ARC 2013).

Clinical Interest Box 44.4 outlines the contents of a resuscitation trolley.

## Indications

### Respiratory arrest

Respiratory arrest can result from a number of causes, including stroke, drug overdose, suffocation, foreign body airway obstruction, injuries and myocardial infarction. When primary respiratory arrest occurs, the heart and lungs can continue to oxygenate the blood for several minutes, and oxygen will continue to circulate to the brain and other vital organs. Individuals suffering respiratory arrest initially demonstrate signs of circulation. When the arrest occurs or spontaneous respirations are inadequate, establishment of a patent airway and rescue breathing can be lifesaving because they can maintain oxygenation and may prevent cardiac arrest (ARC 2016c).

### Cardiac arrest

Cardiac arrest in adults occurs both in and out of the hospital environment. The causes are numerous, but the expectations of the community are always the same: that professional nurses are able to provide appropriate methods of resuscitation in these situations (NMBA 2010).

In cardiac arrest, circulation is absent and vital organs are deprived of oxygen.

Cardiac arrest can be accompanied by the following cardiac rhythms:

- Ventricular fibrillation (VF)
- Pulseless ventricular tachycardia (VT)
- Asystole
- Rhythms associated with pulseless electrical activity (PEA).

These potentially lethal rhythms will be discussed further later in the chapter.

### Cardiopulmonary resuscitation

CPR is the technique of inflation of the lungs and compression of the heart, used in an attempt to revive an individual who has suffered a cardiac arrest. CPR can restart normal heart action after cardiac arrest or maintain artificial circulation to preserve brain function until further treatment is available (e.g. defibrillation) (ARC 2016d). (See Clinical Skill 44.1.)

Remember: the earlier CPR commences the better the chance of perfusion to vital organs.

### Defibrillation

Defibrillation is the therapeutic delivery of an unsynchronised electrical current to the myocardium. A defibrillation shock, when applied through the chest, produces simultaneous depolarisation (i.e. a short period of electrical asystole) of a mass of myocardial cells. This may enable resumption of organised cardiac electrical activity (Soar et al 2010).

Defibrillation is indicated for:

- Ventricular fibrillation (VF)
- Ventricular tachycardia (VT)
- Asystole.

*Ventricular fibrillation* (Figure 44.3) presents with chaotic electrical activity, the result of multiple ectopic foci (an area in the heart that initiates abnormal beats) that may occur in both healthy and diseased hearts and is usually associated with irritation of a small area of myocardial tissue. The causes may include medication, electrolyte imbalances, ischaemia originating from the ventricles and emotional stress. There are no organised QRS complexes (ventricular contractions). An individual with this rhythm has no **cardiac output**, which means that the individual has no circulating blood volume, therefore no blood circulating to the vital organs (Soar et al 2010). A person who has a VF episode will suddenly collapse or become unconscious, because the brain and muscles have stopped receiving blood from the heart.

*Ventricular tachycardia* (Figure 44.4), a rhythm of ventricular origin, may also be a consequence of a slower conduction in ischaemic ventricular muscle that leads to circular activation (re-entry). The result is activation of the ventricular muscle at a high rate (over 120/min), causing rapid, bizarre and wide QRS-complexes; this arrhythmia is called VT (Soar et al 2010). Ventricular tachycardia is often a consequence of ischaemia and myocardial infarction. In this arrhythmia the contraction of the ventricular muscle is also irregular and is ineffective at pumping blood. The lack of blood circulation leads to almost immediate loss of consciousness and death within minutes. The VF may be stopped with an external defibrillator and appropriate medication. Remember: VT may deteriorate to VF and non-shockable rhythms are not responsive to defibrillation.

*Asystole* is characterised by the absence of any electrical activity on the ECG monitor; sometimes referred to as 'flat line'. Ensure that asystole is not another rhythm that looks like a flat line. Consult with a Registered Nurse or medical officer to rule out any other lethal arrhythmia. Fine VF can appear to be asystole, and a flat line on a monitor can be due to operator error or equipment failure.

The following are common causes of an isoelectric line (baseline on an ECG) that is not asystole:

- Loose or disconnected leads
- Loss of power to the ECG monitor
- Low signal gain on the ECG monitor.

Pulseless electrical activity (PEA) is also known as electromechanical dissociation (EMD). PEA rhythm occurs when any heart rhythm that is observed on the electrocardiogram

## CLINICAL INTEREST BOX 44.4 Emergency trolley contents—adult

NB: Content and drawer location may differ slightly according to trolley used in hospital.

All rubber components (gloves, masks, bagging circuits) contained on the arrest trolley should be latex free.

### Top of Trolley

- Defibrillator/monitor
- Defibrillator pads (mininimum 3, check expiry)
- Packet ECG electrodes (in a plastic bag)
- ECG Leads
- Lateral ventilating bag with size 5 mask attached and connected to $O_2$ (latex free)
- Sharps container (< ¾ full)
- 2 × protective eye goggles
- Medium non-latex gloves
- Full face shield
  Note: Defibrillator to be checked daily
- Check OK symbol
- ECG leads to be attached to defibrillator pocket
  Top:
- 2 × defibrillation pads
- ECG electrodes (in a plastic bag)

### Side of Trolley

- Emergency trolley contents list
- Emergency trolley check book
- C size oxygen cylinder with Twin-O-Vac
- Suction tubing with Yankauer sucker attached
- Cardiac arrest record sheet
- Nurse initiated ALS chart
  Note: Size C $O_2$ cylinder to be at least ¾ full
  Test pressure of at least 350 mmHg

### Back of Trolley

- IV pole
- 2 × tourniquets (latex free)
- Cardiac arrest backboard

### First Drawer

- Minijet drugs
- 5 × 10 mL adrenaline 1:10 000
- 3 × 10 mL atropine 1 mg
- 1 × 10 mL calcium chloride 1 gram
- 2 × 5 mL lignocaine 100 mg
- 2 × 100 mL sodium bicarbonate 8.4%
- 1 × 50 mL glucose 50%
- 3 × 150 mg/3 mL amiodarone HCl
- 2 × 10 mmol/5 mL magnesium sulfate
- 2 × 10 mmol/100 mL potassium chloride
- 3 × 400 microg naloxone hydrochloride
- 2 × heparinised blood gas syringes
- 8 × 21 g needles
- 5 × 10 mL syringes
- 5 × 10 mL 0.9% sodium chloride ampoules
- 5 × interlink vial access cannula
- 1 × UEC/electrolyte Vacutainer
- 1 × FBC Vacutainer
- 1 × blood cross-match Vacutainer
- 1 × Vacutainer holder
- 1 × Vacutainer needle adaptor
- 6 × alcohol wipes
  Note: Check expiry date of all drugs and Vacutainers

### Second Drawer

- 2 × IV cannulas: 14g, 16g, 18g, 20g
- 2 × 12 g dwell caths
- 2 × long IV airways
- 1 × roll Transpore tape
- 1 × roll Lifepac paper
- Packet 6 mm Steristrips
- Packet gauze squares
- 2 × small transparent dressings
- 2 × needleless access Luer lock
- 6 × alcohol wipes
- 1 × 20 drops/mL solution infusion set
- 1 × blood/solution administration pump

### Third Drawer

- Yankauer sucker
- Y-suction catheters size 12F × 2 and 14F × 2
- Endotracheal tubes: sizes 7, 8, 9 introducing stylet
- Laryngoscope with size 4 blade attached
- Laryngoscope with size 3 blade attached
- Magill intubating forceps
- Tracheal dilating forceps
- Cotton tape
- Guarded artery forceps
- 10 mL syringe
- Guedel airways sizes 2, 3, 4
- 4 × water-based lubricant sachets
- Scissors
- 1 × laryngoscope bulb/LED (spare)
- 2 × batteries size C
- Cuff pressure manometer
- Lignocaine spray 10%
- Adult $CO_2$ detector
  Note: Check that both laryngoscope blade globes are functioning.

### Fourth Drawer

- 1 × Hartmann's 1000 mL
- 1 × Gelofusine 500 mL
- 1 × dextrose 5% 1000 mL
- 1 × 0.9% sodium chloride 1000 mL

### Fifth Drawer

- Laryngeal masks: sizes 3 & 4
- Bougie × 1
- Australian resuscitation guidelines
- Lantern-style torch with battery

### Emergency Drugs

**First-line drugs**

- Adrenaline 1 mg (1:10 000) × 4
- Atropine 1 mg × 1
- Amiodarone 150 mg ampoules × 2 and 5% glucose
- Lignocaine 100 mg

## CLINICAL INTEREST BOX 44.4 Emergency trolley contents—adult—Cont'd

**Other medications/equipment**
- Salbutamol 5 mg nebules × 2
- Ipratropium 500 mcg nebules × 2
- Nebuliser device and mask
- Sublingual GTN
- Aspirin 300 mg
- Frusemide

**Intravenous medications**
- Adenosine 6 mg × 10
- Adrenaline 1 mg (1:10 000) × 4
- Adrenaline 1 mg (1:1000) × 2
- Amiodarone 150 mg ampoules × 2
- Calcium chloride 10% 1 g/10 mL (6.8 mmol/10 mL) × 1
- Diazepam 10 mg/2 mL
- Glucose 50% × 1
- Magnesium Sulphate 2.5 g/5 mL
- Midazolam 10 mg
- Naloxone 400 mcg × 1
- Potassium chloride
- Propofol 200 mg/20 mL
- Sodium bicarbonate 8.4% 100 mL × 1
- Vasopressin 20 units/mL

*(Adapted from ARC 2014)*

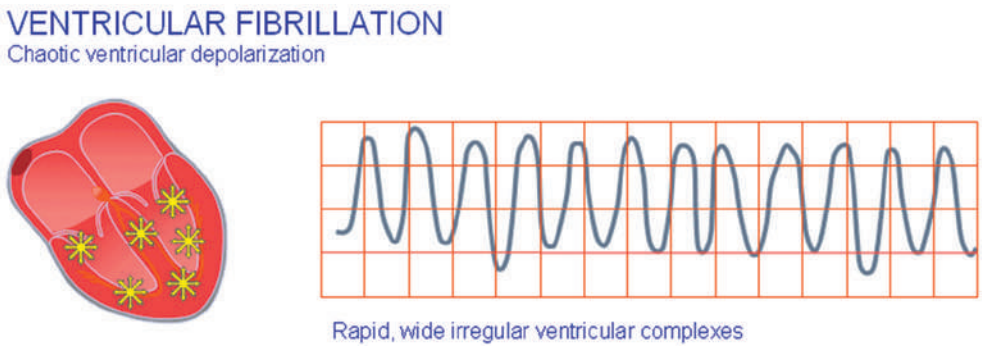



**Figure 44.3** Ventricular fibrillation

*(Malmivuo & Plonsey 1995: Fig 19.3C)*

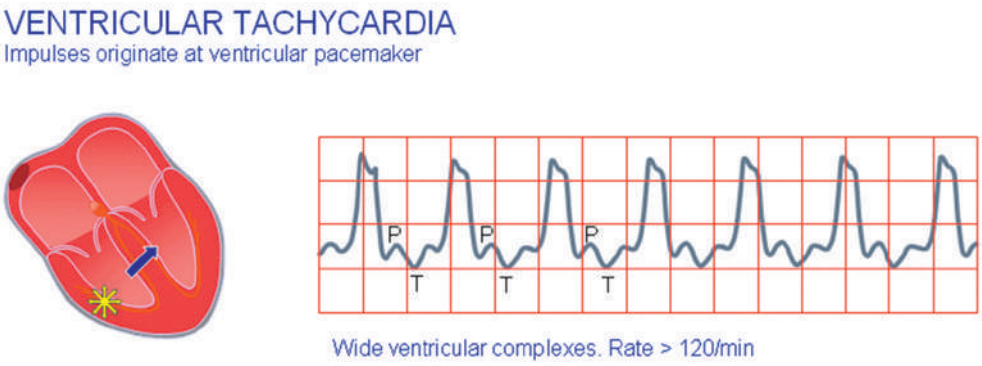



**Figure 44.4** Ventricular tachycardia

*(Malmivuo & Plonsey 1995: Fig 19.3B)*

(ECG) does not produce a pulse. PEA can come in many different forms. Sinus rhythm, tachycardia and bradycardia can all be seen with PEA. Performing a pulse check after a rhythm/monitor check will ensure that you identify PEA in every situation. Pulseless electrical activity usually has an underlying treatable cause. The most common cause in emergency situations is hypovolaemia.

### Danger

Prior to commencing BLS personnel should consider safety and the risks involved.

### Environment

- Move all unnecessary equipment out of the way (i.e. bedside table, head of bed)

- Check for hazards (e.g. equipment, falling debris)
- Observe for fluid spillage or electricity hazards.

### Infection

Infection transmitted from an individual should be considered and appropriate health and safety measures implemented:

- Staff should wear gloves and safety glasses throughout the resuscitation
- Careful handling and disposal of equipment and needles is required during all resuscitation.

### Manual handling

Principles of safe manual handling should be followed for safety of the individual and staff.

## Response

Check for response of an individual who has collapsed by giving a loud, simple command. Stand behind the individual's head and ask the individual if they can hear you, or use tactile stimulation of the individual to determine if they are conscious or unconscious.

Conscious—responds to verbal commands, or by moving.

- Keep the person in a comfortable, safe environment
- Continue to observe closely.

Unconscious—does not respond to verbal commands, does not move.

- Call for assistance immediately
- Proceed with basic life support as per the basic life support flowchart.

## Airway

Manoeuvres to reduce the risk of airway obstruction in the unconscious or unresponsive person include:

- Head tilt/chin lift
- Jaw thrust.

It is important to avoid excessive force, especially where neck injury is suspected, when performing this manoeuvre and ensure the head (NOT the neck) is tilted backwards. The mouth should be opened and turned slightly downwards to allow foreign material to drain. Use the finger sweep using a hooking action or give suction if solid material is visible in the oropharynx of an unconscious person. The person may be turned on their side if the airway needs to be cleared.

## Breathing

Look, listen and feel for 10 seconds to assess for breathing:

- Look for chest movement including rise and fall of the chest. Is it equal?
- Listen for breath sounds including wheezing, and gurgling. Can you hear breath sounds in all areas of the lungs?
- Feel for breath on the cheek or face.

If a person is not breathing normally and is unresponsive, CPR should be commenced with 30 chest compressions followed by 2 breaths, and continued with a ratio of 30:2.

- A resuscitation mask can be used with a one-way, non-return valve.
- If using a Laerdal™ pocket mask, attach oxygen with a flow rate of 10 L/min.

## Circulation

If the person is unresponsive and not breathing normally commence CPR.

The person performing chest compressions should:

- Place the heel of their hand in the centre of the chest with the other hand on top
- Avoid compression beyond the lower limit of the sternum. Compression applied too high is ineffective and if applied too low may cause regurgitation and/or damage to internal organs
- Compressions should be performed with a rocking movement, using the body to apply pressure rather than just the arms. For maximum effect keep your arms straight and elbows fully extended. Position your shoulders vertically above the individual's sternum. If the compressive force is not vertical to the individual's sternum the individual will roll and part of the compressive force will be lost (Rajab et al 2011)
- Note placement for resuscitation—ideally the person is placed supine on a firm surface.

### Depth of compression

- The lower half of the sternum should be depressed approximately one-third of the depth of the chest with each compression.
- This equates to more than 5 cm in adults.

This allows complete recoil of the chest after each compression, to allow for the blood to be pushed around the body (ARC 2016e).

### Rate of compressions

- Rescuers should perform chest compressions for all ages at a rate of approximately 100–120/minute. According to the ARC (2014), the number of compressions will be reduced due to interruptions for breaths given by rescue breathing.
- When performing compressions, if feasible, change rescuers at least every 2 minutes to prevent rescuer fatigue and deterioration in chest compression quality, particularly depth.
- Changing rescuers performing chest compressions should be done with a minimum of interruptions to compressions (Perkins et al 2015).

To avoid fatigue interfering with the delivery of adequate chest compressions:

- Ensure frequent rotation of personnel participating in CPR (every 2 minutes)
- Continue this management until circulation returns or the decision to stop resuscitation is made by the resuscitation team leader (ARC 2016d). See Figure 44.5 for the ARC guideline on CPR.

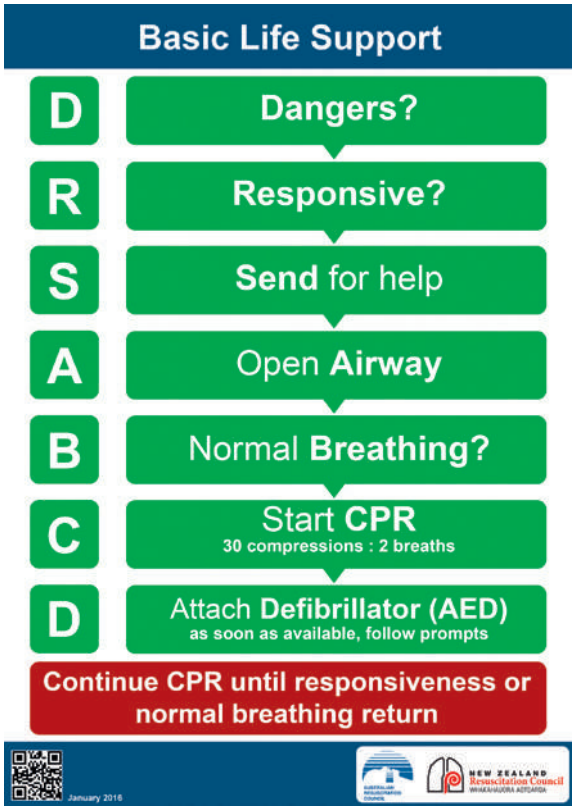



**Figure 44.5** Basic life support

*(Australian Resuscitation Council 2016d)*

## DEFIBRILLATION WITH THE AUTOMATED EXTERNAL DEFIBRILLATOR

The automated external defibrillator (AED):

- Automatically prompts the user regarding intervention
- Automatically analyses the heart rhythm
- Advises and prompts the user to deliver a shock only if needed.

The AED delivers an electrical charge to the person at either 150 J or 200 J, depending on the brand of defibrillator (see Clinical Interest Box 44.5). Some AEDs have a manual override feature allowing responders with greater skill (e.g. critical care trained staff) to have more control over defibrillation. The AED should be connected to the person once they are determined to be unconscious, not breathing normally and show no signs of life (ARC 2016f; 2016g; 2014).

### Preparation of skin prior to pad placement

- Ensure the surface of the individual's skin is dry
- Remove chest hair if required
- Do not delay defibrillation if shaving equipment is not available
- Remove any glyceryl trinitrate (GTN) patches

## CLINICAL INTEREST BOX 44.5 Use of AEDs

The use of AEDs by trained lay and professional responders is recommended to increase survival rates in victims with cardiac arrest. Check local organisation policy regarding AED training, as usually annual training with demonstration of knowledge and skills assessment is a requirement. Please note the ARC guideline 11.4 (2016h) states that 'AED use should not be restricted to trained personnel as the use of AEDs by individuals without prior formal training can be beneficial and may be lifesaving'.

*(Australian Resuscitation Council and New Zealand Resuscitation Council 2010)*

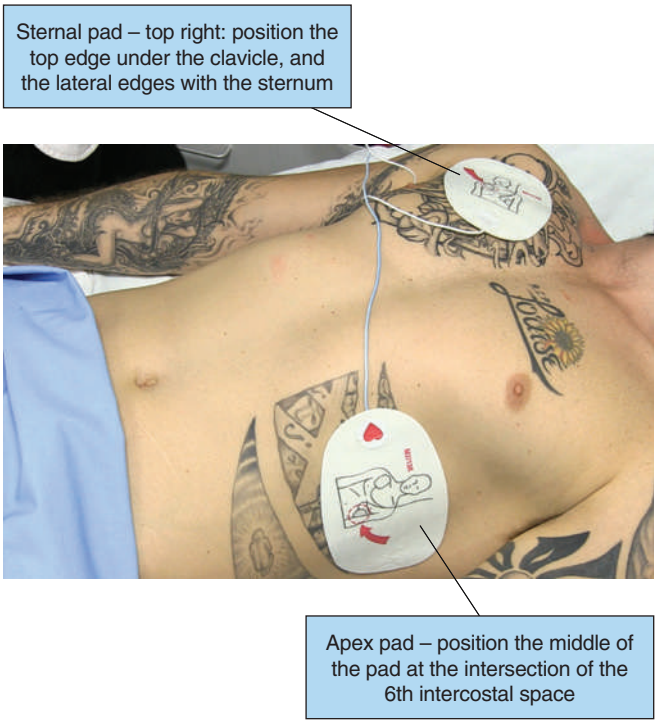



**Figure 44.6** AED pad placement. On large-breasted women the left electrode may be placed lateral to or underneath the left breast

*(© Elsevier Australia)*

- Remove jewellery
- Check for implanted devices (pacemakers).

### Placement of the pads

When applying AED pads (Figure 44.6):

- Remove dressings where pads are placed
- Avoid placing pads over implantable devices (e.g. cardiac pacemaker). If there is an implantable device the defibrillator pad should be placed at least 8 cm from the device
- Do not place AED electrode pads directly on top of a medication patch because the patch may block delivery of energy and cause small burns to the skin. Remove

medication patch and wipe the area before attaching the electrode pad
- In large-breasted women the left electrode or paddle may be placed lateral to or underneath the left breast (ARC 2016f; 2016g; 2014).

### Defibrillator safety

AED instructions:
- Always call 'stand clear' and visually check all personnel are clear prior to discharging the defibrillator
- Do not discharge paddles into the air
- Do not touch the person during defibrillation
- When a shock is delivered the person will usually jump as a consequence of the electrical energy passing through the body and the operator should take care to avoid flailing arms or legs
- Oxygen masks and nasal cannula should be placed a least 1 m away from the person
- Ensure free-flowing oxygen is moved at least 1 m from discharge
- Ensure the person is not near inflammable fluids, fumes or chemicals that could ignite
- Ensure any fluids or water are not present. Dry the individual's chest if necessary as contact with fluid may conduct a shock (ARC 2016f; 2016g; Sunde et al 2010).

If signs of life—including return of a palpable pulse—are evident, successful resuscitation has occurred (at least temporarily) and post-resuscitation care can begin.

## POST-RESUSCITATION CARE

Resuscitation does not stop after the return of a spontaneous circulation. Airway and breathing must be maintained and the blood pressure restored. Hypoxic brain injury, myocardial injury or subsequent organ failure are the predominant causes of morbidity and mortality after cardiac arrests (ACR 2016i; Deakin et al 2010).

Immediate post-resuscitation care should include an ABCDE assessment with the recording of vital signs, and a 12-lead ECG. The medical officer will order a chest x-ray and a full blood screen and any other specific investigations necessitated by the individual's condition (Deakin et al 2010).

Post-resuscitation nursing care needs to achieve certain goals. An example of a nursing care plan has been provided in Nursing Care Plan 44.1.

### Initial objectives of post-resuscitation care

Initial objectives of post-resuscitation care are to:
- Optimise cardiopulmonary function and systemic perfusion, especially perfusion to the brain
- Continue care in an appropriately equipped critical care unit
- Try to identify the precipitating causes of the arrest
- Institute measures to prevent recurrence
- Institute measures that may improve long-term, neurologically intact survival.

The individual post resuscitation is likely to develop electrolyte abnormalities that may be detrimental to recovery. The following investigations may be requested by medical staff. After successful resuscitation you may be required to assist in the following processes, as guided by the Registered Nurse:
- Serum electrolytes: hypo/hyperkalaemia and other metabolic disorders including acidosis and disturbances of magnesium, phosphate and calcium (to treat and prevent further cardiac arrhythmias)
- Arterial blood gases: hypocapnia can lead to cerebral ischaemia after cardiac arrest
- Electrocardiogram (ECG): to monitor rhythm and myocardium damage
- Blood glucose levels: strong association between high blood glucose after resuscitation from cardiac arrest and poor neurological outcome (Deakin et al 2010)
- Transfer of the individual to the special care unit if appropriate
- Consultation for friends and relatives with medical personnel to discuss the event
- Offer pastoral care or services of social worker
- The person should be examined for resuscitation-related injuries (e.g. rib fractures).

#### Emotional care for individual and friends

Nursing skills are important in helping family/significant others to understand and come to terms with a resuscitation

### NURSING CARE PLAN 44.1

**Assessment:** Mr Andrew Thomas has been transferred to high-dependency unit (HDU) post cardiac arrest 36 hours ago; you will be providing ongoing nursing care for this individual.
Mr Thomas's past medical history includes hypertension, elevated total serum cholesterol and osteoarthritis of the knees. At previous baseline, he could walk up to four blocks but felt short of breath with this degree of effort or when climbing two flights of stairs. This pattern has been stable for the past 6 months. He has never experienced chest pain. He attributed his shortness of breath to 'deconditioning' but had not yet discussed this symptom with his GP.
**Issue/s to be addressed:** Decreased cardiac output post cardiac arrest
**Goal/s:** Maintain the individual's blood pressure within an acceptable range to promote warm dry skin, a regular heart rhythm, clear lung sounds and strong bilateral equal peripheral pulses

## NURSING CARE PLAN 44.1—CONT'D

| Care/Actions: | Rationale: |
|---|---|
| Assess neurological status 4 hourly | Restlessness and anxiety are early signs of change in health status and a result of hypoxia and reduced cerebral perfusion |
| Assess heart rate and blood pressure 4 hourly | Increase in heart rate and reduction in blood pressure are indication of deterioration in condition |
| Assess skin colour and temperature 4 hourly | Cold clammy skin is secondary to a compensatory response to stimulation of the sympathetic nervous system, resulting in low cardiac output and oxygen desaturation |
| Assess peripheral pulses 4 hourly | Pulses that are weak and thready could indicate a reduced cardiac output |
| Assess fluid balance and weight gain | Increase in body weight is an indicator of fluid or sodium retention caused by the compromised regulatory mechanisms |
| Assess heart sounds 4 hourly | Different heart sounds can indicate issues with left ventricular ejection (S3 and S4) and a reduction in the compliance of the left ventricle |
| Assess lung sounds 4 hourly | Listen to all lung fields (crackles can indicate accumulation of fluid); look for signs of orthopnoea (difficulty breathing) |
| Continuous ECG monitoring | Monitor for signs of tachycardia, bradycardia, ectopic beats due to electrolyte imbalances—all can compromise cardiac output |
| Assess response to increased activity | Physical activity increases workload on the heart; assess for signs of fatigue and exertional dyspnoea |
| Assess urine output and frequency of urination | The renal system compensates for a low blood pressure by retaining water<br>Oliguria can be an indication of decreased renal perfusion |
| Assess for chest pain | A reduced cardiac output can affect perfusion of the myocardial muscle causing chest pain<br>Indication of imbalance between oxygen supply and demand |

### Evaluation

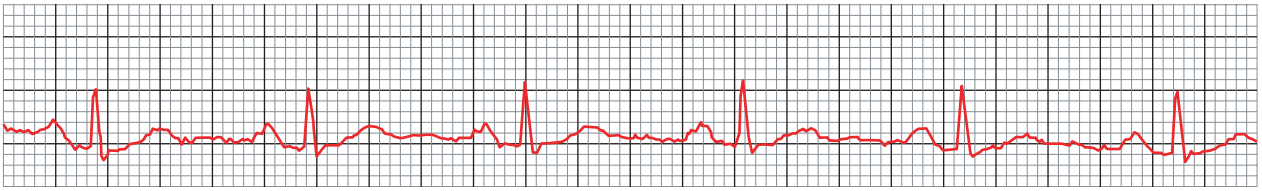
CNS: Alert and orientated, individual educated on the signs and symptoms of chest pain. Individual self-reports no further episodes of chest pain.
CVS: Haemodynamically stable, vital signs maintained within parameters set by medical officer, warm and well perfused. Fluid balance maintained. TED stockings in situ.
RESP: Bilateral equal air entry all lung fields on auscultation. $SpO_2$ on room air 96%, exercise tolerance increasing gradually.
GIT: Bowel sounds all quadrants, bowels opened assisted by stool softeners, tolerating light sodium-reduced diet.
URO: Voiding good clear amounts of urine (see fluid balance chart); individual educated to use urinal so nurse can measure amounts.
INTEG: Skin turgor good, no breaks in skin, reddened areas from defibrillator pads improving.
Person reports that his tolerance to exercise is improving, cardiac rehab continues, SOB minimal and recognises the signs of 'overdoing it'.

