Chapter 1: Dealing with the Angry Patient or Family Member Strategies for Reducing the Risk of Workplace Violence

4 Contact Hours

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Learning objectives

Upon completion of this course, the learner should be able to:

- Describe the phenomenon, incidence and the common characteristics of the individuals involved and the core elements of horizontal violence.
- Identify and describe the multiple treatment modalities and complementary therapies.
- Understand supportive care during a panic attack and collateral impact on families.

Introduction

Serena is an RN who works 7 am to 7 pm in the Emergency Department (ED) of a 500-bed medical center. She arrives at work to find the department in a state of near chaos. People are crying and several police officers are attempting to restore order. It seems that a gunshot victim’s brother stabbed a physician and a nurse after shouting that no one cared if his brother lived or died!

Bob is a physical therapist who works in an outpatient clinic. He has a new patient that is scheduled for her initial evaluation and therapy session at 2 pm. Mrs. Gray has a rapidly progressing form of multiple sclerosis (MS). Her cognitive state and motor skills are quickly deteriorating. Unfortunately, another therapist has called in sick, and, in helping to cover her patients’ therapies, he is running late. Mrs. Gray and her husband have had to wait for over 20 minutes. Mrs. Gray is tearful and Mr. Gray is furious. When Bob arrives Mr. Gray confronts him by stepping to within a few inches of Bob’s face and shouting, “How dare you make my wife sit and wait like this! She is a sick woman and you had better be prepared to deal with me!”

Hannah is an RN who works on the stroke rehabilitation unit. Her patient, Mrs. Clark, is running a slight fever and has developed a cough. Mrs. Clark is often confused as to time and place. As Hannah attempts to auscultate Mrs. Clark’s lungs Mrs. Clark screams, “What are you doing to me? You are trying to kill me!” She makes a fist and attempts to punch Hannah in the face.

The preceding scenarios could be taking place at any time in any healthcare facility throughout the country. Workplace violence in healthcare settings can affect anyone who works or volunteers in such settings. The violence can also affect other patients and families and visitors. It is imperative that persons who work in healthcare know what factors trigger violent behavior and what actions to take to reduce the potential for that violence. They must also know how to deal with violence, whether it is verbal or physical, if and when it does occur.

Incidence and prevalence of workplace violence

The prevention of workplace violence is a critical safety issue. Such violence can take many forms including verbal abuse, threats, physical battery, and even murder. The healthcare workplace, indeed all workplaces, must be made as safe as possible for employees, volunteers, patients, families, and visitors.

The good news regarding workplace violence in the U.S. is that from 2002 to 2009 the rate of non-fatal workplace violence has declined by 35 percent. This follows a 62 percent decline in the rate from 1993 to 2002. The bad news is that it still occurs. In fact workplace violence is responsible for about 900 deaths and 1.7 million non-fatal assaults every year in the U.S.

In March, 2011, the U.S. Department of Justice published a special report, Workplace Violence, 1993-2009. This report is a summary of the National Crime Victimization Survey and the Census of Fatal Occupational Injuries. In order to effectively implement measures to stop or reduce workplace violence it is important to understand the incidence and prevalence of such violence. Here is a summary of the key highlights of this report from findings related to the years 2005 through 2009.

- 2009 preliminary data indicate that 521 persons 16 or older were homicide victims in the workplace.
- The majority of workplace homicide victims were male and middle-aged. Four out of five workplace homicide victims were men, and 48 percent of all workplace homicide victims were between the ages of 35 and 54. Twenty-one percent were 55 or older, and about 10 percent of victims were between the ages of 16 to 24.
- About half of all workplace homicide victims were white. About a fifth of all victims were black, 16 percent were Hispanics, and 11 percent Asian.
- Healthcare practitioners accounted for 1.1 percent of workplace homicide victims 16 years of age or older.
- About 28 percent of workplace homicide victims worked in sales in related jobs. About 17 percent worked in protective service occupations.
- The majority of workplace homicides (70 percent) were committed by robbers and other assailants. About 21 percent were committed by work associates.
- Shootings were responsible for 80 percent of workplace homicides. Firearms were used in five percent of non-fatal workplace violence.
- Law enforcement officers, security guards, and bartenders experienced the highest rate of workplace violence.
- The highest number of non-fatal workplace violence events was committed by strangers against males (53 percent) and females (41 percent).
In the hospital setting, workplace violence occurs most often on psychiatric units, emergency departments (EDs), waiting rooms, and geriatric units. Research shows that 35 percent to 80 percent of hospital staff members have been physically assaulted at least once during their careers. In the ED, the vast majority of the people who commit violence are patients, their family members, and their visitors. These statistics show that workplace violence is a significant occupational risk. There is a real need for employers to develop and implement workplace violence prevention policies and procedures. Both the Joint Commission and The Occupational Safety and Health Administration’s (OSHA) have made recommendations and identified strategies for the prevention and reduction of workplace violence. However, many organizations still struggle to develop and, more importantly, to properly implement such strategies. Compounding this problem is the issue of proper reporting of violence in the workplace. It is suspected that many occurrences of workplace violence are not reported because no significant harm came to the victim, or because the victim believed that such violence was just “part of the job.” Workplace violence is not something that should ever be considered a “normal” risk of certain occupations.

Barriers to the reporting of workplace violence

Charles is the chief executive officer (CEO) of a small rural community hospital. He and his administrative team are working to develop a policy regarding workplace violence based on OSHA recommendations. Even as they work, Charles does not feel that this is a major problem for his organization. “After all,” he thinks to himself, “we really don’t have much of a problem in our little town. Why the most serious problems the local police department faces are drunk driving and maybe a brawl at the only bar in town on Saturday nights!” Charles asks his team how they would define workplace violence. “What exactly is it we’re supposed to prepare to deal with? Are we talking about somebody coming in here with a gun or what?”

Melanie is a respiratory therapist. One of her patients is a 22-year-old man who developed pneumonia after being hospitalized for multiple fractures sustained in a motorcycle accident. He requires assessment and breathing treatments and Melanie dreads going into his room. He continually makes sexual comments and yesterday tried to grab Melanie’s breast during a treatment. Melanie is reluctant to report the incident. She tells herself that nothing “actually happened” and she is both embarrassed and afraid that no one will believe her. The man is the son of a prominent, wealthy businessman who is on the hospital’s board of directors.

Defining workplace violence

Statistical reports of workplace violence cannot be completely accurate because of inconsistencies and/or failure to report the problem. One of the most obvious inconsistencies is a lack of a standardized national definition of workplace violence. Despite the existence of policies and procedures, even employees of the same organization may define workplace violence differently. For example, does workplace violence include verbal aggression or is it limited to actual physical harm? Does the definition also include the threat of physical harm, even if actual harm does not occur? What level of verbal aggression is considered to be a type of workplace violence? If a patient shouts at a staff member, is this workplace violence? How “severe” does verbal abuse have to be to constitute workplace violence?

There are no simple answers to the preceding questions. Most people would agree that actions that cause physical harm are forms of workplace violence. However, what level of harm must exist? Compare a slight pinch of the skin to a black eye. Are both examples of workplace violence?

Failure to understand the scope of the problem

In the first scenario at the beginning of this section, Charles, the CEO of a small rural community hospital, did not believe that workplace violence was a problem for him. This attitude, although not as common as it once was, still exists. And this attitude is not only a barrier to reporting workplace violence, but poses a danger to staff, visitors, and patients as well. If the CEO, and/or others at the executive level fail to understand that the possibility of workplace violence affects all healthcare organizations, staff members will not be prepared to prevent (whenever possible) and/or deal with it when it finally does occur.

Fortunately, both OSHA and the Joint Commission frequently address the problem of workplace violence. This generally means that administrative and managerial staff will support the development and implementation of policies and procedures that address the issue of workplace violence. However, it is not only administrative and managerial staff that need to understand the scope of the problem. What level of verbal abuse must exist to constitute workplace violence? How “severe” does verbal abuse have to be to constitute workplace violence?
Everyone who works in or volunteers for a healthcare organization must be taught how to prevent and deal with workplace violence.

Why would employees be reluctant to learn about the potential for violence in the workplace? Some employees (or volunteers) may believe that the threat of violence in healthcare settings is a problem that only direct patient care providers have to deal with. However, workplace violence can occur anywhere in the workplace and all employees need to be educated about the problem and how to deal with it.

Some employees may equate their risk of experiencing workplace violence with the types of patients they care for. For example, results of a recent study published in the *Journal of Nursing Administration* (JONA) concerning violence against nurses working in EDs, showed that nurses in pediatric EDs were less likely to experience frequent physical violence. But nurses who worked mostly at night and weekends were more likely to experience frequent physical violence. Some employees may feel that their gender affects their likelihood to experience workplace violence. The JONA study also showed that female nurses were less likely than male nurses to report that they experienced frequent physical violence. However, in other areas of healthcare settings, female nurses may feel more vulnerable to violence depending on the time of day they work, the specific setting in which they work (e.g. ED, inpatient units, etc.), and the types of patients they care for.

Employees who fail to comprehend the scope and risk of workplace violence may be perceived as barriers to reporting its existence. They may not define violence according to hospital policy and procedure. They may choose to ignore co-workers’ concerns or reports of violence. They may simply, mistakenly, assume that violence is part of the job. Such attitudes are not only barriers to accurate reporting but are barriers to implementing an effective workplace violence prevention program.

Managers may be part of the group of employees who fail to comprehend the scope of the workplace violence problem. In fact, they may have a significant impact on how willing their subordinates are to report incidents of workplace violence.

### Lack of managerial support and commitment

OSHA, in its guidelines for a violence prevention plan, emphasizes the importance of managerial commitment to reducing and preventing the incidence of workplace violence. “Management commitment provides the motivation and resources to deal effectively with workplace violence…”

Consider the scenario at the beginning of the section in which the RN Daria experienced escalating verbal abuse committed by a patient. Daria’s desire to report the problem per the hospital’s workplace violence policy was “squashed” by her nurse manager. The manager’s comment, “Words can’t hurt you” indicate not only a failure to understand the scope of the problem but an obvious lack of managerial support and commitment. Just how long is Daria supposed to wait to report escalating aggression? What, in the manager’s opinion, has to occur before it is deemed to be workplace violence?

Lack of managerial support and commitment has an adverse effect on employees. In this type of environment staff members may be reluctant to report what they believe to be workplace violence, even though, as in Daria’s case, the verbal aggression is escalating. Escalating behaviors often indicate that potential danger to employees is also escalating. Suppose Daria’s concern and/or fear of Mr. Henry interferes with her ability to concentrate on her job responsibilities and she makes an error? Is Daria’s manager equally to blame since she did not support Daria? Or is Daria to blame since she had the option of filing a report and/or filing a grievance? These are difficult questions to answer, and there are probably no clear-cut right or wrong responses. The point is, lack of managerial commitment can impact the organization in a variety of ways. These include:

- **Increased potential for injury**: If staff members are reluctant to or even prevented from reporting workplace violence no measures are taken to deal with the person or persons who are aggressive. This may increase the aggression until physical harm occurs.
- **Distrust of management**: If management is seen as unwilling to support measures to increase the safety of the workplace, resentment among staff members may grow. This leads to a hostile work environment.

### Embarrassment

Employees may be embarrassed that they cannot defuse an aggressive situation. Think of Henry, the physical therapist who was punched by a frail stroke patient. Henry may have been embarrassed that this frail, elderly woman was able to strike him. Nevertheless, verbal and physical violence should embarrass no employee. The danger for injury is real and all incidents of workplace violence should be reported.

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Fear

A good example of fear is the scenario that describes why Melanie, a respiratory therapist, is reluctant to report the workplace violence she experienced. The person committing the violence, which consisted of inappropriate sexual comments and an attempt to grab her breast, was the son of a member of the hospital’s board of directors. Fear can have a number of causes. These include:7,10

● **Fear of reprisal**: Some workplace violence may involve threats of future harm. For example, a staff member may be told: “If you tell anybody about this, I’ll make sure you’re sorry after I get out of here.” Intimidation may prevent a staff member from documenting workplace violence.

● **Fear of management disapproval**: Some employees may fear that if they report incidents of workplace violence. It may appear that they cannot do their jobs, which may include dealing with aggressive patients, families, and visitors.

● **Fear of political consequences**: As in Melanie’s case, some perpetrators of violence may be prominent members of the community or related to such people. Sadly, political ramifications may be a distinct possibility. However, protecting a violent person is never acceptable, regardless of how prominent or how much influence that person may have.

“It’s just part of the job”

There are some hospital employees who are more likely than others to be at risk for workplace violence. Security guards and emergency department personnel are a few examples. Even those employees who do not work in high-risk areas may believe that experiencing workplace violence is just “part of the job.”9,10

Results of a study conducted on nurses working in emergency departments, intensive care units, and general units in a regional medical center showed that about 50 percent of participants stated that incidents of violence against nurses were never reported in writing. Explanation of this failure to report was based on the belief that such incidents were part of the job and that reporting the violence would not serve any helpful purpose. Other reasons given included feeling empathy for frightened, angry patients and family members and that if no physical injury actually occurred there was no reason to report attempted violence.3

Why does workplace violence occur?

An infant is born with numerous, severe congenital abnormalities. It is doubtful, even with supportive treatment, that the baby will live a year. The infant’s pediatrician sits down with his parents to discuss options. He wants to present them with all possible options in light of the fact that their baby is seriously ill and suffering. The baby has developed an infection and the physician suggests supportive measures rather than aggressive antibiotic treatment. The baby’s parents are distraught and the father attempts to punch the physician screaming, “You are a murderer! You want to kill my son! All life is sacred no matter what!”

Nancy is a speech therapist working with a closed head injury patient. The patient is quite disoriented and, when Nancy pauses to consult her notes, he reaches out and scratches her face, which begins to bleed.

Mark is a security guard in the emergency department. A teenager is helped into the department by two friends. He has been stabbed in the right arm. The boy’s friends begin to call out loudly for help and push and shove around the waiting room. As Mark approaches the boys, one of them pulls out a knife and tries to stab him. All three teenagers smell strongly of alcohol.

The preceding scenarios illustrate a number of reasons why violence occurs in healthcare settings. Fear, anger, confusion, values conflicts, and substance abuse all can contribute to violent behavior. It is important that healthcare workers comprehend the various factors that can trigger violence in healthcare work settings.

Joint commission findings

On June 3, 2010 the Joint Commission published some recommendations on preventing violence in the healthcare setting.8 An analysis of the Sentinel Event Data base concerning criminal events helped to identify the following causative factors that were most often identified in the last five years.1

● **Flaws in leadership**: In 62 percent of events, problems with policy and procedure development and implementation of such policies and procedures were cited as having contributed to the violence.

● **“Human resources-related factors”**: In 60 percent of events factors such as the need for staff education regarding workplace violence and assessing (or failing to assess) the competency of staff to deal with or prevent workplace violence were cited.

● **Assessment**: In 59 percent of events assessment was cited as a contributing factor to workplace violence events. Assessment involved such issues as lack of psychiatric assessment, failure to staff to adequately observe patients, and inadequate tools of assessment.

● **Failures in communication**: In 53 percent of events, inadequate communication among staff, patients, and families were noted.

● **The physical environment**: In 36 percent of events safety deficiencies in the environment as well as deficiencies in security procedures and actions were cited as contributing factors.

● **Patient care issues**: Less frequently mentioned as contributing factors were problems with the patients’ plans of care, patient education, and management of patient information.

Fear

Fear is a common reaction among hospitalized patients and their families. Lack of control over what is happening to them or, in the cases of families, of their loved ones, significantly contributes to fear and anxiety.2,9 These feelings are not limited to persons in the inpatient setting. Consider the patient who is receiving chemotherapy at an outpatient clinic or the patient who is receiving bad news about his/her health in a physicians’ office. Fear occurs in all healthcare settings.

Fear is often a normal response when dealing with the unknown, with pain, with the need to face the reality of a serious or terminal illness or injury. Fear lowers an individual’s tolerance and he/she may react angrily even at the slightest provocation such as failure to receive the proper breakfast or having to wait an extra 15 minutes for a treatment or outpatient visit.