**Nursing interventions**

Administer medications as per medication chart, observing for response and indication of side effects. Ask medical officer for parameters for withholding any medications.
Maintain an optimal fluid balance: for individuals with decreased preload, administer fluids as prescribed and monitor closely for effects of the fluid challenge. This will increase extracellular fluid volume and in turn increase cardiac output.
Maintain haemodynamic parameters at prescribed levels as per medical officer's orders through titration of medications and fluids.
Individuals with increased preload should be prescribed fluid and sodium to reduce extracellular fluid volume.
Maintain adequate ventilation and circulation through positioning individual in semi-high Fowler's as tolerated to reduce preload and filling of the ventricles, therefore reducing work on the heart.
Place the individual in a supine position to increase venous return and promote diuresis.
Administer humidified oxygen as prescribed and monitor closely to accommodate increased oxygen demands.
Ensure promotion of physical and emotional rest by restricting activity to reduce oxygen demand, maintain a quiet relaxed environment to reduce emotional stress that can increase the heart rate and increase cardiac demands. Cluster medical and nursing care to allow for rest periods. Monitor the individual's response to activity to ensure the cardiac demands are within an acceptable limit for the individual.
Administer stool softeners to prevent person straining and placing further demands on the cardiac output.
Monitor the individual's sleep patterns and administer prescribed sedatives as rest is important for conserving energy and promoting recovery.
Provide education for the individual and significant other/s including the signs and symptoms of chest pain.
Explain medications including why they have been prescribed, the dose and any side effects.
Explain the importance of a gradual activity regimen and the signs and symptoms of over-exertion.
Explain the importance of diet restrictions, including fluid and sodium intake, the signs of fluid overload including shortness of breath, weight gain and swelling in ankles.

### CRITICAL THINKING EXERCISE 44.2

If you saw the rhythm below after defibrillation, how would you determine if it is pulseless electrical activity?



event. Individuals who survive resuscitation can experience anxiety, depression, post-traumatic stress disorder (PTSD) and difficulty with cognitive functions (Soar et al 2010). Similarly, the conscious, recovering individual may need help in understanding what has happened to them, the immediate consequences and their future. Nurses are often the providers of skilful, appropriate care and support to individuals (Soar et al 2010).

## IN-HOSPITAL MET DOCUMENTATION

The legal requirement for nurses to document individual care accurately and concisely is clear in the professional standards produced by governing and regulatory bodies. Treatment sequences including the 'who', 'what', 'where' and 'when' of interventions and subsequent individual responses must be documented accurately (Mardegan et al 2013). See Figure 44.7.

### Documentation

The role of documenter/scribe should be assigned to a staff member who is experienced with the data needed and how to obtain it. For example, the documenter may need to request that, as any medication is administered by IV push to the individual, the provider announces when it is 'in' so that the time documented is accurate. The documenter should have no other role during the resuscitation so that full attention can be given to collecting the data and following the multiple interventions that often occur simultaneously (Clements & Curtis 2012).

#### Rationale for documentation

- Provides information that can guide continuing care for the individual
- Helps to answer questions the family may have about the event
- Assists the institution to know if resuscitation care has been provided according to current standards
- Identifies quality issues so they can be investigated in a timely manner
- Provides aggregate data that can be used to identify variances of concern and as the base for continuous quality improvement efforts
- Provides information to guide resource allocation related to personnel, equipment and supplies used during resuscitations
- Helps to identify learning needs of staff
- Provides the data to answer research questions
- Can reduce the risk of medical litigation (ARC 2014).

#### Overcoming barriers to accuracy of in-hospital cardiac arrest documentation

Nurses play an important part in ensuring accurate documentation of the course and nature of resuscitation events. Document the incident management, medications and outcomes (as per hospital procedures and policies). When situations arise that compromise individual care nurses must be prepared to initiate and submit critical incident reports. The nurse team leader or delegate of the ward initiating the code blue event is responsible for ensuring all forms are completed accurately (these will depend on the healthcare facility's procedures and policies).

#### Suggestions for documentation

Most hospitals will have a template with guidelines for documentation. The record should include the following:

1. The individual's demographics
2. Times of arrest, initiation of CPR, defibrillation and initiation of ALS
3. Doses and routes of administration of drugs
4. Sequential cardiac monitoring with correlation to the individual's status, therapy and responses
5. Counter shocks delivered
6. Special procedures such as airway support, chest drains or external cardiac pacing
7. Vital signs and the individual's response to any interventions
8. The individual's status and disposition at the end of resuscitation.

Suggested data elements for collection can be divided into three categories of variables:

1. Individual variables (e.g. age, gender, witnessed/unwitnessed, location of event, date/time of event, comorbidities, any allergies)
2. Event variables (e.g. initial rhythm, essential interventions, event times)
3. Outcome variables (e.g. return of spontaneous circulation (for at least 20 minutes), discharge alive from the hospital, neurological status at discharge, length of stay).

Respond MET Record

UR Number _____

Surname _____

Given Name(s) _____

Date of Birth _____

AFFIX PATIENT LABEL HERE

(Identify) Primary Nurse's name _____ Date: ___ /___ /___ Time: _____ Ward: _____

(Situation) Why was the MET called?

- ☐ Obstructed airway
- ☐ Any difficulty breathing
- ☐ Breathing < 6 breaths / min
- ☐ Heart rate < 40 beats / min
- ☐ Patient cannot be roused
- ☐ Severe bleeding > 100 mls/hr
- ☐ Noisy breathing / Stridor
- ☐ $SaO_2$ < 90% despite 10L oxygen
- ☐ Breathing > 25 breaths / min
- ☐ Heart rate > 120 beats / min
- ☐ Prolonged seizures
- ☐ Worried / other _____
- ☐ Problems with tracheostomy tube
- ☐ Urine output < 50mL in 4 hrs
- ☐ Systolic blood pressure < 90mmHg
- ☐ Sudden change in conscious state
- ☐ Sever / uncontrolled pain

(Background) Past History _____

Reasons for hospital admission _____

(Assessment)

ABBREVIATIONS FOR MANAGEMENT (below):

| | |
|---|---|
| AIRWAY | Patient Maintained (PM), Guedel (G), Assisted Jaw Thrust/Chin Lift(AL), Intubated (ETT), Other (O) |
| BREATHING | Spontaneous breathing (SB), Bag Mask Ventilation (BMV), Mechanically Ventilated (MV), Non-Invasive Ventilation (NIV) |
| CIRCULATION | Rhythm: Sinus Rhythm (SR), Sinus Bradycardia (SB), Sinus Tachycardia (ST), Atrial Fibrillation/Flutter (AF), Supraventricular Tachycardia (SVT), Other (O) |
| NEUROLOGICAL | GCS Score or Alert (A), Responds to verbal stimuli (V), Responds to pain (P), Unconscious (U) |

MANAGEMENT SEQUENCE:

| Time | Airway | Breathing | | Circulation | | | Neuro | Drug & Dose Addictional Observations eg. $O_2$ Therapy, Temperature, BSL and Comments |
|---|---|---|---|---|---|---|---|---|
| | | Mode & Rate | $8pO_2$ | Rhythm | MR | BP | | |
| | | | | | | | | Initial values |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | Continued on reverse |

OUTCOME:

Transferred to ☐ ICU ☐ 5 EAST ☐ Emergency Department

OR ☐ Upgrade to Respond Blue OR ☐ Remained on ward / not transferred out

NEXT OF KIN NOTIFIED Name: _____ Time: _____ BY WHOM _____

PATIENT UNIT NOTIFIED: Doctor: _____ Time: _____ BY WHOM _____

Respond MET Record

M 16.13

**Figure 44.7** In-hospital MET documentation

Suggested critical time elements should be documented:

- Time from collapse to the beginning of CPR
- Time from collapse to first defibrillation when the initial rhythm is VF or pulseless VT
- Time from collapse to first dose of adrenaline.

## STAFF DEBRIEFING

Debriefing is a process to help people use their abilities to overcome the effects of critical incidents and should be performed within 24 hours post trauma, ideally at the end of the shift. Debriefing allows all personnel involved in the critical event to voice their concerns and reflect on the incident.

The debriefing should include the following:

- Forming a clear idea of the events
- Taking stock of the thoughts and reactions staff have experienced
- Providing information about normal stress responses to abnormal experiences
- Helping to mobilise problem-solving strategies
- Supporting personal needs.

## MANAGING SPECIFIC EMERGENCY SITUATIONS

Anaphylaxis is the most severe form of allergic reaction requiring urgent medical treatment. The Australian Society of Clinical Immunology and Allergy (ASCIA 2015) defines anaphylaxis as:

*any acute onset illness with typical skin features (urticarial rash or erythema/flushing, and/or angio-oedema), plus involvement of respiratory and/or cardiovascular and/or persistent severe gastrointestinal symptoms OR any acute onset of hypotension, bronchospasm or upper airway obstruction where anaphylaxis is considered possible, even if typical skin features are not present.*

**(ASCIA 2015)**

See Table 44.3 for signs and symptoms of allergic reactions.

Emergency management of anaphylaxis includes:

- Placing the individual in the supine position to improve blood return to the heart, as fatality can occur within seconds if an individual stands or sits upright suddenly
- If the individual is having difficulty breathing, allow them to sit, but do not allow them to stand or walk
- Individuals who are vomiting or pregnant should be placed in the left lateral position
- Adrenaline is administered as it is the first-line treatment of anaphylaxis and acts to reduce airway mucosal oedema, induce bronchodilation, induce vasoconstriction and increase strength of cardiac contraction
- Intravenous fluid resuscitation with saline
- The individual's airway is supported with ventilation and/or supplementary oxygen (Simons et al 2011; 2014).

**TABLE 44.3 | Signs and symptoms of allergic reactions**

| Mild or moderate reactions | Anaphylaxis |
|---|---|
| Swelling of lips, face, eyes<br>Hives or welts<br>Tingling mouth<br>Abdominal pain, vomiting (these are signs of anaphylaxis for insect allergy) | Difficult/noisy breathing<br>Swelling of tongue<br>Swelling/tightness in throat<br>Difficulty talking and/or hoarse voice<br>Wheeze or persistent cough<br>Persistent dizziness or collapse<br>Pale and floppy (young children) |

*(Adapted from Loh et al 2012)*

### Shock

Shock occurs when the circulatory system is no longer able to complete one of its essential functions such as providing oxygen and nutrients to the cells of the body or removing subsequent waste. Shock is a potentially life-threatening condition resulting from an imbalance of oxygen supply and demand causing hypoxia. Hypoxia affects cell function resulting in organ failure and potentially death (Richards & Wilcox 2014). There are many causes of shock including sepsis, cardiac pump failure, hypovolaemia and anaphylaxis. Individuals in shock can present with a variety of signs and symptoms and there are multiple factors to be considered, including age and comorbidities. The three stages of shock are considered as compensated, progressive and decompensated (Jones & Rushton 2012).

#### Early signs of shock: compensatory stage

This stage is described as a reduction in cardiac output activated by the baroreceptors located in the aortic arch and carotid body. As the receptors recognise the reduction in blood pressure they reduce the transmission of nerve impulses to the cardiovascular centre in the medulla oblongata. As the individual starts to experience a threat to circulation, this threat starts a chain of responses that are intended to maintain a good circulation. These changes are referred to as the compensatory mechanisms as they are designed to compensate for a problem with circulation that has developed. A person who has an effective compensatory response to an insult of circulation can appear quite well; however, the person may be suffering a serious circulatory problem. It is the signs of compensation that alert the nurse to the fact that the person may be in shock (see Clinical Interest Box 44.6 and Table 44.4). All health professionals caring for individuals potentially at risk of shock should aim to identify and correct shock during this compensatory phase (Moranville et al 2011).

**TABLE 44.4 | Stages of shock**

| | |
|---|---|
| **Early stage (compensated shock): compensatory mechanisms are able to maintain perfusion of vital organs** | |
| Heart rate | Mild tachycardia; bounding pulse |
| Level of consciousness | Lethargy, confusion, combativeness |
| Skin | Delayed capillary refill; cool and clammy |
| Blood pressure | Normal or slightly elevated |
| Respirations | Rapid and shallow |
| **Middle stage (uncompensated shock): compensatory mechanisms are unable to maintain perfusion** | |
| Heart rate | Moderate tachycardia; weak and thready pulse |
| Level of consciousness | Confusion or unconsciousness |
| Skin | Delayed capillary refill; cold, clammy and cyanotic |
| Blood pressure | Decreased |
| Respirations | Rapid and shallow |
| **Late shock** | |
| Heart rate | Bradycardia; severe arrhythmias |
| Level of consciousness | Coma |
| Skin | Pale, cold, marked diaphoresis |
| Blood pressure | Marked hypotension |
| Respirations | Decreased rate and tidal volume |

*(Adapted from Kalla & Herring 2013; Rivers et al 2011)*

## CLINICAL INTEREST BOX 44.6 Compensatory stage

- Reduced urine output
- Increased heart rate
- Increased respiratory rate
- Change in pulse pressure (the distance between the systolic and diastolic blood pressure)
- Delayed capillary refill (2 seconds or greater)
- Thirst

*(Garretson & Malberti 2007)*

## CLINICAL INTEREST BOX 44.7 Decompensatory stage

- Signs of early shock
- Lowered blood pressure
- Altered level of consciousness/unconsciousness
- Bradycardia (slow heart rate)
- Looks very unwell
- Oliguria (less than 30 mL of urine per hour or 0.5 mL per kg of weight)

*(Garretson & Malberti 2007)*

### Late signs of shock: decompensatory stage

The period of compensation provides the body with the opportunity to correct itself. In addition to this, this period of compensation provides health professionals with an opportunity to intervene. If this opportunity is not recognised, or the condition causing the shock is severe, the disease can outstrip the body's ability to compensate and signs of circulatory failure will occur. When this happens, the person is said to have decompensated (see Clinical Interest Box 44.7). Late decompensation is normally easily recognised, as the person deteriorates rapidly (Vadakel & Rizzolo 2013).

### Recognising the individual in shock

Traditionally, the presence of a low blood pressure was a sign that the person was in shock; however, low blood pressure is a very late sign of shock and, as previously mentioned, it is a sign that the person is starting to deteriorate. Many changes can be seen before an individual's blood pressure becomes low and it is these signs you must watch for if you are to accurately recognise the person in the early stages of shock.

### Managing the individual in shock

Although the different types of shock require different approaches, the general management of the person in shock should follow the ABC (airway, breathing and circulation) of resuscitation. After securing the airway, probably one of the most important interventions that ward staff can initiate in a spontaneously breathing person is to administer high-concentration oxygen through a non-rebreathe mask (O'Driscoll 2012).

Management in all types of shock includes the following:

- Basic life support—ABC
- Fluid replacement
- Vasoactive medications (a class of medications used to increase the blood pressure)
- Maintaining a patent airway and adequate ventilation
- Promoting restoration of blood volume; administering fluids and blood replacements as ordered
- Administering medications as ordered
- Minimising factors that contribute to shock
- Maintaining continuous assessment of the person

- Providing psychological support: reassuring the person to relieve apprehension and keep family members/significant others informed. The nurse's ability to recognise and consider the emotional and psychological distress suffered by these individuals could significantly improve the individual's long-term wellbeing (Mirabel et al 2011)
- Providing nutritional support.

It is important to remember to ensure safe administration of ordered fluids and medications, documentation of their administration and evaluation of the effects. Monitor the person for signs of complications and response to treatment. Oxygen is administered to increase the amount of oxygen carried by the available haemoglobin in the blood.

# CARDIAC EMERGENCIES

Any number of factors can disrupt the normal cardiac excitation process, resulting in arrhythmic contractions. Such factors include disease, metabolic and electrolyte imbalances, abnormal autonomic influence on the heart, toxicity to other drugs (e.g. digitalis) and myocardial ischaemia and infarction (Jafri 2012).

## Angina

Angina occurs when the coronary arteries become seriously narrowed by disease and the supply of oxygenated blood to the heart becomes insufficient for the increased oxygen needed (Patton & Thibodeau 2012).

### Manifestations of angina

Individuals often describe the pain as constricting, squeezing or suffocating, usually occurring after exercise. Angina can also be brought on by exposure to cold or emotional stress and is often of a short duration.

### Management of angina

Emergency management of angina includes:

- Reducing the workload on the heart to prevent further damage
- Encouraging the person to rest to prevent further exertion on the heart
- Keeping the person quiet and still
- Moving the person to a warm environment to prevent shivering
- Removing constrictive clothing
- Observing ABC.

### Initial management

- Call for assistance and reassure the person
- The routine use of supplemental oxygen is not recommended. Supplemental oxygen should be initiated if the individual is short of breath or there are signs of hypoxaemia, heart failure or shock (ARC 2016j; Chew et al 2011). There is relatively limited evidence from clinical studies to support the routine use of oxygen therapy in acute coronary syndrome (ACS) (Cabello 2010)
- Pulse oximetry should be used as a guide to administering oxygen therapy (ARC 2016k). The bottom line is that in individuals with suspected or proven ACSs, the routine use of supplemental oxygen is not recommended. However, oxygen therapy is indicated for individuals with hypoxia and those with evidence of shock to correct tissue hypoxia. It is recommended that oxygen administration be targeted to achieve oxygen saturation ($SpO_2$) of 94–98% (Caldeira 2014; Singletary et al 2015)
- Request or assist the Registered Nurse or doctor with gaining IV access if not already established
- Administer prescribed morphine intravenously to relieve pain
- Document effectiveness of pain relief
- Administer dispersible aspirin (instruct the individual to chew tablet)
- Acquire ECG.

## Myocardial infarction: cardiac arrest

Acute myocardial infarction (AMI) is a sudden loss of blood supply to an area of the heart, causing permanent heart damage or death. There are different types of AMI, classified by the location in the heart where the infarct occurs. Blood flow to the myocardium may be obstructed by atherosclerosis or thrombus formation (coronary occlusion). Damage occurs to the heart muscle when blood supply in the coronary arteries is blocked (Patton & Thibodeau 2012).

### Manifestations of myocardial infarction

Individuals can often confuse the pain with indigestion, as it ranges from discomfort to unbearable. The pain is often described as crushing, squeezing, tightness, aching, constricting or heavy, and is frequently around the central chest area, but may radiate to the back, shoulder, neck, jaw and arm. The person may have cool, pale and clammy skin, an early sign of shock. One of the significant differences between angina and a myocardial infarction is that medication or rest does not relieve myocardial infarction pain (Zafari et al 2011).

### Management of myocardial infarction

Emergency management of myocardial infarction includes:

- Keeping the person still and providing reassurance
- Calling emergency help
- Obtaining information about the individual's condition
- Assisting with gaining patent IV access
- Assisting with prescribed medication
- Monitoring vital signs
- Retrieving emergency equipment—emergency trolley including AED
- Being prepared to perform CPR if there are no signs of life following the algorithm for BLS.

When stabilised the individual will be transferred to one of the following: catheter lab for angiogram or ICU/CCU for further management.

## Hypertensive crisis

The definition of hypertensive crisis relies on absolute blood pressure; such numerical digits cannot verify the hypertensive crisis being urgent or emergent (Al Bannay et al 2013). A hypertensive crisis is a severe, sudden elevation in blood pressure that is accompanied by progressive or impending organ damage including irreversible injury to the brain, heart or kidneys. The brain is particularly vulnerable to the effects of severe hypertension. Isolated systolic hypertension, diabetes mellitus and poor adherence to treatments are known predictors of hypertensive crises. Presenting clinical signs and symptoms can differentiate hypertensive emergency versus urgency. Shortness of breath and neurological deficits indicate hypertensive emergency, whereas giddiness and headache are typical of hypertensive urgency (National Heart Foundation of Australia 2010). A hypertensive crisis is not an isolated BP reading but a clinical state and it is not necessary for the person to have a systolic BP >180 mmHg.

Individuals at risk of experiencing a hypertensive crisis include:

- Individuals with primary hypertension—a condition in which the cause of high blood pressure is unknown
- Individuals with secondary hypertension—high blood pressure that accompanies conditions such as renal disease, cardiovascular disease and sleep apnoea.

### Signs and symptoms

Signs and symptoms include headache, dizziness, syncope, numbness, weakness, blurred vision, angina pain, palpitations, peripheral oedema, fatigue and nose bleed.

### Nursing interventions

- Take a set of vital signs including blood pressure measurement on both arms
- Document and report your findings immediately to a senior staff member
- Assist with gaining patent IV access if not already established as the person will require a fast-acting IV antihypertensive medication.

Cardiac monitoring should be in place to monitor the person closely. For this reason the person is in most cases transferred to the intensive care environment for invasive blood pressure monitoring using an arterial line. You may be required to assist the Registered Nurse to prepare the individual for transfer to intensive care unit (ICU).

## Asthma

Individuals with asthma will have airways that narrow in response to triggers making it harder for them to breathe.

Three main factors cause the airways to narrow:

1. The inside lining of the airways becomes red and swollen (inflammation)
2. Extra mucus (sticky fluid) may be produced, which can block airways
3. Muscle around the airways tightens. This is called bronchoconstriction.

In the hospital environment, a person may be exposed to a number of different chemicals and be unaware that this may trigger an asthma attack.

### Signs and symptoms

A person experiencing an asthma attack may exhibit wheezing, chronic coughing, shortness of breath, chest tightness

### DECISION-MAKING FRAMEWORK EXERCISE 44.1

Molly is a student Enrolled Nurse currently on placement in an acute medical/surgical ward of the local hospital. She is working with her buddy nurse Lina and they have been allocated four individuals to care for. One of the individuals, Mr Beckett, complained of a headache and dizziness earlier this morning when he got up to go to the bathroom. Mr Beckett was admitted yesterday for review of his medications as he has hypertension that is not well controlled. Molly also notes that a previous admission was due to a hypertensive crisis. She takes a set of vital signs and notes that his blood pressure is quite high and that he appears quite red in the face. She goes to look for her buddy nurse to report Mr Beckett's vital signs, but is told that Lina has been called away. Molly looks at Mr Beckett's medication chart and notes that Mr Beckett has a new medication ordered that is due to be given.

Molly has not achieved 100% in her medication calculation hurdle so is not permitted to administer medications unless under direct supervision of her buddy nurse or clinical educator. She is concerned about Mr Beckett considering his past admission that involved a hypertensive crisis.

Using the decision-making framework:

1. What should Molly consider when deciding whether she should administer the medication?

### PROGRESS NOTE EXAMPLE 44.1

| | |
|---|---|
| 15/06/2015 2030 hrs | Nursing: Mr Beckett was admitted to the ward this afternoon for review of his medications for uncontrolled hypertension. On his last admission 12 months ago Mr Beckett had a hypertensive crisis. At 1800 hrs Mr Beckett's BP was 190/110 and he reported feeling unwell. The medical officer was notified and medication ordered as per medication chart. At 2000 hrs BP was 150/95 and Mr Beckett reported feeling better.<br>***M. Argote* (Argote) EN student** |

and anxiety. If the attack is life threatening, the person may demonstrate trouble focusing or talking, nasal flaring and cyanosis.

### Nursing interventions

- Think DRABC—person may need supplemental oxygen
- You may be asked to perform ongoing observation—remain calm and reassure the individual
- Measure and document vital signs with continuous pulse oximetry monitoring
- Alert the RN to *any* unusual findings of respiratory assessment
- You may be instructed to administer nebulised medications such as Ventolin (salbutamol) and/or Atrovent (ipratropium). Both are used to treat bronchospasm

Asthma emergency treatment is 4 puffs of Ventolin every 4 minutes until review

- Evaluate the individual's response to the bronchodilator.

## Seizures

Seizure is a sudden surge of electrical activity in the brain that usually affects how a person feels or acts for a short time. It is an event characterised by a sudden, excessive and disorderly (abnormal) discharge of electrons in the brain that may be accompanied by an abrupt alteration in motor and sensory function and level of consciousness.

Seizures are not a disease in themselves. Instead, they are a symptom of many different disorders that can affect the brain. Some seizures can barely be noticed, while others are totally disabling (Berg & Scheffe 2011). Individuals who present to emergency may have seizures that are secondary to causes such as electrolyte disturbances, withdrawal, toxins, infections, central nervous system (CNS) mass lesions or other aetiologies; these are classified as acute symptomatic or provoked seizures (Huff et al 2014).

Causes of seizures include:

- Brain tumours
- Cerebral hypoxia (breath holding, carbon monoxide poisoning, anaesthesia)
- Cerebrovascular accident (infarct or haemorrhage)
- Convulsive or toxic agents (lead, alcohol)
- Alcohol and drug use withdrawal
- Head injury (highest incidence is found in young adults)
- Heat stroke
- Infection (acute or chronic)
- Metabolic disturbances (diabetes mellitus, electrolyte imbalances)
- Kidney failure (uraemia)
- Degenerative disorders (senile dementia) (Berg et al 2010).

### Signs and symptoms

There are six types of generalised seizures:

1. Grand mal/tonic–clonic (loss of consciousness with generalised body stiffening followed by violent jerking)
2. Absence (a short loss of consciousness with few or no symptoms)
3. Myoclonic (sporadic jerks, usually on both sides of the body)
4. Clonic (repetitive rhythmic jerks involving both sides of the body)
5. Tonic (sudden stiffening of the body)
6. Atonic (sudden general loss of muscle tone which often results in a fall).

### Nursing interventions

If you suspect the person is having a seizure, stay with the person, and call for help. **Remember DRSABCD.**

### Initial nursing management

- Position the person to avoid aspiration or inadequate oxygenation
- If possible, a soft oral airway can be placed (do not force teeth apart)
- Suction and $O_2$ must be available
- Monitor respiratory function with ongoing pulse oximetry
- Note the time the seizure started, and what body part it is affecting, with the type of movement involved
- Loosen any restricting clothing; protect the person from harming themself with pillows, bed rails. Remove any furniture from the area but do not restrict the movement of their limbs as this may cause musculoskeletal damage
- Place the person in the recovery position if possible as this will assist the tongue to return to its front-forward position and will also allow accumulated saliva to drain from the mouth. Apply supplemental oxygen and have suction ready.

### Post-seizure care of the individual

- Provide adequate ventilation by maintaining a patent airway
- Suction secretions if necessary to prevent aspiration
- Allow the individual to sleep post seizure
- On awakening, orient the individual to what has occurred
- Provide reassurance as this can be a very distressing event
- Assist the Registered Nurse or medical officer to gain IV access
- Frequent monitoring of neurological status using the Glasgow Coma Scale, including vital signs, must be documented and any changes reported immediately
- Monitor glucose (hyperglycaemia followed by hypoglycaemia is common)
- Treat hyperthermia (occurs often with status epilepticus) aggressively.

## Epilepsy

Epilepsy is a disorder characterised by recurring seizures (also known as 'seizure disorder') parallelled to a seizure described

as a brief, temporary disturbance in the electrical activity of the brain. The human brain is the source of human epilepsy. Although the symptoms of a seizure may affect any part of the body, the electrical events that produce the symptoms occur in the brain. The location of that event, how it spreads and how much of the brain is affected and how long it lasts all have profound effects. These factors determine the character of a seizure and its impact on the individual.

### Terminology

*Status epilepticus*: a prolonged seizure (usually defined as lasting longer than 30 minutes) or a series of repeated seizures—a continuous state of seizure activity. Status can occur in almost any seizure type. It is a medical emergency and can be life threatening.

*Post-ictal phase*: the abnormal condition occurring between the end of an epileptic seizure and return to baseline condition (Fisher & Engel 2010).

### Nursing management in the post-ictal phase

Post-ictal behaviours and symptoms often require special assessment and treatment. Potential complications experienced during the post-ictal period include headache, functional deficits and behavioural manifestations. In the post-ictal phase individuals can experience delirium and psychosis and may exhibit agitation and confusion (Fisher & Engel 2010). Medical and emergency staff require careful training to manage behaviours associated with post-ictal delirium and psychosis in order to protect individuals while their confusion resolves (Krauss & Theodore 2010). See Chapter 35 for more information.

## Summary

The Enrolled Nurse requires the skills and knowledge to respond quickly and effectively in a variety of emergency situations, to be an effective member of a team and to work efficiently in a stressful environment. The Enrolled Nurse, as an integral member of the healthcare team, has a duty of care to deliver care that is holistic, including to the family and significant others. Nurses care for an increasing percentage of individuals with complex problems who are likely to be or become seriously ill during their hospital stay. The basic requirement is always thorough assessment, accurate measurement and recording of vital signs and timely reporting of any changes in the individual's condition, no matter how subtle the changes may appear to be. The effectiveness of handover tools such as ISBAR/ISOBAR ensures that all relevant information is communicated to all parties involved efficiently and effectively.

The inclusion of the Nursing and Midwifery Board's national framework for decision making offers a process to encourage the Enrolled Nurse to apply clinical judgment with decision making to promote safe individual care (Jacob et al 2013).

## Review Questions

1. Explain the aims of emergency care.
2. Provide a brief summary of your understanding of the modified early warning scores chart (MEWS).
3. You are working in the medical/surgical ward and are about to finish your morning shift. You decide to do a final check to ensure you have completed all your individuals' charts when you discover one of your individuals, Mr Lynch, collapsed on the floor in his room. When you enter the room you notice the following:
   - The individual is not moving
   - A vase of flowers is overturned on the floor.
   a. As the first responder what are your immediate priorities?
   b. Explain the assessment process when responding to an individual who is unresponsive.
4. Mr Lynch's medical history includes hypercholesterolaemia and hypertension; he had complained earlier in the day that he 'felt dizzy' when he got up to go to the toilet. There is no evidence in his progress notes that his concerns have been addressed or investigated. His admission notes state that he was admitted the previous day for stabilisation of his blood pressure. Mr Lynch has not had his vital signs measured since 0600 hrs that morning.
5. Reflect on this situation. How could you have managed this situation?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Australian Resuscitation Council: www.resus.org.au/

New Zealand Resuscitation Council: www.nzrc.org.nz/

CHAPTER 45

# Nursing care: maternal and newborn

*Kate Stainton*

## KEY TERMS

amenorrhoea
Apgar score
birth
breast milk
caesarean
colostrum
fetal heart rate
fetus
labour
lanugo
lochia
meconium
morning sickness
quickening
trimester
uterine enlargement
vernix caseosa

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Describe the physiology of pregnancy
- Describe the physiological changes that occur during pregnancy
- Discuss the care of the pregnant woman during the pre/antenatal period
- Explain the postnatal care of the woman
- Identify common medications used in the final stage of labour
- Identify activities that should be included in a daily care plan for a normal newborn

## CHAPTER FOCUS

Maternity nursing involves the care of a woman during her pregnancy and labour, and the care of both the woman and her baby during and after birth. Although midwifery is a specialised profession, requiring the learner midwife to undertake a separate educational program, the Enrolled Nurse may be required to assist in the provision of maternity care. It is therefore important that the Enrolled Nurse has a basic knowledge of human growth and development, the processes of normal pregnancy and labour and an understanding of the immediate and subsequent care of the mother and the newborn infant. The actual work and scope of practice of the individual Enrolled Nurse is influenced by the employment setting, their level of competency and employer policy requirements.

The birth of a baby follows a woman's pregnancy and the process of labour. The first part of this chapter focuses on the physiology of pregnancy and the indicators and methods of confirming pregnancy and pregnancy care, which includes preparing for the birth. Later, the four stages of labour, and nursing measures for mother and baby during the postnatal period, are explained.

## LIVED EXPERIENCE

My mother-in-law keeps telling me that if I put my baby on his back to back to sleep he will get a flat head, but the midwives say that sleeping on his stomach will increase his risk of SIDS. I know that sleeping him on his back or side and breastfeeding are two things that I can do to help prevent SIDS. There is so much to learn and take in at the moment; sometimes it is hard to remember it all.

**Kim, talking to Jane, an Enrolled Nurse**

# PREGNANCY

Pregnancy (the gestational process) comprises the growth and development, within a woman, of a new individual from conception to birth. The average duration of pregnancy is 266 days after fertilisation of the ovum, or 40 weeks from the first day of the last normal menstrual period.

## Physiological changes

Pregnancy, which is a normal physiological function, produces changes in almost all the mother's body systems. Most of these changes are temporary and most are the result of hormone actions. These changes prepare the mother's body to protect the developing embryo and fetus, provide for the demands of the **fetus** and prepare to feed the baby when it is born. Profound endocrine changes occur that are essential for maintaining pregnancy, normal fetal growth and postpartum recovery. The hormonal factors involved in pregnancy are listed in Table 45.1.

Pregnancy can be divided into three periods called **trimesters**, each lasting about 3 months (Blackburn 2013; Davidson et al 2014). The first trimester comprises the embryonic phase. The uterus continues to be a pelvic organ. Towards the end of the first trimester it is possible to record fetal heart tones by fetascope or ultrasound. The second trimester comprises the fetal phase of development. During this phase the uterus becomes an abdominal organ. A protective coating called **vernix caseosa** covers the fetus. **Lanugo**, fine downy hair, covers the body. At the end of the second trimester, the fetus resembles a small baby. During the last 3 months of pregnancy the fetus grows to approximately 50 cm and 3.2 to 3.4 kg (Crisp et al 2013). The skin thickens, subcutaneous fat makes the fetus appear rounder and the lanugo begins to disappear. The normal fetus at this stage is ready to make the transition from intrauterine to extrauterine life.

Adaptation to pregnancy involves all of a woman's body systems. The mother's physical response is assessed in relation to normal expected alterations. Women can experience varying signs that can signify pregnancy. The maternal physiological changes during pregnancy are listed in Table 45.2.

### Psychological changes

During pregnancy a woman's psychological status may alter; for example, she may experience anxiety and emotional lability. The pregnant woman's psychological status depends on many factors, including her basic personality, whether the pregnancy was planned and is desired, the strength of her social and family support systems and her self-concept. A number of emotional problems can arise during pregnancy or after the birth. Anxiety or depression can occur antenatally or postnatally (see also Chapter 39).

## Confirmation of pregnancy

The signs of pregnancy are divided into three general groups: possible, probable and positive.

### Possible indicators of pregnancy

Signs of possible pregnancy are those from which a definite diagnosis of pregnancy cannot be confirmed. Signs and symptoms during this stage can often be caused by other conditions. The indications of possible pregnancy are:

- Amenorrhoea
- Nausea and vomiting
- Breast enlargement and tenderness
- Frequency of micturition
- Quickening (Perry et al 2014).

**TABLE 45.1 | Hormonal factors in pregnancy**

| Source | Hormone | Actions |
|---|---|---|
| Ovary | Oestrogens and progesterone during the first few weeks of pregnancy | Oestrogens influence:<br>• Uterine growth<br>• Breast growth<br>• Water and sodium retention<br>• Pituitary hormone release<br>Progesterone influences:<br>• Relaxation of smooth muscle<br>• Relaxation of connective tissue<br>• Secretory changes within the breasts<br>• Development of the lactiferous ducts |
| Placenta | Oestrogens and progesterone when the placenta is fully developed | |
| | Placental lactogenic hormone | Promotes growth, stimulates development of the breasts and plays a role in maternal fat metabolism |
| | Relaxin | Has a relaxant effect, especially on connective tissue |
| Pituitary | Thyroid-stimulating hormone (TSH) | Stimulates release of thyroxine to maintain increased metabolism |
| | Oxytocin | Contraction of the uterus (at the end of pregnancy). Secretion of milk (after birth) |
| | Prolactin | Initiates and sustains lactation (after baby is born) |
| Parathyroids | Parathormone | Maintains normal calcium ion concentration |
| Adrenals | Adrenal hormones (e.g. glucocorticoids and aldosterone) | Increased secretion maintains increased metabolism |

*(Blackburn 2013)*

**Amenorrhoea** (the cessation of menses) in a sexually active healthy woman is often the first indication of pregnancy. However, other factors may cause amenorrhoea, such as eating disorders (anorexia nervosa, bulimia), excessive exercise or changes in metabolism and endocrine function.

The symptoms of nausea and vomiting, which can occur at any time of the day, are often referred to as **morning sickness**. Nausea often occurs between 6 and 14 weeks gestation and is believed to be a result of large quantities of placental hormones (progesterone, oestrogen, human chorionic gonadotrophin [hCG] and human placental lactogen).

Breast enlargement and tenderness are a result of the placental hormones stimulating the breast ductal system in preparation for breastfeeding. Some women experience similar symptoms premenstrually and pregnancy is often overlooked for this reason.

Increased pigmentation of the skin occurs over the face (chloasma), breasts (darkening of the areolae) and abdomen (linea nigra—a dark line extending from the umbilicus to the symphysis pubis).

Frequency of micturition occurs at the start of pregnancy and then again in the third trimester. In the first trimester the enlarging uterus competes for space in the pelvic cavity and exerts pressure on the urinary bladder. In the later stage of pregnancy the descending fetal part of the uterus moves into the pelvic cavity in preparation for birth.

**Quickening** is the result of fetal movement and is first perceived at 16–20 weeks gestation. The sensation is felt by the mother and described as gentle fluttering in the lower abdomen (Pairman et al 2015; Perry et al 2014).

## Probable indicators of pregnancy

Abdominal **uterine enlargement**, the presence of Braxton Hicks contractions and a positive pregnancy test are indicators that a woman is probably pregnant. However, on very rare occasions there may be other conditions or factors (uterine tumours, medications or premature menopause) that cause these events.

Abdominal and uterine enlargement occurs around the 12th week of pregnancy. At this stage the fundus of the uterus can be located just above the symphysis pubis, and extends to the umbilicus between weeks 20 and 22.

Braxton Hicks contractions are irregular, painless uterine contractions that first occur in the second trimester. They are more pronounced in multiparas (women who have had more than one child) and can be mistaken for labour contractions.

A pregnancy test may be performed after the first missed menstrual cycle. Pregnancy tests use maternal blood or urine to determine the presence of the placental hormone human chorionic gonadotrophin (hCG). A positive result from a pregnancy test is considered an indicator of probable

## TABLE 45.2 | Physiological changes in pregnancy

| Area of change | Description |
|---|---|
| Uterus | Increase in size to about 30 × 22 × 20 cm (at term)<br>Increase in mass to about 1 kg (at term)<br>Cervix becomes softer (in preparation for labour)<br>A plug of mucus (the operculum) is formed by, and remains in, the cervix from the eighth week until labour begins<br>The uterus forms into two segments; the lower segment is thinner and becomes soft and dilated towards the end of pregnancy<br>Painless, irregular contractions (Braxton Hicks contractions) occur throughout pregnancy |
| Vagina | In early pregnancy, the vagina (and cervix) change in colour from pink to dark red/blue<br>The amount of acidic vaginal secretions increases<br>Thickness increases, due to venous dilation |
| Breasts | Increase in size and mass<br>Nipples enlarge and become more prominent and darker in colour<br>Areolae become darker<br>Prominent sebaceous glands (Montgomery's tubercles) appear on the areolae at about 12 weeks<br>Increased sensation and tingling<br>Colostrum (the fluid secreted during pregnancy) can be expressed at 16 weeks |
| Skin | Darker pigmentation in the nipples and areolae, on the face (chloasma) and on the abdominal midline (linea nigra)<br>Stretch marks may appear on the abdomen, breasts and buttocks<br>Spider naevi (bright red lesions with minute radiating branches) may appear on the face and upper chest |
| Musculoskeletal system | Spinal curvature changes to compensate for the abdominal enlargement, resulting in arching of the back<br>The symphysis pubis and sacroiliac joints become mobile and the pelvis becomes wider, due to softening of the connective tissue in preparation for labour |
| Urinary tract | Relaxation of smooth muscle causes the ureters to become dilated, elongated and kinked<br>These changes may lead to stasis of urine and infection<br>Frequency of micturition may occur in the early months, as the uterus occupies more of the pelvis<br>Reduced muscle tone in the pelvic floor, and increased pressure from the growing fetus, may result in stress incontinence towards the end of pregnancy |
| Gastrointestinal tract | Hormonal and mechanical changes (e.g. increased hormonal levels and reduced intestinal motility) may result in morning sickness, gastric acid reflux and constipation |
| Cardiovascular system | Blood volume increases by 40–50%<br>Cardiac output is increased because of increased blood volume<br>Haemodilution (due to increased plasma volume) results in lowered haemoglobin level<br>Coagulability of blood is slightly increased<br>Reduced tone in blood vessels may result in varicose veins |
| Respiratory tract | Ventilation rate is increased to obtain the higher amounts of oxygen required |
| Basal metabolic rate (BMR) | In the second half of pregnancy, BMR increases by 15–25% to cope with the increased demands |
| Body mass | Increases by about 25% of the pre-pregnant weight. Weight gain is due to the growth of the uterus and breasts, the uterine contents, increase in maternal blood volume and interstitial fluid and maternal storage of fats and protein |

*(Blackburn 2013; Pairman et al 2015)*

pregnancy. Provided that they are carried out precisely according to the given instructions, home pregnancy tests based on the amount of hCG in the urine are capable of greater than 97% accuracy.

Professional pregnancy tests based on urine or blood serum are even more reliably accurate. The most highly reliable test is the radioimmunoassay (RIA), a technique in radiology that can accurately identify pregnancy as early as 1 week after ovulation. While attributed with high levels of accuracy, pregnancy tests cannot be classed as absolutely certain indicators because there are factors that may interfere with the reliability of test results. These factors include premature menopause, the effects of taking some particular medications (anticonvulsants or anti-anxiety drugs) and the presence of a malignant tumour or haematuria (Murray & McKinney 2014).

### Positive indicators of pregnancy

The most positive sign of pregnancy is a growing and developing baby (Perry et al 2014). The fetal heartbeat can be detected as early as 10 weeks gestation using equipment such as a tocograph pelvic ultrasound or Doppler device. This scan enables (allows) the examiner to detect and record the fetal heart rate and therefore confirm pregnancy. The Doppler can be used to listen to the baby's heart rate from 18–20 weeks gestation onwards.

Fetal body parts can be felt by an educated examiner (medical officer, obstetrician or midwife) from the second trimester onwards. This gives the examiner an indication of the position of the fetus, which is vital during the third trimester when discussing birthing options.

## Estimated date of delivery

The date when the baby is due (confinement date) may be calculated by dates or using ultrasound. Calculation by dates to determine the estimated due date is made by ascertaining the first day of the last known menstrual period and adding 9 months and 7 days. Calculation by ultrasound is made by using height frequency, short wavelength and soundwave reflections to visualise the size of the fetus.

Estimated date of delivery (EDD) may be calculated by using the date of the LNMP, an early dating ultrasound or a scan at 18–20 weeks. The EDD according to the LNMP (last normal menstrual period) is used if:

- The LNMP is reliable (the woman is certain of the first day of LNMP and she has a regular 28- or 35[1]-day cycle)
- The early dating scan calculates the EDD to be within 5 days of a reliable LNMP due date.

The EDD according to the early dating ultrasound is used if:

- The LNMP is unreliable and/or
- The early dating scan calculates the EDD outside 5 days of a reliable LNMP due date

[1]Add 7 days to the EDD when a woman has a regular 35-day cycle

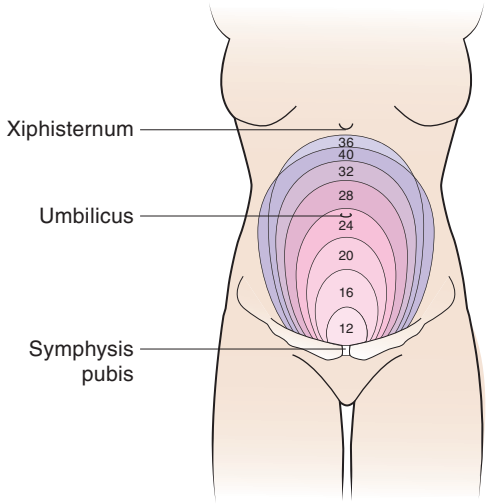


**Figure 45.1** Fundal height of the uterus

- Ultrasound performed prior to 14 weeks is more accurate for estimating gestation.

The 18–20-week scan should be used if:

- There was no dating scan performed and
- The LNMP is unreliable and/or
- The 18–20-week scan calculates the EDD outside 10 days of a reliable LNMP due date.

Fundal height is used to indirectly measure fetal growth in relation to gestational age. Fundal height, measured in centimetres, should equal the number of weeks of gestation plus or minus 2–3 cm (Murray & McKinney 2014). Calculation by assessing the fundal height (Figure 45.1) is made by measuring the height of the uterine fundus from the symphysis pubis.

## Minor discomforts associated with pregnancy

The pregnant woman may experience one or a variety of minor disorders or discomforts, many of which are the result of increased secretion of hormones or pressure from the uterus and its contents on other body structures. Table 45.3 lists the potential discomforts and outlines guidelines that can be used to increase women's levels of comfort.

# PRENATAL CARE AND PREPARATION

Prenatal (or antenatal) means before birth. The aims of prenatal care are to:

- Promote a healthy pregnancy and normal labour
- Promote the birth of a healthy, living baby
- Prepare the woman and her partner for labour and birth
- Detect and manage any complications.

## The initial consultation

The woman's initial consultation concerning her pregnancy may be with her general practitioner, obstetrician or a midwife. The first consultation involves obtaining a

**TABLE 45.3 | Health education: management of minor discomforts during pregnancy**

| Discomfort | Management guidelines |
|---|---|
| Morning sickness | Small, frequent dry meals<br>Fluids in between meals<br>Something to eat (e.g. a dry biscuit) before getting out of bed in the morning<br>Avoid fried and heavily spiced foods |
| Indigestion | Small frequent meals<br>Avoid spicy foods if not used to them<br>Elevate the head of the bed |
| Constipation | High-fibre foods<br>Adequate fluids<br>Exercise |
| Fainting | Avoid sudden postural changes<br>Avoid constrictive clothing<br>Avoid lying on the back during late pregnancy<br>Avoid fatigue |
| Backache | Maintain correct posture<br>Daily rest periods<br>Wear low-heeled shoes<br>Sleep on a firm surface (e.g. place a board under the mattress) |
| Varicose veins | Avoid long periods of standing<br>Avoid constrictive clothing<br>Elevate the legs whenever possible<br>Wear supportive stockings<br>Avoid sitting or standing with the legs crossed |
| Urinary tract infection | Adequate fluids<br>Perineal hygiene measures (e.g. wiping from front to back after elimination) |
| Leg muscle cramps | Avoid standing for long periods<br>Elevate the legs whenever possible<br>Relieve symptoms by pulling upwards on toes |
| Haemorrhoids | Avoid constipation<br>Relieve discomfort by applying cold compresses or icepacks |

*(Perry et al 2014; Lowdermilk et al 2014)*

comprehensive health and social history, thorough physical examination, and discussion on selecting where the woman wishes to give birth (Perry et al 2014).

The physical examination includes checking the blood pressure, heart, lungs, palpating the abdomen and assessing weight, height, body build and skin colour. Samples of urine and blood are obtained and tested. Urine is tested to diagnose pregnancy and to detect the presence of abnormalities; for example, glucose or protein. Blood is tested to determine blood group and Rhesus (Rh) factor status, haemoglobin level and the presence of rubella antibodies. It may also be tested to exclude certain disorders such as blood-borne viruses (e.g. human immunodeficiency virus (HIV) and hepatitis) and sexually transmitted infections (e.g. syphilis).

Problems may occur when a mother has an Rh (D) negative blood group and her baby is Rh (D) positive. If during pregnancy or labour the baby's blood cells cross the placenta into the woman's bloodstream and the woman produces antibodies to the baby's red blood cells problems such as severe anaemia, brain damage or even death may occur. This condition is known as haemolytic disease of the newborn. RH (D) immunoglobulin (also known as anti-D) is an antibody injection that can help prevent the woman developing antibodies to her baby's blood. This will help prevent potential harm to the baby during the pregnancy but also help protect babies in future pregnancies. It is given during pregnancy or soon after birth for all Rh (D) negative women who have an Rh (D) positive baby (Australian Red Cross Blood Service 2014).

A cervical smear and/or cervical swabs may be obtained if the woman has not had regular Papanicolaou (Pap) smears or if infection is suspected. This may be delayed until the woman has her 6-week post-birth check-up.

If pregnancy is confirmed, the obstetrician will discuss with the woman possible options regarding the birth. The woman may choose to give birth in a hospital, or in a birthing centre; she may also choose not to continue with the pregnancy (Pairman et al 2015).

Prenatal education may be provided by the obstetrician, midwives or childbirth educators. The educational aspects of prenatal care are listed in Table 45.4.

### Subsequent consultations

The frequency with which subsequent visits occur depends on the obstetrician and the needs of the woman, but the usual practice is to schedule visits every 4 weeks until 28 weeks, then every 2 weeks until 36 weeks, then weekly until birth.

Prenatal care involves:

- Gestation and estimated due date (EDD)
- Blood pressure
- Fundal height measurement
- Fetal movements
- Auscultation of the fetal heart
- Abdominal palpation.

The standard antenatal check provides the basis for routine biophysical screening, assessment, referral and education (Pairman et al 2015). Blood tests or other investigations, for example ultrasonic examination, may be performed as part of routine care or when other tests or physical symptoms indicate there is a need.

## LABOUR

**Labour** is the process in which the woman has uterine contractions to assist with her baby's **birth**. The process also

## TABLE 45.4 | Prenatal education

| Aspect | Description |
|---|---|
| Diet | A balanced diet designed to meet the nutritional requirements of pregnancy:<br>• An extra 600–800 kilojoules per day in the last 6 months of pregnancy<br>• An extra 500 mg of calcium per day in the last 4 months of pregnancy<br>• An extra 3 mg of iron per day throughout pregnancy<br>• Increased amount of vitamins, supplied by suitable foods rather than artificial supplements<br>• Total daily intake of about 10 500 kilojoules |
| Exercise | • Moderate exercise encouraged (e.g. a daily walk or swim). Some activities (e.g. vigorous athletics) may need to be avoided if the woman has a history of abortion or premature labour<br>• Prenatal classes educate the woman in specific exercises designed to prepare her for labour and birth |
| Rest | • Fatigue should be avoided by obtaining sufficient sleep and by having numerous short rest periods during the day |
| Hygiene | • Normal hygiene practices should be continued. Vaginal douching is to be avoided |
| Clothing | • The woman is advised to wear comfortable non-constrictive garments, and shoes with low heels<br>• Maternity girdles are available, which provide support for just above the symphysis pubis and the lower back |
| Preparation for labour and birth | • Education on childbirth and relaxation techniques is conducted on an individual or group basis by midwives or physiotherapists. The woman's partner is also encouraged to attend the childbirth education program, which prepares the couple for labour and birth. The classes include instruction in relaxation techniques<br>• The couple is also informed of the physiology of labour and encouraged to discuss all aspects of pregnancy, birth and care of the baby |
| Manifestations of complications | The woman is advised to contact her obstetrician or the hospital immediately if there is:<br>• Vaginal bleeding<br>• Abdominal or 'menstrual-type' pain<br>• Severe headaches<br>• Drainage of fluid from the vagina<br>• Excessive vomiting<br>• Blurred vision<br>• Difficulty in passing urine<br>• Swelling of the hands, feet or face |
| Manifestations of labour | The couple are informed of the manifestations of the onset of labour:<br>• Regular contractions<br>• Vaginal 'show' (blood-stained mucus)<br>• Drainage of amniotic fluid from the vagina (ruptured membranes) |
| Breasts | • Maternity brassieres are designed to support the breasts as they increase in size and mass<br>• If the nipples are flat or inverted, nipple shields may be worn under the brassiere. The shields depress the areolae and allow the nipples to extend |
| Sexual activity | • Sexual activity may be continued throughout the pregnancy, unless there is a risk of haemorrhage (e.g. from a malpositioned placenta (placenta praevia))<br>• If the woman has a history of spontaneous abortion, she may be advised to avoid sexual intercourse during the first 3 months of pregnancy |
| Environmental hazards | Factors potentially harmful to the pregnancy should be avoided:<br>• Smoking is linked to abortion, intrauterine growth retardation and perinatal death<br>• Alcohol is linked to physical and mental fetal abnormalities and fetal growth retardation<br>• Many drugs, prescribed and unprescribed, are linked to physical and mental fetal damage<br>• Exposure to microorganisms (e.g. the rubella virus) in the first 3 months can result in fetal abnormalities<br>• Immunisations generally should not be performed during pregnancy because of possible damage to the fetus<br>• Exposure to radiation during the early weeks of pregnancy may inhibit normal cell division<br>• Exposure to pesticides and other chemicals may result in fetal abnormalities |

*(Murray & McKinney 2014; Lowdermilk et al 2012)*

includes the vaginal birth of the placenta and membranes. Normal labour occurs spontaneously at about 40 weeks of pregnancy and lasts for up to 24 hours after onset. Factors that cause the spontaneous onset of normal labour include changes in hormonal levels, uterine distension, fetal pressure and a sudden reduction of intrauterine pressure when the membranes rupture (Davidson et al 2014; Murray & McKinney 2014). Labour is divided into four stages; Table 45.5 lists the characteristics of each stage. During labour the uterus contracts rhythmically to dilate and efface (take up) the cervix and push the fetus through the birth canal. After the baby is born the uterus continues contracting to aid in birth of the placenta and membranes.

Labour and childbirth are normal events, accompanied by a variety of emotions, such as excitement, fear, anxiety and anticipation. As the management of, and attitudes towards, labour and birth differ widely among different cultures, expectant women, obstetricians and midwives, practices are adjusted according to individual needs, knowledge and experience. The following section addresses the general aspects of care and support throughout labour and birth.

## The first stage

### Latent stage

Latent stage refers to a period of time, not necessarily continuous, when the woman has painful contractions with some cervical change, including cervical effacement and dilation up to 4 cm.

### Active or established first stage

In this stage there are regular, painful contractions associated with progressive cervical dilation from 4 cm.

Care during the first stage involves monitoring the progress of labour, monitoring the condition of the woman and unborn baby (fetus) and promoting physical and psychological comfort. Progress of labour is monitored by assessing the strength, frequency and duration of contractions, by palpating the abdomen to assess the position and descent of the fetus and by performing vaginal examinations only when deemed necessary to assess the degree of cervical dilation and the position of the presenting part of the fetus. The condition of the woman and her response to labour are monitored by checking her vital signs, by observing urinary output and testing the urine for the presence of protein and ketones, and by observing her for the manifestations of fatigue, discomfort or pain.

The health of the unborn baby is monitored by assessing the fetal heart. As the **fetal heart rate** and rhythm is the main indicator of the baby's health, the heartbeat is regularly assessed during labour. The heart rate should remain between 120 and 160 beats per minute and the beat should remain strong and regular. Assessment may be performed by listening to the heart through a fetal Doppler placed on the woman's abdomen or by using a fetal monitoring device, such as electronic fetal monitoring, known as a cardiotocograph. Fetal monitoring devices provide an audible and/or visual record of the fetal heartbeat (Pairman et al 2015; Perry et al 2014).

**TABLE 45.5 | Stages of labour**

| Stage | Characteristics |
|---|---|
| First | Contractions occur at fairly regular intervals, from about every 10 minutes at the onset of labour to about every 2 minutes at the end of the first stage<br>The cervix is effaced (raised up)<br>The fetal head begins to descend in the pelvis<br>The cervix is gradually dilated<br>The membranes may rupture, and release amniotic fluid |
| Second | Strong contractions occur, lasting about 60 seconds and becoming expulsive, and the woman experiences a desire to bear down<br>The woman uses abdominal muscles and the diaphragm to assist in pushing the fetus down the birth canal<br>The muscles of the pelvic floor are displaced by the advancing fetal head<br>The vagina is dilated, and the perineum is thinned and flattened by the advancing head<br>The vulva and vaginal orifice bulge and the anus dilates as the head advances<br>The baby is born |
| Third | After a brief period the placenta separates from the uterine wall<br>Uterine contractions restart to expel the placenta and membranes<br>Signs of separation and descent of the placenta are:<br>• A small rush of blood from the vagina<br>• The cord lengthens at the vulva<br>• The uterus is firmly contracted and the height of the fundus drops to umbilical level |
| Fourth | In the 1–2 hours after birth of the baby and expulsion of the placenta and membranes, the uterus begins the process of involution. Involution is the return of the uterus to its normal size. The fourth stage of labour completes when the mother's body has returned to physiological stability |

*(Davidson et al 2014)*

Another way that the condition of the fetus is assessed is by observing the passage of 'liquor' draining from the woman's vagina. Normally the liquor remains clear and straw coloured, while green-tinged liquor indicates the presence of meconium. The passage of **meconium** (the dark green tarry substance formed in the fetal bowel) by the fetus while still in the uterus indicates that the fetus is physically distressed because of a period of fetal oxygen deprivation.