By recognizing and acknowledging fear healthcare workers may be able to help reduce the emotion and reduce the potential for violence.
Fear should never be dismissed as “over-reacting.” The need for diagnostic procedures and treatment affects each person (and each family member) differently. One person may stoically receive a diagnosis of cancer while another may weep hysterically. Objectivity on the part of healthcare workers is necessary. It is unfair and unrealistic to compare different patients’ responses or to compare a patient’s response with how the healthcare worker feels he/she should respond. Patients and families who sense that they are being judged by their healthcare providers may quickly become angry, and that anger may eventually escalate to violence.

**Conflict of values**

Values are beliefs about the “right” and “wrong” way to conduct one’s life including personal and career behaviors. Differences in values can lead to conflict. Such conflict can evolve into violence, verbal or physical behaviors, or both.

Consider the scenario that described distraught parents whose infant was born with terminal congenital abnormalities. Their fear was compounded by a physician’s attempt to discuss difficult options for the baby’s care. The parents’ values, “all life is sacred” may be perceived by the parents as in conflict with the physician, who is attempting to present a variety of options to the parents.

Values are influenced by upbringing, religious beliefs, age, and culture. Medical options that come into conflict with the values of the patient and/or family can cause considerable stress and add to fear and anxiety. This kind of conflict can also deteriorate into violence.

Even something as “harmless” as mistakenly serving a meal containing meat to a vegetarian can incite conflict. The values of the vegetarian are offended by this mistake. If the person making the mistake apologizes and corrects the mistake by ordering another meal the issue will likely resolve itself. But if the staff person reacts by dismissing the patient’s concern conflict may escalate. Staff members must be alert to the patients’ values and not judge as to what values are “important” and what are not.

When a patient’s values come into conflict with the healthcare professional who is providing patient care it is up to the staff member to maintain objectivity. This may be challenging in some cases. Consider a patient with late-stage lung cancer values on quality of life. His treatments leave him sick and exhausted. He decides to stop treatment and instead opt for measures that will allow him to remain as comfortable as possible for as long as possible. A nurse who believes that every option for treatment should be utilized may be tempted to try to change the patient’s mind. Attempting to do so will cause not only stress but may lead to conflict. It is not appropriate to challenge a patient’s values. Once the healthcare team has presented all options to a patient it is up to the patient to direct his plan of care and the team must respect the patient’s values and decisions.

Even simply presenting options that threaten a patient’s values may lead to conflict, as in the scenario with the terminally ill infant. Physicians have an obligation to present all options and information about each option so that patients and families can make informed decisions. But presenting options must be done with compassion and respect. Patients and families should never be made to feel that there is a “right” and a “wrong” decision.

**Culture**

Cultural (and religious) values and customs are usually deeply important to persons embracing them. Healthcare workers should make every effort to respect the culture and religious beliefs of the patients they care for. For instance, some female Hispanic patients may defer to their husbands as the decision-maker in matters of health and wellness. This may contradict the values of a healthcare professional who believes that each patient should make her or his own decisions about treatment, follow-up care, etc. But the staff member must respect the patient’s own values and not attempt to change them. Attempting to do so may cause considerable conflict. But respecting such values and including the patient’s husband in all aspects of decision-making will more than likely facilitate patient care.

For example, suppose a young male patient is dealing with a diagnosis of diabetes. This will require changes in diet, exercise, and in many aspects of his activities. He will need to take insulin. The patient is having a difficult time accepting the diagnosis and his physician believes that psychosocial counseling may be helpful. The patient and his family adamantly refuse. The family is of Middle Eastern descent and believe that personal problems are best taken care of within the family. The physician needs to work with the family, especially the family spokesperson, to help the patient receive the care that he needs while respecting the family’s cultural values.

Cultural and religious beliefs should always be respected. If the healthcare team is unfamiliar with a particular culture and/or religion they need to gather information about both and, if possible, ask for the assistance of representatives from that culture and/or religion to help provide culturally appropriate care. Failure to do so may lead to conflict and even instances of workplace violence.

**Substance abuse**

Having to deal with patients, families, and visitors who are under the influence of alcohol, prescription drugs, or illegal drugs is a fairly common problem in the healthcare setting. People under the influence of such substances may exhibit a wide range of behaviors, from being withdrawn, to euphoric, to depressed, to belligerent and combative.

When thinking of patients under the influence of alcohol or other drugs some healthcare professionals may picture an out-of-control patient or family member in the emergency department or a family member or visitor making a scene while visiting a hospitalized loved one. However, a review of some recent studies show that just as big a problem is the need to deal with patients who are going through alcohol withdrawal while hospitalized.

Recent studies indicate that a significant number of hospitalized patients suffer from alcohol use disorder (AUD) such as alcohol abuse or dependence. Results of a 2008 study show that an estimated one in five patients admitted to a hospital suffer from an AUD. Additional data estimate that one in four medical-surgical hospitalized patients have some form of AUD.

Staff members need to be alert to alcohol withdrawal signs and symptoms, which may mimic other illnesses or disorders. These signs and symptoms are indicative of declining alcohol blood levels and usually appear within a few hours to a few days after alcohol intake stops. These signs and symptoms may increase in severity as the time from when the last drink of alcohol increases. These signs and symptoms include:

- Tremors.
- Anxiety.
- Headache.
- Palpitations.
- Diaphoresis.
- Nausea and vomiting.
- Seizures.
- Hallucinations.
- Delirium.
- Tachycardia.
- Hypertension.
- Fever.

It is important that healthcare professionals recognize the potential for alcohol withdrawal and know what signs and symptoms to look for. They should also anticipate potentially violent behavior. Early recognition and preparation for alcohol withdrawal will help to initiate appropriate treatment measures that help patients get through the withdrawal and to be prepared for potential violent outbursts.

**AUD Alert!** Remember that alcohol withdrawal is a stressful time for the patient’s loved ones as well. Increase in stress and anxiety may also increase the risk of verbal and/or physical aggression!

### Side effects of prescription medications

Mr. Bob Forrester is a 40 year-old business executive. He is hospitalized after having developed a severe, systemic fungal infection. He has been taking the antifungal drug Nizoral (ketocanazole). Mr. Forrester is sad and withdrawn and tells the nurses that he just wants to be left alone! His wife is tearful and stops at the nursing station to tell his primary nurse, Hannah, that, “I just don’t understand what is happening. Bob was always so upbeat and positive. Since he got this horrible infection he is so depressed and at times he just yells at me to leave him alone.” A pharmacist, who is a friend of the Forrester’s, also happens to be present. At that moment Bob is heard shouting at another nurse. As Hannah, the pharmacist, and Mrs. Forrester hurry into the room Bob is seen throwing his water pitcher at the housekeeper and yelling, “Just get out. I want everyone to leave me alone. I don’t care if I live or die!” The pharmacist asks Hannah what medications Bob is taking and what potential side effects may occur. Using her iPad to consult her online drug reference Hannah finds that depression is a potential side effect of Nizoral.15

Sometimes it can be easy to forget that prescription medications have a wide variety of side effects, including changes in mental status. Mood changes, outbursts, agitation, and depression are just some of the side effects that can be caused by many common medications and that also can contribute to workplace violence.

If a patient is displaying unusual behaviors and outbursts of anger look up the side effects of medication he/she is taking. There are so many varied reasons for workplace violence that sometimes busy healthcare professionals forget to consider the effects of medications.

### Patient assessment

The Joint Commissions sentinel event data base contains data pertaining to inadequate assessment as a contributing factor to workplace violence. As seen in the preceding section on prescription drugs, a thorough assessment of the medications Mr. Forrester was taking might have helped the nursing staff to more quickly identify his medication as a contributing factor to his behavior. A thorough patient assessment is critical to safe and appropriate patient care.

Think not only about the patient’s history and presenting clinical picture but about his home environment as well. Is there a family history of abusive behaviors? Does the patient feel safe in his/her own home? Has there been an incident in the patient’s past (e.g. experiencing a traumatic event such as rape or serving in the military in a war zone) that could affect how he/she responds to others? What pathophysiological changes have occurred that may have an adverse impact on a patient’s mental status or the ability to control anger?

Include the patient’s family in the health assessment as much as possible. They may be able to provide important information, especially if the patient is confused or incompetent. The family unit may also need to be assessed. Are they anxious and fearful? Have they been acting as the patient’s caregivers? If so, are they tired and under stress? Most families and other loved ones are worried about the patient. They (and the patient) feel a lack of control and may use aggression as a means to gain some control over a frightening situation.

Most hospital stays involve exposure to the unknown. Unpleasant, painful diagnostic tests and treatments, having to deal with a serious diagnosis, and feeling that nurses, therapists, doctors, and other healthcare professionals have “taken over” their lives definitely do not make for a calm experience. Assess patients and families for their levels of stress, coping mechanisms, and support systems.

Also, don’t forget to assess for alcohol and drug use. As pointed out in the previous section, such substances can have quite an impact on the behavior of patients and families. Equally important is to check for nicotine use. Hospitalized patients have few if any opportunities to smoke. Abrupt cessation of smoking can make for very irritable, and even aggressive, patients.

### Confused patients

Mr. Wilson is a retired minister with a reputation as a kind, gentle man, who is a good husband and father. He recently suffered a stroke. He is confused and often verbally aggressive, cursing and shouting at staff members. His wife is heartbroken, telling nurses and therapists that her husband rarely raises his voice at home and never uses “foul” language. Staff members try to comfort Mrs. Wilson, explaining that these behaviors can be part of the pathophysiology of stroke.

Many illnesses and injuries contribute or cause confusion, fear, and belligerence. Persons who were polite, well-mannered, and gentle may become aggressive and physically abusive. It is important to explain to families and loved ones about the reasons for these types of behaviors. It is also important to help staff members who may not have a good understanding of the pathophysiology of conditions that contribute to such behaviors. For example, dietary aids, students, housekeepers, and maintenance personnel may all come into contact with persons who are confused and belligerent. It is important that these staff members be educated about the effects problems such as stroke, dementia, and head injury can have on behavior. In fact, education concerning workplace violence and its causes should be offered to all employees, not just direct patient care providers and security guards. Workplace violence can affect any and all employees!

### Change

Change can be seen as either positive or negative. A promotion, buying a new house, losing weight, having surgery or treatment that cures an illness may all be viewed as a positive change. Diagnosis of a serious illness, experiencing painful and otherwise difficult treatments, and hospitalization all involve change of a less pleasant nature.

Change has often been a source of conflict. Changes in policies and procedures, changes in personnel, changes in job expectations may all be greeted with distrust and even hostility.15 Patients, especially those who are inpatients or who are dealing with serious or chronic conditions, are forced to deal with a multitude of changes on an almost daily basis. Compounding the problem is that patients and their families often have...
no control over what is happening to them. Feelings of loss of control compounded by change can be an explosive combination.\(^2\)

Consider how healthcare employees feel when changes in routine or policy are mandated without their input. This comparison can help healthcare employees to empathize with patients and families and acquire a better understanding of how they feel when confronted by the changes that occur as the result of illness or injury. Expressions of empathy and acknowledging just how difficult change can be can help to calm a patient and defuse a potentially violent situation.

## Communication

The Joint Commission has cited inadequate communication as a potential cause of workplace violence.\(^3\) But what exactly does inadequate communication mean? Inadequate communication can mean that:

- Patients receive incorrect or contradictory information from various members of the healthcare team.
- Patients receive information in terms that they do not understand. Perhaps information contains a great deal of technical terms that are not defined. Perhaps English is not their first language and information in their native language is inadequate or not available.
- Patients are “told” what to do or what decision to make without being given enough information to make an informed decision or to provide informed consent.
- Patients are given “biased” information. In other words the healthcare professional providing information allows his/her personal beliefs and values to influence how they communicate with the patients.

## Lack of a safe environment

All employees should ask themselves if they believe that their work environment is safe. Joint Commission findings show that 36 percent of reported workplace violence events in the sentinel event database were due to a lack of safety in the work environment.\(^3\) Some deficiencies that contribute to workplace violence include:

- Lack of effective policies and procedures that address the issue of workplace violence.
- Lack of management commitment.
- Lack of trained security guards.
- Lack of sufficient numbers of security guards.
- Inadequate system of staff and visitor identification.
- Failure of staff members to wear employee identification.
- Lack of education and training for employees on the topic of workplace violence and how to reduce and/or prevent it.

## Belief that healthcare professionals don’t care about them

It is important that all staff members who come into contact with patients (and this includes housekeepers, volunteers, secretaries, etc.) convey the attitude that they genuinely care about all patients and their families.\(^2,3\) It is easy to become complacent about interacting with patients. And there may be some patients and family members that staff members actually dislike. It is not expected that all staff members like every patient and every patient’s family members and visitors. What is expected is that all staff members treat all patients, families, and visitors with respect and objectively do their best to promote the patients’ maximum health and wellness.

It is not necessary to like someone to provide safe and appropriate care and to convey an attitude of compassion and empathy. If patients and their loved ones believe that the persons who are responsible for their very lives genuinely care about their welfare, chances are they will be, at least, minimally cooperative. If these same patients and their loved ones believe that no one cares if they get well or not, aggression is a distinct possibility.

## Violence as part of the patient’s lifestyle

There are patients (and families and friends) whose lifestyle is violent. Violence is part of their everyday existence. Examples include persons who are victims of and/or perpetrators of domestic violence, gang members, persons who are involved in criminal activities, and those who have grown up in a family where verbal and/or physical violence was the norm.

These individuals are more likely to behave in a violent manner because this is what is “normal” for them. Assessing a patient for a violent lifestyle will help to prepare staff members to deal with persons who are verbally aggressive and possibly physically aggressive.

## Taking patient aggression personally

Jasmine is a nursing assistant who is Asian-American. She is taking care of an elderly patient who has dementia. The patient is usually confused and often verbally aggressive. When she sees Jasmine she screams, “Get away from me! I’m sick of all you foreigners taking over my country.” Jasmine becomes upset and begins to shout back at the patient. The situation escalates and the patient attempts to strike Jasmine.

Most patients and families are not being deliberately aggressive. In the preceding scenario, Jasmine takes the patient’s comments personally. It can be difficult to remain calm and objective when someone is making hurtful comments. However, Jasmine’s patient is confused and suffering from dementia. It is unlikely that she has any idea of what she is saying.

It is important that all staff members be taught ways to remain calm even in the midst of verbal aggression. It is important that all staff members be taught about the effects of disease and injury and how fear and other reasons for aggression are often due to feelings of loss of control and anxiety. Of course, there are instances when patients,
families, and visitors are deliberately aggressive. Fortunately, this is usually the exception, not the norm.

The important thing to focus on is not to take behavior personally. No matter how difficult, the first thing to do is to help healthcare workers establish an objective therapeutic relationship with patients. Understanding how and why patients behave the way they do is a foundation for establishing such a relationship.²

Communication as the foundation for reducing/preventing workplace violence in healthcare settings

Communication is the foundation of practice for any healthcare organization. It is an issue that can enhance patient care and workplace safety or increase the risk for poor patient care outcomes and workplace violence. There are many aspects of communication to discuss. A good place to start is with communication among those who work in healthcare settings.

Communication among staff members

Raymond is a pharmacist making rounds with the interdisciplinary rehabilitation team on the spinal cord rehabilitation unit. He and the team are discussing concerns about one of the patients, whom they are carefully monitoring for symptoms of worsening depression. The patient has just been started on an antidepressant, and, as an 18-year-old, is at risk for an increase in suicidal thoughts when beginning antidepressant therapy. They are satisfied that he shows no evidence of such an increase. However, the housekeeper stops them in the hallway. “You had better pay more attention to that young man. His girlfriend just broke up with him last week and when no one is around I see him crying and muttering about killing himself or someone else. I told the doctor about this but she told me I was just here to clean rooms and to mind my own business!

This scenario is a good example of communication failure among staff members. A housekeeper’s observations can be critical to the health and well-being of patients. The willingness of physicians, nurses, pharmacists, and therapists to respectfully listen to each other cannot be stressed enough. All employees need education about preventing workplace violence and the importance of communication among all who work in the organization. Discounting important observations based on the role someone fulfills can be a dangerous mistake.