### Promoting comfort

Unless there are factors that may compromise the condition of the woman or her baby, the woman is encouraged to do

whatever will contribute to her comfort. She may choose to walk around or may prefer to sit or lie down. The woman may like to engage in some form of activity, such as reading, watching television or listening to music. Some women find that frequent warm showers enhance their comfort, while others may prefer to have their partner or the midwife massage their abdomen and back.

During the first stage the woman may need to be encouraged and supported to use the relaxation techniques learnt in prenatal classes. She is encouraged to empty her bladder at least every 2 hours, as a full bladder can inhibit uterine action. The woman is also encouraged to consume frequent small amounts of clear fluids (e.g. 75 mL/h). Because the absorption of food is slowed down during labour and because there is the possibility that a general anaesthetic may be necessary, solid food is generally restricted during labour. The input and output of fluids are monitored to assess for the manifestations of the woman becoming dehydrated. Because the process of labour requires the expenditure of large amounts of energy, the woman may become fatigued. Fatigue is minimised by encouraging rest and relaxation and by relieving discomfort of pain.

Strong contractions may cause considerable discomfort, and the measures used to minimise and relieve discomfort will vary according to the needs and choices of each woman. Measures to relieve discomfort aim to reduce pain and tension without causing any harmful effects to the woman or baby. Measures include practising relaxation techniques, assuming the most comfortable position, back and abdominal massage, using music as a distraction and medications. Medications such as analgesics may be prescribed. Any medication administered must not cause harmful effects to the baby or retard the progress of labour. Analgesic medications may be administered by inhalation (e.g. nitrous oxide and oxygen), intramuscular injection (e.g. pethidine) or intrathecal injection of local anaesthetic solution into the epidural space surrounding the spinal cord, from which the nerves supplying the uterus or cervix arise (epidural analgesia).

Throughout the first stage the midwife should provide emotional support and encouragement, and do all that she can to ensure that the labour is not a distressing experience (Murray & McKinney 2014; Perry et al 2014).

## The second stage

Traditionally, and currently, the definition of second stage labour commencement is described as when the cervix is fully dilated. The duration of second stage is therefore based on when the woman is diagnosed as being fully dilated by the midwifery or medical staff.

Although it may be accompanied by some anxiety, the second stage of labour signals the imminent birth of the baby. It concludes with the actual birth of the baby (Murray & McKinney 2014). Progress of labour and the condition of the unborn baby are monitored as in the first stage, but at more frequent intervals. During contractions the midwife and/or partner should offer encouragement. As the fetal head reaches the pelvic floor, most women experience the urge to push (Murray & McKinney 2014). Automatically the woman will begin to exert pressure downwards by contracting her abdominal muscles while relaxing her pelvic floor. This bearing-down reflex is an involuntary reflex response to the pressure of the presenting part on stretch receptors of pelvic muscles. The midwife then encourages the woman to push when the urge to push is felt, rather than giving a long prolonged push on command.

Between contractions the woman may wish to have her lower back massaged, and should be encouraged to rest. Small sips of fluid or ice chips should be offered to moisten her mouth, and the woman may wish to have her face wiped at frequent intervals. Labour is often hard and tiring work. The woman is encouraged to adopt the position in which she feels the most comfortable for the birth. Physical support may be needed to maintain the woman in a suitable position. She may wish to have her back supported by pillows, depending upon the position she adopts (see Case Study 45.1).

### CASE STUDY 45.1

**Mandy and Tom**

Mandy had been in labour for 12 hours and delivered a 3.9 kg male infant vaginally after a normal pregnancy, labour and delivery. She and her husband Tom have another son at home aged 18 months. Mandy had just transferred into the ward an hour before and the report you received was that all her assessments were normal. She uses her call bell and when you go to answer, she shows you her perineal pad which is saturated.

What nursing actions should you take?

## The birth

The birth of the baby may take place with the mother lying down, standing, squatting or kneeling. Some maternity units and birth centres are equipped to accommodate the woman and her partner in a home-like environment, with some women choosing to have a water birth. During birth of the baby the obstetrician or midwife assists by gently controlling the emergence of the head to prevent perineal damage. In some instances an episiotomy (incision into the perineum to enlarge the vaginal opening) may be necessary. Sometimes the application of obstetric forceps to the fetal head may be necessary to assist in its passage through the birth canal.

During an uncomplicated birth, after the baby's head has cleared the vagina, the shoulders and the rest of the baby's body are gently pushed out. Immediately after birth, provided that everything is normal and as expected, the baby is generally placed on the mother's abdomen. The umbilical cord is clamped in two places and cut between the clamps (Davidson et al 2014). Although about 95% of babies present head first, a small number are born buttocks first (breech presentation).

The second stage is completed when the baby is born, which is an emotional time for everyone involved in the birth process. The baby is placed on the mother's abdomen, and

both she and her partner can look at and caress their infant. The obstetrician or midwife remains nearby so that the condition of both mother and baby can be monitored. It may be necessary to aspirate mucus from the baby's mouth to prevent inhalation. The midwife encourages the mother to initiate skin-to-skin contact with her baby: the baby is placed at her breast and encouraged to suckle. This is thought to help establish the attachment process between mother and baby, and suckling promotes uterine contractions, necessary for expulsion of the placenta.

### Caesarean birth

A **caesarean** birth is the birth of the baby through a surgical abdominal incision. The incision is usually made just above the pubic bone in the lower part of the abdomen. When the uterus is cut through the lower part this approach is referred to as a lower uterine segment caesarean section (LUSCS). Some caesarean births are planned in advance (elective caesarean) because of existing problems with the pregnancy. These may include presentation and size of the fetus, hypertension, maternal diseases, prolapsed umbilical cord or placenta praevia. In other cases, the decision to perform a caesarean is made during the course of labour. This is called an emergency caesarean. An emergency caesarean section may be indicated for a variety of reasons, including maternal complications, such as severe bleeding or pre-eclampsia, fetal distress or failure to progress in labour. Most women who have had a LUSCS are eligible for a vaginal birth after caesarean (VBAC) (Murray & McKinney 2014; Perry et al 2014).

## The third stage

During this stage the placenta and membranes are expelled. In most settings, oxytocic medications such as ergometrine or syntometrine are given to promote uterine contraction and reduce the risk of postpartum haemorrhage. After expulsion of the placenta the woman's vulva and vagina are swabbed clean so that the areas can be inspected for any lacerations or tears. Any laceration or episiotomy is repaired. A sterile vulval pad is applied to collect the vaginal discharge. The woman is assessed for signs of haemorrhage and for any adverse effects of the birth. To assist with involution (decrease in size of the uterus), the midwife will massage the uterine fundus through the abdominal wall to promote contraction and retraction. The placenta and membranes are assessed to see if they are normal and complete. If they are incomplete, there may be fragments retained in the uterus, preventing uterine contraction and providing a focus for infection (Davidson et al 2014).

## The fourth stage

The fourth stage of labour is the first 1–4 hours after birth of the placenta, or until the mother has regained physiological stability (Lowdermilk et al 2014). During this time the midwife's role includes monitoring the mother for her emotional health and wellbeing, levels of pain, bladder function, blood loss and recovery from anaesthesia. The midwife also provides the initial care for the new baby. The role also includes providing emotional support that may be necessary for the mother, family or significant others. It should be acknowledged that not all mothers will have partners, not all will have the family support they may desire and this may be a time when particular sensitivity is required.

## Cultural influences on birthing practices

The needs and wishes of the woman during pregnancy, labour and the postnatal period may be influenced by her cultural background. This may be very different from that of the midwife, but must be understood and respected. Australia is a multicultural society, and providing for the many different cultural preferences of women requires flexibility on the part of midwives and nurses. There are differing cultural beliefs of significant importance to women concerning:

- Who should be present during the labour and birth
- Showering or bathing after birth
- What is considered an appropriate diet for a new mother
- How long and how much a woman should rest after the birth
- What should happen to the baby (e.g. when breastfeeding should begin, what clothing and adornments should be used)
- Specific rituals and practices that promote healing of the body
- What should happen to the placenta.

Cultural attitudes vary enormously. For example, in over 50 known cultures, including Filipino, Vietnamese, Korean and Mexican, it is not the cultural norm for women to give infants colostrum, and breastfeeding is delayed until the milk has come in (Ladewig et al 2014). In most South-east Asian cultures it is seen as essential that the woman is not exposed to anything cold after the birth, as this is believed to risk the onset of arthritis and bladder problems. Many people of Vietnamese culture believe that showering and washing the hair too soon after giving birth leads to recurring headaches and hair dropping out quickly in old age. Many people in Hmong culture believe that when a person dies they must collect the person's placenta (termed 'black jacket') and put it on the deceased so they can be allowed entry into heaven. For this reason a Hmong woman may be very anxious about what is happening to her placenta and may request that it be given to the family for burial at the woman's home. Clinical Interest Box 45.1 provides examples of cultural preferences in women who are of Chinese and Samoan descent.

When nurses understand the beliefs behind particular cultural practices, the risk of confusion and conflict concerning what the woman chooses to do during and after the birth of her baby is reduced (Pairman et al 2015). However, care should be taken not to generalise about what happens in particular cultures because attitudes, values, beliefs and practices can vary significantly even within each cultural group (see Chapters 10 and 11). In addition, the process of assimilation into a new culture may alter traditional beliefs and practices. Clinical Interest Box 45.2 provides examples of traditional birthing practices in the Indigenous population of Australia.

## CLINICAL INTEREST BOX 45.1 Cultural preferences in women of Chinese and Samoan descent

### Women who are of Chinese descent

Many Chinese people, when they are ill or pregnant, assume a 'sick role' in which they depend heavily on others for assistance. This means that some healthcare providers may be seen as uncaring because they encourage independence rather than catering directly to the wishes of the individual.

Pregnancy and especially childbirth are believed to disturb the balance of hot and cold required for good health. Because of this, various dietary and behavioural practices are customary to keep the mother and baby physically healthy including:

- Eating special soups and chicken/chicken broth
- Not eating lamb because of the belief that it may cause the baby to develop epilepsy
- Not eating pineapple because it is believed to cause miscarriage.

*Birth*

Many Chinese people believe that a woman should not cry out or scream during labour.

Women may experience distress if not given a choice between cultural traditions and Western practices. Women may prefer sitting or squatting to give birth. Ideally, the labouring woman's mother or mother-in-law attends childbirth, rather than the father of the child. This practice varies among communities.

#### After birth

Some women may observe a period of confinement after birth, during which they rest, dress warmly, limit showers and eat only foods classed as hot. Staff may need to discuss the option of exercises to avoid deep vein thrombosis while in bed (e.g. bending knees, moving legs).

According to some customs in Guandong and Hong Kong, postpartum women may not eat with other family members for up to 1 month due to the notion of pollution linked to lochial discharge. For the same reason, postpartum women may abstain from sexual relations.

#### Infant care

Women are often expected to follow certain traditional practices advocated by older female relatives. However, practical constraints mean that many Chinese women opt for an approach to child rearing which combines practices from both Australian and Chinese culture.

Infants may be over-wrapped and slept in prone position. Many Chinese people believe that infants should not be dressed in used clothing as the baby may take on the characteristics of those that wore the clothes previously. Therefore, the family may bring new clothing for the baby instead of dressing the baby in hospital clothing. Disposable shirts may be acceptable. Infants may be separated from their mother for at least the first 24 hours. This tradition is practised to allow the postpartum woman to rest. The Australian practice of leaving infants with their mother should be discussed with women of Chinese background. Some women believe that if a newborn child is praised, bad spirits will take the infant away or the child will fall ill. Grandmothers, particularly the father's mother, are often very involved with the new infant and the new mother's recovery. They should be acknowledged when caring for the mother and during teaching sessions.

#### Infant feeding

Colostrum may be considered stale or dirty and discarded. Staff may need to explain the benefits of colostrum feeding and encourage women to feed their infant. Babies may be fed with boiled rice water or formula instead of colostrum during the first 2 days.

### Women who are of Samoan descent

Samoans often view pregnancy as a sickness. Pregnant women are cautioned against being alone in the house or going outside, especially after dark. Samoans believe that a lone pregnant woman can be hexed by evil spirits, causing abnormalities to the unborn child. A pregnant woman should always be accompanied by an elderly woman, even to the toilet. Samoans believe that pregnant women should avoid heavy work which may lead to the displacement of internal organs.

For their first delivery, Samoan women usually return to their mother's home and after a confinement period, the new family returns home. This should be kept in mind since in Australia, Samoan women may have no parental support. Episiotomy is not considered a part of usual delivery-related procedures. Birth attendants usually perform a cut on the umbilical cord after it has stopped beating. After birth, the baby is massaged with blood from the placental part of the umbilical cord. Health professionals should be aware of this practice.

#### After birth

In Samoa, the placenta is usually expelled by pulling, while the abdomen is massaged. Sometimes the father is asked to apply force to facilitate expulsion. Care should be taken to ensure that the placenta is offered to the new parents. In Samoa the placenta is disposed of in various ways. It may be wrapped in a cloth and buried in the ground by close family members, burned in a hole dug in the ground or thrown into the sea. It may be believed that the newborn is at risk if anything happens to the placenta. In Samoa, after labour, the woman's abdomen may be firmly bound with cloth to prevent the uterus from 'falling down'. This remains in place for up to 1 month. After delivery, women traditionally

## CLINICAL INTEREST BOX 45.1 CULTURAL PREFERENCES IN WOMEN OF CHINESE AND SAMOAN DESCENT—cont'd

receive abdominal and pelvic floor massage to correct any displacement that may have occurred during labour. They will then bathe. Sometimes, a bowl of steaming water is placed between a woman's legs, so that the rising steam can cleanse the birth canal. In Australia, Samoan women could be asked if they would like a hot water bottle to replace this procedure.

Once postnatal procedures are complete, a woman may be given a bowl of sago cooked in coconut cream and flavoured with lemon leaves. According to Samoan practice, a woman should rest for a month after her first delivery. After subsequent deliveries, she should rest until the infant's umbilical cord falls off. The benefits of early physical activity after birth should be discussed with Samoan women in Australia.

**Infant care**

Samoan infants are usually bathed immediately after birth. A newborn is usually placed in cold water to make them breathe.

**Infant feeding**

Samoan midwives may recommend that a woman breastfeed immediately after birth; others give boiled water only for up to 5 days. Samoan infants are fed on demand. Breastfeeding is considered to be a contraceptive.

*(Queensland Health 2009)*

## CLINICAL INTEREST BOX 45.2 Cultural beliefs and childbirth of Indigenous people in Australia

Birth is seen very much as 'women's business' in Aboriginal society. Education has been traditionally undertaken through observation and involvement in the life of the extended family, with elders imparting specific knowledge as required. Traditionally men have not been involved during the pregnancy or the birth and appeared to play a minor role in baby care and child raising.

Much of this is changing as Aboriginal people move in from the bush to town living, and family support systems shrink. Western ideas are being embraced as young Aboriginal people seek inclusion in the wider Australian way of life. Many Aboriginal women now give birth in hospitals, often far from family and friends. The traditional women's business of childbearing seems to be breaking down in some places, as men accompany their partners during labour and birth in hospitals.

*(Pairman et al 2015; Queensland Health 2009)*

## CRITICAL THINKING EXERCISE 45.1

You are caring for Hong, a young woman who came to Australia from China a year ago. She gave birth to her first baby earlier today. The midwife has instructed her to get up and go and have a shower. Hong is crying and distressed and tells you that 'the midwife doesn't understand'.

1. What do you think might be the reason for Hong's distress?
2. How could this misunderstanding have been avoided?
3. What will you do now to relieve Hong's distress?
4. What other cultural issues need to be explored to ensure that care is culturally appropriate?

# POSTNATAL CARE

The postpartum period is called the puerperium. Sometimes called the fourth trimester of pregnancy, the puerperium begins after childbirth and continues for the following 6 weeks (Davidson et al 2014). This is the time during which the changes to the woman's body brought about by the pregnancy gradually resolve. It is also a time of adjustment to changed responsibilities. Mothers generally return home within days of the birth, so it is important to provide as much help and education as possible before discharge. While this section focuses mostly on care in the birthing centre or hospital, the ongoing needs of the mother, baby and family should be considered so that support can be planned as necessary for the remainder of the puerperium.

After the third stage of labour is completed, the mother's immediate comfort is promoted by ensuring that any wet or soiled clothing is replaced, and by offering her a drink and snack. She and her partner should be allowed to spend time together with the baby. If the mother is exhausted she may appreciate being left to rest or sleep.

## Care of the mother

The degree of care required will depend on a variety of factors, such as where the birth occurred, how long the mother remains in the maternity unit or birth centre, whether the birth was full or preterm, if it was uncomplicated, whether there were multiple births and whether there are any postnatal discomforts or complications. In addition, care must be adapted to meet any specific cultural needs. The woman who has had a caesarean birth must also be assessed like any other postoperative person. Postnatal care is directed at promoting the health of both mother and baby. Aspects of care include promoting:

- Adequate rest
- Reduced risk of infection
- Freedom from discomfort or pain

- The establishment of lactation and breastfeeding
- Maternal bonding and attachment
- The mother's confidence in caring for her baby (Perry et al 2014; Murray & McKinney 2014).

Assessment is made of the **lochia**, the vaginal discharge that occurs after birth. Lochia consists of blood and broken-down endometrium and is discharged for up to 3–4 weeks after birth. At first it is bright red in colour, then becomes pink and ultimately presents as a colourless or white discharge. Lochia should not have an offensive odour or contain any blood clots; the presence of either indicates the possibility that products of conception have been retained in the uterus. Observe for character, colour, odour and presence of clots. Clinical Interest Box 45.3 outlines the assessment of lochia. Nursing Care Plan 45.1 outlines the care of a postnatal woman and Progress Note Example 45.1 shows an example of an entry into progress notes.

Perineal care involves daily showering to cleanse the area, and frequent changing of vulval pads. If a perineal tear occurred or if an episiotomy was performed, care may be needed to reduce discomfort and prevent infection around the area. Local care may involve the application of cold packs to the area, or sitz baths to which salt has been added. A soft cushion to sit on or lying on the side to feed may help to relieve perineal soreness, and analgesic medications such as

## CLINICAL INTEREST BOX 45.3 Changes in lochia that cause concern

**Change**

- Presence of clots
- Persistent lochia rubra

**Possible problem**

- Inadequate uterine contractions that allow bleeding from vessels at the placental site.
- Inadequate uterine contractions; retained placental fragments; infection

**Nursing action**

- Assess location and firmness of fundus
- Assess voiding pattern
- Assess activity pattern
- Assess for signs of infection
- Record and report findings

*(Ladewig et al 2014)*

## NURSING CARE PLAN 45.1

**Assessment:** Kylie Jones, delivered a 3.5 kg male infant earlier this morning. She had an epidural anaesthetic during a 12-hour labour. She had a greater than normal blood loss at delivery. The midwife has asked you to get her up and walk her to the toilet. She says she has full return of sensation to her legs but feels a little light headed. As she stands up, Kylie says she feels weak and dizzy. Her gait is unsteady so you lower her back to bed to prevent her from fainting.
**Issue/s to be addressed:** Risk of injury related to postural hypotension
**Goal/s:** To remain free of complications related to mobilisation post delivery

| Care/Actions | Rationale |
|---|---|
| Allow Kylie to rest before attempting mobilisation | Rest will allow dizziness to pass and circulation to stabilise |
| Assist with ambulation | Orthostatic hypotension may occur, and having someone present helps prevent injury |
| Check Kylie's blood pressure before getting her out of bed again | A decrease of 15 to 20 mmHg in systolic pressure on rising indicates postural hypotension |
| Instruct Kylie to bend her knees and move her feet when she first stands | Will increase venous return from the lower extremities |
| Initiate measures to prevent injury if Kylie were to faint | |

**Evaluation**

Kylie requested assistance when ambulating initially and sustained no injury during her postnatal stay.

*(Murray & McKinney 2014)*

## PROGRESS NOTE EXAMPLE 45.1

| | |
|---|---|
| 12/04/2015<br>1030 hrs | Nursing: Kylie supervised with mobilisation to toilet as feeling light headed getting out of bed for first time after delivery. BP checked and no postural drop noted. Instructed to call for assistance when next wanting to mobilise. Call bell left within reach. Kylie stated she will do this.<br>***L. Adams* (Adams) EN** |

paracetamol may be prescribed. Observe for haematoma and oedema.

Fundal height is assessed by the midwife and documented each day to monitor involution of the uterus. It may be necessary to massage the fundus to promote uterine contraction. The height of the fundus decreases by about 1 cm each day until, by the 11th or 12th day, it can no longer be palpated abdominally. The firmness, height and location are evaluated.

The breasts and nipples are assessed each day for any red areas, oedema, cracking or bleeding. Palpation of each breast detects any areas of hardness, which may indicate blocked milk ducts.

Vital signs are assessed with abnormalities reported. The extremities are evaluated for signs of thrombophlebitis. The bladder is observed for fullness, output, burning and pain. The bowels are assessed to determine passage of flatus and bowel sounds and for defecation.

Postnatal exercises are started on the first day. They are designed to strengthen the pelvic floor and abdominal muscles. An instruction sheet illustrating the exercises to be performed is generally given to the mother and explained by the midwife.

Evaluation of the woman's emotional status involves observing family interaction and support and any signs of a depressive state. The woman should also be observed for interest in the newborn, eye contact, touch contact and the ability to respond to the infant's cries (Davidson et al 2014). Signs of the 'baby blues' include being teary, irritable, overly sensitive in interactions with others and moody. The 'baby blues' usually clear up after a few days with no other treatment except support and understanding. If the woman's mood does not lighten it may be a sign of something more serious, like depression or anxiety (see Chapter 39).

Postpartum teaching covers topics such as nutrition, rest, breast care, exercise, activity, urinary and bowel function, blood loss, perineal care, contraception, sexual activity, postpartum signs and symptoms that should be reported, infant care and feeding, postpartum depression, available resources and follow-up care (Murray & McKinney 2014).

A balanced diet, which provides adequate nutrients and fibre, is advised. In the hospital setting a dietitian may be responsible for accommodating special cultural needs in relation to diet but often family members will want to bring meals from home for the new mother. If the woman is breastfeeding, she should consume an extra 2500–4000 kJ/day above the requirements of pregnancy. This provides the extra energy required to produce milk. In addition to nutritional requirements, the lactating mother requires 3 L of fluid a day.

The lactating mother is advised to avoid consuming foods that may affect her lactation and can upset the baby. This is very individual and may include highly spiced foods. The woman who wishes to breastfeed should also be advised of the substances known to be excreted in the **breast milk**. Substances that should be avoided or taken sparingly include:

- Nicotine
- Alcohol
- Caffeine
- Laxatives
- Anti-infective agents
- Sedatives.

## Minor postnatal discomforts

Some discomforts are associated with the postnatal period (Murray & McKinney 2014). These include after-pains, constipation, difficulty with passing urine and engorged breasts. After-pains are cramps that may occur for a few days after birth, as the uterine muscles contract during the process of involution. Mild pain relief medication may be prescribed.

Constipation may result from inadequate fibre or fluid intake. The woman may also be afraid to go to the toilet post birth as it may increase her levels of pain and discomfort. Increasing fibre in the diet and maintaining a high fluid intake is important and, if necessary, a stool-softening medication may be prescribed. Analgesia may also be given prior to the woman going to the toilet.

Difficulty in voiding may be experienced initially because of loss of bladder tone, bruising of the urethra or perineal soreness. Some women may find that voiding in a bowl or bath of warm water eases the soreness. If the woman finds that this helps, she should be advised, as a precaution against infection, to wash the perineal area gently after voiding.

Engorged breasts may occur a few days after the birth because of increased blood supply to the breasts in beginning lactation. The breasts may become full, distended, hard and uncomfortable. The midwife should advise mothers that this is not unusual and that wearing a supportive nursing bra, even during the night, will help, provided that it is not too tight. Breastfeeding the baby at frequent intervals (2–3 hours if necessary) helps and promotes engorgement to diminish naturally. A qualified midwife or lactation consultant should be contacted to assist women who are concerned about breast engorgement.

## Breastfeeding

Breastfeeding is the optimal method of feeding the baby. While most women will choose to breastfeed, there are others who, for a variety of reasons, will prefer not to. While it is important that a woman be advised of the benefits of breastfeeding, it is also important that she is not made to feel guilty if she chooses to bottle-feed.

### Lactation

During pregnancy, placental hormones, oestrogen, progesterone, hCG and placental lactogenic hormone stimulate the development of glandular tissue and ducts in the breasts. **Colostrum** is the fluid secreted by the breasts during pregnancy and during the first few days after birth. It is a thin, yellow serous fluid consisting of water, protein, fat, carbohydrates and immunologically active substances. When the placenta is expelled after birth of the baby, the anterior pituitary gland releases prolactin, which activates the mammary cells to produce and release milk (Davidson et al 2014).

Lactation depends on the maintenance of milk production and on the 'let-down' reflex, whereby milk is ejected from the breasts. The let-down reflex is stimulated by a neurogenic reflex, with oxytocin released from the pituitary gland in response to suckling, forcing milk out of the alveoli in the breasts. The let-down reflex, which generally occurs a short time after the baby begins to suck on the nipple, can also be stimulated when the mother sees, hears or thinks about her baby. Conversely, the reflex can be inhibited by anxiety, fear or tension.

Breastfeeding has advantages for both the mother and the baby. Breast milk is free from microorganisms, is easily digested, contains all the essential nutrients necessary for the baby's development and contains immunoglobulins and other substances that protect the infant from some infections while the immune system is underdeveloped. Breastfeeding aids involution of the uterus and is generally emotionally satisfying for the mother. Breastfeeding is also convenient and economical.

## Management

The four basic principles to correct attachment are that the:

1. Baby must be close to mother and facing her
2. Baby's mouth and mother's nipple are in alignment
3. Mother holds her breast in such a way that the baby can grasp a large mouthful of breast tissue
4. Baby's mouth is gaping wide with tongue forwards and down in order to be able to take a large amount of breast tissue into the mouth (Murray & McKinney 2014).

## Preparing to feed

The mother:

- Should be comfortable
- Can be either sitting straight and well supported or lying down
- Can have pain relief as required.

The baby is:

- Unwrapped
- Well supported and held close
- Facing the mother (The Royal Women's Hospital 2013).

## Attaching the baby

The mother:

- Supports her breast with her free hand with her fingers well back from the nipple/areola
- Holds baby close enough to maintain chin contact with the breast.

The baby:

- Exhibits rooting reflex—opens mouth wide.

After the mother has latched her baby to her breast, the baby is stimulated to start suckling when it feels the nipple touching the junction of the hard and soft palate.

## Indications of good attachment

FEEL—a 'drawing' sensation may be felt by the mother. There may be some 'nipple stretch' soreness in the first few days (peaking days 3 to 6) of feeding. This usually occurs with the first sucks of the feed and eases after milk transfer is evident. The 'let-down' itself may or may not be felt by the mother

LOOK—the baby's mouth is wide open and the chin is in contact with the breast. The tip of the nose may be touching or free of the breast. Baby's head is tilted back slightly so that the chin is pushing into the breast.

LISTEN—the baby's swallows may be audible. There should be a change from short 'suck/suck' pattern to deeper 'suck/swallow' cycle.

To detach the baby from the nipple, the mother should place a finger into the side of the baby's mouth to let air in to break the suction. Gentle detachment helps to prevent the development of sore nipples.

After the feed the baby is checked to ensure that it is clean and comfortable, and should then be placed in its cot without too much handling. The mother should ensure that her nipples are clean and dried. Expressed breast milk is rubbed into the nipple after the feed then allowed to dry to protect them against soreness or cracking.

The baby is fed when hungry (demand feeding). Each baby is an individual and some may require breastfeeding as frequently as every 2 hours, while others will be content if they are fed every 3–4 hours. The length of time the baby feeds also varies. The baby and mother establish their own feeding routine, and the mother's milk supply adjusts according to demand.

Breast milk may be expressed, either manually or with a breast pump, if necessary. Expression may be necessary to relieve discomfort if the breasts are overfull, to help stimulate milk production or to put breast milk into a feeding bottle; for example, if the baby requires feeding when the mother is temporarily unavailable. Expressed breast milk can also be provided by the mother if the baby is premature or ill and is unable to feed at the breast.

Breastfeeding difficulties sometimes arise, for a variety of reasons:

- Maternal anxiety or frustration about breastfeeding
- Cracked nipples, which cause pain when the baby sucks
- Inverted nipples, which are difficult for the baby to grasp
- Breast engorgement, which prevents the milk from flowing readily
- Over-abundance of milk, which flows too quickly causing the baby to splutter and perhaps vomit
- Failure of the let-down reflex
- Inability of the baby to suck well enough at the breast.

Management of breastfeeding difficulties depends on the cause, but with time, patience and encouragement, most can be overcome. Organisations such as the Australian Breastfeeding Association provide support and advice on how to prevent and deal with breastfeeding difficulties.

Artificial bottle feeding is the method of infant feeding women choose if not breastfeeding their babies. Artificial feeds are generally based on cow's milk, although other preparations are available, such as soy-based formulas. The formula selected will depend on the needs of the mother and the baby.

## CLINICAL INTEREST BOX 45.4 Baby Friendly Health Initiative (BFHI)

BFHI is a global initiative introduced by the World Health Organization (WHO) and the United Nations International Children's Emergency Fund (UNICEF) to implement practices that protect, promote and support breastfeeding.

1. Have a written breastfeeding policy that is routinely communicated to all healthcare staff
2. Train all healthcare staff in the skills necessary to implement this policy
3. Inform all pregnant women about the benefits and management of breastfeeding
4. Place babies in skin-to-skin contact with their mothers immediately following birth for at least an hour and encourage mothers to recognise when their babies are ready to breastfeed, offering help if needed
5. Show mothers how to breastfeed and how to maintain lactation even if they should be separated from their infants
6. Give newborn infants no food or drink other than breast milk, unless medically indicated
7. Practise rooming-in: allow mothers and infants to remain together 24 hours a day
8. Encourage breastfeeding on demand
9. Give no artificial teats or dummies to breastfeeding infants
10. Foster the establishment of breastfeeding support and refer mothers on discharge from the facility

*(BFHI 2009. © Baby Friendly Health Initiative (BFHI), Australian College of Midwives 2016. All rights reserved)*

Some formulas are expensive, others may not be readily available or the baby may require a special formula, such as soy-based or lactose-free. Whichever formula is selected, the mother must know how to make it up, how to store it and how to care for the bottles and teats. This information is given by the midwife during the mother's stay in hospital.

As a response to the falling breastfeeding initiation and retention rates worldwide, UNICEF/WHO published the 10 Steps to Successful Breastfeeding in the early 1990s (see also Clinical Interest Box 45.4 and Case Study 45.2).

## CRITICAL THINKING EXERCISE 45.2

You are caring for Maddy, a 25-year-old woman who 3 days ago gave birth to her first baby. She tells you her breasts feel really heavy, tight and uncomfortable and the baby is not feeding properly.

1. What is the likely reason for this discomfort?
2. What might help to relieve the discomfort?
3. What advice would be appropriate in relation to promoting satisfactory breastfeeding?
4. What are your responsibilities as an Enrolled Nurse in this situation?

## CASE STUDY 45.2

**Angela, Brett and Alex**

I had Alex 2 days ago. I had to have a caesarean delivery, as he was breech. I was worried that I wouldn't get to bond with him, but as soon as he was delivered they quickly dried him and gave him to me for a cuddle for a few minutes before my husband Brett left with him and the midwife for the ward. I really hoped to be able to breastfeed, so once they told me I had to have a caesarean delivery, I was worried I would not be able to breastfeed so easily. When I told my midwife this, she reassured me that it would be okay and they even brought Alex back down to the recovery area once I was there so that I could try to breastfeed. With the midwives' help, he went on first go. I couldn't believe it! We are doing really well, and with help from the midwives, I have been able to get the hang of breastfeeding him. Now that I am up and about we are managing ourselves most of the time, but the midwives are available to help if I need them.

**Angela, first time mum, talking about breastfeeding her infant**

How can the midwife help Angela establish breastfeeding during the initial breastfeeding session?

## Immediate care of the baby

Immediately after the birth the midwife or obstetrician checks that the baby's airway is clear and that it is breathing normally. Ventilation is initiated in response to high blood carbon dioxide level, stimulating the respiratory centre in the medulla. In the first few breaths, air is drawn in to expand the alveoli in the lungs, thus oxygenating the blood. Because the newborn baby has a limited ability to regulate its body temperature in relation to the environment, care is taken to ensure that it does not become cold.

One minute after birth, and again at 5 minutes, the **Apgar score** estimation is performed. The Apgar scoring system gives an estimation of the baby's condition and is an indicator of whether special resuscitation measures are required (Murray & McKinney 2014). Table 45.6 illustrates the Apgar score chart. A total score of 10 indicates that the infant is in optimal condition; if the score is 6 or less the baby requires immediate attention. A score of 8–10 is normal, a score of 4–7 indicates that the infant's condition is moderately depressed, while a score of 0–3 indicates a severely depressed condition.

In a healthcare setting such as a hospital or birth centre, an identification band is placed on the baby's wrist or ankle for identification. This identification procedure must be performed before the baby is removed from the mother's bed; this is essential to prevent any later confusion about which baby belongs to which mother. The baby is weighed and measured and the information documented (Perry et al 2014). It is recommended that every baby be given an

**TABLE 45.6 | Apgar scoring**

| Factor | Score | | |
|---|---|---|---|
| | 2 | 1 | 0 |
| Heart rate | >100 | Slow (<100) | Absent |
| Respiration | Good cry | Slow weak cry | Absent |
| Colour | Pink all over | Centrally pink, but with blue extremities | Blue, pale |
| Muscle tone | Well flexed | Fair (some flexion of extremities) | Flaccid |
| Irritability | Cry | Grimace | None |

*Murray & McKinney 2014; Lowdermilk et al 2014*

## CLINICAL INTEREST BOX 45.5 The role of vitamin K

Vitamin K is needed by humans to cause blood to clot. Without vitamin K small cuts can go on bleeding for a long time, small injuries can cause a lot of bruising and bleeding can occur in many parts of the body, including in the brain, causing a stroke.

Vitamin K is mostly made by bacteria in our gut because humans are unable to make vitamin K themselves.

### Vitamin K at birth

All newborn babies have low levels of vitamin K. Only a little vitamin K goes through the placenta to the baby, and at birth a baby's gut is sterile (there are no bacteria in the gut).

After birth there is little vitamin K in breast milk and breastfed babies can be low in vitamin K for several weeks until the gut bacteria start to make it.

Infant formula has added vitamin K, but formula fed babies have very low levels of vitamin K for several days.

### Why is it given?

It is recommended that all babies are given vitamin K at birth to prevent a bleeding problem called vitamin K deficiency bleeding (VKDB). This bleeding is rare even when babies are not given extra vitamin K, but if it happens it can cause severe harm to a baby, including death or severe brain damage.

*(NHMRC 2010; Pairman et al 2015)*

intramuscular injection of vitamin K as a preventative measure against bleeding tendencies (see Clinical Interest Box 45.5).

An initial examination of the baby is performed soon after the birth so that any abnormal findings can be acted on as soon as possible. Table 45.7 outlines the findings expected in a normal newborn. The examination assesses the baby's ventilation, colour, muscle tone, reflexes, movement and the presence of any obvious abnormalities. Later a more thorough examination is performed. See also Figure 45.2.

**TABLE 45.7 | The normal newborn**

| Anatomy | Characteristics |
|---|---|
| Head | Average circumference 35 cm<br>Anterior fontanelle—no tension or depression<br>Posterior fontanelle—palpable<br>May be elongated from moulding as the skull bones glide over each other during passage through the birth canal |
| Face | Nose and cheeks may have tiny white spots (milia) |
| Skin | Normal colour for race<br>May be covered with lanugo (fine downy hair)<br>May be vernix (white, greasy protective substance) in the skin folds |
| Eyes | Dark blue; white sclera<br>Blink reflex present |
| Thorax | Average circumference 34 cm<br>Expands symmetrically with ventilations<br>Breast tissue palpable in males and females |
| Abdomen | Prominent but not distended<br>Moves up and down with ventilations<br>Umbilical cord blue/white |
| Limbs | Symmetrical, warm, rounded<br>Move freely<br>Hands and feet may be slightly cyanosed |
| Back | Spine straight, intact, easily flexed |
| Genitalia | Male: large in relation to body, scrotum contains both testes, foreskin adheres to glans, urethral meatus central on tip of penis<br>Female: prominent labia and clitoris, vaginal opening visible |
| Anus | Patent |

*(Davidson et al 2014; Hockenberry & Wilson 2014)*

## Subsequent care of the baby

Care of the baby in the period immediately after birth is directed towards keeping the baby adequately nourished, clean, warm and free from infection. Careful observation is necessary to detect any problems should they occur. In most healthcare agencies it is common practice for the baby to remain in the same room as the mother. This is termed rooming-in and enables the mother to care for the baby from

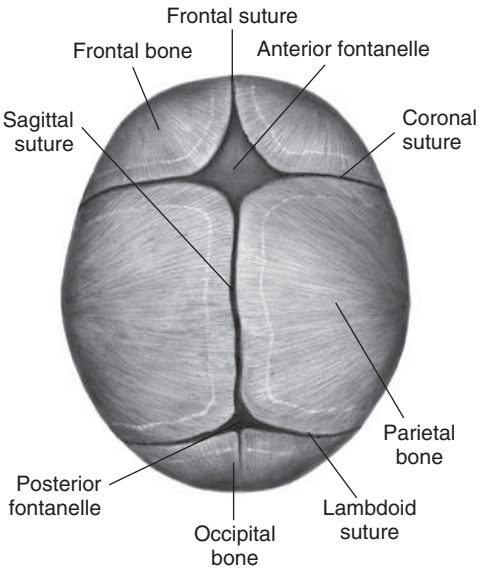

**Figure 45.2** Fontanelles and suture lines

*(Crisp et al 2013)*

**Figure 45.3** Parent–child nurturing

*(© privilege/Shutterstock)*

**TABLE 45.8 | Newborn vital signs**

| Vital sign | Normal range |
|---|---|
| Pulse | 120–160 bpm<br>During sleep as low as 100 bpm; if crying, up to 180 bpm<br>Apical pulse counted for 1 full minute |
| Respirations | 30–60 respirations/minute<br>Predominantly diaphragmatic but synchronous with abdominal movements<br>Respirations are counted for 1 full minute |
| Temperature | Normal range: 36.5–37.5°C<br>Axillary: 36.4–37.2°C<br>Skin: 36–36.5°C<br>Rectal: 36.6–37.2°C |

*(Ladewig et al 2014; Murray & McKinney 2014)*

the beginning (Figure 45.3). The mother gets to know, and gains confidence in caring for, her baby. The midwife is available to offer guidance and encouragement in all aspects of infant care.

## Supporting thermoregulation

Maintenance of body temperature is vital. The core temperature of the term newborn is 36.5–37.5°C (Blackburn 2013). Hypothermia can cause problems such as hypoglycaemia, as the newborn uses glucose to generate heat and respiratory distress, because the metabolic rate is higher and consumes more oxygen. The first bath is not undertaken until the temperature is between 36.5°C and 37°C.

## Obtaining vital signs

Respiratory rate: It is best to obtain this before disturbing the baby. Count the respirations for a minute. The rate can be auscultated with a stethoscope, or a hand can be placed lightly over the abdomen—watch for the rise and fall.

Heart rate: Assess using a stethoscope at the apex of the heart. Count for 1 minute.

Temperature: Axillary temperatures are most commonly used for the well newborn infant. A thermometer is placed in the axilla, parallel to the chest wall.

Table 45.8 gives the vital sign parameters for a healthy newborn.

## Hygiene and skin care

Healthcare settings establish their own protocols for washing or bathing newborn babies (neonates). The baby is usually washed or bathed daily; a mild pure soap may be used. It is important that the infant's skin is kept clean and dry, with special attention being paid to the scalp, skin folds and genitals. The buttocks and groin area are washed with plain water or cleansed with a mild lotion each time a wet or soiled nappy is removed. A protective cream or lotion may be applied.

Disposable or cloth nappies may be used. The mother may need some advice on how to fold and apply napkins.

If the baby's fingernails are long, the infant may scratch their face and the scratches may become infected. Mittens may be worn to prevent the infant from scratching.

The bath is a good time to observe the newborn for general wellbeing, activity and behaviour.

## Umbilical cord care

Care is aimed at preventing infection. The remnant of the cord is observed every time a napkin is changed, until it has separated and the umbilicus has healed. It is kept clean and dry and observed for any bleeding or signs of infection. It becomes dry and brownish black as it dries. The cord remnant separates from the umbilicus by a process of dry necrosis on days 6–8. The parents are taught to report redness of the area or a moist or a foul-smelling cord. See Figure 45.4.

## Elimination

Most newborns void within 12 to 24 hours of birth. Infants void at least one or two times during the first 2 days and at least 6 times a day by the fourth day. Any unusual colouration or odour must be reported to the medical officer. The baby's first bowel action consists of meconium, the dark green tarry substance formed in the intestinal tract during intrauterine life. Seventy per cent of newborns pass meconium in the first 12 hours (Davidson et al 2014). When the baby begins to take milk, there is a gradual transition to the normal yellow stools of the neonate. The stools gradually change during the first week. They become loose and are greenish yellow with mucus; these are called transitional stools. Breastfed babies pass stools that are yellow to pale brown, soft and unformed. There may be three to six stools a day. The stools of an artificially fed baby are yellow to pale green, firmer and have a distinctive odour. They are generally fewer in number.

### CRITICAL THINKING EXERCISE 45.3

You are helping care for an infant who was born 20 hours ago, and the mother tells you that the infant has not passed meconium yet. What should you do?

## Identification

Identification bands with pre-printed numbers are placed on the infant and the mother. If the infant is separated from the mother, the bands should be checked to ensure they match. Infants are usually labelled with two bands as the bands easily fall off. Identification procedures should follow the Australian Commission on Safety and Quality in Healthcare National Standards for patient identification bands in Australia (ACSQHC 2012).

## Nutrition

The baby is fed when hungry. Frequent feedings, for example every 2 hours, may be indicated if the baby shows signs of hypoglycaemia. Signs of hypoglycaemia in the newborn include: jitteriness, poor muscle tone, sweating, respiratory difficulty, low temperature, poor suck, high pitched cry, lethargy and seizures. A heel stick is performed when obtaining capillary blood for glucose screening.

## Weighing and measuring

In healthcare settings the neonate is generally weighed every second day to assess weight gain or loss. More frequent weighing is indicated if the birth weight was low or if the baby is losing excessive weight. A loss of up to 10% of the birth weight is normal in the first 3–4 days; after this, the baby should begin to gain weight. It is expected that the baby will be back to its birth weight within 10–14 days (Pairman et al 2015).

The length and head circumference are routinely measured. Measurements are noted for gestational age assessment.

## Infection control

Infections that are harmless to adults may be fatal to the newborn because of immaturity of their immune system. The baby is protected from infection by normal hygiene practices, the most important aspect of which is washing the hands thoroughly before attending to the baby. Anyone with an infection is advised to limit close contact with the baby.

## Temperature control

As the neonate's temperature-regulating centre is not fully functional, the baby must be protected from extremes of environmental temperature. Conduction, convection and radiation can be used to add heat to the body. This can be achieved by maintaining the room at an even, comfortable temperature, dressing the baby in suitable clothes and wrapping the infant in warm lightweight rugs.

Overheating is also avoided as a measure to prevent sudden infant death syndrome (SIDS). Parents are taught how to wrap and position their infant as part of health education prior to discharge (SIDS and Kids 2014) (see Clinical Interest Box 45.6).

## Screening tests

Newborn screening (NBS) is a publicly funded system for testing newborn babies' blood for about 30 rare conditions. All newborn babies are offered screening in Australia. The blood test is taken by heel prick, usually between 48 to 72 hours after birth. Collection of several blood spots is made onto an absorbent card and sent for analysis. After the dried blood has been tested, it will be stored in the laboratory for varying periods in different states of Australia. The conditions tested for include phenylketonuria (PKU), congenital hypothyroidism, cystic fibrosis (CF), galactosaemia and a number of other extremely rare conditions. Some of these conditions can result in physical and/or intellectual problems if not treated promptly, and are often referred to as inborn errors of metabolism (Dempsey et al 2014; Pairman et al 2015).

Newborn hearing testing is a free universal hearing screening that has been in use in Australia since 2000.

**Figure 45.4** Umbilical cord care

## CLINICAL INTEREST BOX 45.6 Safe sleeping

- Sleep baby on the back from birth, not on the tummy or side
- Sleep baby with head and face uncovered
- Keep baby smoke free before birth and after
- Provide a safe sleeping environment night and day
- Sleep baby in their own safe sleeping place in the same room as an adult caregiver for the first 6 to 12 months
- Breastfeed baby

*(SIDS and Kids 2014)*

## CLINICAL INTEREST BOX 45.7 Assessing for jaundice

- Observe skin in a well-lit room
- Press skin with thumb until the skin lightens
- Observe level of jaundice using Kramer's rule
- Visual estimation should not be relied on to estimate the bilirubin level in an infant with jaundice

| Zone | Baby's body area | Approximate bilirubin level |
|---|---|---|
| 1 | Head and neck | 100 µmol/L |
| 2 | Upper body (chest) | 150 µmol/L |
| 3 | Lower body, below the belly button and upper thighs and arms | 200 µmol/L |
| 4 | Lower legs and forearms | 250 µmol/L |
| 5 | Hands and feet | Above 250 µmol/L |

*(Kramer 1969; NICE 2010)*

Screening can be done any time after the newborn is 12 hours old.

## Neonatal disorders

Only brief mentions of some of the disorders that can affect neonates are included here. For detailed information, the nurse should refer to a current paediatric text. Disorders may be minor and temporary, major and permanent or life threatening. They include:

- Prematurity
- Low birth weight
- Jaundice
- Hypoxia
- Atelectasis
- Hyaline membrane disease
- Hypoglycaemia
- Persistent vomiting
- Birth injuries
- Congenital abnormalities.

Jaundice is a yellow discolouration of the skin caused by an excess of bilirubin in the blood. There are two main types of neonatal jaundice: physiological and pathological. Physiological jaundice is due to the inability to break down bilirubin due to immaturity of the liver. It appears 2 to 4 days after birth and lasts for 1 to 2 weeks. It is commonly treated with phototherapy. Pathological jaundice can occur if there is an incompatibility of the mother's and neonate's blood group (Dempsey et al 2014; Pairman et al 2015).

Clinical Interest Box 45.7 outlines the procedure for assessing the newborn for jaundice. It describes Kramer's rule (Kramer 1969). This rule is based on the way the jaundice will tend to 'migrate' down the baby's body, as the bilirubin levels rise. In essence, the baby's body is categorised into five zones with an estimated bilirubin level for each zone. If the jaundice is believed to be between 200 and 250 µmol/L or more then transcutaneous bilirubinometry and a blood test will be used to estimate the exact bilirubin level. Visual estimation should not be relied on to estimate the bilirubin level in an infant with jaundice (National Institute for Clinical Evidence (NICE) 2010).

## Summary

A nurse may be required to assist qualified midwives in the care of mothers and their newborn babies. This chapter has briefly outlined the basic knowledge that is essential for the nurse who undertakes this role: the processes of normal pregnancy, labour and birth and the postnatal care of the mother and her baby. It is recommended that nurses gain an understanding of cultural differences in birthing beliefs and practices of the women they care for during and after the birth of their babies. It is also recommended that nurses access current paediatric textbooks to gain or enhance knowledge of neonatal care and disorders that may be encountered in the areas of maternal and child health nursing.

## Review Questions

1. Describe the physiological changes of pregnancy.
2. How and why is fundal height measured during antenatal visits?
3. What is the expected uterine growth at 16 and 20 weeks of gestation?
4. Immediately after the birth of a baby an assessment is performed on the neonate. What is this called and what does it entail?
5. What are the findings expected in the normal newborn infant?
6. What assessments of the mother are made in the postpartum period?
7. When is the newborn screening test attended?

## DECISION-MAKING FRAMEWORK EXERCISE 45.1

Alexa, a newly graduated EN, is working in the postnatal unit with Kate, a midwife. They are sharing the care of a group of postnatal women and their infants. Kate asks Alexa to insert an indwelling catheter into Sue Brown in room 6, as she could not void post delivery of her infant earlier that day. Alexa had learnt about insertion of IDCs during her course but had never inserted one before.

Using the decision-making framework, what is Alexa's scope of practice in relation to this scenario?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

About Paediatrics: www.pediatrics.about.com

Active Birth Centre: www.activebirthcentre.com

Australian Breastfeeding Association: www.breastfeeding.asn.au

Australian College of Midwives: www.midwives.org.au

Beyond Blue: www.beyondblue.org.au

Birth Psychology: www.birthpsychology.com

Childbirth.Org: www.childbirth.org

Genetics: www.genetics.com.au

KidsHealth: www.kidshealth.org

La Leche League International: www.lalecheleague.org

National Institute for Health and Clinical Excellence (NICE) (UK): www.nice.org.uk

Online Birth Center: www.moonlily.com/obc

Queensland Health: www.health.qld.gov.au/maternity/publications.asp

RANZCOG College Statements: www.ranzcog.edu.au/publications/collegestatements

SIDS and Kids: www.sidsandkids.org

The Royal Women's Hospital: www.thewomens.org.au/neonatalclinicalpracticegidelines

Umbilical Cord Care: www.umbilicalcordcare.net

US Centers for Disease Control and Prevention: www.cdc.gov

# Nursing in the community

*Kym Louise Strachan*

CHAPTER 46

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define the key terms
- Explain the role of public health in community-based care
- Discuss primary healthcare
- Describe the role of the community health nurse
- Identify the models of care used in community health practice
- Explain the issues that affect nurses who are involved in home care
- Describe the common competencies and skills of the community health nurse
- Define person-centred care

## KEY TERMS

community-based healthcare
community nursing
models of care
person-centred care
primary healthcare
public health

## CHAPTER FOCUS

There has been a gradual change in Australian healthcare policies with an increased focus on primary healthcare in the community. These changes have occurred as a result of public health policies aimed at maintaining health and preventing illness, a consumer push for more healthcare options, earlier discharge from acute hospitals and containment of costs.

This chapter discusses the diverse role of the nurse who works in the community in Australia. It also explains the principles of primary healthcare and how they are practised in the context of the public health paradigm. Community health and healing are also explored. The factors that impact the health of individuals, families and communities are discussed. The role, skills and competencies of the community health nurse are broadly examined. Reference is made to the literature and research on the topic, in deference to evidence-based principles.

## LIVED EXPERIENCE

My husband is 76 years old and is getting more and more forgetful. He retired from the public service 15 years ago and has had well-controlled epilepsy for the past 40 years, but I think his medication makes him very slow. I am 72 years old and we have been married for 51 years. I am happy to look after him but it is getting harder and harder. He used to pay all the bills, do all the driving and help around the yard but he is now finding this too hard. I don't drive, I have recently had two knee replacements and I have a bad back. We live in our own home but are struggling to get by. I can't do yard work and the housework is getting harder for me too. I am worried that my husband might have dementia and that we will not be able to live together any more. I never thought I would be in this situation, not being able to be together and care for us both.

**Edna**

# COMMUNITY HEALTHCARE

Community healthcare has been changing. More attention is directed to the provision of disease-recovery nursing care for transitioning individuals as they move out of the hospital environment and into the community context. Early intervention measures for people living with chronic conditions are focused on preventing re-admission into the acute healthcare system (Paterson et al 2012). Community nurses increasingly assist individuals and their carers/families to self-manage their health situation within their home environment and thus require a **person-centred** approach to care (Paterson et al 2012; Kitson et al 2012).

A social view of health considers other determinants of health such as economic and social factors (National Rural Health Alliance 2014; Australian Government 2013). The social determinants of health have been recognised and asserted by the World Health Organization (WHO 1978). 'Health for all', a philosophy developed by the WHO, has been promoted in many countries (WHO 1978). An example of this within Australian society can be seen in Indigenous populations where statistics indicate a causal link between economic and social factors and chronic disease such as asthma and diabetes (Paterson et al 2012). A social view on health impacts on the provision of care for people in the community.

Illness is influenced by how an individual experiences medically diagnosed pathophysiology which may have characteristic signs and symptoms (McMurray & Clendon 2011). The interactions between factors affecting health are illustrated in Figure 46.1.

According to Moore (2009), the 'extension of health services beyond the medical treatment model to a social model, and beyond the institutional to the community context, has seen "patients" now described also by terms used in social settings as "clients"'. Service users include the individual and their primary carers who access a service with the individual's consent. With the introduction of the National Safety and Quality Health Service Standards (Australian Commission on Safety and Quality in Health Care (ACSQHC) 2012) and in particular Standard 2 'Partnering with Consumers', this has evolved to also include the term 'consumer'. Such a change illustrates an increased focus on active partnerships between health service organisations and consumers, and focuses on responding to consumer needs (ACSQHC

## CRITICAL THINKING EXERCISE 46.1

Mr Jobe, 32, is homeless and spends most nights sleeping in the park. He has asthma and chronic bronchitis. Sometimes he drops in at the local charity food kitchen. He likes to pay his way and usually offers to help with the clean up. Recently he has been short of breath. What interventions would you consider to improve Mr Jobe's health and quality of life?

**Figure 46.1** Interactions between factors affecting health *(McMurray & Clendon 2011)*

2012). In Australia, community-based services are moving from being population-based to focusing on specific at-risk sub-groups (Lewin et al 2011).

## The health of a community

Baisch (2009) suggests that 'community health is grounded in philosophical beliefs of social justice and empowerment … and … is achieved through participatory, community development processes based on ecological models that address broad determinants of health'. Community nurses are critical in helping individuals, families and communities become whole by acting as a conduit or facilitator for positive change and improved health outcomes. This concept is illustrated in the model for community healing in Figure 46.2.

According to the ARC Centre of Excellence in Population Ageing Research (2014) factors that impact on the context of community care include:

- The changing and diverse complexity of illness and disease comorbidities that people experience as they live longer
- The increasing number of people who want to be cared for in their homes
- Healthcare delivery that is becoming more complex with multiple services that require multidisciplinary team approaches to care provision and complex policy and strategic guidance to ensure quality and safe outcomes.

People with chronic illness face many challenges. Helping a person to be more empowered is the role of any nurse. Empowerment is beneficial as it enhances a person's capacity to develop personal resources to manage their particular situation.

## Public health

**Public health** philosophy strives to re-orientate health systems towards health and wellness rather than disease and illness. Philosophically, the values for public health are based on notions of health for all, social justice and equity (Gruszin et al 2012).

The Public Health Association of Australia's (PHHA) vision for a healthy population is 'healthy people living in a healthy society and a sustaining environment, improving and promoting health for all' (PHAA 2011). Public health action has had a significant impact on improvements in the health of the Australian population. Key issues such as control of infectious diseases, environmental health, improved maternal and child health, better food and nutrition, injury prevention and chronic disease prevention are all contributing factors to improved population health (Gruszin et al 2012).