Communication among staff members does not have to be verbal. Consider documentation. Team members do not always have the ability to discuss a patient’s status face-to-face. Patient’s lengths of stay are shorter and shorter and opportunities to communicate seem to decrease as well. Think about the pharmacist who fills prescriptions and sends medications to various patient units but must rely primarily on the patient’s medical record as a means of communication. Or the physical therapist who sees patients in the gym but seldom has an opportunity to interact with the nurses in person. Documentation must be concise and accurate and easily accessible to all. The implementation of electronic medical records has helped with accessibility. But if documentation is not complete, timely, and accurate, accessibility means nothing.

Finally, think about how healthcare professionals communicate with each other. Do they treat each other with respect? Do they actively listen to each other? Do they take the time to relay important information? If face-to-face communication is not possible do they make time to telephone each other to relay essential information quickly? If the answer to any of these questions is “no” then changes need to be made to the way communication among staff members takes place. Active listening, genuine interest in the observations of colleagues, and the willingness to treat each other with respect are the focus of good communication among staff members.

Good communication between staff members and patients/families

Andy is an RN on a medical floor. He has an unusually heavy patient load today because several colleagues have called in sick. A family member wants to talk to him about her mother’s medication. Andy pauses on his way down the hall to answer her questions. The conversation is conducted in the hallway, neither of them sit down, and other staff members are constantly rushing by them. As Andy answers her questions he glances at his watch every few minutes. Finally, the family member becomes angry and says loudly, “Don’t bother with me anymore. It’s obvious you couldn’t care less. But I’ll tell you that I am not leaving here tonight until someone answers my questions properly. And I don’t want you taking care of my mother any more either!” Her voice carries down the hall and people stop and stare and listen to the confrontation.

Andy is busy and it was not the best time for him to attempt to answer the woman’s questions. But he violated almost every principle of good communication. He conducted an important conversation in a public hallway. Neither of the persons involved were in a comfortable environment. Andy kept glancing at his watch, indicating a lack of interest and/or being anxious to finish the conversation.

Failure to communicate adequately can and does increase the likelihood of workplace violence. Here are some verbal communication guidelines to help prevent patient/family anger and to defuse an angry confrontation if it does occur.¹,²,⁹,¹２

- **Listen actively.** Show interest and a desire to assist the patient or family member. Maintain eye contact if culturally appropriate. Don’t indicate impatience by checking a wristwatch. If it is not understood what the patient or family member is asking, ask for clarification. Check if the patient or family member understands what is being said to her/him.

  - **Listen in a timely fashion.** Consider Andy’s actions in the preceding scenario. It would have been better if he explained to his patient’s daughter that he needed to do something urgently for another patient but would return in 15 minutes (if that time frame is realistic) to talk with her. It is better to delay a conversation and set a time limit for return rather than rush through a conversation.

  - **Show respect.** All human beings deserve respect. A visitor may arrive in dirty jeans and unshaven, but he still deserves to be treated with respect. Lack of respect will almost always lead to animosity. Address patients and visitors as Mr., Mrs., Ms, etc. unless invited to use first names. Never address adult patients and visitors as “honey,” “dear,” “sweetie,” or other demeaning term. They are not children. Some healthcare professionals seem to feel that patients and visitors, especially elderly patients and visitors, should be addressed as though they are children. This is demeaning and will not facilitate good communication. This principle holds true for patients who have dementia or are confused. Respect is always important and always appropriate! Say please and thank you.

  - **Use a calm tone of voice.** This is always appropriate and could make the difference between calming an angry patient or family member or triggering an instance of verbal or physical aggression.
Avoid public confrontations. Do not have difficult conversations in a public place. Such conversations are best conducted in a private patient room, a private lounge, an office, etc. If family members or other visitors are involved in a conflict direct them to separate waiting areas. Do not allow quarrels and other confrontations to occur in front of patients. If patients are quarreling with visitors it may be necessary to ask the visitors to leave. Never hesitate to call for the assistance of security guards.

Offer options. For example, suppose a patient is away from the nursing unit for a diagnostic test and a family member is becoming increasingly anxious. Offer the family member the choice of having a seat in the waiting room or remaining in the patient’s room. If the test will last for any length of time it may be appropriate to suggest that the family member get a snack or cup of coffee in the coffee shop.

Help patients/families to maintain or regain control. Comments such as, “I understand you’re upset, what can I do to help?” Or “Take some deep breaths” or “Please sit down and breathe slowly” are simple instructions that will help them to focus on something other than fear or anger.

Monica is a 36-year-old breast cancer survivor. She has arrived at her doctor’s office for the results of some additional diagnostic tests that were conducted to determine if there is any evidence of metastasis. The office is crowded and Monica has been waiting for over 30 minutes past her scheduled appointment time. When the nurse finally escorts Monica to an exam room she apologizes to Monica for the delay. Monica responds by saying that “I know you are busy. I am sure that everything will be OK.” Monica is clenching and unclenching her fists and breathing quickly. As the doctor enters the room she shouts, “How dare you keep me waiting like this!” Both the nurse and the doctor are surprised. The nurse tells the doctor that “Monica wasn’t upset. She said she understood the delay!” The nurse has “missed” important non-verbal cues that the patient was upset.

Communication reminder! Aggression should not be taken personally!

Cultural awareness

Joseph is a 20-year old college student of Middle Eastern ancestry. He is hospitalized following a car accident during which he sustained multiple fractures. His female nurse asks him if he would prefer a male nurse and if he would like his bed turned to face east so that he can pray. The nurse assumes that a man of Middle Eastern ancestry is Muslim and prefers a member of the same sex as a care provider. Joseph looks puzzled and a little annoyed. He is a fourth generation American and a Christian. “Why are you assuming what I am just because of my ethnic background?”

Elizabeth is a Japanese citizen who is in the United States on a work visa. She is hospitalized because of a septic infection that developed after removal of an ovarian cyst. During a patient education session her nurse, a man, uses hand gestures to explain some points of care. Elizabeth is offended since, in her culture, the use of hand gestures can be insulting.4

It is important that culture be considered and respected when attempting to provide a safe environment for patients, families, visitors, and staff members. It is important to avoid assumptions. Cultural generalizations can be made but all persons are unique. Avoid assuming that all persons of a particular race, religion, or ethnicity will behave in the same way and have the same values and religious beliefs. But be aware of generalizations that can help reduce the risk of workplace aggression.

Even some seemingly simple behaviors like eye contact and a handshake can have cultural implications. Here are some tips for ensuring cultural sensitivity.11

Handshake: In Western cultures the right hand is extended with the thumb up. The handshake is firm but should not cause discomfort. The hand is shaken two or three times and then released. Handshakes often differ in other cultures. For example, the Chinese and Japanese may grasp hands less firmly but hold the hand for a longer period of time. Muslim men generally do not shake the hand of a woman.

Eye Contact: In the United States eye contact demonstrates interest and is part of active listening. It indicates honesty and confidence. However, in many Asian countries direct eye contact may be interpreted as disrespectful. Looking away may be an indication of respect. In Mexico direct eye contact may be interpreted as aggressive behavior while in France, eye contact may be maintained so intensely that Americans may become uncomfortable.

Personal space: Personal space varies among countries and cultures. In the U.S. personal space is usually about three feet. In Italy and South American countries the distance is closer, but in Asian countries the distance is often greater. Be guided by the other person’s body language. If they seem uncomfortable, allow a greater amount of personal space.
• Facial expressions: A smile in most Western countries indicates pleasure. Americans in particular smile easily. However, people in some Asian countries may actually conceal annoyance or other negative emotions with a smile. Japanese may smile less often, believing that if one is really happy, a smile is not necessary.
• Hand gestures: Hand gestures, a common practice in American culture, may be seen as signs of aggression in other countries. For example, in China and some other Asian countries hand gestures can be considered rude. Hand gestures in general are easily misunderstood. For example the thumbs up sign, an indication of approval or victory in the U.S. is considered rude in the Arab world. Winking at someone is considered rude in Australia and Taiwan. Standing with hands on hips can be interpreted as aggressive in many countries.

The preceding generalizations help to illustrate just how varied cultural considerations can be. Facial expressions, hand gestures, eye contact, and personal space are just a few of the behaviors that can offend others or help to enhance communication.

Ensuring personal safety

It is important to ensure personal safety when dealing with aggressive patients, families, or visitors. Violence rarely takes place without some warning such as raising one’s voice, clenching fists, and violating personal space. Part of controlling the problem of workplace violence includes ensuring your personal safety.

Here are some recommendations for maintaining personal safety:1,2,9

• Trust your instincts. If you feel uncomfortable, recognize early warning signs of violence, or just have a “feeling” that you are in danger, trust your instincts. Use good communication techniques to defuse the situation. If this does not work, take protective measures.
• Tell someone else of potential difficult situations. If you know in advance that a meeting with a patient or family member is going to be or may become problematic tell at least one other co-worker where you will be meeting and how long you anticipate the meeting will take.
• Maintain an exit pathway. Never allow a patient, family member, visitor, etc. to get between you and an exit. Always position yourself between the person you are talking to and the exit.
• Evaluate your environment. Remove items that could be used as weapons such as syringes, scissors, knives from meal trays, etc. from the environment. Assess the likelihood that someone could use a chair, bedpan, meal tray, or other object as a weapon.
• Dress appropriately. Be aware of your appearance and what, if any, articles of clothing that could be used as weapons. Avoid tight fitting clothing that accentuate breasts and/or hips. Avoid clothing that shows cleavage. Such clothing may encourage some persons to make inappropriate remarks or sexual gestures. Avoid wearing jewelry or accessories that can be used to injure you. For example, a scarf or necklace can be pulled tight around the throat. Keys worn around the neck can be grabbed and used as a weapon. Long earrings can be pulled off, causing injury. Avoid high heels that can prevent you from moving quickly if you need to get away from a dangerous situation.
• Know how to get help. Know what to do in case of an emergency. Know how to quickly contact security guards. Do not be afraid to shout for help if necessary.

Suggestions for implementing a strategic plan for preventing workplace violence

OSHA and the Joint Commission have made a number of suggestions for the development of a strategic plan for preventing workplace violence. Some practical suggestions include the following factors:3,8,13

• All healthcare organizations should have a violence prevention program in place. The program should be based on policies and procedures that are developed with input from all levels of staff and who represent all departments.
• All employees should have the opportunity to review policies and procedures and support their implementation.
• All administrators and managers must support the implementation of policies and procedures that guide the implementation of a workplace violence prevention program.
• A written plan should be in place that describes the various types of workplace violence, how to prevent their occurrence, how to deal with them if they do occur, and how to document their occurrence.
• All employees should receive education and training concerning a violence prevention program.
• The written plan should make it clear that there is zero tolerance for violence, verbal and nonverbal threats, and physical violence.
• The written plan should clearly state that no reprisals will be taken against any employee who report or experience workplace violence.
• The written plan should include a plan for establishing and maintaining security such as the hiring of security guards, mandating that all employees wear organization-mandated identification, and how to report instances of violence.
• An analysis of the workplace for the potential for violence and how well each department is equipped to deal with violent behavior should be conducted. An analysis should include:
  ○ Review of risk management and other data that document occurrences of workplace violence.
  ○ Evaluation of the physical environment for safety issues such as are fire and security doors secure, are medications secured, are employees wearing identification, are objects that could be used as weapons easily accessible to patients and visitors, and availability of security guards throughout the organization.
  ○ The work environment should be free from clutter so that items such as books, keys, pens, etc. cannot be used as weapons.
  ○ Assessment of employees’ knowledge of how to prevent and/or deal with workplace violence.
• A system that allows for additional security precautions in high risk areas such as the emergency department should be established.
• Assessment of risk factors for violence such as substance abuse, history of domestic violence, etc. should be part of a patient’s admission assessment.
• A system of documenting instances of workplace violence should be clearly established.
• The workplace violence prevention program should include medical intervention, follow-up counseling, support groups, stress management, and employee assistance programs to help victims of workplace violence deal with the aftermath of violence.
• The workplace violence prevention program should include a mechanism to analyze trends, assess strengths and weaknesses of the program, measure improvements, and maintain current knowledge of strategies to reduce the occurrence of workplace violence.
• Periodic, unannounced assessments of the organization for violations of security and staff members’ ability to deal
with aggressive or potentially aggressive patients should be conducted.

- Appropriate staff members, such as security guards and emergency department personnel, should receive training in responding to agitated, potentially violent persons. Such training may include ways to physically restrain agitated, violent persons without causing them injury.

**Education and training**

No strategic plan can be implemented successfully unless all employees receive ongoing education and training concerning the incidence of workplace violence, how to prevent it, how to deal with it when it occurs, how to document it, and how to receive necessary follow-up help if they become victims of such violence.

Appropriate education is ongoing. A one-time discussion of policies and procedures is not enough to ensure a culture of safety. Establishing and maintaining a workplace environment that helps employees to prevent and/or reduce the incidence of workplace violence requires continuing education endeavors. The organization’s professional development/staff development department and human resource department should work with administration, management, and staff members to plan, implement, and evaluate education offerings pertaining to workplace violence prevention.

Here are some strategies for the implementation of ongoing education and training.

**Orientation**

Workplace violence prevention strategies should be part of the orientation of every employee. Topics to include are:

- A discussion of policies and procedures related to workplace violence.
- An explanation that the organization has a zero tolerance toward workplace violence.
- An explanation that there will be no reprisals or disciplinary action taken against employees who report workplace violence.
- A review of data pertaining to the occurrence of workplace violence and the organization’s response to these occurrences.
- Conditions that can predispose patients, families, and visitors to become violent.
- Reasons for the occurrence of workplace violence.
- Warning signs of escalating anger and aggression.
- Techniques to calm angry and/or agitated persons.
- How to deal with verbally and/or physically violent persons.

- How to document occurrences of workplace violence.
- How to access employee assistance if workplace violence is experienced.
- As appropriate, physical restraint and crisis management techniques to subdue violent persons.

Employees should be given the opportunity to express concerns and ask questions. The purpose of addressing workplace violence during orientation is not to frighten employees but to prepare them to help prevent the problem and deal with it if they experience it.

**Education Alert!** The depth and specifics of interventions will vary depending on the role of the employee in the organization. For example, a security guard or emergency department nurse may receive training in the physical restraint of violent patients. A member of the housekeeping department would most likely not receive such training.

**Annual mandatory training**

All healthcare employees are required to participate in mandatory training on an annual basis. Common topics are infection control, safety, and risk management. As part of safety training, prevention of and dealing with workplace violence should be addressed.

Time for such training is limited. Numerous topics must be addressed within a limited time frame. Case studies, role play, and computer-based training are all ways to incorporate prevention of and dealing with workplace violence as part of annual mandatory training. Competency of staff members regarding workplace violence should be assessed. Ways to assess competency include demonstrating effective communication as part of a role play demonstration and written quizzes.

**Continuing education**

Continuing education involves offering additional information beyond what is provided during orientation and annual mandatory training. Such information might include:

- Current statistics on the incidence and prevalence of workplace violence.
- Information regarding new techniques to help calm patients, family members, and visitors.
- Data pertaining to incidence and prevalence of workplace violence occurrences within the organization including strengths and weaknesses of the organization’s workplace violence prevention program.
- Current techniques (as appropriate depending on the employee’s role in the organization) for the restraint of violent persons that can be implemented without harming those persons. Such training should be offered by educators who are trained in physical crisis management techniques.

**Simulation of workplace violence**

Simulation of clinical situations has been used as an education technique for a considerable length of time. Simulation of workplace violence can be used to prepare staff members to defuse such situations. Simulation can also be used to help staff react if violence actually occurs.

Various scenarios such as a visitor who is under the influence of alcohol, a confused patient, or a family member who is angry about the care a loved one received can be simulated.

Simulations can be conducted in a classroom setting or spontaneously enacted in the actual work setting. The focus of simulation is to help prepare staff members to better cope with the problem of workplace violence. Simulation can also be used to assess competency of staff members to defuse potentially violent situations as well as their ability to deal with actual violence.
In summary, violence in the workplace is a problem that must be dealt with by every organization. A zero tolerance for such violence must be clearly established and upheld by all members of the administrative and management staff. A workplace violence prevention program must be developed and implemented with the cooperation and support of all employees. Barriers to the reporting of workplace violence must be identified and eliminated, and reasons for the occurrence of such violence discussed.

All employees, including administrators and managers, must receive ongoing training and continuing education about the incidence and prevalence of workplace violence, how to prevent such violence, and how to deal with it if it occurs. Competency of the ability to help prevent and deal with workplace violence should be assessed.

Workplace violence should be part of the annual mandatory training that all employees receive.

Data pertaining to the organization’s specific record of incidence and prevalence of workplace violence as well as the violence prevention program’s strengths and weaknesses should be shared with employees. Employees have the right to know just how safe their workplace is. Employees also have the responsibility to help enhance the safety of their work environment. Responsibilities include helping to write and evaluate relevant policies and procedures, participating in continuing education and training pertaining to workplace violence, and reporting unsafe conditions including documenting incidents of workplace violence. Workplace safety is the responsibility of all employees!

References
Chapter 2: Diabetes: A Comprehensive Overview

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Learning objectives

Upon completion of this course the learner should be able to:

- Identify the different types of diabetes and prevalence in the United States.
- Understand recommended screening guidelines, diagnostics tests, and the common signs and symptoms of the disease.
- Identify the nonmodifiable and modifiable risk factors for developing diabetes.
- Discuss the pathophysiology of diabetes as well as the psychological impact of a diagnosis for the patient and family.
- Compare and contrast the various treatment modalities of diabetes, (nutrition/diet, oral medications, insulin, pumps and surgical options).
- Identify and understands the role of the nurse caring for a patient along with the cultural considerations related to that care.
- Discuss the future of diabetes, including stem cell research.

Introduction

Diabetes mellitus is a common, chronic, complex disease characterized by an insufficiency of, or the body’s failure to properly use, insulin [78]. Proper management of diabetes requires a collaborative approach with the patient and family to make lifelong behavioral and lifestyle changes. The nurse has an enormous role in facilitating the treatment regimen and empowering patients and families to achieve maximum states of wellness. Regardless of a nurse’s specialty, each of us has been responsible for the care of a patient living with diabetes. Although nurses may have a basic understanding of diabetes, it is important for them to understand the complexity of the disease and feel comfortable in their knowledge of it to ensure that they give patients the right information to control their diabetes and to avoid serious complications.

Diabetes is the world’s most prevalent metabolic disease and it is the leading cause of adult blindness, renal failure, gangrene and the necessity for limb amputations [58,63]. Since 2007, diabetes has reached epidemic proportions worldwide, making it the seventh-leading cause of death in the United States [58]. Growing numbers of people are dealing with acute and chronic complications, disability and death due to the diabetic disease process.

Prevalence of diabetes in the United States and worldwide

In 2011, the National Diabetes Information Clearinghouse (NDIC) and the American Diabetes Association (ADA) provided the following prevalence statistics regarding diabetes [19,58]:

### Diabetes in the United States

There are about 25.8 million children and adults (8.3 percent of the total United States population) living with diabetes. This included 18.8 million people diagnosed and 7 million who were not diagnosed. Additionally, there are 79 million people diagnosed as prediabetic. In 2011 the National Diabetes Fact sheet used both fasting glucose and A1C levels to obtain estimates for undiagnosed diabetes and prediabetes since these are the most commonly used tests in clinical practice.

- Only a fraction of the total number of cases are found under the age of 20:
  - 215,000 or 0.26 percent of all people in this age group have diabetes.
  - About one in every 400 children and adolescents has type 1 diabetes.

- The majority of diabetes is found in patients over the age of 20:
  - **Age 20 or older**: 25.6 million (11.3 percent) of all people in this age group have diabetes.
  - **Age 65 or older**: 10.9 million (26.9 percent) of all people in this age group have diabetes.
  - **Men**: 13 million (11.8 percent) of all men age 20 or older have diabetes.
  - **Women**: 12.6 million (10.8 percent) of all women age 20 or older have diabetes.
  - **Non-Hispanic whites**: 15.7 million (10.2 percent) of all non-Hispanic whites aged 20 years or older have diabetes.

- **Non-Hispanic blacks**: 4.9 million (18.7 percent) of all non-Hispanic blacks aged 20 years or older have diabetes.

### Prediabetes in the United States

Prediabetes is a condition characterized by blood glucose or A1C levels that are higher than normal but not high enough to be called diabetes. Persons who have pre-diabetes are at increased risk for developing type 2 diabetes, heart disease, and stroke. Research shows that pre-diabetics who lose weight and increase their physical activity can actually prevent or delay the development of type 2 diabetes and may even, in some cases, return their blood glucose levels to normal [58].

- In 2005-2008 (based on fasting glucose or A1C levels) 35 percent of adults in the United States ages 20 years or older had pre-diabetes. Fifty-percent of these individuals were 65 years of age or older. “Applying this percentage to the entire U.S. population in 2010 yields an estimated 79 million Americans ages 20 years or older with pre-diabetes.” [58].

- Based on fasting glucose or A1C levels, and after adjusting for population age differences, the percentage of American adults ages 20 years or older with pre-diabetes in 2005-2008 was similar for non-Hispanic whites (35 percent); non-Hispanic blacks (35 percent); and Mexican Americans (36 percent) [58].

### Gestational diabetes

Gestational diabetes has been reported in 2 percent to 10 percent of pregnancies in the United States. Immediately following their pregnancies, 5 percent to 10 percent of women with gestational diabetes are found to have diabetes (usually type 2). Those women who had
gestational diabetes have a 35 percent to 60 percent chance of developing diabetes in the next 10-20 years [58].

Diabetes and death in the United States
According to the Diabetes Research Institute and the Centers for Disease Control and Prevention (CDC), diabetes reduces life expectancy by one-third [37]. Based on the most recent available statistics, diabetes was the seventh leading cause of death based on U.S. death certificates in 2007. This conclusion is based on the 71,382 death certificates in 2007 in which diabetes was the underlying cause of death. Diabetes was a contributing cause of death in an additional 160,022 death certificates. In general, the risk for death among people with diabetes is about two times that of people of similar age but without diabetes [58].

Cost of diabetes in the United States
Diabetes is a major public health concern and debt to the U.S. population. In 2007, the most recent year for which statistics are available, the total (direct and indirect) cost in the U.S. was 174 billion. However, according to the Diabetes Research Institute, diabetes costs the American people an estimated $218 billion each year [37,58]. This includes:

- **Direct medical costs:** $116 billion in 2007; up from 91.8 billion in 2002 [19]. After adjusting for population age and sex differences, average medical expenditures among people with diagnosed diabetes were 2.3 times higher than what expenditures would be in the absence of diabetes.
- **Indirect costs:** $58 billion; up from 39.8 billion in 2002 [19]. Indirect costs compromise the amount spent on disability, work loss and premature mortality.

Even though the statistics are astonishing in the U.S., it is more profound globally. According to the World Health Organization (WHO), more than 220 million people worldwide have diabetes. [76] The WHO (2011) released the following data as well [76]:
- More than 80 percent of deaths due to diabetes occur in low-and middle-income countries.
- WHO predicts that diabetes deaths will double between 2005 and 2030.
- Healthy diet, regular physical activity, maintaining a normal body weight and avoiding the use of tobacco products can prevent or delay the onset of type 2 diabetes.

Understanding the role of the pancreas and diabetes

The pancreas is a banana-shaped organ that lies behind the stomach, with the head and neck extending into the curve of the duodenum and the tail lying against the spleen. The pancreas has endocrine and exocrine capabilities [19,79]:

- **Endocrine function** involves the islets of Langerhans, microscopic structures that are responsible for two major hormones, glucagon (secreted by the alpha cells) and insulin (secreted by the beta cells) that have an enormous effect on diabetes.
  - **Glucagon** is a hormone that increases blood glucose levels when the blood sugar is low.
  - **Insulin** is a hormone that stimulates growth and promotes the movement, storage and metabolism of carbohydrates, protein and fat. Insulin plays a role in lowering the blood glucose levels by allowing glucose to move across the cell membranes into many tissues.

- **Exocrine function** is responsible for the digestive enzymes excreted to facilitate the eating process. Although the exocrine function of the pancreas plays an enormous role in excreting various digestive enzymes every day, it does not have any relation or effect to diabetes.

Normal physiology in a non-diabetic individual

When an individual eats or drinks something, the body responds by raising the blood sugar to provide energy and nutrients to the cells and organs. Carbohydrate foods provide most of the glucose absorbed and used by the body; proteins and fats provide smaller amounts [75]. According to the ADA, a patient without diabetes will maintain a fasting blood glucose level between 70-99 milligrams/per deciliter (mg/dl) and less than 140 mg/dl postprandial (two hours after eating) [2]. Our bodies cannot differentiate the type of glucose ingested, but after eating any meal or drinking, the blood sugar normally rises, often to between 120 and 130 mg/dl, but generally not above 140 mg/dl [52]. Once the blood sugar rises, the pancreas will respond by releasing insulin to help control the metabolism of the carbohydrates ingested.

Insulin secreted via the pancreas “opens the doors” of the cells throughout the body by binding to insulin receptors on the cell membranes. Once the doors open, insulin travels immediately to the liver via the bloodstream. The pancreas secretes approximately 40 to 50 units of insulin daily into the liver in a two-step manner [19]:

- **Low levels during fasting** (basal insulin secretion).
- **Increased levels 10 minutes after eating** (prandial). Insulin will continue to be released periodically if hyperglycemia persists.

Once the insulin is in the liver, it promotes the production and storage of glycogen (long chains of glucose) [19]. Glycogen is required to ensure that a normal, therapeutic blood glucose level is maintained throughout the day. Therefore, if an individual ingests a large amount of food, the excess glucose will be converted into glycogen and stored within the liver and muscles.
During a hypoglycemic event (blood glucose 70 mg/dl) brought on by an individual choosing to skip a meal or choosing to ingest a smaller portion, the body responds by mobilizing glucose into the bloodstream and cells from the stored glycogen to raise the blood glucose levels [19]. At the same time, another major hormone, glucagon, allows glucose to be released from glycogen as needed from the storage sites (predominantly within the liver and muscles) whenever the blood glucose levels are low [19]. The glucagon will then mobilize the glucose from the storage sites to increase the concentrations of glucose in the bloodstream. It is imperative that the pancreas and hormones respond appropriately to prevent complications and a lack of glucose and nutrients from getting to organs and tissues.

Pathophysiology in a diabetic patient

In the diabetic patient, the glucose is unable to “unlock” the cell and enter into the body’s cells, allowing it to stay in the bloodstream and induce a hyperglycemic state that denies the cells their source of energy [75]. Without therapeutic levels of glucose, the body cannot function adequately because glucose is the main fuel for the central nervous system (CNS). The brain cannot store glucose; therefore it requires a continuous supply. The body attempts to compensate for the insufficiency, however. When the cells are unable to absorb the glucose, they rely on fat and protein for energy. Fat (in the form of triglycerides) and proteins should only be utilized as “reserves” for fuel and not used as energy under normal conditions [19]. If the body continues to use fat and protein for the source of energy, the cells break down, inducing a form of emaciation, muscular atrophy and weakness [63,79].

Diabetes also causes insulin to either not be produced (Type 1 diabetes) or production to be decreased (Type 2 diabetes). In either instance, without an adequate supply of insulin, glucose is unable to properly move in the bloodstream to the tissues and organs, further exacerbating the cells that are starving for energy and nutrients for survival [2]. Over time, the patient will exhibit various symptoms due to the buildup of glucose in the bloodstream and lack of insulin production (See Signs and symptoms of diabetes).

Diagram 1 below (Role of Insulin)

Diagram 1: Carbohydrates that we eat make our blood glucose rise. To utilize the carbohydrates and lower the blood sugar, insulin opens the doors of the body’s cells to glucose circulating in the blood. The glucose enters the cells and is used as the cells’ fuel for energy. Insulin binds to a spot on the cell surface called a receptor. Likened to a lock and key, insulin is the key that opens up the lock (receptor) so that glucose can pass through the door into the cell. Using this analogy in type 1 diabetes, the keys have been stolen because no insulin is produced (the pancreas does not make the insulin). With type 2 diabetes, the door will not open fully even with the right key, which is known as insulin resistance. Source: [52].

Type 1 diabetes

According to the ADA and the CDC, type 1 diabetes is classified in one of the following categories [5, 31, 48]:

Type 1 diabetes was previously referred to as insulin-dependent diabetes mellitus (IDDM), juvenile-onset diabetes, ketosis prone diabetes, brittle diabetes and idiopathic diabetes. Type 1 diabetes is a multifactorial disease caused by an autoimmune destruction of insulin-producing pancreatic beta cells. It typically develops when the body’s immune system destroys the pancreatic beta cells and insulin is no longer produced in response to the individual’s ingestion of food. It is speculated that type 1 diabetes is caused by a family history, women who have had gestational diabetes, the pancreas attacking itself following certain viral infections or after the administration of certain drugs (autoimmune response) [75]. Other risk factors include the following:

- **Genetics** plays an enormous role in predisposing individuals to develop diabetes. In Type 1, family members are at risk of developing diabetes throughout their life. Researchers have identified genetic markers that determine immune responses, specifically DR3 and DR4 antigens on chromosome number six of the human leukocyte antigen (HLA) system, amongst 95 percent of people diagnosed with type 1 diabetes [25, 53]. The inherited antibodies can be detected in the blood years before the development of any clinical symptoms [25]. In the general population without any genetic predisposition, an individual has a one in 400 to one in 1,000 risk; however, a child of a diabetic patient has a one in 20 to one in 50 risk [51]. Interestingly, the offspring of a mother with type 1 diabetes has a 3 percent risk that increases to 6 percent if the father is affected [53]. The risk increases tremendously among identical twins, up to 25 to 50 percent [53].
- **Age**. Type 1 diabetes can occur at any age; however it is more common in children and young adults, typically under 40 years of age. Type 1 diabetes may account for 5 to 10 percent of all diagnosed cases of diabetes [53].
Type 2 diabetes

Type 2 diabetes was previously referred to as noninsulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes begins as insulin resistance, a disorder in which the cells do not utilize the insulin produced by the pancreas properly. As the need for insulin rises, the pancreas gradually loses its ability to produce insulin. In type 2, the body either does not make enough insulin (insulin deficiency), something interferes with the action of the insulin that is made by the pancreas (insulin resistance) or there is an increase in the hepatic glucose output [21]. Type 2 diabetes is the most common form nurses will care for in their career.

Type 2 diabetes may account for about 90 to 95 percent of all diagnosed cases of diabetes. Type 2 diabetes is associated with older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity and race/ethnicity — African Americans, Hispanic/Latino Americans, American Indians and some Asian Americans and Native Hawaiians or Other Pacific Islanders are at particularly high risk for type 2 diabetes [31]. The prevalence of type 2 diabetes among African Americans is 1.6 times higher than that of the total U.S. population [50]. It is speculated that African Americans are at a higher risk because of correlating obesity and hypertension rates, especially among African American women [50].

Type 2 diabetes is increasingly being diagnosed in children and adolescents due to genetics, a significant incline in childhood obesity and decreased activity [25, 75].

The patient with type 2 diabetes typically presents as an obese patient with a family history of diabetes and a recent stressor, such as a death of family member, illness or loss of a job [75].

Although the origin is unknown, research has demonstrated that type 2 diabetes is influenced by genetics along with the combination of environmental factors. Type 2 diabetes is very complex and not all that well defined because there have been numerous susceptibility genes identified. The pathogenesis of type 2 diabetes revolves around genes that either influence viability or cellular responses to insulin or beta cell function or both [48].

- Genetics. Genetics plays an enormous role in the development of diabetes (90 percent). However, in contrast to type 1 diabetes, there is no identified HLA link. The maturity-onset diabetes of the young (MODY) is thought to be an autosomal dominant as it effects 50 percent of first-degree relatives. At this time, there are at least six types of MODY, and it is considered to be a subset of type 2 diabetes. Each specific type of MODY is caused by a specific mutation in the enzyme that is involved in the beta cell function and insulin action. For example, MODY3 develops after a mutation occurs in the hepatocyte nuclear factor alpha-1, and MODY2 can be attributed to a defect in the glucose-sensing ability (glucokinase mutation). Since only 2 to 5 percent of cases of diabetes are monogenic, they are classified as MODY [48].