Fleming and Parker (2009) suggest that 'public health is about preventing disease, illness and injury, together with

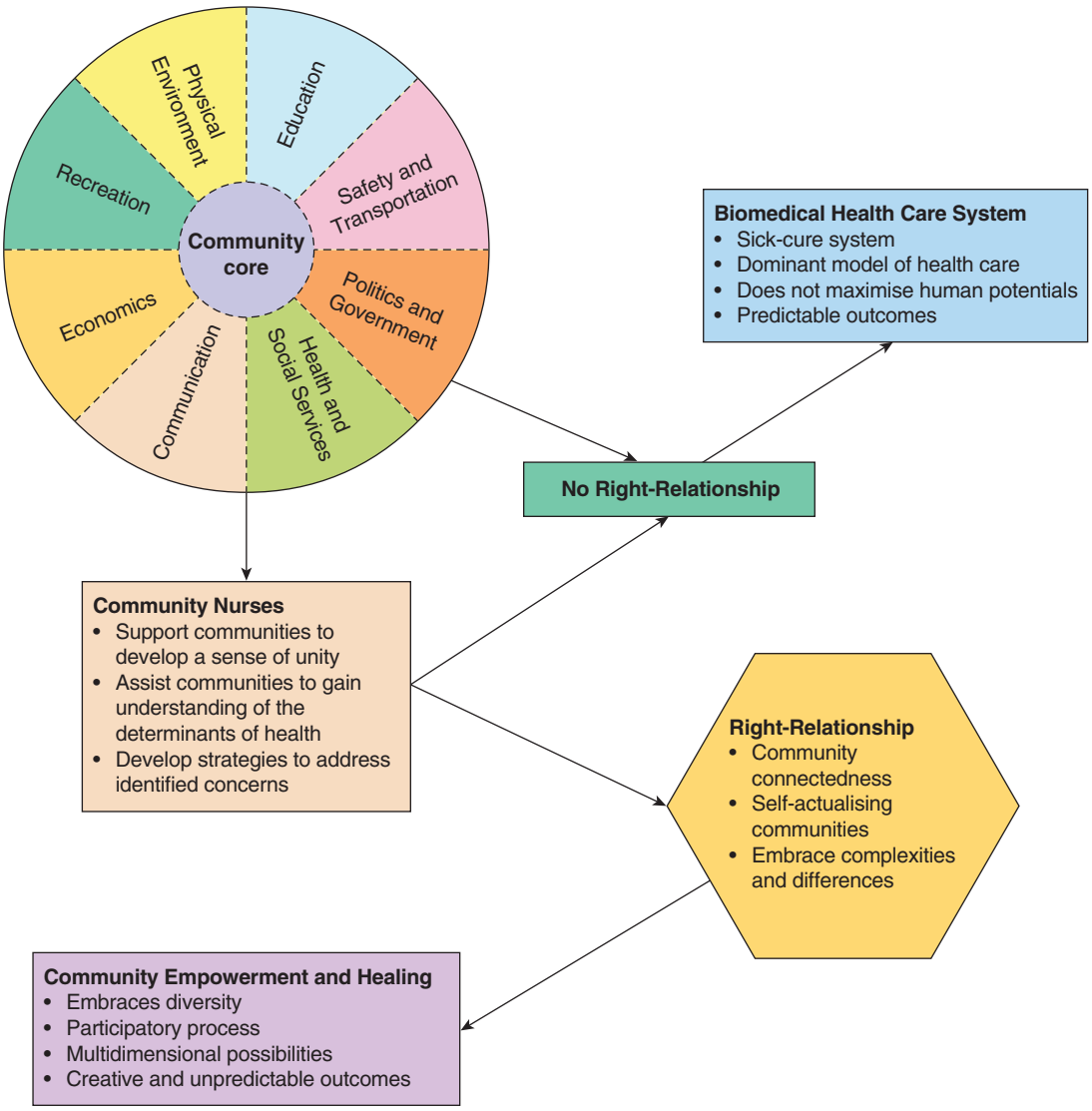


**Figure 46.2** Model for community healing

*(Francis et al 2013)*

promoting the quality of life of human populations. This is a very complex process and requires the committed skills and expertise of many different professional disciplines'. These authors have summarised the roles and functions of the public health workforce as:

- Understanding the context for public health activity and its role and functions
- Providing clarity around political impacts on public health
- Applying a range of methodological approaches to understand data
- Having a theoretical understanding of the disciplines that underpin public health and their contribution to strategy selection
- Understanding a range of skills around surveillance, prevention, promotion and restoration of the population's health
- Developing and analysing policy
- Planning, implementation and evaluation
- Using evidence-based practice
- Using advocacy, communication and negotiation skills
- Working intersectorally and with multidisciplinary groups
- Demonstrating ethical practice (Fleming & Parker 2009).

## Community health nursing and primary healthcare

Community-based nursing services comprise continuing nursing care, which may be preventative, curative, rehabilitative, supportive or palliative. Community health nursing focuses on promoting and preserving the health of population groups (Hales 2010a). Community nurses have a role in

promoting community health through primary healthcare. **Primary healthcare** is a model of community-based health service delivery that is part of the publicly funded health system in Australia. It focuses on decreasing the burden of chronic disease, decreasing the burden on hospitals and health services, and increasing equity in access to healthcare (Henderson et al 2013). **Community nursing** in Australia draws much of its revenue from a complex mix of health, community, veterans', fee-for-service and aged care programs which are funded by different levels and arms of government (Taylor 2008).

Primary healthcare reflects care that transitions health system boundaries and focuses attention on community needs (Henderson et al 2013). Primary healthcare takes a person-centred approach which minimises the potential for harm, because the individual's values and preferred approaches to health are respected (Eckermann et al 2010). The outcomes of primary healthcare, apart from better health, should be empowerment and self-reliance. Primary healthcare every day, according to Eckermann et al (2010), should be holistic in its approach. This involves:

- High levels of trust and community participation
- Shifting the power and control to those whose health is at stake.

**Community-based healthcare** is a primary healthcare system that provides holistic health-related services within the context of people's daily lives, and is directed towards a specific group within the geographical neighbourhood. To be effective it needs to:

- Provide easy access to care
- Be flexible in responding to the care needs that individuals and families identify
- Promote care between and among healthcare agencies through improved communication mechanisms
- Provide appropriate support for family caregivers
- Be affordable (Hales 2010a).

A range of services delivered in community-based settings in Australia are designed to provide early intervention to maximise health and wellbeing outcomes and prevent or slow the progression of ill health. These services are funded by the state and federal governments, private services and volunteer-led and community-based organisations and they play an important role in meeting the needs of people with, or at risk of, poorer health (Department of Health (Victoria) 2012). Australia also has many not-for-profit home nursing organisations, the Royal District Nursing Service (RDNS) being one of many that delivers general and specialised nursing and healthcare in individuals' homes, and which is 'committed to improving and maintaining our clients' quality of life and independence by providing tailored care to meet their individual needs' (RDNS nd).

According to the National Primary Health Care Strategy in Australia, general practice is the centre of the primary healthcare system. A primary healthcare nurse works autonomously and collaboratively to promote, improve and restore health. Primary healthcare nursing encompasses population health, health promotion, disease prevention, wellness care, first point of contact care and disease management across the lifespan. The setting and the ethnic and cultural grouping of the people determine models of practice. Partnerships with people—individuals, families, communities and populations—to achieve the shared goal of health for all is central to primary healthcare nursing. According to Henderson and colleagues (2013) primary healthcare nursing includes Registered and Enrolled Nurses working in a wide variety of areas including maternal and child health, general practice, community health, schools sexual health and mental health (Hoare et al 2011). However, with significant policy changes in the primary healthcare arena, the focus remains firmly on general practice and increasing the scope of the practice nurse in community-based healthcare (Henderson et al 2013).

According to Woods (2010), recent health reform in Australia which seeks to curtail the burden of chronic disease by adopting a primary healthcare approach challenges community health nurses to demonstrate their understanding and capacity to practise according to primary healthcare principles. Woods suggests that there is a need to formulate an Australian model for community nurses and national competencies through a national professional body. Community health nursing competencies are discussed later in this chapter.

## COMMUNITY HEALTH NURSE ROLE

Competencies integral for community health nurse care are discussed later in this chapter; however, the community health nurse competency statement from Queensland Health (2009) in Clinical Interest Box 46.1 encapsulates the role of the community health nurse in Australia.

According to the Australian Nursing and Midwifery Federation (2014) community health nurses practise primary healthcare in a diverse range of settings. They provide continuous monitoring of the health status of communities and respond to episodic health needs. Community health nurses need to be creative, adaptable and responsive to a variety of norms, cultures and value systems whether they are working with individuals, families or community groups. According to the Australian Nursing and Midwifery Federation (ANMF) (2011), community health nursing is 'a combination of nursing practice, public health practice, health promotion and primary healthcare'. Central to the role is working with

### CLINICAL INTEREST BOX 46.1 The role of the community health nurse

The community health nurse is a professional who delivers evidence-based nursing care to individuals, families, significant others and defined communities, underpinned by the principles of primary healthcare and health promotion, supporting self-reliance in recovery from illness, enhancement of health or management of chronic and terminal conditions, in a setting which is optimal for the person or community.

*(Queensland Health 2009)*

local communities to prevent illness and promote health for all ages by identifying barriers to health and wellness. Key concepts such as self-determination and empowerment of people to change unhealthy lifestyles and also care for individuals on discharge from acute care in their homes are central to the role of community nurse (Australian Nursing and Midwifery Federation 2011).

**CRITICAL THINKING EXERCISE 46.2**

Consider the community health nurse competencies described in this chapter. Which of the competencies would be within the scope of practice of the Enrolled Nurse?

### Teamwork in community care

Community nurses base their practice on the concepts of partnership, collaboration and empowerment (Hoare et al 2011). Partnerships between community members and healthcare professionals are critical for collaborative decisions that promote awareness and understanding of a community's health needs (Chapman et al 2008; Paterson et al 2012).

A study by O'Neill and Cowman (2008) investigated community nurses' understanding of an interdisciplinary team-based approach to primary care using a qualitative research design. Their conclusions were that nurses can contribute significantly to the re-orientation and development of primary care services. Collective team efforts enhance individuals' care and effective teamwork requires a greater understanding of group processes and team development.

As well as community nurses there are many other healthcare workers who provide community-based healthcare, both in centres and in people's homes. Some of these include occupational therapists, physiotherapists, social workers, dietitians, general practitioners, home care workers, volunteers, personal carers and home maintenance workers. Collaborative working relationships between healthcare workers, institutions and agencies are essential for providing coordinated care for individuals in the community. Competencies identified as being vital for collaboration include effective communication skills, mutual respect and trust and a team decision-making process with shared responsibility for the outcome (Hales 2010a).

### Home care

The terms used to describe the provision of nursing care in people's homes varies but can include domiciliary nursing, ambulatory care, community health nursing, district nursing, hospital in the home and home care. Regardless of the title, home care requires specialised skill sets of advanced nursing care as nurses may work in an environment which necessitates that they work independently, and includes coordination of services, provision of direct care, assessment, consulting, education, administration and research activities (Hales 2010b).

The Registered Nurse working in home care may also be responsible for the direction and supervision of unregulated care workers as well as the Enrolled Nurse. The role of the home health nurse includes being: advocate, carer, educator, case manager or coordinator. The home care nurse also needs to consider other perspectives related to working in a person's home environment: the person's safety, legal and ethical issues, infection prevention and control and nurse safety (Hales 2010b).

## MODELS OF CARE IN COMMUNITY HEALTH

Various approaches are emerging to address community health, such as integrated health, community initiatives, coalitions, managed care, case management and outreach programs (Hales 2010a). See Clinical Interest Box 46.2 for the effectiveness of a community nursing model of care and Clinical Interest Box 46.3 for a summary of these **models of care**.

## ISSUES FOR COMMUNITY HEALTH NURSES IN HOME CARE

Isolation is an issue for some community nurses. Rural and remote community nurses work in diverse settings, often in isolated practice in resource-poor environments with their practice influenced by the geography of the community, issues of transportation, communication and personal safety (Francis & Chapman 2008; Baldwin et al 2013; Ellis & Chater 2012).

In addition to incident management and reporting, the community nurse has mandatory reporting requirements as part of their duty of care to the person. These requirements include reporting all:

- Suspected incidences of child abuse and neglect
- Suspected incidences of elder abuse
- Cases of inappropriate use and storage of firearms
- Unexpected deaths (Maddock & Trowbridge 2008).

### CLINICAL INTEREST BOX 46.2 Effectiveness of a community nursing model of care—research

Edwards et al (2009) undertook a study to determine the effectiveness of a new community nursing model of care on quality of life, morale, depression, self-esteem, social support, healing, pain and functional ability of individuals with chronic venous leg ulcers. A randomised controlled trial was used with participants randomised to either a Leg Club model of care, which emphasised socialisation and peer support, or the traditional community nursing model of home visits by a Registered Nurse. Participants in the Leg Club model demonstrated significantly improved outcomes in quality of life, self-esteem, healing, pain and functional ability.

## CLINICAL INTEREST BOX 46.3 Models of care

- Integrated healthcare system—makes all levels of care—primary, secondary and tertiary—available in an integrated form
- Community initiatives—members of the community establishing health priorities, goals and actions to achieve goals
- Community coalitions—individuals and groups having a shared purpose of improving community health
- Managed care—multidisciplinary teams working together to provide cost-effective and quality healthcare across the care continuum with the managed care organisation liaising between individuals, provider and payer
- Case management—tracks individuals' needs and helps them access services through a variety of care settings to ensure continuity. Case management is defined as a collaborative process of assessment, planning, facilitation and advocacy for options and services to meet an individual's health needs through communication and available resources to promote quality cost-effective outcomes. It is a dominant model used in community mental healthcare
- Outreach programs—link people who have difficulty accessing services with the formal healthcare system
- Solution-focused nursing—considers the sociocultural as well as the individual world of a person with nurses being proactive in promoting health and wellbeing rather than reacting to palliate symptoms.

*(Aged and Community Care Services Australia & Case Management Society of Australia 2006; Henderson & Walter 2009; Hales 2010a; McAllister 2010)*

Giving culturally safe care is also an integral requirement in community healthcare. Cultural safety is an outcome experienced by the person receiving care and is described as 'the effective nursing of a person/family from another culture by a nurse who has undertaken a process of reflection on own cultural identity and recognises the impact of the nurse's culture on own nursing practice' (Te Kaunihera Tapuhi o Aotearoa Nursing Council of New Zealand 2015). Culturally safe nurses accommodate and respect a diverse range of views on health and healing (Stein-Parbury 2009). Refer to Chapter 10 for further reading on cultural diversity in healthcare.

Aboriginal health workers are vital in Aboriginal health services as they are better equipped to provide services to Indigenous populations, and bridge the gap with non-Aboriginal health professionals in their community (Eckermann et al 2010). As stated by Eckermann and colleagues (2010), 'some Aboriginal people maintain that the cornerstones of their culture are lore, law, language and land, which forms the basis of their identity'. See Chapter 11 for further reading on Indigenous health.

Personal safety is an important consideration for the nurse who makes home visits. Strategies to eliminate or manage risks must be implemented. Risks include: working as a sole practitioner; being 'on call' in remote communities; the gender bias (most community health nurses are female); dealing with hazards in the home such as obstructions and debris; aggressive dogs; having to use mobile telephones, especially in rural Australia; dealing with angry and aggressive individuals and domestic violence; driving; needlestick incidents; and working alone (Henderson 2009; Newman & Berens 2010).

### CRITICAL THINKING EXERCISE 46.3

The community health nurse role involves case management and can be challenging. As an Enrolled Nurse working in this environment what are the key components of your role?

## Skills and competencies of the community nurse

The competencies of community health nursing that make it a unique specialty are actually attributes that are desirable in nursing practice, regardless of the setting (DeBrew & Lutz 2010). Community nurses must be compliant with the legal and regulatory requirements of the jurisdictions in which they practise. Enrolled Nurses who work in community health must work within their scope of practice under the supervision of the Registered Nurse. The Community Nurses Special Interest Group (2013) and the Australian Nursing and Midwifery Federation (2014) developed competency standards for the community health nurse (see Clinical Interest Box 46.4). They make the distinction between the competencies of the beginning practitioner and the practitioner with advanced skills.

Queensland Health (2009), with the Institute of Primary Health and Ambulatory Care and the Institute of Women's and Children's Health, Townsville Health Service District, developed community health nursing competency and skills checklists designed to support the transition of nurses into community health nursing. These competency and skills checklists were derived by reviewing a number of services; categorising and summarising competency, competency units and skills; and consulting with stakeholders. A refined list of competencies emerged to reflect community nursing in the Townsville Health Service District. Standards and competencies that exist from national, state and organisational levels take precedence—with the competency and skills framework intended to fill a gap and add refinement to a specific area of

## CLINICAL INTEREST BOX 46.4 Competencies of the community health nurse

**Domain one: professional practice**

Standard 1: Demonstrates a comprehensive knowledge of community health nursing incorporating population health, primary healthcare and health promotion
Standard 2: Advocates for individuals/groups/communities and their rights for community health nursing service, primary healthcare, health equity and healthy environments, policies and legislation
Standard 3: Practises within an ethical and professional nursing framework
Standard 4: Practises in accordance with legislation affecting community health nursing practice and primary healthcare
Standard 5: Demonstrates leadership in the development, coordination and management of systems and processes to anticipate and facilitate safe quality health and wellbeing services

**Domain two: critical thinking and analysis**

Standard 6: Participates in continuing professional development (CPD) of self and others
Standard 7: Practises within an evidence-based framework

**Domain three: provision and coordination of care**

Standard 8: The community health nurse (CHN) conducts comprehensive and systematic assessment, planning, implementation and evaluation in an ongoing way in collaboration with the individual, family, group, team and community
Standard 9: Coordinates, organises and provides integrated health promotion (IHP) considering a whole of community approach
Standard 10: Facilitates a physical, emotional, social and cultural environment that promotes individual/group/community safety, security, respect and health and wellbeing

**Domain four: communication and collaboration**

Standard 11: Establishes, maintains and concludes therapeutic relationships with individuals, groups and communities
Standard 12: Collaborates with the multidisciplinary team to provide community health nursing

*(Community Health Nursing Special Interest Group 2013; Australian Nursing and Midwifery Federation 2014)*

## CLINICAL INTEREST BOX 46.5 Community health nurse competencies and skills

**Competency Unit 1 Community health appraisal and screening**

Skill 1 Surveillance
Skill 2 Disease and other health event investigation
Skill 3 Outreach
Skill 4 Screening
Skill 5 Case finding

**Competency Unit 2 Healthcare delivery**

Skill 6 Referral and follow-up
Skill 7 Case management
Skill 8 Delegated functions (assessment, nursing diagnosis, planning, implementation, evaluation)

**Competency Unit 3 Education and support**

Skill 9 Health teaching
Skill 10 Counselling
Skill 11 Consultation

**Competency Unit 4 Community development**

Skill 12 Collaboration
Skill 13 Coalition building
Skill 14 Community organising

**Competency Unit 5 Political action**

Skill 15 Advocacy
Skill 16 Social marketing
Skill 17 Policy development and policy enforcement

*(Copyright Townsville Health Service District, Queensland Health 2009)*

nursing practice. Five competency units and 17 skills are described in Clinical Interest Box 46.5.

## THE NURSING PROCESS AND COMMUNITY NURSING

The nursing process is used in community health and community-based nursing, as in many other areas of nursing care (see Chapter 17). As a logical framework for nursing care, the steps of assessment, nursing identification of issues, planning, implementation and evaluation are particularly useful for individuals receiving care in the community. The nursing process is instructive in providing a formalised and documented problem-solving strategy (Luxford & Avery 2010). Using tools designed to help in decision making, such as the nursing practice flowchart developed by the Australian Nursing and Midwifery Council in 2007 and now available from the Nursing and Midwifery Board of Australia (NMBA), is recommended (NMBA 2010). Nurses in community care also use critical-thinking skills to resolve issues, manage risks and make appropriate referrals (Luxford & Avery 2010). Community nurses need to reflect at the analytical and personal levels about the individuals in their care and the larger community, and also about themselves and their own role and function in the community they serve. See Chapter 16 for further reading on critical thinking, problem-based learning and reflective practice.

Nurses working in the home setting have the opportunity to observe individuals in their own environment, enabling a more holistic assessment (see Clinical Interest Box 46.6). The focus on a person's choice and autonomy means that

individuals and families are encouraged to participate actively in the nursing process. As a result, the individual and their family may be more proactive in the implementation phase, significantly contributing to the success of the care plan as they work towards their own goals. An example of a care plan has been provided in Nursing Care Plan 46.1.

## CLINICAL INTEREST BOX 46.6 Program snapshot: Refugee Health Nurse Program, Victoria

The Refugee Health Nurse Program provides a coordinated approach using community nurses who have expertise in working with culturally and linguistically diverse and marginalised communities. These nurses work in community health services with high refugee populations. The program has three aims: increase refugee access to primary health services; improve the response of health services to refugees' needs; and enable individuals, families and refugee communities to improve their health and wellbeing.

*(http://refugeehealthnetwork.org.au/)*

### NURSING CARE PLAN 46.1

**Assessment:** Community medication review
**Issue/s to be addressed:** Medication compliance in elderly person recently discharged from hospital after an acute myocardial infarction
**Goal/s:** Ensure individual understands all medications, what they are for, when and how they should be taken

| Care/Actions: | Rationale: |
|---|---|
| Explain discharge medications<br>Discuss blister packs for ease of medication management<br>Discuss possible MedsCheck with local pharmacist<br>Help write a daily/weekly medication plan for the individual | To increase individual's understanding and compliance with medications to help prevent re-admission to hospital or a negative health outcome related to medication mismanagement |

**Evaluation:**

Medications taken as directed.
MedsCheck undertaken.
Blister packs in situ.
Nil further readmission related to medication management.
Referrals to pharmacist and general practitioner regarding medication review.

## CASE STUDY 46.1

Rebecca is an Enrolled Nurse who works in a community-based nursing service. In a typical day Rebecca sees 10–15 individuals in their homes. The activities she is involved in include hygiene assistance, wound care, monitoring blood glucose levels and assisting individuals with the application of compression stockings.

Rebecca is responsible for organising her own day, which starts at the office base with a handover and ends there with time allowed to debrief with the coordinator and other staff. Rebecca's days are not often the same and she finds herself regularly involved in providing health education and emotional support to individuals and carers, as well as information on other services that are available in the community.

1. What are some of the community services in existence that could benefit the individuals Rebecca cares for?
2. What are some relevant health promotion/education programs that could benefit the individuals Rebecca cares for?
3. One of the individuals Rebecca cares for in the community has a BGL of 27.9 mmol. What action would she take?
4. When assisting an individual in the shower, Rebecca notices significant bruising on her arms. When questioned, she tells her her son did this but that he didn't mean to hurt her. What is Rebecca's responsibility in this scenario?
5. What are some of the key personal safety strategies Rebecca would implement when working in community nursing?

## Summary

There has been an increased focus on preventative care and wellbeing promotion in recent years. Community care is increasingly helping individuals transition from acute services to care and enabling services in the community. The philosophy of public healthcare and the practice of primary healthcare underpin the delivery of community health services in Australia. Integral to this service is empowering communities to become healthy while addressing the non-traditional determinants of health such as social and economic factors. Community nurses have particular competencies and skills which are now being formally recognised. Nurses providing care in the community, and in particular home care, have specific issues which impact on their practice. The nursing process informs care delivery along with applying critical thinking strategies and decision-making tools to assist to manage risks and resolve problems. Several case studies illustrate particular aspects of community-based healthcare.

### DECISION-MAKING FRAMEWORK EXERCISE 46.1

You have just been employed at a large, busy general practice surgery. You have been asked to do a day shift under the supervision of a senior Enrolled Nurse who has worked at the practice for the past 4 years. The general practitioner on shift has said they are happy to provide support if needed. You have been asked to do all wound care appointments, triage of walk-ins and follow-up phone calls of the clinic's diabetics.

Using the decision-making process address the following:

1. Do you accept this allocation of duties?
2. Considering the staff on this shift, is the model of nursing care appropriate?
3. What (if any) are the issues that could potentially result in you working outside of your scope of practice?
4. Identify the potential and/or actual flaws within this scenario.

## Review Questions

1. What is meant by a social view of health?
2. What are the philosophical values of public health?
3. What influence does public health aim to have on the Australian healthcare system?
4. What are some of the key benefits of primary healthcare?
5. List some models of care used in community health.
6. Define community health nurse as an occupation.
7. What are some of the issues community nurses face in home care?
8. Describe 'cultural safety'.
9. What are the steps in the nursing process?

Answer guide for the Review Questions, Critical Thinking Exercises, Decision-Making Framework Exercises and Critical Thinking Questions in Case Studies are hosted on Evolve: http://evolve.elsevier.com/AU/Koutoukidis/Tabbner/

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## Online Resources

Department of Health Victoria, Primary and Community Health: http://health.vic.gov.au/communityhealth/about_chs.htm

Plunket: www.plunket.org.nz

Public Health Association of Australia: www.phaa.net.au

Public Health Association of New Zealand: www.pha.org.nz.

Queensland Health: www.health.qld.gov.au

http://refugeehealthnetwork.org.au/

Royal District Nursing Service: www.rdns.com.au

Te Kaunihera Tapuhi o Aotearoa Nursing Council of New Zealand. www.nursingcouncil.org.nz

# Nursing care in rural and remote areas

*Melissa Taylor*

CHAPTER 47

## LEARNING OUTCOMES

At the completion of this chapter and with further reading, students should be able to:

- Define key terms
- Compare and contrast health status and needs between urban, rural and remote communities
- Identify how regions are classified as rural or remote in Australia
- Identify the key infrastructures for effective healthcare service delivery in remote settings
- Identify and discuss potential sources of stress related to working in a remote health context
- Describe the characteristics of rural and remote area nursing
- Describe the challenges a nurse may face when providing nursing care to people living in rural and remote areas

## KEY TERMS

classification
geographical isolation
remote area health services
remote area nurses
rural health services
rural nurses
telehealth

## CHAPTER FOCUS

Rural and remote nursing is any type of nursing practice that involves the provision of nursing care in a centre that is geographically removed from a major city (Berman et al 2012). This chapter provides an overview of rural and remote healthcare environments, focusing on related workforce development and health service delivery in Australia. This chapter also discusses the role of the rural and remote nurse, including the challenges such nurses face while providing nursing care in these communities. Key factors such as geographical isolation and sociological and cultural challenges are explored.

## LIVED EXPERIENCE

My first trauma came into the clinic only 1 week after I had started as a remote area nurse in Far North Queensland. A man with a severe head injury was brought in by the local ambulance; he was unconscious and showing signs of shock. All I could do was get orders via the telephone from a doctor thousands of miles away and wait for the emergency air ambulance to arrive. It was one of the most challenging experiences of my nursing career and I have been a nurse for 30 years.

**Yvonne, Remote Area Nurse, Qld**

# INTRODUCTION

In Australia, 66% of the country's people live in metropolitan regions, with 31% residing in regional and rural areas, and only 3% living in remote areas (Brown & Edwards 2012). The concept of remoteness is an interesting and complex one, and is central to a chapter on rural and remote health practice.

A common distinction between **rural health services** and **remote area health services** usually involves the presence (rural) or absence (remote) of a medical officer. In addition, rural communities usually have a 24-hour healthcare facility with medical service capabilities at all times, whereas most remote areas rely on health centres that are open during office hours and an on-call service after hours (Brown & Edwards 2012).

Significant factors for the role of the rural nurse are the context of the environment; its location and distance from a tertiary referral centre; the size of the facility; the healthcare team in which nurses work; the working conditions; and the profile of the rural community in which the nurses care, work and reside (Mills et al 2011). For example, for a resident of Yuendumu in the Western Desert, Northern Territory, access to health services and education services and the degree of perceived 'remoteness' will differ from that of someone in a regional centre such as Alice Springs or a rural town like Goondiwindi. There will also be variations over time—for example, when the Yuendumu road is washed out or when drought occurs. For health professionals at Yuendumu, perceived remoteness would also differ. An Aboriginal health worker is likely to be in their home community and therefore close to family, albeit far from most formal educational opportunities. However, the remote area nurses (RANs) are likely to be remote from family and professional support, as well as being physically remote from the closest regional centre. For many nurses the opportunity to provide nursing care within or near their home town locality is appealing and provides a rewarding and challenging career pathway. Within Indigenous communities in Australia, the opportunity for Aboriginal healthcare workers to engage within their community and work with and for the community is available. This is achieved through the role of the Aboriginal healthcare worker, trained specifically in the needs of Indigenous populations to work within the healthcare team for Aboriginal and Torres Strait Islander people.

Several **classifications** are used in Australia to define 'rural' and 'remote' and these are often used to allocate both services and resources. The most commonly used systems are:

- Accessibility/Remoteness Index for Australia (ARIA or ARIA+) classification
- Australian Standard Geographical Classification (ASGC) Remoteness Areas classification. This is based on the road distance to the service centres.

These classification systems do not take into account the socioeconomic status, population size or cultural factors (Brown & Edwards 2012).

The proportion of the rural and remote population in Australia that is Indigenous is high (Anderson et al 2006). Therefore, there are often cultural and cross-cultural issues distinguishing service provision in rural and remote areas. As a nurse working in a rural setting there are often significant issues that arise that may result in staff leaving the area, taking away their valuable knowledge and expertise (Muecke et al 2011; Diaz et al 2015).

In any culture there exists a set of values, beliefs, rituals and practices and understanding and adapting to these is often a complex and difficult pathway. Working as a non-Indigenous nurse within an Indigenous community can highlight many differences in ideals, expectations and understanding of the healthcare setting (Muecke et al 2011). These can vary according to the location and remoteness of the setting; however, they are reliant on the nurse being able

to understand and adapt. Often the support structures are limited and require the nurse to become familiar with tradition and culture and adapt work practices to achieve this. Sometimes this results in an inability to work within the area and a high mobility or transient characteristic in the workforce of the area. Positive work relations can be developed and grown with local elders within the community and in the inclusion and support that can be provided by an Aboriginal healthcare worker. Getting to know and understand the community that you work within is important to gaining a better understanding and socialisation within a rural or remote area.