The offspring of people with type 2 diabetes have a 15 percent chance of developing type 2 diabetes and a 30 percent risk of developing glucose intolerance (inability to metabolize carbohydrates normally).

- Race/ethnicity. Type 2 diabetes is prevalent in half of all black and Hispanic children and in over two-thirds of American Indian children [46].

- Environment. Environmental triggers can be exacerbated by exposure to a viral infection (mumps, rubella or coxsackievirus B4) and chemical toxins (smoked and cured meats) [53].

- Modifiable risks. There are certain risks that patients have the power to potentially change and control in their life, such as:
  - Obesity. Obesity is defined as being at least 20 percent over the recommended body weight for an individual’s height and weight or having a body mass index (BMI) of at least 27 kilograms per meter squared (kg/m2) [53]. When an individual is obese, it hinders the ability of glucose to enter the liver, adipose tissue and skeletal muscle [48]. Intra-abdominal obesity is the single most important risk factor in determining who is at risk of developing type 2 diabetes. Research has demonstrated that severe obesity creates 10 times the risk of developing type 2 diabetes. In addition, having an excessive caloric intake contributes to obesity and predisposes an individual to type 2 diabetes [48].

  The fat accumulation in nonadipose tissue (ectopic fat) is very common in insulin resistance and type 2 diabetes. The accumulation of lipids in the islets can be attributed to the impairment of insulin secretion, and insulin resistance has been attributed to excess fat in the muscle. Nonalcoholic steatohepatitis is the infiltration of fat within the liver and may result in cirrhosis and hepatic failure. Very little is understood about the pathogenesis of ectopic fat, but overnutrition is clearly the main culprit. Pancreatic fibrosis, which occurs in 33 to 66 percent of type 2 diabetics, can also contribute to the loss of beta cell function.

  - Physical inactivity. The Diabetes Prevention Program, DPP) a prevention study of persons at significant risk for diabetes, found that losing weight and increasing physical activity reduced the development of type 2 diabetes by 58 percent during a 3-year period. The reduction was even greater (78 percent) in adults 60 years of age and older [31].

  - Hypertension (greater than 130/85 in adults), High density lipoproteins (HDL) cholesterol less than 35 mg/dl and/or a triglyceride level greater than 250 mg/dl [78].

- Insensitivity to insulin. Interestingly, patients living with or at risk for diabetes typically have a cellular resistance factor 60 to 80 percent of the time. Resistance to insulin also increases with obesity and a condition called metabolic syndrome. An integral part in the pathogenesis of type 2 diabetes and metabolic syndrome is the decrease in beta cell responsiveness to the plasma glucose levels as well as abnormal glucagon secretions. (See the subsequent section for further explanation).

Pre-diabetes and insulin resistance (metabolic syndrome)

Type 2 diabetes does not just occur overnight; often a patient will have one of the following conditions before being diagnosed with diabetes [29, 57]:

1. Prediabetes is a condition in which a patient will have a higher-than-normal blood glucose level but not high enough to be classified as diabetes. People with prediabetes have an increased risk of developing type 2 diabetes, heart disease and a stroke. Prediabetes is a condition that needs to be assessed and monitored by health care professionals because of the seriousness and the risk of developing complicating diseases. As noted, 79 million Americans ages 20 years or older are estimated to have prediabetes.” [58].

   People with prediabetes have impaired fasting glucose (IFG) and/or impaired glucose tolerance (IGT) [19, 29, 52]:

   - IFG is a condition in which the fasting blood sugar level is 100 to 125 milligrams per deciliter (mg/dL) after an overnight fast. This level is higher than normal but not high enough to be classified as diabetes.

   - IGT is a condition in which the blood sugar level is 140 to 199 mg/dL after a two-hour oral glucose tolerance test (OGTT).
An A1C of 5.7 percent to 6.4 percent indicates an increased risk of type 2 diabetes and is diagnostic for prediabetes [80]. Various research studies and the Diabetes Prevention Program (DPP) have demonstrated that most people with prediabetes develop type 2 diabetes within 10 years unless they make the following lifestyle changes [29, 57]:

- **Decrease weight.** Lose 5 to 7 percent of their body weight, approximately 10 to 15 pounds for someone who weighs 200 pounds. Losing just 5 to 7 percent of body weight prevents or delays diabetes by nearly 60 percent. The body mass index (BMI) chart is a measurement of body weight relative to the individual’s height. Adults aged 20 or older can use the BMI table below to find out whether they are normal weight, overweight, obese or extremely obese.

It is important to note that the BMI table has certain limitations as it may overestimate body fat in athletes and others who have a muscular build and underestimate body fat in older adults and others who have lost muscle. BMI for children and teens must be determined based on age and sex in addition to height and weight. Information about BMI in children, teens and adults, including a BMI calculator, is available from the Centers for Disease Control and Prevention (CDC) at www.cdc.gov/nccdphp/dnpa/bmi.

- **Diet changes.** Change their diet by decreasing the total calories and cutting out the total fat intake to reduce their risk of complications (such as heart disease).

- **Physical activity.** Increase their level of physical activity, such as walking 30 minutes a day five days a week. Physical activity helps muscle cells use blood glucose for energy by making the cells more sensitive to insulin.

In the DPP study, people aged 60 or older who made lifestyle changes lowered their chances of developing diabetes by 70 percent. Many participants in the lifestyle intervention group returned to normal blood glucose levels and lowered their risk for developing heart disease and other problems associated with diabetes. The DPP also showed that the diabetes drug Metformin reduced the risk of developing diabetes by 31 percent (See the section Medication Modalities for the Type 2 Diabetic for further discussion about Metformin.)

It’s important for health care professionals to urge their patients to be physically active, make wise food choices and reach and maintain a healthy weight.

2. **Insulin resistance** (commonly referred to as metabolic X syndrome) is a condition in which the body produces insulin but does not use it properly. Over the past decade, there has been a lot of hype correlating diabetes, metabolic syndrome and cardiovascular disease. However, it should be noted that since the late 1960s, research has demonstrated a significant association among diabetes, hypertension, obesity and hyperlipidemia [1]. Then, in the early 1990s, researchers discovered that the same chronic cluster of disorders was caused by insulin resistance and concluded that “insulin resistance syndrome” (syndrome X and metabolic syndrome) was the appropriate name for this condition. At the same time, researchers discovered from the Framingham Offspring Study that a clustering of risk factors, including hyperinsulinemia, dyslipidemia, hypertension and glucose intolerance (rather than hyperinsulinemia alone), characterized the underlying features of the insulin resistance syndrome [1].

Individuals who are insulin resistant are unable to respond appropriately to insulin, and as a result, their bodies need more insulin to help glucose enter cells. The pancreas tries to keep up with this increased demand for insulin by producing more, but eventually the pancreas can’t keep up with the body’s needs. So excess glucose builds up in the bloodstream, setting the stage for diabetes. Many people with insulin resistance have high levels of both glucose and insulin circulating in their blood at the same time. Insulin resistance increases the chance of developing type 2 diabetes and heart disease.

A diagnosis of prediabetes or insulin resistance does not mean that diabetes and/or heart disease will definitely develop over the next few years. However, it should be looked upon as a wake-up call to make lifestyle changes to prevent or delay diabetes. According to the CDC (2008) [29]:

- Progression to diabetes among those with prediabetes is not inevitable. Studies have shown that people with prediabetes who lose weight and increase their physical activity can prevent or delay diabetes and return their blood glucose levels to normal.

- The DPP, a large prevention study of people at high risk for diabetes, showed that lifestyle intervention reduced developing diabetes by 58 percent during a three-year period. The reduction was even greater, 71 percent, among adults age 60 or older.

- Interventions to prevent or delay type 2 diabetes in individuals with prediabetes can be feasible and cost-effective. Research has found that lifestyle interventions are more cost-effective than medications.

Typically, patients with insulin resistance (metabolic X) and/or prediabetes do not exhibit any diabetic symptoms, and they may have one or both conditions for several years without noticing anything. People with a severe form of insulin resistance...
(metabolic X) may have a condition called acanthosis nigricans – dark patches of skin, usually on the back of the neck, elbows, knees, knuckles, and the armpits – an early sign of prediabetes. Nurses and health care providers need to be attuned to the major risk factors (similar to the development of diabetes). According to the NDIC (2008) and the ADA, the risk factors for prediabetes, insulin resistance (Metabolic X) and diabetes are typically the same [57].

Research has demonstrated that 25 percent of the general nonobese, nondiabetic populations have insulin resistance at a magnitude similar to type 2 diabetes [53]. It occurs more frequently in men and Mexican Americans between the ages of 20 to 70. While metabolic syndrome may have a basis from a genetic standpoint, other influential environmental factors may be involved, including lack of exercise, excess nutrients and obesity [48]. Metabolic syndrome has a group of clinical traits that, when combined together, increase the risk for developing cardiovascular disease significantly. According to the American Heart Association (AHA) and the National Heart, Lung and Blood Institute, metabolic syndrome is diagnosed when a minimum of three of the following criteria are met [48]:

○ Elevated waist circumference (abdominal obesity). Increased abdominal adiposity (waist greater than 40 inches in men and greater than 35 inches for woman). The excess fat in the intra-abdominal area is a huge component of the metabolic syndrome. The majority of experts concur that the combination of obesity, obesity-related cytokines called adipokines, excess nutrients and inflammatory cytokines are the main contributors to beta cell death and insulin resistance in type 2 diabetes. Regardless of which event occurred, the mechanisms that are responsible for insulin receptor binding or postreceptor can be reversed by weight loss [48].

○ Elevated triglycerides (TG) greater than 150 mg/dl.

○ Reduced HDL cholesterol (less than 40 mg/dl in men and less than 50 mg/dl for women).

○ Fasting blood glucose (Hyperglycemia) greater than 100 mg/dl).

○ Increased blood pressures (130/85 mm Hg or greater).

Research has also correlated other risk factors, such as physical inactivity, aging, hormonal imbalance and genetic predispositions [75].

Insulin resistance and prediabetes are diagnosed by one of the following laboratory tests [57]:

- **Fasting glucose test.** This test measures blood glucose in people who have not eaten anything for at least eight hours. This test is most reliable when done in the morning. Fasting glucose levels of 100 to 125 mg/dL are above normal but not high enough to be called diabetes, so that level is called prediabetes or IFG. People with IFG often have had insulin resistance for some time and are much more likely to develop diabetes than people with normal blood glucose levels.

- **Glucose tolerance test.** This test measures blood glucose after people fast for at least eight hours and two hours after they drink a sweet liquid provided by a doctor or laboratory. A blood glucose level between 140 and 199 mg/dL means glucose tolerance is not normal but is not high enough for a diagnosis of diabetes. This form of prediabetes is called IGT and, like IFG, it points toward a history of insulin resistance and a risk for developing diabetes.

For over a decade, the WHO, AHA and the National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) III have recognized and appreciated the significant correlation of metabolic syndrome, diabetes and cardiovascular disease [1,20]. Throughout their research they have seen a significant prevalence of metabolic syndrome with worsening glucose tolerance from 26 percent in patients with normal fasting glucose rising to 86 percent in those with diabetes. Metabolic syndrome is a very common disorder in the U.S. population for people over the age of 50. In contrast, diabetes without metabolic syndrome is uncommon in the over-50 population (only 13 percent of diabetic patients do not meet criteria for metabolic syndrome) [1].

In contrast, the ADA and the European Association for the Study of Diabetes state there is no solid evidence that any of the metabolic syndrome health factors contribute more together than they do individually. In other words, the whole is not greater than the sum of its parts. The authors recommend that doctors should [15]:

- Aggressively treat the individual health factors that lead to heart disease (diabetes, insulin resistance, unhealthy triglyceride and cholesterol levels, high blood pressure, and signs of kidney disease).

- Continue to evaluate patients for other risks that can lead to heart disease.

- Avoid labeling patients with the term “metabolic syndrome.”

- Avoid prescribing a treatment for the “syndrome” until new, solid evidence is found.

However, many health care providers have recognized the significant correlation of metabolic syndrome diabetes and cardiovascular disease. The American Academy of Family Physicians (AAFP) (2004) believes metabolic syndrome will overtake cigarette smoking as the number 1 risk for developing cardiovascular disease [18]. It is imperative to monitor and diagnose this condition as it significantly correlates to an increased risk of the patient developing type 2 diabetes and heart disease [75].

According to the NDIC (2008), people whose test results indicate they have prediabetes should be educated about changing their lifestyle behaviors, and their blood glucose levels be rechecked in one to two years. At the time of diagnoses or recognizing a patient with the risk factors for developing diabetes, clinical research trials have demonstrated that the patient and family should be educated on the following [57]:

- The first therapy should always be an intensive lifestyle modification program because weight loss and physical activity are much more effective than any medication at reducing the risk for developing diabetes.

- At this time, several drugs have been shown to reduce diabetes risk to varying degrees, but at this time there is no drug approved by the U.S. Food and Drug Administration (FDA) to treat insulin resistance, prediabetes or to prevent type 2 diabetes. However, the ADA recommends the initiation of Metformin (See Medication Modalities for Type 2 Diabetics).

**Gestational diabetes**

Gestational diabetes (GDM) is a form of glucose intolerance that is diagnosed in some women during the later part of their pregnancy. The risk increases especially if the pregnant woman has coinciding risk factors for type 2 diabetes [75]. During pregnancy, the extra metabolic demands required to support the pregnancy and potential other co-morbidities or risk factors may cause the onset of diabetes. Throughout the pregnancy, the woman’s hormones are providing growth for the baby, but these same hormones also block the action of the mother’s insulin in her own body, potentially leading to insulin resistance.

In a normal pregnancy, there are complex alterations in the maternal glucose metabolism, insulin production and metabolic homeostasis. It is imperative that these complex alterations occur to ensure adequate nutrition for the mother and developing fetus [77]. Glucose is the primary fuel used by the fetus through the process of carrier-mediated diffusion, implying it is directly proportional to the maternal levels. At
10 weeks gestation, the fetus secretes its own insulin at adequate levels to balance the glucose ingested by the mom. Therefore, as the maternal glucose levels rise, the fetal glucose levels are increased, resulting in increased fetal insulin secretion. Each of the metabolic changes is elaborated upon as follows [77]:

- **During the first trimester** (through week 12 gestation), the pregnant woman’s metabolic status is influenced by the rising levels of estrogen and progesterone. The hormones stimulate the beta cells in the pancreas to increase insulin production, promoting increased peripheral utilization of glucose and decreased blood glucose with fasting levels being reduced by approximately 10 percent. There is an increase in tissue glycogen stores and a decrease in the hepatic glucose production, which further increases the risk of hypoglycemia occurring during the first trimester.

- **During the second and third trimesters**, the pregnancy exerts a diabetogenic effect on the maternal metabolic status, thus increasing the risk of developing diabetes. Since there are significant hormonal changes occurring throughout this period, there is a decreased tolerance to glucose, increased insulin resistance, decreased hepatic glycogen stores and increased hepatic production of glucose. Maternal insulin requirements gradually increase from 18 to 24 weeks gestation to about 36 weeks. At 36 weeks, insulin requirements usually level off until labor begins.

**Other/rare forms of diabetes**

Latent autoimmune diabetes in adults (LADA), also referred to as 1.5 diabetes or double diabetes, is diagnosed in individuals over the age of 30. The individuals demonstrate signs and symptoms of both type 1 and type 2 diabetes. Initially, the individual with LADA will still produce their own insulin, similar to a type 2 diabetic, but within a few years must take insulin to control blood glucose levels. In LADA, as in type 1 diabetes, the beta cells of the pancreas stop making insulin because the body’s immune system attacks and destroys them [55].

**Diabetes related to genetic conditions**, such as maturity-onset diabetes of youth (MODY) or mutated genes. These rare genetic forms of diabetes are elaborated as follows per the current medical diagnosis and treatment (CMDT) 2007 guidelines [53]:

- **MODY** is a rare monogenic disorder characterized by noninsulin diabetes with an autosomal dominant inheritance in a person younger than 25 years of age. Typically, the patient presents with hyperglycemia related to impaired glucose, induced secretion of insulin and is nonobese.