Resourcing within remote centres differs greatly from that provided within a tertiary referral setting. The availability of public (and often private) transport decreases with increasing remoteness. Coupled with poorer socioeconomic status, unsealed and sometimes unmaintained roads, and seasonal variations in road access, access to health and other services is often poorer in remote communities and towns (Cleland et al 2010).

Health services in remote areas have distinctive features. One of these is that they tend to be supply driven. That is, access is constrained by the availability of suitably experienced staff and appropriately resourced clinics. In urban and many rural areas, services are more demand driven. The population exists for a variety of services and access to these is within driving or public transport distances. In other words, with a better supply (and diversity) of health staff and facilities, persons can access doctors, health clinics and allied health professionals as often as they need and can afford. Additionally, remote health services are predominantly state/territory government funded, whereas in urban and most rural areas there is a greater private component, and a greater use of Medicare funding.

## REMOTE AND RURAL AUSTRALIA

The remote areas of Australia generally pose particular challenges for the consumers and providers of health services. The Australian outback is characterised by large distances, extremes of climate, formidable geography, poor health status, diverse cultures, sparse population and tenuous infrastructure. There is nothing better than raising a family within a rural setting, being able to run through paddocks and gain an appreciation for animals, food supply chains and the great outdoors. This concept of living in a rural locality creates a sense of life on a farm, fresh food, water and the great outdoors; however, according to the Australian health-related statistics, individuals in rural areas are at greater risk of health-related problems than those in urban areas (Jukkala et al 2010; Cleland et al 2010).

### Significant issues

#### Government

In Australia, the majority of remote health services are provided or funded by state and territory governments. In cross-border regions, there are differences and difficulties over policies, laws and historic traditions. Superimposed are the Commonwealth, state and local government divisions of responsibility, which also vary from area to area. The Commonwealth has responsibility for some aspects of health, such as general practice (GP) services, immunisation and some Indigenous health services; however, the state government has authority over most areas of health service. The Commonwealth and the states and territories may also have jurisdiction over land, particularly crown land, mining and conservation (Cleland et al 2010). It is these government boundaries that require additional communication and planning for people from within health services to achieve an outcome for an individual.

In many ways the bush is the battleground on which the issues of state and federal politics are fought. It is also the place where the lack of defined responsibilities for the different tiers of government in areas such as health is more apparent. Medicare services versus state-government-funded health services, native title, mining, fishing rights, forestry, environmental control and conservation are a few of the major issues in remote and rural Australia.

#### Health resources

The health status of people living in remote areas is significantly worse than those living in urban areas. People living in remote areas have less access to health resources, and have traditionally had services delivered mainly by remote area nurses—hence, they have had little or no access to MBS and PBS funding. Findings of the Australian Institute of Health and Welfare (AIHW 2008; 2011) include:

- The supply of GPs and retail pharmacists falls sharply in remote zones
- Nurses provide a higher proportion of healthcare in rural and remote Australia than in metropolitan Australia
- The number of medical specialists per capita is substantially lower
- Nursing home availability decreases with increasing remoteness
- Medicare data indicates that people living in rural and remote zones are using fewer services than those living in metropolitan zones
- Overall hospitalisation rates are highest for those living in the remote zone.

### Comparison of health needs of urban, rural and remote communities

Internationally there is a disparity in health status in favour of urban populations and Australia reflects this trend, with current morbidity and mortality data showing a significant rural/remote–urban differential. Examples of this include:

- Australia's farming population has a distinctive illness/injury profile, characterised by high rates of unintentional injury and fatality
- Geographically the healthcare workforce is unevenly distributed and problems of access extend beyond 'mere distances to services' (AIHW 2011)

- Cardiovascular death and hospitalisation rates increase within increasing remoteness (AIHW 2010:vii)
- Rural and remote health services are more dependent on primary healthcare services with medical support provided by general practitioners (GPs)
- People living in rural and remote areas generally receive a smaller share of overall health spending; there are fewer GPs, specialist nurses and health professionals; and more limited access to specialist services (National Strategic Framework for Rural and Remote Health 2011)
- People living in rural and remote areas are often required to travel large distances to attend medical appointments with even greater distances to seek specialised treatments.

## HEALTH AND ILLNESS PATTERNS IN RURAL AND REMOTE AUSTRALIA

Australian statistics indicate that rural and remote Australians are disadvantaged compared with urban-dwelling Australians on a number of critical indicators (AIHW 2008). These include income and poverty levels, unemployment rates, education achievement and living costs. The rural/remote population also experiences poorer health than their urban counterparts, with health status and life expectancy decreasing the further the individual resides from an urban centre. Needless to say, they also have less access to health services. Rural and remote Australians also display higher rates of disability, premature mortality, morbidity, hypertension and mental illnesses. Health risk factors such as smoking, alcohol consumption and environmental dangers are greater in rural areas; as are rates of injury (including particularly high rates of child accidents) and chronic conditions (especially asthma and diabetes).

These higher morbidity and mortality rates are exacerbated by poor infrastructure supports (inferior roads, long distances to services and lack of transport options) and are often a deterrent to help-seeking behaviours, thus further impacting on health outcomes.

Needless to say, Indigenous Australians experience not only significantly lower life expectancy rates than their non-Indigenous counterparts but also higher rates of most ill health and trauma, particularly higher rates of chronic conditions and accidents.

### Rural/remote Australia, population health and provision of services

Healthcare provision and access is one of the most significant issues for rural and remote Australia. Despite the evident health needs (as briefly outlined above), health services in rural and remote Australia remain stretched and underfunded and there is a widespread lack of specialist services. Inaccessible areas, particularly small, remote communities, are likely to have a poorer health status and poorer standard of care. This corresponds with less availability of services or ability to access services. There are many reasons for this with the biggest being the size of the area that needs to be serviced and the distance between the services that are currently offered.

Rural/remote populations have greater difficulty accessing basic services, including general practitioners. There is considerable evidence of service paucity and overstretched resources, with patterns indicating declining service provision at the same time that demand is increasing. Health disadvantage and poorer standards of service delivery are well-established factors of rural/remote life in small communities throughout Australia yet government policy responses generally do not seem to be able to ameliorate this issue, thereby limiting appropriate and effective responses (Alston & Dietsch 2008; Nankervis et al 2008). It is a complex issue and one that is not easily resolved. Given the enormity of distance that health services are required to cover it is an ongoing debate and dilemma for any government in power.

Positively, living in a rural or remote setting provides health workers and the local community with a sense of community. There is a noted reliance on each other, the community and the service providers that do have services in town. In the event of trauma, natural disaster or illness it is not uncommon for community to 'pitch in' and help out in many and varied ways (Corbett & Williams 2014; Kitchen et al 2012; Kutek et al 2011; Shamah 2011).

This sense of community provides psychological support and reassurance for community members and also for healthcare workers who can sometimes be caught between the professional requirements of the registration standards of an Enrolled or Registered Nurse and that of community member. As a nurse there is a privacy privilege that allows for the disclosure of personal medical and personal information relevant to the provision of care; however, there remain distinct confidentiality requirements of professionals (Kutek et al 2011). In 'tight-knit' communities this requires health professionals to be discreet and have the ability to maintain confidentiality and trust in all conversations.

There is an increasingly well-documented, uneven geographical distribution of the healthcare workforce. But while there are fewer doctors per capita in rural and remote areas compared to urban areas, the contribution and importance of other health professionals must not be underestimated (Hughes 2009). The Australian government has introduced many initiatives: for examples refer to the Department of Health and Ageing, Office of Rural and Regional Health. However, it remains to be seen whether these initiatives to maintain and increase the numbers of health professionals in remote and rural areas will be effective in the longer term.

Nursing schools now focus attention on clinical placements within rural and remote settings in an aim to showcase the positives of working within these. For many students this is their first time experiencing a rural locality and for some it offers the chance of future work opportunities. For many it is the opportunity to become part of the community, learning from Enrolled and Registered Nurses within the area.

The early focus of such initiatives was on the medical workforce, with programs for nursing and allied health professionals coming later. Recruitment is only part of the story; retention is impacted by a number of factors including 'living in a fishbowl', often being the sole provider, blurred professional and personal boundaries, the requirement for a broad range of skills and limited opportunities for professional development, to name but a few.

Those who provide healthcare services certainly understand that their roles differ compared with those of their urban counterparts, and they know that they need extended and additional skills to work in rural and remote contexts. Healthcare delivery in rural geographical locations is challenging and rural nurses need to be more 'multiskilled generalists' (Bish et al 2012; 2014; Nankervis et al 2008).

The diversity of situations rural nurses attend requires them to make decisions independent of other health professionals. This requires that nurses are prepared, skilled and educated in contemporary practice to manage and coordinate situations from outpatient clinics to multi-trauma life-threatening situations (Bennett et al 2012; Keast 2014; Nankervis et al 2008). Coupled with this demand is the geographical barrier to access of education; however, the improvement in telehealth and internet accessibility has slightly diminished this barrier.

Rural and remote health is a complex problem that does not have one neat fix, nor does it belong to one government department. There is a need for a whole-of-government response: a national, coordinated approach that takes into consideration the needs and diversity of the population.

According to a 2009 statement released by the National Rural Health Alliance (NRHA), Australia faces the 'perfect storm' in its healthcare system, with increasing demand, inadequate infrastructure, a rapidly ageing workforce and escalating costs. Many rural regions are growing rapidly, primarily through the boom in mineral exports and the subsequent location of a high proportion of health activity. Rural and regional Australia is central to Australia's economic success and deserves to be a high priority in health service considerations.

## Geography, space, place and health

Health status comparisons are typically assessed through rates of life expectancy, morbidity and mortality. As referred to previously, life expectancy rates have been found to be significantly higher in urban areas compared to rural and remote areas. The rates ranged from 78 years in major cities to 72 years in very remote areas. Therefore, it is not surprising that all-cause mortality rates of Australian people increased with the level of remoteness. Most rural men are hard workers in the agricultural sector—and the appropriate services may not be available to them nor affordable to access in another locality. Likewise, property landholders may struggle with workload requirements resulting in the inability to take time 'off the land' to attend health ailments. Within rural industry time off leaves properties unattended or with less than the required staff to enable functioning of the property, with resultant loss of income. This, coupled with the ongoing struggle that nature presents with drought, flood and fire, and the political landscape with mining and changes in export market requirements, add greater pressure to those working and managing rural properties.

The common leading causes of death in rural areas include cardiovascular and respiratory diseases, as well as injury (e.g. poisonings, motor vehicle accidents and suicides). A recurring theme in rural and remote demography is that population density is low and dispersed. These characteristics impact on healthcare services, particularly the ability to sustain healthcare services at accessible locations.

While an increase in local hospital closures in rural and remote locations has resulted in a reduction of primary care and an increase in travel, this has not been the sole rural healthcare issue. Additional healthcare concerns include quality of care, specialisation of services, ambulatory care and emergency treatment, all factors that can negatively impact the health of rural people.

In large part, distance, isolation and dispersed populations have been the leading causes of these problems. These common characteristics have led to difficulties in recruiting—as well as retaining—qualified and skilled professionals. The

### DECISION-MAKING FRAMEWORK EXERCISE 47.1

It is an evening shift at the local hospital and you are working with a Registered Nurse (RN) who is busy in the office area with an upcoming audit. There are a total of 11 inpatients allocated to you and the RN. One of these inpatients was admitted 24 hours ago with a diagnosis of urinary tract infection. At 1800 hrs the RN asks you to complete a set of observations and prepare the next round of antibiotics for this patient (this will be the fifth dose) and she will be with you in a minute. You have just completed the observations for the inpatient and notice that this person has a temperature of 38.6°C. You notice that the antibiotics due at 1400 have not been given. You have only just finished your medication endorsement and are not really familiar with the antibiotic prescribed.

1. What handover do you provide the RN to alert them of the clinical situation evolving?
2. What is your responsibility in relation to the clinical error that has been identified with the omission of a medication at 1400?
3. Within the scope of the EN what are the supervision requirements relating to the administration of IV antibiotics?
4. Practise the conversation with the RN to ensure that you are able to effectively communicate and work together within the scope of practice of both RN and EN.

urban and more prosperous areas are disproportionately home to the skilled healthcare workforce in most, if not all, countries around the world.

Many promising health service initiatives in rural and remote areas have not been sustained, with the result that many communities still lack adequate health services and residents often forgo care at times of need. It is appropriate to consider the critical factors driving the need for changes in healthcare models and what impediments exist to achieving equitable access to healthcare regardless of geographical or socioeconomic circumstances (Humphreys & Wakerman 2008).

An extensive history and many issues and factors have dramatically shaped rural and remote Australia. Many of these are not unique to Australia; across the globe countries are experiencing significant and often rapid changes in geographical redistribution of their populations. These changes are mainly caused by political, economic and climate factors.

Alston (2009) discussed some of the global factors that have led to large-scale movements of people from rural to urban areas; these are mostly to do with security of employment, loss of services and jobs and climatic conditions (e.g. the natural disasters in early 2011, the drought of 2014–15).

For many reasons there is a growing diversity of rural and remote populations and a high level of unemployment and welfare dependency. The factors that have shaped and continue to shape the culture of rural and remote areas include people movements, changes in agricultural prosperity, workforce changes, globalisation (growth of the international marketplace) and 'detraditionalisation' and diversity of rural and remote areas. More than a decade ago, Welch (2000) wrote about the determinants of rural health and much of what she discussed is still the case today. Her argument is that while Australia is one of the most highly urbanised countries in the world, the economy is still dependent, to some degree, on the rural sector. The general perception of rural Australia as a homogenous mass of people, experiencing health and healthcare in a similar way, is not the case in reality.

### CRITICAL THINKING EXERCISE 47.1

There are many challenges facing nurses working in the area of rural and remote health (geographical isolation, environmental, sociological or cultural factors). These challenges often create barriers to care provision.

1. Discuss why the following factors are a challenge to individuals living in a rural or remote area:
   - Geographical isolation
   - Environment (population size)
   - Sociological issues (e.g. employment)
   - Cultural diversity.
2. What individual nurse practice changes do you need to consider in care delivery and decision making to be an effective nurse providing quality care in the rural or remote setting?

## REMOTE AREA AND RURAL NURSING

In any healthcare service in Australia, nurses make up the greatest number of health professionals in the workforce, and this is even more so in rural and remote areas. Nurses working in these areas must possess high-level clinical skills across a range of specialty areas (Berman et al 2012).

The healthcare team within a rural community is made up of different members including medical officers, nurses, allied health professionals (e.g. physiotherapists, dietitians and speech pathologists), a general practitioner or Royal Flying Doctor Service clinic doctor/nurse, community health and, within some communities, Aboriginal healthcare workers and the possibility of a nurse practitioner. Interestingly, not all members of the team will be located within the local area. Some members of the team will be accessed via the phone link within the telehealth systems and sometimes via a visiting practitioner who periodically comes to town. This approach provides the benefits of holistic and culturally sensitive health services without the need for individuals to travel large distances.

The inclusion of Aboriginal healthcare workers aims to achieve better health outcomes and better access to health services for Indigenous people. These quite distinctive healthcare providers communicate and plan care often by telehealth or phone consultation to achieve the optimal outcome for residents residing in rural and remote localities. The role of the Registered and Enrolled Nurse often comes with advanced practice opportunities to ensure that the people being cared for have access to services that are usually offered by other members of the healthcare team. For example, nurses within rural and remote areas may have prescribing rights for some medications, are able to perform Pap smears and, in some areas, x-rays. Advanced practice standing differs between the Registered and Enrolled Nurse; however, opportunities are offered that are not available within regional or metropolitan areas.

### Remote area nursing

Nurses in remote areas are required to manage medical emergencies and trauma, usually with assistance via telephone or, in some instances, telehealth from medical colleagues hundreds, even thousands, of kilometres away. **Remote area nurses** provide the following care:

- Age-appropriate wellness check-ups and healthcare
- Detection and monitoring of chronic disease
- End-of-life care
- Examination and diagnosis, and prescribing (in Australia only) and dispensing medications as part of routine practice
- Follow-up nursing and medical care after transfer back to the local area from a regional or tertiary health facility
- Community development and health promotion activities
- Public health programs (e.g. screening and surveillance).

This care often occurs in a cross-cultural environment that operates with languages, knowledge and cultural systems different from those of the healthcare providers (Brown & Edwards 2012).

## Rural nursing

The lack of other healthcare professionals will determine the scope of practice of the rural nurse. In Australia, and internationally, **rural nurses** have a more generalist role as the population declines and nurses have to work with remotely located allied healthcare and medical practitioners. Rural nurses also require a broad range of skills and knowledge (Brown & Edwards 2012). The team comprises Registered Nurses, Enrolled Nurses and Aboriginal and Torres Strait Islander healthcare workers. In some settings a nurse practitioner or Enrolled Nurse may also be an Aboriginal healthcare worker. Each member of the nursing team provides care within their level and scope of practice. For many years nursing within rural and remote areas has been identified with a 'bush' nursing model of care. That is, a generalist yet expert role that has extended beyond nursing care realms of those working in larger centres, with inclusions of prescribing rights and extended assessment and treatment plans, to name a couple of areas.

Extensions now exist to these roles of nurses in rural and remote settings and the role of the nurse practitioner has evolved (Gardner et al 2006; Klein 2007; Corbett & Williams 2014). Often it is these services led by a nurse that now provide a greater ability within a health service to provide frontline care and referral within rural and remote communities. This positive inclusion within the workforce is not in all areas but where evident is key to prompt and efficient care delivery, coordination and referral without delays in service delivery (Corbett & Williams 2014).

## Characteristics of remote and rural nursing

The characteristics of remote area and rural nursing in Australia are usually not experienced in other nursing contexts. Clinical Interest Box 47.1 shows examples of rural and remote nursing characteristics.

The need for remote area and rural nurses to work at an advanced practice level increases as the size of the healthcare service decreases. Clinical Interest Box 47.2 outlines some of the activities that remote area and rural nurses undertake.

The professional support available to remote area and rural nurses is outlined in Clinical Interest Box 47.3.

### CLINICAL INTEREST BOX 47.1 Characteristics of remote area and rural nursing

- Providing care to small, dispersed and highly mobile populations
- Climatic extremes
- Providing care to populations with high morbidity and mortality
- Working in the context of a lack of social and human services infrastructure
- Working in isolation, which is geographical, social, professional and cultural
- Absence of remote health standards, credentialling or remote service accreditation
- A strongly multidisciplinary approach with flexible professional boundaries, often with a horizontal style of management
- Advanced and collaborative practice
- Lack of boundaries between home and work
- Frequently on call
- Dependence on remote technologies
- High level of traumatic events
- Autonomy and flexibility
- Cross-cultural environment
- Frequently lacking formal preparation for the advanced and extended practice role
- Primary healthcare approach

*(Brown & Edwards 2012:213)*

### CLINICAL INTEREST BOX 47.2 Nursing activities for remote area and rural nurses

- Assessment, diagnosis and treatment of acute conditions
- Early detection and co-management of chronic disease
- Child health, and growth and development monitoring of 0–5-year-olds
- Health promotion activities (immunisation programs, outbreak control and sexually transmitted infection control), environmental health and nutrition programs
- Dispensing medications
- Management of acute trauma and medical emergencies
- Evacuating an individual via road, sea or air

*(Brown & Edwards 2012:216)*

# EFFECTIVE HEALTHCARE SERVICE DELIVERY IN REMOTE SETTINGS

Effective healthcare service delivery in remote settings can involve working in teams and in partnership. Health professionals need to share problems and be prepared to resolve differences. The key to achieving successful partnerships is a willingness to consider and respect the perspectives and needs of others (Brown & Edwards 2012).

## Recruitment and retention of workforce

The difficulties associated with recruitment and retention in small rural and remote health services are widely recognised. A wide range of measures have been implemented by

## CLINICAL INTEREST BOX 47.3 Professional support for remote area and rural nurses

In Australia the following organisations support nurses:

- CRANAplus is the professional organisation representing health professionals of all disciplines who work in rural and remote areas
- Rural Nursing and Midwifery Faculty of Royal College of Nursing Australia provides professional support for rural nurses
- The National Rural Health Alliance (2010) is the peak multidisciplinary body for rural and remote health
- The Rural General Practice Network supports rural health professionals

*(Brown & Edwards 2012:217)*

governments and health authorities in an attempt to redress these issues.

The 2008 paper by Humphreys and Wakerman represents the first time health workforce retention benchmarks and recruitment costs have been identified for rural and remote primary healthcare services located in different geographical contexts. Its outcomes enable health services to know what is a reasonable length of service that might be expected from health workers employed in different rural and remote contexts, what are the real costs associated with replacing staff who leave and how the service might fashion its workforce retention strategy and incentives most appropriately to better serve the needs of its health workers. Additionally, this research identified sentinel indicators which will enable health services and health authorities to better use their human resource data to monitor workforce performance and plan future retention measures designed to maximise length of service.

Accessible in situ healthcare services are not only preferred by people within communities, but arguably result in better health outcomes, whether it be in terms of more responsive treatment to acute care needs or increased likelihood of adopting health promotion and early intervention behaviours. Maximising the retention of existing health workers is the key to ensuring the maintenance of locally available, appropriate, sustainable rural and remote health services across this vast land.

The Services for Australian Rural and Remote Allied Health (SARRAH) position paper *Principles of recruitment and retention of allied health professionals serving remote Australian communities* (February 2010) provides information and recommendations regarding principles and strategies to be developed, funded and implemented to support the recruitment and retention of an allied health practitioner (AHP) workforce for remote communities in Australia. A consistent, national approach to recruitment and retention of AHPs adopted at national, state and local levels is required to ensure that remote communities have access to the range of allied health services necessary to meet their current and projected health needs.

## Working in health teams and partnerships in rural and remote contexts

Successful teamwork is an essential ingredient for providing an effective health service in rural and remote contexts. Proficient teamwork can also enhance satisfaction, productivity and survival; whereas dysfunctional teams compound the considerable challenges that already exist for rural and remote health professionals and the consumers of the service (see Case Study 47.1).

There are many leadership styles and a number are seen in healthcare. Historically nursing has seen autocratic leadership or a 'top-down' style of leadership, with tasks and skills delegated as deemed relevant. Jeon et al (2010) explored the notion that leadership plays a critical role in setting the climate for practice development and the outcomes of care; according to Cook and Leathard (2004) and MacPhee (2012) this is particularly relevant within the complex and continually changing world of health. It is the effect of leadership that will determine an organisation's ability to change and learn and it is the organisation's willingness that will promote or inhibit change within the organisation. This creates challenges for nurses as they have to balance their leadership role between resolving immediate and conflicting clinical pressures, as well as continuing to make progress in staff development and the identification and implementation of the latest evidence within their nursing practice. Through development and promotion of clinical nursing leaders for the future, rural facilities can aim to achieve the goal of providing quality nursing care within supportive work environments that use evidence to guide their nursing practice.

Successful leadership in healthcare is greater than defining and engaging a specific leadership style and through research conducted by Stanley (2009) a model of congruent leadership was developed. Stanley (2009:63) affirmed that it is 'congruent leadership that responds to challenges and critical problems with actions and activities in accordance with staff values and belief.'. Nursing clinical leadership is about the leadership demonstrated within a nursing clinical setting. A nurse will lead their team in accordance with the clinical demand they meet each day and it is in these areas that the need for nursing leadership is important. The nurse in their clinical setting (ward, unit or residence) will utilise decision-making capacity in line with clinical needs, staff relations, organisational capacity and scope of practice.

As nurses, we are all leaders of the care we provide, the communication we have with our colleagues, individuals in our care and their families and the professional approach that we use. It is about how we treat each other and the people we care for. In a rural setting this is also the social network of the nurse and a balance must be maintained between professional and social identity.

## CASE STUDY 47.1

Working in teams is complex and multifaceted irrespective of the clinical setting. Team work requires all members of the team to listen, participate and respond to each other in amicable ways. In nursing, teamwork also requires a 'hands on' assistance approach to achieving individualised care in timely and efficient ways.

Below a remote area nurse describes how the health centre staff were having some communication problems and needed to look at new ways of building their team in a more positive way. A new assistant director of nursing position was being advertised and it was hoped that this role would assist the team to improve the following team concerns:

This is how the team did not work:

- We had an old-fashioned, vertical structure. The doctor was above the nurse, the nurse was above the Aboriginal health worker (AHW) and we were all above the community and anybody from outside the community. There was division along professional, gender, cultural and experience lines. So each of us needed to 'divide to rule' or to at least have a say. This was a very unhappy team
- The team did not build a sense of community. The health centre was not then a community health place; it was a 'sickness' place—the place of last resort. Things looked efficient; everyone knew their place (like it or not). The trains ran on time; the problem was there was no one on the train, only the drivers, and the community got nowhere
- This situation manifested in late presentations. Families and individuals delayed at home ill, so the children came very late, often when they were too sick to treat locally. The traditional healer would not come near the health centre as they clearly felt uncomfortable and culturally unsafe.

A successful appointment was made to the team and a new nurse took charge of the team and negotiated a change of focus and leadership style. This led to the following experiences:

- The nurses and AHWs together with the visiting doctor worked collaboratively and developed a plan to manage children who didn't appear to be growing well. Mothers with sick children would come to the health centre a lot. The children presented as very weak and undernourished, usually with an associated infection. The nurse and the AHW would examine the child, undertake the relevant investigations for the presentation and if necessary refer to the doctor for further review, examination and tests. This is where the senior clinician would take the lead
- Sometimes the child would be referred back—medical causes excluded, it seemed there were problems with access to food. Questions would be asked as to why? Was it an issue of money, understanding or home situation? This was where the AHWs would take the lead. Together the health staff would visit the home and talk to the family but the AHWs took the lead on this. 'First to speak, first to walk into the home'
- Sometimes the numbers of children would get too big for the team to manage effectively. Too many children were malnourished or were not adequately recuperating after an acute illness. So the health staff took the information to the community. The community leaders started looking at funding programs for child feeding and maternal education. Then they looked at the community and family issues that were directly impacting on the health and wellbeing of the kids and used the state of the children as a springboard for a range of actions. This is where the community took the lead.

1. How would you describe this leadership change in focus for the healthcare team?
2. What benefits does the shift in leadership have for a nurse working in the setting?
3. What benefits do the shift in leadership and resultant outcomes have for the individual using the health service?

## Features of remote health teams

Rural and remote health teams have a number of features, some that they share with teams in urban areas and some that are unique to the rural and remote context. Generally they operate in areas of high morbidity and mortality, and hence have a greater health need; extreme isolation; harsh environments; often in cross-cultural contexts including the city/bush cultural divide, with a highly transitory, cross-discipline membership. These factors provide not only the greatest challenges and but also the greatest potential accomplishments of teams in rural and remote areas. The experience of operating effectively as a team member enhances interpersonal skills, problem-solving capacity, conflict management skills and mutual support. It is common for rural and remote team members to become long-term friends. The intense teamwork experience creates friendship and support that can extend into the future.

Working within a rural and remote health setting can be rewarding and provide opportunities that are not able to be experienced in any other setting. As Mitchell and Hussey (2006) described it, 'working in one's own community can be rewarding but stressful; there is a perception that you are "everything to everyone"'. However, it is the reward that encourages staff to continue to work in these settings, the satisfaction that all that could be done has been done. It is the sense of belonging and the sense of community that holds nurses in high regard in these settings. As one nurse describes it:

*I came to work here 5 years ago; I had never lived in a rural area but trained as a Registered Nurse in a regional university. I did a clinical placement at a rural hospital and loved every minute of it. I then applied for a graduate position here and have not left. I love it, the people, the work, and the opportunity. I have since completed my rural and remote*

*practice qualification and want to seek a role as a nurse practitioner one day.*

**(Carina, RN)**

***Multidisciplinary team*** Rural and remote health teams are multidisciplinary, involving Aboriginal health workers, doctors, nurses, community welfare and allied and other professional groups, as well as administrative and management staff. They require each member to have specific areas of expertise as well as advanced generalist skills and the capacity to support and complement each other. The inclusion of the Aboriginal health worker seeks to provide the key link between culture, the people and their health.

As one healthcare worker outlined, 'these ties to the community and local health networks provide us with a real sense of what is going on and what is needed at a grassroots level' (Mitchell & Hussey 2006).