- **Diabetes due to mutant insulins** is a rare form of nonobese type 2 diabetes with an autosomal dominant genetic disposition in which the individual has only one normal insulin gene. The diabetes is mild and does not appear until middle age.

- **Diabetes due to two mutant insulin receptors genes**. Over 40 percent of all diabetic patients have a defect in one of their insulin receptor genes; however it is rare for it to occur in two. If an individual has two mutant insulin receptor genes, it will be noted in infancy. The newborn will have a leprechaun-like phenotype and unfortunately, rarely survives.

- **Diabetes associated with a mutation of mitochondrial deoxyribonucleic acid (DNA)** impairs the transfer of leucine or lysine into mitochondrial proteins. This rare form is transmitted only by the mother because sperm do not contain mitochondria. Typically the diabetes is mild and the patient responds to oral hypoglycemic agents. Interestingly, two-thirds of the patients with this form of diabetes have a hearing loss, and others in smaller amount (15 percent) may have coinciding Myopathy (muscular weakness), Encephalopathy (degenerative brain injury), Lactic Acidosis and Stroke-like episodes (MELAS).

- **Wolfram’s syndrome** is an autosomal recessive neurodegenerative disorder that presents in childhood. Wolfram’s syndrome consists of Diabetes Insipidus (DI), Diabetes Mellitus (DM), Optic Atrophy and Deafness (DIDMOAD). At this time there is no treatment for DIDMOAD, and the patient typically lives to about 30.

Other rare forms of diabetes may result from one of these [31, 55]:

- **Surgery**.
- **Drugs** (steroid hormones, Dilantin, thiadize diuretics and thyroid hormones as they may impair the normal action of insulin).
- **Malnutrition**.
- **Infections**.
- **Other illnesses** (pancreatitis or cystic fibrosis).

All of the rare forms of diabetes, including the mutated genes and genetic predispositions, account for 1 to 5 percent of all diagnosed cases of diabetes [31]. Due to the rare cases, little data is available online and/or in textbooks elaborating upon the details and mechanisms.

**Signs and symptoms of diabetes**

Many times, patients may be unaware of their potential risk or living unknowingly with diabetes. The initial signs and symptoms of diabetes may be very subtle, and a patient may assume it is related to another reason. The classic signs and symptoms of diabetes in general are the “three polys”: polyuria (excessive urine output), polydipsia (increase thirst), and polyphagia (extreme hunger) [63]. Other clinical signs noted during a clinical exam, revealed in blood and urine tests, include: hyperglycemia, glycosuria (glucose in the urine) and ketonuria (ketones in the urine) [49, 63,78]:

- **Polyuria** occurs from increased glucose circulating in the blood, resulting in hyperglycemia. The hyperglycemia causes serum hyperosmolarity, drawing water from the intracellular spaces into the general circulation. All of the extra fluid increases blood volume, leading to an increase in flow to the kidneys. The build up of glucose, especially in the renal tubules, acts as an osmotic diuretic, thus increasing urine output.
Polyuria can be measured in the urine when the blood glucose level exceeds the renal threshold for glucose, usually about 180 mg/dl. The condition is called glucosuria.

Polydipsia occurs due to a decrease in the intracellular spaces. Water is pulled out into the general bloodstream and then compounded with an increased urinary output leading to dehydration and the patient having an urge to drink continuously.

The glucose is unable to enter the cell without insulin, therefore the energy level declines (fatigue), but it will stimulate the patient to have the urge to eat more (polyphagia). It is important to note that although the patient is increasing food intake, he or she will typically lose weight (maybe even become emaciated) because as the body loses water, it will break down proteins and fats in attempt to replenish the energy source.

Other potential signs and symptoms of diabetes are [8,45,48, 53,78]:

- Dehydration leading to hemoconcentration (increased blood concentration), hypovolemia (decreased blood volume), hyperviscosity (thick concentrated blood), hypoperfusion (decreased circulation) and hypoxia (poor tissue oxygenation).
- Unusual weight loss related to the breakdown of protein and fats and depletion of water, glycopen and triglycerides due to the lack of insulin. Therefore, reduced muscle mass occurs as the amino acids are diverted to form glucose and ketone bodies [8, 10].
- Increased fatigue due to a lack of energy from inappropriate absorption of glucose in the cells.
- Irritability due to fluctuations and/or changes in the blood glucose levels.
- Blurred vision typically occurs with polydipsia as it often develops when the lenses are exposed to hyperosmolar fluids.
- Postural hypotension results from a lower plasma volume.
- Paresthesias (numbness and tingling of the lower extremities; “feeling the limbs are asleep”) may or may not be present at the time of diagnosis as a result of a temporary dysfunction of peripheral sensory nerves. Paresthesias typically resolves once insulin is replaced and the glycemic levels are restored to a homeostasis level.

In addition, health care professionals should always contemplate a potential diagnosis of diabetes in women who have delivered large babies (macrosomia; greater than 9 pounds, or 4.1 kilograms), history of polyhydramnios (excess amount of amniotic fluid in the sac; occurs in 1 to 2 percent of all pregnancies) or pre-eclampsia or unexplained fetal loss, even if she did not develop GDM [53].

Type 1 diabetes affects the metabolism of fat, protein and carbohydrates so glucose accumulates in the blood and leaks into the urine when the glucose exceeds the kidney’s ability to excrete it appropriately. Type 1 diabetes is correlated to the destruction of beta cells. Unfortunately, the patient typically does not exhibit any signs or symptoms until 80 to 90 percent of them are destroyed and insulin falls to critically low levels [63]. The major initial clinical manifestations noted in type 1 diabetes include the “three polys” [48].

Type 2 diabetes is typically more nonspecific because the patient will often complain of polyuria and polydipsia along with often being overweight, hyperlipidemic (high lipid levels) and high blood pressure. However, children and adolescents may not present with only symptoms of polydipsia or polyuria and acanthosis nigricans [25]. Children often present with a preceding minor illness, such as a flulike episode prior to being diagnosed with diabetes [46]. In addition, there have been several cases of children and adolescents who were undiagnosed with type 2 diabetes who had reported to the emergency room or their primary care provider in a hyperglycemic hyperosmolar state (HHS) that was confused with a diabetic ketoacidosis (DKA) and unfortunately had a high mortality rate due to the lack of recognition and proper treatment [25]. (See the section, Hyperglycemia and Diabetes for further explanation).

The type of obesity fat seen in type 2 diabetic patients is predominately distributed on the upper segments of the body (especially in the abdomen, chest, neck and face) and less often on the appendages [53]. However, nurses should never think that type 2 diabetes occurs in only obese patients. Some who suffer it can be emaciated due to the breakdown of fat and protein. Another aspect in type 2 diabetes is the onset is usually slow and insidious, making the diagnosis difficult [48, 53]. Since the symptoms may be very subtle and/or intertwined with other co-morbidities, it is important to ensure the primary care provider recognizes other manifestations such as [8]:

- Recurrent infections, which are common due to the proliferation of increasing glucose circulating in the blood stream, impairing the blood supply and thus hindered the healing process.
- Acanthosis nigricans, a hyperpigmentation and thickening of the skin with velvety irregularities apparent in skin folds of the neck, axillae, elbows, knees, groin and abdomen [25].
- Genital pruritus, common especially in women due to circulating glucose and glycosuria (glucose excreted in the kidneys) which both promote the growth of fungus, such as Candida.
- Visual changes that occur from the water balance in the eye fluctuating due to increased glucose levels.

Type 2 diabetes has a unique manifestation, HHS, characterized by a plasma osmolarity of 340 mOsm/L (greater than the normal range of 280-300 mOsm/L), elevated blood glucose (greater than 600mg/dl and may be as high as 1,000 to 2,000 mg/dl) and an altered level of consciousness (HHS, characterized by a plasma osmolarity of 340 mOsm/L, elevated blood glucose (greater than 600mg/dl and may be as high as 1,000 to 2,000 mg/dl) and an altered level of consciousness [53]. HHS is a serious, life-threatening complication of type 2 diabetes. (See Hyperglycemia and Diabetes for further explanation)

Gestational diabetes may or may not have any present symptoms. Many women remain asymptomatic throughout their pregnancy if they have no previous history of diabetes prior to conceiving. However, if a woman is at risk or may be developing symptoms, she may test positive with polyuria and glycosuria during her routine prenatal care appointments and she may complain of any of the following symptoms [22]:

- Polydipsia.
- Frequent urination.
- Fatigue.
- Nausea.
- Frequent infections of bladder, vagina and skin.
- Blurred vision.

Screening and diagnosing diabetes

There are over 7 million people in the U.S. living unknowingly with diabetes. Health care professionals must learn to recognize the symptoms and then educate patients and the community to ensure people recognize the signs and symptoms to prevent long-term complications. Some patients may present to their health care provider with the classic symptoms of the “three polys” (polyuria, polydipsia and polyphagia). Others may be diagnosed as they present for another concern or complaint. Unfortunately, there are some patients who skip through the radar because they avoid seeing doctors or they do not have access to adequate health care.

Health care professionals typically complete a routine urinalysis on each of their patients because it is relatively inexpensive. All patients over the age of 3 will have a urinalysis completed before seeing their health care provider. In a routine urinalysis, the health care provider will be able to screen for the following presence of glucose, but the test is not used for diagnostic measures [34, 53]:

- Polydipsia.
- Frequent urination.
- Fatigue.
- Nausea.
- Frequent infections of bladder, vagina and skin.
- Blurred vision.
• **Glycosuria** (sensitive to picking up less than 0.1 percent of glucose in urine) occurs when the renal threshold for glucose is exceeded (180 mg/dl or greater) due to osmotic diuresis [25].

• **Ketonuria**, with any amount found a concern as it may imply the possibility of diabetic ketoacidosis (DKA). Ketonuria occurs due to an abnormal breakdown of fatty acids (the backup source of energy) that may accumulate in the blood and urine when insulin is not available [49].

If glucose and/or ketones are found on the urinalysis, then the health care provider will initiate blood testing to confirm a diagnosis of prediabetes (insulin resistance/metabolic syndrome) or diabetes. However, nurses should realize there are different recommendations circulating among health care professionals to screen for diabetes, so the practice of the primary care provider may be different.

**Children**

Since 2007, the ADA and the American Academy of Pediatrics (AAP) have recommended a fasting blood glucose (FBG) at the age of 10 or the onset of puberty, and every two years if overweight (BMI greater than 85th percentile for age and sex), plus two additional risk factors (family history of diabetes in a first- or second-degree relative; high risk race/ethnicity; signs of or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, or PCOS) [32, 45].

**Adults**

Since 2003, the U.S. Preventive Services Task Force (USPSTF) has recommended that adults with high blood pressure or high cholesterol be screened for type 2 diabetes (insulin-resistant diabetes) as part of an integrated approach to reduce their risk of cardiovascular disease, but concluded that further research is needed to determine whether widespread screening of the general population would improve health outcomes [62].

The National Guideline Clearinghouse (2009) and Current Practice Guidelines (2008) recommend that between the ages of 18 and 39, screening may be indicated in patients with risk factors for diabetes, previously identified impaired FBG or OGTT, history of GDM, hypertension, HDL-C less than 35 mg/dL and/or triglyceride greater than 250 mg/dL, PCOS, or history of vascular disease. Beginning at the age of 45, a fasting plasma glucose is recommended every three years on all patients, especially if the patient has a body mass index greater than 25 [45, 59].

The ADA (2007) guidelines are partially congruent with the previous recommendations that screening should begin with a FBG or OGTT every three years, beginning at the age of 45, especially if BMI greater than 25. In addition, screening should be initiated earlier and more frequently in overweight patients with diabetes risk factors (family history, high risk ethnic group, history of impaired glucose testing, GDM, mother with an infant birth weight greater than 9 pounds, comorbid conditions hypertension (greater than 140/90), dyslipidemia HDL less than 35mg/dl or Triglycerides (TG) greater than 250 mg/dl, overweight (BMI greater than 25), PCOS or acanthosis nigricans, history of vascular disease and/or habitually physically inactive [45,81].

**Adults with comorbid hypertension or dyslipidemia (metabolic syndrome)**

The AAFP (2007) and USPSTF (2003) recommend screening for type 2 diabetes in patients with hypertension and/or dyslipidemia due to the potential correlating metabolic syndrome and risk for developing type 2 diabetes. However the specific testing and frequency is not mentioned or suggested. There is strong evidence that in hypertensive patients, the health care provider needs to be more aggressive in controlling the blood pressure when diabetes is coinciding [45].

According to the Journal of Family Practice (2009), research reiterates the information provided by the AAFP and USPSTF that although there are no specific guidelines for patients with hypertension (HTN) or dyslipidemia, practitioners should still educate their patients at risk. In addition, unless the patient meets another guideline or recommendation, then all patients should be screened beginning at 45 per the ADA [60].

**Pregnant women**

The USPSTF (2003) and AAFP (2007) have found insufficient evidence that routine screening for gestational diabetes substantially improves the health of mothers or their babies, although it is implemented in care among pregnant women between 24 and 28 weeks gestation [45,62].

According to the ADA (2007), all pregnant women should be screened for the potential risk of developing GDM at their first prenatal visit [45]:

• A woman with a high risk of developing GDM (obesity with a BMI greater than 27, family history, personal history of GDM, glycosuria, previous delivery of a large for gestational age infant, or PCOS), is urged to get an OGTT completed as soon as possible. If an OGTT is not completed with the initial testing, then the woman should be tested between 24 and 28 weeks gestation.

• A woman with an average risk of developing GDM is recommended to test between 24 and 28 weeks gestation.

• For a woman with a low risk of developing GDM (less than 25 years old, [not of Hispanic, African, Native American, South or East Asia or Pacific Islander ancestry], with weight normal before pregnancy, no history of abnormal glucose tolerance, no previous history of poor obstetric outcome and no known diabetes in a first-degree relative) is no glucose testing is recommended.

Most health care providers also will order a routine electrolyte panel at least annually, regardless of any symptoms or family history due to the prevalence of diabetes in our country. However, according to the Quality Adjusted Life Year (QALY) (2004), failure of health care providers to adhere to the recommended guidelines is not cost-effective for our health care system and budget [45].

Before assessing fasting blood glucose (FBG) or OGTT, the patient should be free from any acute illnesses. If so, then the nurse should instruct the patient three days before testing to continue a regular diet with at least 150 to 200 grams (g) of carbohydrates daily and then no caloric intake at least eight hours before the test [35]. If the patient is having a serum fasting blood glucose, the blood will be taken upon arrival at the laboratory. However, if the patient has been ordered an OGTT, the patient will be instructed to drink 75 to 100 g of glucose over five minutes. OGTT may be ordered for one or two hours in nonpregnant adults [35].

The ADA and AAFP (2007) and the USPSTF (2003) comply with the following acceptable diagnostic measurements for children and non-pregnant adults [35, 45, 46, 53]:

• **Diabetes** is diagnosed by:
  1. A fasting blood glucose level greater than 126 mg/dl on two or more occasions (a normal FBG is less than 100 mg/dl).
  2. A random plasma glucose concentration greater than 200mg/dl taken at any time, regardless of the last meal
  3. Two-hour plasma oral glucose tolerance test (OGTT) greater than 200 mg/dl (two hours after ingesting 75g of a glucose load). A normal FBG level for nondiabetics is 70-110 mg/ dl. A normal OGTT is less than 140mg/dl. There are certain medications that may skew the OGTT, such as diuretics, contraceptives, glucocorticoids, niacin and phenytoin [10].

• **Prediabetes** (High risk for developing diabetes). Normoglycemia is defined as a plasma glucose level less than 100 mg/dl in the FBG and less than 140 mg/dl in the two hour OGTT.
  1. Impaired glucose tolerance (IGT) is diagnosed in a patient without any prior history of diabetes by:
     - FBG greater than 126mg/dl and a plasma glucose 140-200mg/dl
     - 2 hour- OGTT 140 mg/dl, but less than 200mg/dl

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2. Impaired fasting glucose (IFG) is diagnosed in a patient without any prior history of diabetes by:
   - FBG 100-125 mg/dl and a plasma glucose less than 140 mg/dl.

It can be a little tricky to find a normal level because the levels may be different if a patient is pre-diabetic, undiagnosed or living with diabetes. The ADA and the American College of Endocrinology (ACE) have provided the following 2008 ranges to ensure compliance by patients and health care professionals; see Table 1 [3, 13].

### Table 1: Diagnostic Results for Pre-diabetes and Diabetes

<table>
<thead>
<tr>
<th></th>
<th>Pre-diabetes per the ADA &amp; ACE</th>
<th>Living with Diabetes guidelines per the ADA and ACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal fasting blood glucose level</td>
<td>Less than 100 mg/dl</td>
<td>70–130 mg/dl</td>
</tr>
<tr>
<td>Postprandial (2 hours after eating)</td>
<td>Less than 140 mg/dl</td>
<td>Less than 180 mg/dl</td>
</tr>
</tbody>
</table>

Diagnostic for diabetes:
- Fasting plasma glucose (FBG)
- 2 hours Postprandial (after eating) oral glucose tolerance test (OGTT)

<table>
<thead>
<tr>
<th></th>
<th>Greater than 126 mg/dl</th>
<th>Greater than 126 mg/dl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting plasma glucose (FBG)</td>
<td>Greater than 126 mg/dl</td>
<td>Greater than 200 mg/dl</td>
</tr>
<tr>
<td>2 hours Postprandial (after eating) oral glucose tolerance test (OGTT)</td>
<td>Greater than 200 mg/dl</td>
<td></td>
</tr>
</tbody>
</table>

*Table 1 devised based upon the ADA & ACE literature review.

In a pregnant woman, the ADA and AAFP (2007) and USPSTF (2003) recommend the following diagnostic measurement for GDM [45, 67]:
- FBG greater than 126 mg/dl or a casual plasma glucose greater than 200mg/dl and precludes the need for an OGTT challenge. However, most providers caring for pregnant woman will order an OGTT between 24-28 weeks gestation. Diagnosis is confirmed if:
  - Initial screening for gestational diabetes is accomplished by performing a 50-g, one-hour OGTT at 24 to 28 weeks of gestation. Normal should be less than 130 to 140 mg/dl; both are accepted. If the patient does not pass the one-hour test (results greater than 140 mg/dl), the woman will have to complete a 75 or 100-g, three- hour OGTT. The patient will be instructed to remain without food or drinks for eight to 12 hours before the exam. During the exam, she will be tested upon arrival to obtain a fasting level. Then she will drink the 75- or 100-g glucose challenge within five minutes, and then be tested every hour for three hours and three-hours after she completes the glucose challenge.
  - Diagnosis of GDM is confirmed if the woman’s level is above normal on any two of the following parameters [11]:
    - Fasting 95 mg/dl.
    - 1-hour 180 mg/dl.
    - 2-hour 155 mg/dl.
    - 3-hour 140 mg/dl.

Once diabetes is diagnosed, then the patient can anticipate having the following routine tests completed to monitor the management and appropriate care [36, 53]:
- **Chemistry profile** to assess the electrolyte panel, especially the blood sugar and kidney function.
- **FBG** will be ordered if the patient is experiencing any signs or symptoms of hypoglycemia or hyperglycemia because it is quick and cheaper than the chemistry profile. In addition, it may be ordered to assess for complications, such as DKA or HHS.
- **Glycosylated hemoglobin (c) (HbA1c)** is a laboratory test that should be monitored every six months if the patient is meeting specific treatment goals; otherwise it will be completed every three months. The HbA1c will be ordered approximately every three months to monitor the average glucose level over the previous three months; however it is not used as a diagnostic measurement for diabetes. Anytime the glucose level is elevated or erratic, glucose attaches to the hemoglobin molecule then remains there for the life of the hemoglobin, typically 120 days in a healthy person. The normal level should be below 7 percent, typically 4 to 6 percent in healthy individuals [34]. According to the CDC (2008), for every 1 percent reduction in results of A1C blood tests (e.g., from 8.0 to 7 percent), the risk of developing eye, kidney and nerve disease is reduced by 40 percent [30]. The ADA recommends all diabetics keep their HbA1C less than 7 percent [7].
- **Urine analysis** to assess for the presence of glucose, ketones and proteins [34]:
  - The presence of glucose in the urine indicates hyperglycemia (greater than 180 mg/dl).
  - The presence of ketones indicates that carbohydrates in the body are diminished and fats are broken down. If ketones are present in the urine, ketonuria is diagnosed and is an indicator of DKA. However, if DKA is speculated and the urine ketones are negative, rule out renal insufficiency as it may skew the data. If the kidneys are not functioning appropriately, the kidneys may not be able to filter the ketones, leading to a false negative.
  - The presence of protein in the urine (microalbuminuria). Normally, less than 150 mg of protein is excreted in the urine within a 24-hour period. If microalbuminuria is noted, it is an early indicator of nephropathy in diabetic patients. It is important to assess for the presence of microalbumin to screen all diabetic patients for the future development of renal failure. The primary provider may refer the patient to urologists or order a urine culture because urinary tract infections may cause excretion of proteins in the urine. Other causes of microalbuminuria include heart failure, hypertension and heavy exercise; therefore a positive result is confirmed with three additional tests over the next few months.
- **Serum cholesterol and triglyceride levels**. The lipids are ordered to assess for atherosclerosis and cardiac impairments every three to six months.
- **Thyroid function tests** will be ordered every three to six months to assess for the risk of coinciding thyroid disease that typically occurs in diabetic patients due to the autoimmune effect.

**General treatment modalities for all diabetic patients**

The key to being successful in the treatment of diabetes and metabolic syndrome (prediabetes) is collaborating with the patient and family by providing education with each visit to ensure the patient is empowered to control the diabetes, rather than the diabetes controlling the patient. Regardless of the type of diabetes, all patients need to make lifestyle changes and monitor their diabetes as recommended per the ADA and European Association for the study of diabetes [45]:

- **Weight loss.** One of the major, first-line treatment modalities is to encourage the patient to lose weight by choosing healthy foods and exercising. Losing weight will decrease the complications related to the heart and mortality risk factors correlated to obesity (BMI greater than 30 and increased abdominal fat).
- **Nutrition therapy.** Nutrition is one of the key factors in order to maintain euglycemia, but it may be impeded or customized based
upon the culture, lifestyle and financial issues of the patient and family. It is important to convey that in order to maintain glycemic control, the patient should learn to count carbohydrates or follow the conventional meal plan (three meals a day and three snacks). The ADA does not provide a specific meal plan for every diabetic patient; rather it is important for the patient to be familiar with his or her own nutritional goals and laboratory values to assess whether he or she is within the guidelines. In addition to the education provided by the nurse and physicians, the patient and family should be encouraged to discuss their nutrition with a registered dietician (RD) to help customize their own nutritional needs and goals.

Although there are no specific recommendations for diabetic patients, there are certain parameters that should be adhered to on a daily basis, as well as the importance of understanding the relationship between foods and insulin [25, 47].

Typically, the ADA encourages most patients to be familiar with the following food groups:

- **Carbohydrates** since they are the body’s main and preferred energy source. The ADA recommends that most patients limit their total carbohydrates to 40 to 60 percent of their total calorie intake; however it may be customized by the patient’s average blood glucose levels [49, 74]. Carbohydrates are composed of starches (breads, cereals, rice, and pasta), fruit, milk/yogurt, and sugars/sweets (gum, sodas, fruit drinks and pastries) [74].

- **Fiber** is also considered a carbohydrate, but the body does not digest it. Therefore, it cannot raise the blood glucose level. Fiber is an important nutrient that promotes health by improving carbohydrate metabolism and lowering the patient’s cholesterol levels [19]. Main sources are whole grains, legumes, fruits and vegetables. All diabetics should be encouraged to increase the fiber in their diet to control their blood glucose as well as adhering to the recommended carbohydrates per meal [44]. The ADA recommends that individuals should be ingesting 20 to 35 grams of fiber a day from a variety of sources [74].
  - The nurse should educate patients to increase fluids and to gradually add high fiber in their diets to reduce abdominal cramping, loose stools and flatulence [19]. In addition, increasing too much high fiber at one time can increase the risk of hypoglycemia.

- **Proteins** help the body function appropriately by maintaining homeostasis and helping in the repair of tissues. Proteins are very complex, since there are complete proteins and nonproteins. A complete protein is a food that contains nine essential amino acids (found in meat, poultry, seafood, dairy products, eggs and soy) [74]. Incomplete proteins are missing one or more essential amino acids (beans, peas, nuts, seeds and vegetables) [74]. Protein is very important to patients with diabetes. The ADA recommends protein intake be approximately 15 to 20 percent of total calorie intake for people with normal kidney function [49, 74]. For patients with microalbuminuria (increased protein in the urine), protein should be reduced to 10 percent of their total calories a day to slow the progression of kidney failure [49].
  - For type 1 diabetics, protein has little effect on glucose levels if the patient is taking enough insulin. However, if the patient ingests large amounts of protein, it can increase the blood glucose level, thus increasing the insulin needed [74]. The newer school of thought per the ADA and research is to have the individual patient monitor his or her protein intake and blood glucose levels to assess whether any changes need to be addressed with their provider.
  - If the patient is a type 2 diabetic, protein stimulates the production of insulin; therefore a small rise in insulin does lower the blood glucose levels [74].

- **Fat** is required in small doses to provide essential fatty acids, carry the fat soluble vitamins (A, D, E and K), maintain healthy skin and produce components needed for some hormones [74]. Similar to proteins, fat typically has little effect on the total blood glucose levels. However, it can affect the blood lipid levels, thus increasing the risk of heart disease. Therefore, the patient should avoid any fat high in trans-fatty acids [49].

- **DASH diet**. The DASH diet may be encouraged and/or collaborated with the diabetic diet if the patient has a coinciding cardiac issue, such as HTN and/or dyslipidemia. The DASH diet emphasizes fruits, vegetables, low-fat dairy foods, whole grains, poultry, fish and nuts, while reducing saturated fats, red meat, sweets and sugar-containing beverages. Reducing sodium intake can further reduce blood pressure or prevent the increase in blood pressure that may accompany aging [20].

There are various approaches to acclimate patients and their families to the importance of maintaining a healthy balance of nutrition and controlling their diabetes. Since 1995, the ADA and the American Dietetic Association have adopted the United States Department of Agriculture (USDA) Food Guide Pyramid [74]. It is a great diagram and tool to teach about food groups and appropriate portion sizes. In addition, the ADA recommends different tools to plan the most appropriate meals for patients and families. People should understand that they can change their plans as they gain better control of their diabetes. Patients should always be referred to a registered dietician to help them customize their meals.

1. **Carbohydrate counting** is a practice that has been utilized for many years. In order to count the carbohydrates, the patient needs to know their allotted carbohydrates for the day based upon the individual food intake, lifestyle, diabetes medications and physical activity [40]. The RD will be the best health care professional to help the patient and family determine this daily allotment. Carbohydrate counting focuses on the total grams of carbohydrates, regardless of the source [49].

The ADA has determined the following advantages and disadvantages for carbohydrate counting [47, 49]:

- **Advantages**:
  - The patient may perceive it to be easier to focus only on the carbohydrates ingested on a daily basis.
  - Typically the patient is able to achieve a stable blood glucose control if their carbohydrate intake is consistent every day.
  - Patients on insulin or an insulin pump can match the carbohydrates ingested to the amount of insulin needed. For example, an initial formula of one unit of rapid acting insulin is administered for each 15 g of carbohydrates. Patients become proficient at reading their labels or weighing each item to ensure they calculate the appropriate insulin dosage required for that particular snack or meal.

- **Disadvantages**:
  - Although the patient may enjoy focusing on just one food group, it may also be a disadvantage if the patient loses focus on the other nutrient value of the food. For example, if a patient eats bacon or sausage for breakfast, the carbohydrates will be counted based upon the total number and type ingested. However, the patient may ignore the fat content, and too much fat exacerbates the risk of heart disease, cancer and weight gain.

2. **Fat-gram counting** is a practice that has been around for almost 30 years that helps the patient learn about eating a low fat diet to reduce the risk of cancer. Fat gram counting is helpful for type 2 diabetics who are overweight to help reduce their total weight.
The ADA has determined the following advantages and disadvantages for fat-gram counting [47]:

- **Advantages:**
  - Provides flexibility and control over the food choices ingested. Typically, the patient who counts fat grams will choose healthier foods such as low fat fruits, vegetables, grains and low-fat dairy products.
  - May be time-consuming to calculate the total fat content of each food ingested.

- **Disadvantages:**
  - The patient is only focusing on the fat ingested.

3. **Food exchange system** is a unique way to group foods with similar nutritional values into lists to help the diabetic patient eat consistent amounts of nutrients [47]. It is probably the most popular since it was initiated back in the 1950s [74]. The ADA and the American Dietetic Association have actually published handy books, such as Exchange Lists for Meal Planning on three broad groups (the carbohydrates, meat and meat substitutes, and the fat group). In addition, there are books published every year that discusses the total number of nutrients based upon the patient’s food choices at restaurants and their ethnic/cultural considerations.

The ADA has determined the following advantages and disadvantages for food exchanges [47]:

- **Advantages:**
  - The patient has more knowledge of various nutrient groups and the correlation to their glucose level.
  - Typically it results in more consistency in the patient’s blood glucose levels.

- **Disadvantages:**
  - It requires the diligent patience of the patient to truly grasp the concept of “exchanging” foods.

4. **Calorie counting** is a tool that has been encouraged for many years to lose, gain or maintain an individual’s weight. Similar to the carbohydrate counting, the RD will be more apt to customize it to the patient based upon their weight, height and activity level.

The ADA has determined the following advantages and disadvantages for calorie counting [47]:

- **Advantages:**
  - Allows the patient to expand the choices of foods as long as he or she abides by the total calorie goal a day.

- **Disadvantages:**
  - May be time-consuming to calculate the calorie content of each food ingested.

5. **Exercise.** Exercising has phenomenal benefits on the metabolism of carbohydrates and insulin sensitivity [49]. According to the AAP (2004) and the AHA, all diabetic patients should be encouraged to exercise as it will improve physical fitness, emotional well-being, weight control, decrease cholesterol and triglyceride levels, and improve work capacity and decrease cardiac complications [5, 20]. Regular physical activity reduces very low density lipoprotein (VLDL) levels, raises HDL cholesterol, and in some people, lowers the LDL levels. It also can lower blood pressure, reduce insulin resistance and improve the function of the heart [70]. It should be important for the health care provider to find a level of activity that the patient can accomplish over the long term [18]. The AAFP (2004) recommends a combination of resistance and aerobic exercise, but any activity is better than none, and patients who have been sedentary need to start with walking and gradually increase duration and intensity [19, 20].

- Initially, the patient can be instructed to use low-weight dumbbells, elastic exercise bands or even heavy food containers that can provide the needed weight for resistance training.
- Instruct the patient to stretch for five to 10 minutes prior to performing any exercise, then have a five- to 10-minute cool-down period afterwards to reduce the risk of dysrhythmias.
- Gradually work up to aerobic exercise for 40 to 60 minutes. Aerobic exercise includes walking briskly, running, jogging, stationary or regular bicycling, swimming, dancing, rowing and cross-country skiing as they each improve cardiac output. If the patient is a type 1 diabetic, the patient should limit the exercise time to 20 to 40 minutes four to seven days a week.

Nursing considerations and exercise education for the diabetic patient [19]:

- **Assess the blood glucose level before exercise.**
  - If the patient is hyperglycemic (greater than 250 mg/dl), check the urine for ketones. If the patient has positive ketones, the patient should be instructed not to exercise because exercise would cause the patient to become hyperglycemic.
  - Type 1 diabetics should only perform vigorous exercise if their blood glucose levels are 80 to 250 mg/dl and no ketones are present.
  - Although the patient is at risk of becoming hyperglycemic, the patient can also become hypoglycemic. Therefore, encourage the patient to keep a snack on standby. Type 1 diabetics are unable to make the shift in hormones because the inadequate insulin supply doesn’t allow proper flow of glucose to the cells. Hypoglycemia can occur during exercise and continue for up to 24 hours afterward, so patients might require an additional carbohydrate.