It is through a combined team approach that care is coordinated and provided to those in need or those who require primary health strategies within the community setting. Nurses provide the dominant service within rural and remote communities from both a preventative and an illness or injury management perspective. This often overlaps with roles and responsibilities of other members of the healthcare team; however, it is unavoidable due to the nature of the work. This is commonly a source of conflict in those teams whose members originate from traditional practice backgrounds of urban hospitals and private practice and are more familiar and comfortable with the models of clear boundaries between professional roles, responsibilities and authority.

From a positive perspective, multidisciplinary teams with overlapping roles reduce professional barriers and barriers between individuals and increase the team's capacity to deal effectively with the greater demands of the service, while utilising individual expertise appropriately.

One of the few constants of rural and remote area teams is the changing membership as a result of staff turnover. Staff change is a major feature of rural and remote health teams. It is influenced by many external forces, such as emergencies, the family setting back east, west, north or south, ageing parents, children's education and so on. The high staff turnover is a strong argument for working in teams in remote health.

Teamwork is highly valued within the rural and remote health context (Lawrence et al 2015). As in so many other areas of rural and remote practice there is a huge learning curve (and unlearning in terms of past hierarchical team processes) to come to grips with. In summary, teamwork is about constant adaptation and change: adaptation to new members and rapidly changing circumstances as well as health systems. In the vortex of external change the team needs to be a haven of support for the individual health professional, a motivator through shared visions of the future, a creator of learning opportunities and a way to reality test expectations.

## STRESS RELATED TO WORKING IN A REMOTE HEALTH CONTEXT

Stress reactions can be described as a process of adaptation, a concept that can apply to stress associated with rural and remote practice. When health professionals begin work in a situation they have not worked in before, a period of adjustment is expected. The adjustment process will give rise to varying levels of stress (i.e. psychological 'strain'). This will persist until they gain a level of mastery (i.e. become comfortable and effective) in their new environment.

High turnover of staff in rural and remote areas prevents the development of an experienced workforce whose members have completed their adaptation process and become effective health professionals. This means that the bulk of the rural and remote workforce is at the beginning of their learning curve. Collective memory of what has gone on before, what works and what does not work tends to be short, resulting in the same mistakes being made over and over again. It is difficult to establish or maintain efficient and effective remote health services when health professionals are constantly being replaced.

### What is stressful about remote practice?

Stress is an issue that impacts on all health professionals, regardless of where they work, whether in towns, cities or the bush.

### DECISION-MAKING FRAMEWORK EXERCISE 47.2

You are working with a Registered Nurse in the emergency area of a rural health facility. The staffing in the area is yourself as EN and the RN; the ward area attached to the emergency area has an RN and EN working in the area alongside a ward assistant. The morning has been extremely busy and you are aware that the RN is with an acutely unwell person in the resuscitation bay. A local resident arrives at the triage desk and informs you they have cut themselves with a machete knife while harvesting broccoli. Their arm is currently wrapped in a towel; however, there are traces of blood evident on the towel. You take the person's details and move them to a cubicle where they can be seen and let the RN know what has occurred. The RN tells you to deal with the situation, assess the wound and let her know what needs to happen.

1. Do you leave and assess the person's arm?
2. What strategies can you use within the EN scope of practice in caring for this person?
3. Considering the staff in the whole facility at the time of this presentation, what other strategies could you utilise?
4. How would you effectively discuss these strategies with the RN and maintain harmony within the team?

Commonly accepted sources of stress in rural and remote work environments can be:

- The job—for example, workload (too much or too little), role ambiguity, lack of control and conflict
- The organisation—for example, working conditions, lack of recognition and support and unsuitable staffing levels
- Organisational change—changes to procedures, new technologies and expectations of transfer or retrenchment
- Violence and other traumatic events in the workplace.

While stressors in the rural and remote work environment, such as heat, dust and humidity, are easy to recognise, many of the causes of stress in the rural and remote workplace may not be so obvious. Health professionals may be stressed by uncertainty about their roles, by the responsibilities they carry, by their workload, by the way their working lives are organised, by the content of their jobs or by the network of interpersonal relationships that characterise their day-to-day existence.

## Lack of anonymity and personal privacy

Life in small remote communities is sometimes described as 'living in a fish bowl'. All areas of the remote health professional's life may come under scrutiny and provoke comment from local residents, not just about their professional abilities.

Many people value the interconnectedness of small communities, particularly if there is a community culture of helping each other out in hard times. Many would suggest that urban dwellers miss out on this sense of community. For example, many urban dwellers might not even know their neighbours.

However, like most things in remote areas, knowing everybody and everyone knowing the nurse is a two-edged sword. In some situations it is a blessing. In others it may be a curse.

Accountable practice can take on a new dimension: residents happy or unhappy with service provision have ample opportunities to express their satisfaction or dissatisfaction directly to the health professional.

Lack of anonymity of health professionals and individuals (and their families) in small communities may raise issues about confidentiality. For example, a common rule of thumb in terms of maintaining confidentiality has been that workers may talk about work-related issues with others (e.g. colleagues or partner), but only if they can do so in a way that does not identify those involved. This is hard to achieve in small communities when most people know most of what goes on and the people involved.

Opportunities for health professionals to talk about their work with others or to safely express any anger or frustration may be restricted as a result. Yet, the need to talk over work-related issues is recognised as an important part of debriefing following a stressful day.

Lack of anonymity of health professionals and individuals may also pose ethical challenges. For example, health professionals are generally discouraged from providing health services to friends and family. Ethical guidelines for professional practice have been developed to suit urban health professionals, who usually deal with individuals who are strangers to them. While practising in small community settings nurses may find themselves in breach of the ethical guidelines set down by their professional body.

Lack of anonymity also impacts on the health professional's ability to maintain privacy and personal space. In some instances on-site health professionals may be seen as a community resource, with the expectation that they will be there to meet the health needs of the community at any time of the day or night. On-site health professionals may be accessed by health service consumers wherever they are in the community, regardless of what they are doing—shopping or socialising, for instance.

This might be a negative or positive experience—depending on whether the health professional finds this level of trust and responsibility to be enriching or whether they see it as an intrusion.

*I feel quite alienated by having to be a doctor 24 hours a day in the supermarket and everywhere else. General practitioner*
**(Tolhurst & Bell 1997)**

*It's almost impossible to get enough personal space for myself … I was speaking to a friend the other day and I said I felt like a sitting duck in a shooting gallery that's going back and forwards waiting for someone to get me. General practitioner*

**(Tolhurst & Bell 1997)**

*I wouldn't work anywhere else. Where else could I care for a person with a snake bite at the beginning of my shift, assist with the plaster cast on a gentleman with a broken arm, attend a community immunisation clinic before lunch and provide a talk to school children on looking out for a mate with epilepsy in the afternoon. No other nursing job would allow me to be in all these places, it would be multiple positions, not as I love it … it is my everyday.*

**(Joan, RN)**

If you have grown up in a small community, this may not seem a big issue to you. If you are not accustomed to these levels of connectedness and visibility, then a period of adjustment will be necessary before a level of comfort is achieved.

## Lack of boundaries between work and home

The division between the nurse as a person and the nurse as the health professional tends to be less clear-cut in small rural and remote communities. This is partly due to the lack of natural circuit breakers between work and home, and between personal and professional.

City workers and health professionals who provide visiting health services can do their job and then leave their professional role behind and return home to personal lives relatively unconnected to their work. They may have a choice of recreational activities to participate in, and access to a range of other people, friends and acquaintances that are not connected to their workplace. This allows some down time to relax following work demands.

In small and remote communities, work and home life are less easily differentiated. Home may be just a stroll away from work or home may be in living quarters in the hospital grounds. If the health professional is on call their movements may be restricted. Rural and remote communities tend not to offer the same range of recreational activities available in town. In addition, friends and acquaintances tend to be drawn from contacts made in the workplace. Areas of common interest may be work-related.

For health professionals who live on-site in the remote community, the lack of boundaries between work and home may become particularly apparent when they are required to be on call. Their home becomes part of the workplace; people knock on their door to request assistance.

In such contexts, it may be difficult for remote health professionals to find time and personal space to just be themselves and to escape from their professional roles. This can impact on their ability to achieve rest time and to express parts of themselves not related to their work.

## Housing issues

The difficulties in establishing personal boundaries sometimes extend to the health professional's living space. Housing issues in rural and remote areas traditionally have been long-standing sources of conflict and stress for many health professionals. While health professionals recruited from outside the community may be provided with accommodation, local people (e.g. health workers) may not have accommodation provided (yet they may share the same issues of inadequate and overcrowded housing as others in Indigenous communities).

In some instances the lack of guest accommodation in remote communities (e.g. motels or guesthouses) means that there may be an expectation that health professionals will provide accommodation for health professionals and others that visit the community.

Some health professionals are required to leave the remote community to access annual or other leave so that the relieving/locum health professional can use their accommodation.

## Unrelenting demands

Health professionals who have grown up in the community may find the demands on them from friends, families and health service individuals to be unrelenting.

*I work in a multidisciplinary health service within an Indigenous community. I am a single parent and live with my four children just out of town and work 4 days a week within the service. Many of the individuals are family to me and this makes it difficult when I see the decisions they make and the complications I tend with respect to their failing renal function and diabetes management. Sometimes it is hard to differentiate between nurse and family member; it tears me apart.*

**(Deb, RN Indigenous health)**

*A position became available and I went to the deputy director of nursing and said, 'I'd love the role' and she said, 'Good, you can have it.' That was it, applications done and dusted, appointment made.*

**(Bish et al 2013:385)**

The unrelenting nature of remote work is a particular issue for on-site health professionals who may be required to be on call frequently. Sole health professionals may be on call 24 hours a day, 7 days a week.

*Sue received a call alerting her to a vehicle rollover out of town. The ambulance was sent and staff began preparing the clinic's rooms awaiting the arrival of the injured. A man arrived and said, 'No, it's nothing, it was just me', and he had a broken hand. I relaxed a bit. About half an hour later noise was heard outside and 17 further people presented—they were all in the vehicle rollover. The event required the whole nursing team, a 24-hour shift, and six people evacuated.*

**(Keast 2014:19)**

Sleep deprivation may become an issue at times. Even losing a single night's sleep can impair performance. Both short-term and long-term memory is affected after a night without sleep, and performance is slower (Silva-Costa et al 2011). Without enough sleep, individuals can have problems paying attention, and they can miss information due to lapses in attention (Silva-Costa et al 2011). People deprived of sleep also tend to be more irritable than usual.

### CASE STUDY 47.2

You have applied and successfully been appointed to a position within a rural hospital located 1100 km west of where you currently live. You have visited the town only once before and do not know anyone except the director of nursing (DON) and one staff member who you met at the interview. Your first shift commences and you start to introduce yourself to the other staff and the people that you will be caring for. A woman arrives at the front counter and asks how her husband is today. You ask her who he is and she responds with, 'Why don't you know and who are you anyway?'

1. What is your response?

Later in the evening you notice the same lady crying as she makes herself a cup of tea. You go to see if she is okay. She responds by telling you that their farm is not doing so well, the drought has meant they have had to sell a large number of cattle and feed is running low for those animals that remain. She tells you she has been hiding the severity of the feed issue from her husband as he is so unwell. By now, you know that her husband is a 60-year-old man with a recent diagnosis of bowel cancer who has been transferred back to the local hospital from a long stay for surgery, radiotherapy and chemotherapy in a tertiary facility. He remains in hospital as he still is receiving treatment for an infection within his bowel.

2. How do you respond to this woman and what support mechanisms do you see could be provided in the rural and remote setting?

## Cultural adaptation

All rural and remote communities have their own culture, whether agricultural, fishing, Indigenous, mining, railway or tourist. Being familiar with the culture and the demand that this places to be able to successfully work and reside in an area requires attention, discretion and understanding. Working within and with cultures and building community trust are inherent features within the *Code of Professional Conduct for Nurses* (NMBA 2008).

Culture shock can be a significant issue confronting healthcare workers in any healthcare setting but more so in the rural and remote space. Particularly of interest is non-Indigenous workers working within Indigenous communities as culture shock is not just about the healthcare worker and adjustments to the culture, but also the adjustment of the people in the area to a new worker from perhaps a differing background, culture or ethnicity (Muecke et al 2011). In transitioning into a setting priority needs to be given to gaining an understanding of the community expectations, the practices and ideologies of the community; introducing yourself and attending appropriate social events to engage in local heritage; listening to the local conversations; working with staff with experience in the area; and sharing your experience and knowledge where it is deemed appropriate.

***Indigenous communities*** The greater the difference between the health professional's cultural background and the community's culture(s), the greater the adaptation required before they master the new environment sufficiently to become effective and competent. This is particularly apparent for non-Indigenous health professionals recruited to work in remote Indigenous communities (Francis et al 2012).

Adjustment (and re-adjustment) is likely to occur when a health professional begins work in a remote area for the first time. For example, when a local from the remote community begins work within the bureaucratic environment of the health department, when a health professional moves from one remote community to another or during periods of organisational change.

*If you work in bigger hospitals you seem to have more support ... here you are limited. You depend on your colleagues ... who you can debrief with, who would experience and understand the way you feel.*

**(Kenny & Allenby 2013)**

*We carry so many portfolios ... I'm the [three specialist nursing roles] ... I have to have all these audits and stats done by the end of every month, effective discharge stats, nursing care stats, I have to have my floor report every month, and care for the people I see on my shifts.*

**(Kenny & Allenby 2013:196)**

Some health professionals feel they must exchange their own cultural values for the cultural values of the remote community they are living or working in. This is not so, nor is it necessarily desirable. Living one's own life according to one's own cultural values helps to maintain a sense of security, meaning and identity. However, this concept applies to individuals accessing health services as well as health professionals.

Nonetheless, the remote health professional will need to develop sufficient understanding of the culture(s) of the remote community and the impact of their own behaviours if they are to be effective and culturally safe when working within the cultural context(s) of a particular community.

Living and/or working in a culture other than your own can be a disorienting experience. Some speak of experiencing 'culture shock' while adjusting to living and working in a culture other than their own.

As health professionals learn new knowledge, skills and attitudes and adapt to the remote community over time, it is almost inevitable that they will be changed in some ways. It can be disconcerting for some health professionals working in rural or remote environments to find that a period of re-adaptation is required upon returning to the city or 'mainstream'. Many report feeling uncomfortable and out of place for a while until they re-adapt to their own culture and the non-remote setting.

## Issues of isolation

Isolation in remote communities can occur at several levels: geographical, professional and cultural. **Geographical isolation** is something that cannot usually be changed and is by definition part of remote health work. For those who grew up in the remote community, it may not necessarily be seen as unusual or a hardship.

A sense of isolation may be relative. A person's sense of geographical isolation may be reduced by, for example, roads being upgraded, frequency of air services, owning their own vehicle, networking with outside organisations or maintaining contact with others, both inside and outside the community.

For community members the need for accurate and timely healthcare is important. The need also for preventative health information is important. How to balance and manage the needs of individuals within communities can be assisted with the inclusion of information sourced and accessed via the internet or telephone. It is these services that can be updated and managed remotely that can assist communities to gather information to prevent health concerns or to assist in their management. It is also a key link to understanding a diagnosis or treatment plan. Healthdirect is one of these services that is available via the internet, or via a phone app. Healthdirect offers the community within Australia with resources in relation to symptoms, conditions, medications and treatments with a 1800 telephone number for health-related questions or advice. The service also offers information and guidance to healthcare professionals working in areas of isolation or rurality. Through the use of the internet or smart phone applications access has become easier; however, there are still barriers within levels of literacy or the lack of suitable phone or internet coverage.

Healthdirect is also a source of information for nurses working in the remote setting and is an ideal way of sharing reliable and evidence-based information with the community. Often working alone, without colleagues to consult or discuss

clinical and other issues with, can increase the stress associated with many situations. Some remote health professionals may feel isolated within their own professions. Remote workers are not only minorities within the population, but also within their own professions. Urban health professionals may have different agendas and issues of concern.

A sense of professional isolation can be reduced by, for example, joining and participating in professional bodies which contain other remote health professionals, networking with other remote health professionals, subscribing to professional journals or undertaking further study. If the health professional has not grown up in the cultural context of a particular community, be it mining, tourism, railway or Indigenous, then a sense of isolation may arise, particularly until they learn enough to feel comfortable or become competent within that particular cultural context. This is commonly cited as a barrier to recruitment and retention of remote health professionals. Certainly, for new graduates or those new to remote area work practice, it may be difficult to access the ongoing supervision and mentoring which is necessary as they adjust to their new role.

A sense of cultural isolation can arise as a consequence of being a member of a minority culture within a larger cultural group. This can be felt not only when recruited from outside the community, but also when working in an organisational setting which does not share your values, cultural or otherwise. A sense of cultural isolation may be reduced, and a sense of security and identity maintained, by maintaining links with the health professional's own culture, particularly during the early stages of cultural adaptation.

### CRITICAL THINKING EXERCISE 47.2

Take a piece of paper. List the positive aspects of working in a remote context on one side of the page, and list the negative aspects of working in a remote context on the other side. How many factors appear on both lists? That is, do the blessings of remote practice also contain the potential to become 'curses'? Do the positives outweigh the negatives?

## Trauma and violence

Traumatic events are those in which the individual experiences some form of threat to their own or others' lives, or are exposed to the threat or actual death of others, particularly under violent, shocking or horrific circumstances, and may also involve exposure to gruesome images. During or after the event the individual may feel an overwhelming sense of horror, terror or helplessness.

Individuals who are exposed to such events may experience a characteristic set of psychological and behavioural reactions that have their roots in the human stress response. Considering the great diversity of human nature and cultures, the uniformity of the experience of traumatic stress reactions is remarkable and suggests a biological basis to the reaction pattern, and also that the reaction pattern is a form of adaptation which has survival value.

As in day-to-day stress, a traumatic event is a combination of the actual event—which contains the potential to traumatise, whether the health professional perceives the event to be personally traumatic—and the health professional's reactions during and after the event. The experience of traumatic stress is an essentially human and normal response to extremely stressful situations.

Violence against health professionals is not uncommon in remote areas (Hills 2008; Taylor 2013). The effects of social tensions and violence in the remote community can also impact on the workplace. The emotional aftermath, although a normal reaction following such events, can be a difficult and challenging experience. While early intervention strategies, such as psychological support and debriefing, aim to prevent long-term psychological harm from occurring, some health professionals may become overwhelmed by their experience and go on to develop posttraumatic stress disorder.

Remote area health professionals may be particularly vulnerable to the impact of traumatic events; for example, road accidents, natural disasters, death of friends and physical assault (Lenthall et al 2009).

While employers have a duty of care to prevent traumatic events where possible, and to support workers in their recovery, it is also important that health professionals accept responsibility for their own role in maximising their recovery following such events.

Living and working within a rural or remote setting can be difficult particularly when traumatic events occur. The role of healthcare worker can involve being a provider, community support and personal involvement. The importance of identifying personal boundaries and the maintenance of an individual's scope of practice and ethical conduct is complex (Kutek et al 2011). The support that a nurse requires during these times is also difficult (e.g. deciding who to talk with when the involvement is widespread in the community). Such is often the case when a major road trauma or suicide occurs within the community resulting in the 'loss of a local'. Support for nurses and the awareness of ethical and legislative boundaries are vital; however, they are often limited in the rural and remote space (NMBA 2008).

The key importance in dealing with traumatic events is the post-event debrief time that should be conducted within the healthcare team at a time and place suitable to participants. Boundaries should be established and the ability to grieve, converse and gain a sense of closure be established for individuals participating. Often this is a complex process given the professional and personal boundary blur. The *Code of Professional Conduct for Nurses* in Australia sets the minimum Standards for Practice of a nurse in Australia (NMBA 2008). Within the Code are 10 Standards with Standard 5 pertaining to the respect of dignity, culture, values and beliefs of individuals and Standard 8 specifically relating to preserving the trust and privilege in the relationship between nurses and those receiving care (NMBA 2008).

**CRITICAL THINKING EXERCISE 47.3**

What are your views on being accessed after hours—for example, while shopping or at a community social event? What are your personal guidelines regarding what you see as acceptable and not acceptable in relation to this issue?

## ACCESS TO HEALTH SERVICES IN RURAL AND REMOTE AREAS

### Telehealth

One of many strategies currently being used to deliver healthcare services to rural and remote communities is telehealth. **Telehealth** is defined by the World Health Organization (WHO) as 'the use of information communication technology applications to provide health and long-term care services over a distance' (Berman et al 2012). There have been many reported examples of ongoing use of telehealth in Australia and clinical reports of positive results for people suffering from ongoing effects of acute illness and chronic illness and for their carers and rural and remote health service providers. It is anticipated that improved communications through teleconference and videoconference facilities will be the basis of strategies to ensure equitable access to healthcare and form the framework for future healthcare provision in rural and remote Australia (Berman et al 2012).

Telehealth is being extended into rural Australia as the use of digital infrastructure improves. There are many advantages for the nurse working in a rural or remote facility; for example, nurses are able to communicate with experts in trauma centres in relation to individual care situations as they present rather than managing a person based on the team's knowledge or limited prior exposure. This provides a sense of security for healthcare teams in rural and remote areas and also provides the best possible approach to timely, lifesaving or immediate advice from a specialist consultant from a tertiary setting.

*Telemedicine* refers to the practice of a medical consultant having communication, consultation and the provision of advice or care planning and medical intervention in a setting outside the area usually within rural or remote facilities (Wesson & Kupperschmidt 2013).

The challenges that present within a rural setting are often complex and require a nurse to manage the situation until medical assistance arrives. As a nurse working in a rural setting it is important that the provision of care for a person and their carer is completed in partnership. Decision-making processes, the model of care used in the setting and the delegation and responsibility of all staff within their scope of practice are vital to positive outcomes (Australian Commission on Safety and Quality in Health Care (ACSQHC) 2012). Individuals using health services should participate in making decisions about their own healthcare.

In the provision of care consideration needs to be given to the individual roles of the healthcare team and the required resources of each health service organisation. The National Safety and Quality Health Service Standards identify key processes to ensure that there is early recognition of the deteriorating person and prompt and effective management of individuals in these circumstances (ACSQHC 2012). Time is a critical factor in managing a deteriorating individual and for nurses in rural and remote health areas the access to more specialised services can sometimes be complex. This is where telehealth can prove very advantageous to the healthcare team.

### Transferring to regional or metropolitan health services

At times people in rural and remote areas are required to travel to a regional or metropolitan specialist centre. This process can often be a source of great anxiety and stress for the person, their family and community. As a nurse working in urban, regional, rural or remote communities it is important to have an understanding of the issues relating to transfer for treatment (Berman et al 2012).

The Royal Flying Doctor Service (RFDS) supports residents in rural and remote communities requiring access to high-level care. In one day in Australia, the RFDS flies more than 65,000 km and performs more than 100 medical evacuations, and over 85,000 consultations are conducted each year. The RFDS provides more than emergency retrieval and transfer services; it plays a key role in the provision of health prevention and screening programs and general practice clinics run in isolated areas on a regular basis (Berman et al 2012).

Angel Flight is a charity service that provides flights for non-urgent travel to and from medical appointments. The staff and pilots are volunteers and the service relies on fundraising to exist. A referral must be completed and submitted to Angel Flight up to 2 weeks before the required travel depending on the location. This can be completed by a nurse, doctor or allied health professional. This service is not for individuals with acute care needs as no medical assistance is provided onboard the plane, but is for people needing to attend medical appointments.

For community members within a rural or remote location within Australia there exists within each state a transport system of support. The level of support is both physically and financially driven for those needing medical care outside their local community. The patient-assisted travel schemes (PATS) provide a subsidy to help with travel, escort and accommodation expenses incurred by those living within a rural or remote area. The scheme is available to individuals who need to travel to medical appointments or hospitals more than 100 km from where they live. As a nurse it is important to communicate with individuals about the scheme and how to apply for assistance during times when medical referral away from home is needed. The link to the scheme is available within the list of online resources.

Clinical Interest Box 47.4 outlines the considerations to take into account when someone in your care is being transferred to another healthcare service and requires retrieval services.

## CLINICAL INTEREST BOX 47.4 Considerations for healthcare transfer

- Does the person have anyone to travel with them, or meet them at the destination?
- What is the name of the facility they are being transferred to?
- How will they get to their destination?
- What is the anticipated length of stay?
- Do they require accommodation for support person and/or themselves?
- What arrangements need to be made for their home, work or family?
- Do they have necessary items such as a small amount of money, toiletries and a change of clothes, contact details or identification documents?
- What are the weight requirements or size restrictions of the transfer vehicle?

*(Berman et al 2012:168)*

## Summary

In this chapter we undertook a broad comparison of the health status and needs of urban, rural and remote communities and outlined some of the features of remote environments. We also looked at the key infrastructures for effective healthcare service delivery in rural and remote settings in general and discussed potential sources of stress related to working in a remote health context.

The roles of the remote area and rural nurse were explained, including recognition that these nurses require a high level of knowledge and clinical skills. We noted that advances in technology may have a substantial impact in the future on the ability of Australians living in remote and rural areas to receive healthcare in their home communities with a reduced need to travel for specialist or follow-up support services.

## Review Questions

1. What indicators would you use to define remoteness? Think about these in order of priority for you as a health professional working in a remote location.
2. List 4–6 key features of rural or remote healthcare environments in Australia.
3. What are the key factors and processes that have led to poorer health service delivery in rural and remote areas than in urban areas?
4. List the common characteristics of rural and remote nursing.
5. What are the key determinants of health affecting the rural or remote geographical area in Australia and how do these impact on the care provided in rural facilities?
6. Identify key ways of engaging with the rural or remote community to minimise culture shock and to become part of the setting.
7. What nursing codes of practice relate to the nurse working in Australia? Discuss the impact of the *Code of Professional Conduct for Nurses* on nurses in rural and remote settings.
8. Telehealth and telemedicine are more widely available in rural and remote settings in Australia with greater digital infrastructure.
   a. What advantages and disadvantages does this have on care in the rural or remote setting?
   b. What advantages does this have on nursing practice in the rural or remote setting?

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## Online Resources

Angel Flight http://angelflight.org.au/about-angel-flight/faqs/

Australian Health Practitioner Regulation Authority. Online. Available: https://www.ahpra.gov.au/

CRANAplus: www.crana.org.au

Healthdirect http://www.healthdirect.gov.au/

National Rural Health Alliance: www.ruralhealth.org.au

Patient-assisted travel schemes http://www.ruralhealthaustralia.gov.au/internet/rha/publishing.nsf/Content/Patient_Assisted_Travel_Schemes

# Credits

CIB, Clinical Interest Box; CS, Clinical Skill; Fig. Figure; NCP, Nursing Care Plan

## CASE STUDY

**Case Study 18.2,** NSW Health: Implementation Toolkit—Standard Key Principles for Clinical Handover IIMS Data (2009:11). Reproduced by permission, NSW Ministry of Health © 2016.

## CLINICAL INTEREST BOXES

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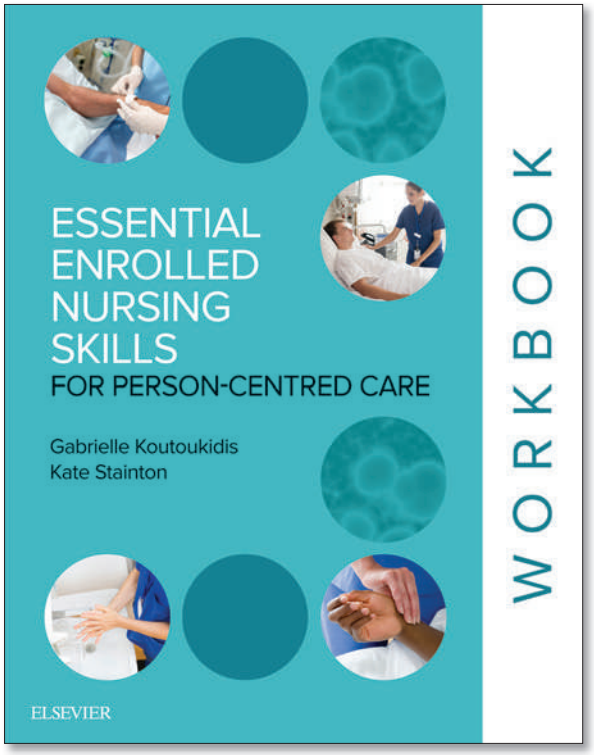


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