- **Avoid exercising within one hour of insulin administration or at the peak of the insulin.** Exercise can increase the absorption of insulin from the injection site, increasing the blood glucose levels.
- **Avoid exercising in extreme cold or heat.**
- **Assess for the following complications related to exercise:**
  - If the patient has peripheral neuropathy, observe and limit the risk of foot and joint injuries. (See below, ADA recommendations for all diabetic patients to avoid injury).
  - If the patient has retinopathy, educate the patient to avoid the Valsalva maneuver and activities that increase the blood pressure because heavy lifting,
If the patient has nephropathy, exercise may increase proteinuria (microalbuminuria).

- If the patient has nephropathy, exercise may increase proteinuria (microalbuminuria).
- It is important to note that the ADA recommends that all diabetic patients adhere to the following when they exercise to avoid injury and complications [10]:
  - Utilize proper fitting footwear.
  - Never walk barefoot.
  - Inspect the feet daily and after exercising.
  - Avoid exercise in extreme heat or cold.
  - Avoid exercise during periods of poor glucose control, avoid smoking to ensure adequate circulation, and any diabetic patient over 35 should have an exercise-stress electrocardiogram prior to any exercise routine.

6. Stress management (illness, surgery, corticosteroid therapy). Any time a diabetic patient is ill, the blood glucose levels will increase, even though the intake has diminished [49]. The nurse should educate all patients on the following [25,49]:

- Assess the blood glucose levels at least four times a day while ill. As with patient exercise, assess the urine ketones if the glucose level is greater than 250 mg/dL.
- Encourage the patient to continue taking the usual insulin dose or an oral hypoglycemic agent.
- Encourage the patient to drink extra fluids, sipping 9 to 12 ounces of fluid each hour.
- Encourage the patient to substitute easily digested liquids or soft foods if solids are not being tolerated.
- Encourage the patient to notify their health care provider if they are unable to eat for more than 24 hours or if vomiting and diarrhea last more than six hours.

7. Monitoring blood glucose levels. Self-monitoring of the daily blood glucose level (SMBG) is important for the diabetic patient, and devices to do so are available to purchase. It is important that patients and their families are adequately trained on their specific machine to ensure accurate readings. It is also important to note that self-monitoring is vital for the patient to understand their average blood glucose readings, but a health care professional caring for the patient will not change the treatment plan based upon the patient’s home readings because there are multiple variables that may skew the data. The accuracy of self-monitoring results depends upon the patient adhering to the manufacturer’s directions and the following variables [68]:

- Quality of the meter, test strips and patient’s training.
  The patient should always read and follow the directions from the manufacturer. Failure to comply may result in inaccurate results. In addition, if the patient has any sensory deficits or is unable to comprehend the directions, the nurse should encourage the patient to bring in their machine to ensure proper understanding and demonstration.

- Patient’s hematocrit level. If the patient has a higher-than-normal hematocrit value, the patient will usually test lower on their SMBG than patients with normal hematocrit. In addition, if a patient has lower hematocrit values, their SMBG will test higher.

- Other substances in the body may interfere with the testing results, such as uric acid (a natural substance in the body that can be more concentrated in some people with diabetes), glutathione (an “anti-oxidant” also called “GSH”), and ascorbic acid (vitamin C).

- Altitude, temperature and humidity. Altitude, room temperature and humidity can cause unpredictable effects on glucose results. Therefore the patient should be referred to read the manufacturer’s directions if the climate changes or they travel to another part of the country.

The ADA recommends that all diabetics maintain their daily blood glucose levels as follows [7]:
1. Pre-prandial 70 to 130 mg/dL.
2. Postprandial less than 180 mg/dL.

8. Collaborating with their health-care provider and endocrinologists. Typically, the patient’s diabetes will be ultimately be managed by their primary health care provider, and then followed up by an endocrinologist or a cardiologist if other co-morbidities are present or as needed. Patients can expect their primary care provider or endocrinologist, whichever one is responsible for the treatment modalities, to see them every three months to assess their laboratory data (FBG, A1C, lipids). Other referrals include ophthalmologists and podiatrists. The patient should be seen annually unless their ophthalmologist or podiatrist informs them otherwise. It is important that any referrals or education are documented appropriately to avoid any potential complications to the patient and legal consequences for the health care provider.

In addition to the patient taking their diabetic agents (insulin and/or oral meds), the patient may be prescribed any or all of the following medications [24]:

- Annual flu vaccination to provide coverage two weeks to a month after injection for up to six months, although the flu vaccination should be avoided by anyone with an allergy to eggs or a current respiratory infection. The patient should be instructed to return for the flu vaccination once the respiratory infection has subsided.

- Pneumonia vaccination can be administered anytime during the year. According to the ADA, for most people, one shot will provide protection for life and typically provides effectiveness 60 percent of the time against the deadliest pneumonia pneumococcus and meningitis. However, people under 65 who have chronic illnesses or weakened immune systems should discuss with their doctor a potential repeat vaccination every five to 10 years [9].

- An Ace inhibitor (ACEI), such as Lisinopril to help prevent the conversion of angiotension two, especially in the larger blood vessels, which causes vasoconstriction, may be prescribed. ACEI are ideal in diabetic patients to enhance vasodilation, especially to the kidneys. The JNC 7 and the ADA recommend that the majority of patients with diabetes require two or more antihypertensive agents from different classes. Research has demonstrated that combining agents with two different mechanisms of action can result in an additive blood pressure lowering effect and may permit for lower doses of each agent to be used, possibly decreasing the potential for dose-related side effects. Furthermore, the National Kidney Foundation recommends that patients with chronic kidney disease (including albuminuria and/or nephropathy), should be treated with an ACEI and/or Angiotensin receptor blockers (ARB) (prevent the conversion in the smaller arterioles) in combination with a diuretic.

- Baby aspirin up to 325mg every day.

- Due to the coinciding hyperlipidemia/dyslipidemia, the third report of the expert panel on detection, evaluation and treatment of high blood cholesterol in adults (Adult Treatment Panel III) (ATP) and the national cholesterol education program (NCEP) recommend that the lipids should be controlled. The LDL cholesterol goal of therapy for most persons with diabetes should be less than 100 mg/dL. When LDL cholesterol levels are in the range of 100-129 mg/dL at baseline or on treatment, several therapeutic options are available [70]:
  - Increasing intensity of LDL-lowering therapy.
Adding a drug to modify atherogenic dyslipidemia (fibrate or nicotinic acid).

Intensifying control of other risk factors including hyperglycemia.

If triglyceride levels are greater than 200 mg/dL, non-HDL cholesterol becomes a secondary target of cholesterol-lowering therapy.

See Table 2- Drugs affecting Lipoprotein Metabolism [69]

Table 2: Drugs Affecting Lipoprotein Metabolism [69]:

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Agents and Daily Doses</th>
<th>Lipid/Lipoprotein Effects</th>
<th>Side Effects</th>
<th>Contraindications</th>
</tr>
</thead>
</table>
| HMG CoA reductase inhibitors (statins) | Lovastatin (20-80 mg), Pravastatin (20-40 mg), Simvastatin (20-80 mg), Fluvastatin (20-80 mg), Atorvastatin (10-80 mg), Cerivastatin (0.4-0.8 mg) | LDL-C ↓ 18-55% HDR-L C ↑ 5-15% TG ↓ 30%                                                  | Myopathy Increased liver enzymes                  | Absolute:
|- Active or chronic liver disease
| Relative:
| - Concomitant use of certain drugs* |
| Bile acid Sequestrants            | Cholestyramine (4-16 g) Colestipol (5-20 g) Colesevelam (2.6-3.8 g)                   | LDL-C ↓ 15-30% HDR-L C ↑ 3-5% TG No change or increase                                  | Gastrointestinal distress Constipation Decreased absorption of other drugs | Absolute:
| - dysbeta-lipoproteinemia
| - TG greater than 400 mg/dL       |
| Nicotinic acid                    | Immediate release (crystalline) nicotinic acid (1.5-3 gm), extended release nicotinic acid (Niaspan ®) (1-2 g), sustained release nicotinic acid (1-2 g) | LDL-C ↓ 25-35% HDR-L C ↑ 3-5% TG ↓ 20-50%                                                | Flushing Hyperglycemia Hyperuricemia (or gout) Upper GI distress Hepatotoxicity | Absolute:
| - Chronic liver disease
| - Severe gout                     |
| Fibric acids                      | Gemfibrozil (600 mg BID) Fenofibrate (200 mg) Clofibrate (1000 mg BID)                    | LDL-C ↓ 20% (may be increased in patients with high TG)
|                                   | HDR-L C ↑ 10-20% TG ↓ 20-50%                                                           | Dyspepsia Gallstones Myopathy                    | Absolute:
| - Severe renal disease
| - Severe hepatic disease          |

Medication modalities for the type 1 diabetic

Patients living with Type 1 Diabetes are reliant on insulin for the rest of their lives. Failure to administer exogenous or endogenous insulin injections will result in death. Other patients who may be required to receive insulin include[53]:

- People with type 2 diabetes who are unable to control their glucose levels with oral antidiabetic drugs and/or diet.
- People with type 2 diabetes, who at the time of diagnosis are unable to achieve glycemic control, especially if blood glucose values are greater than 250 or 300 (depending on the health care provider), AIC greater than 10 or the patient initially presented in a DKA state [25].
- People with diabetes who are experiencing physical stress (infection, surgery or corticosteroid therapy) and are unable to control their blood glucose levels between 110 and 180 mg/dL per the ADA.
- People with type 2 diabetics who are already taking two oral agents but are unable to maintain glycemic control.
- Pregnant women, regardless of whether they have a previous history of any form of diabetes or GDM.
- People with DKA or HHS.
- People who are receiving high-calorie tube feedings or parenteral nutrition.

Insulin is derived from animals (pork pancreas) or synthesized in the laboratory from either an alteration of pork insulin or recombinant DNA technology, using strains of Escherichia coli (E.coli) to form biosynthetic human insulin. Insulin is an endogenous hormone, secreted by the beta cells of the pancreas to lower the blood glucose levels by stimulating glucose passage across the cell membranes and uptake into the cells [25]. In addition, insulin also promotes the conversion of glucose to glycogen and inhibits hepatic glucose production from glycogen [25]. It should be noted that there are different types of insulin and it should be prescribed on an individual basis.

Insulins are available in rapid-acting, short-acting, intermediate-acting and long acting preparations. (See Table 3- Insulin Preparation).

Once an individual has been diagnosed with type 1 diabetes, it is important to discuss the potential options of administering insulin since it is a lifelong commitment. Insulin therapy can be administered in one of the following manners:

1. Subcutaneous shot; dispensed in 100 units per ml (u/ml). For infants and toddlers, a pharmacist may prepare a diluted insulin preparation to ensure a smaller dosage [25].
Table 3- Insulin Preparation [25].+

<table>
<thead>
<tr>
<th>Preparation</th>
<th>Name</th>
<th>Onset (hours)</th>
<th>Peak (hours)</th>
<th>Duration (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rapid acting or ultra-shorting acting</td>
<td>Lispro (Humalog)</td>
<td>Less than 15 minutes</td>
<td>30 to 60 minutes</td>
<td>3-4</td>
</tr>
<tr>
<td></td>
<td>Regular Humulin (R)</td>
<td>0.5-1.0</td>
<td>2-3</td>
<td>4-6</td>
</tr>
<tr>
<td></td>
<td>Regular lletin II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Velosulin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short acting</td>
<td>Lente Humulin (L)</td>
<td>2</td>
<td>6-8</td>
<td>12-16</td>
</tr>
<tr>
<td></td>
<td>Lente lletin II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NPH Humulin (N)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NPH lletin II</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NPH</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intermediate acting</td>
<td>Ultraplante (U)</td>
<td>2</td>
<td>16-20</td>
<td>24+</td>
</tr>
<tr>
<td></td>
<td>Lantus</td>
<td>No onset</td>
<td>No peak</td>
<td>24</td>
</tr>
<tr>
<td>Long acting</td>
<td>Humulin 50/50</td>
<td>0.5</td>
<td>3</td>
<td>22-24</td>
</tr>
<tr>
<td></td>
<td>Humulin 70/30</td>
<td>0.5</td>
<td>4-8</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Novolin 70/30</td>
<td>0.5</td>
<td>4-8</td>
<td>24</td>
</tr>
<tr>
<td>Combinations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Single daily injection is typically compromised of intermediate-acting insulin or a combined short and intermediate.
- Two-dose protocol injections are combined of short and intermediate-acting insulin injected twice a day.
  - Two-thirds of the dose (intermediate acting and regular insulin in a two-to-one ratio) is administered before breakfast; one-third is administered before the evening meal (intermediate acting and regular insulin in a one-to-one ratio).
- Three-dose protocol.
  - Combination of short and intermediate-acting before breakfast, short-acting insulin administered before evening meal, and intermediate-acting insulin administered at bedtime to lower fasting and after-breakfast blood glucose levels. In addition, it typically prevents a night-time hypoglycemic event.
- Four-dose protocol.
  - Short acting insulin 30 minutes before meals to provide the greatest amount of insulin to be present when needed.
  - Basal insulin is provided twice a day with an intermediate-acting or once-a-day injection of long-acting insulin.

If the patient is required to mix insulins, it is important for the nurse to convey the importance of compatibility to avoid changing the “expected” peak times. Mixing short- and intermediate-acting insulins produce normal blood glucose levels.

2. Alternative methods to administering insulin [19]:
- **Basal-bolus therapy**, in which it is administered once a day using glargine (a pre-filled lightweight syringe), then a bolus of rapid-acting insulin is administered with each meal and snack.
  - Avoid if the patient has any visual or neurological impairments.
- **Continuous subcutaneous insulin infusions (CSII) “pump therapy”** is becoming popular among children and teenagers.
- **Advantages of the CSII:**
  1. CSII are more effective in controlling blood glucose levels than a multiple injection schedule.
  2. Externally worn pump that contains a syringe and reservoir with rapid or short-acting insulin and is connected to the patient via an infusion system.

- **Disadvantages of the CSII:**
  1. Site infections occur if the infusion site is not cleaned or the needle is not changed every three days.
  2. Hypoglycemia may result if the patient is receiving rapid-acting insulin and has a normal blood glucose level.
  3. Higher risk of developing ketoacidosis if the patient does not adhere to the CSII recommendations due to infection, noncompliance or infusion obstruction.
- **Implanted insulin pumps** are implanted in the peritoneal cavity where insulin is absorbed by local blood vessels, similar to natural insulin release. The pump provides a reservoir re-filled with 400 units of insulin every one to two months. Complications that may arise include catheter blockage, pump failure and subcutaneous inflammation in the subcutaneous pockets.

Nursing considerations for the patient taking insulin [75,78]:
- Educate the patient on the purpose of their insulin (to emulate their nonfunctioning pancreas) and emphasize that it is required to sustain life.
- Educate the patient about the various types of insulin and the insulin prescribed by their physician. If the patient is prescribed more than one type, reinforce that changing insulins may affect their blood glucose and should be done under only the supervision and guidance of their prescribing provider.
- Educate the patient about the technique and sites.
  - **Technique.** The patient should be instructed to inject the insulin in the subcutaneous tissue at a 90-degree angle. In contrast, if it is a thin patient, inject at a 45-degree angle and avoid intramuscular (IM) since it has a faster absorption. It is not necessary to aspirate the blood.
  - **Sites.** The patient should always rotate the sites to prevent day-to-day changes in absorption and to prevent the development of lipohypertrophy (increased fat deposits in the skin) or lipoatrophy (loss of fatty tissue). Absorption is faster in the abdomen, followed by the deltoid, thigh and buttocks.
- Educate the patient about insulin storage, disposal and syringes. According to the ADA, the following guidelines are recommended [14]:
  - **Storage.** Although manufacturers recommend storing your insulin in the refrigerator, injecting cold insulin can sometimes...
make the injection more painful. To counter the reaction, many providers suggest storing the bottle of insulin you are using at room temperature; it will last one month. Always put the date and time that the insulin was opened, and check the expiration date to avoid administering insulin that has already expired.

- **Syringe re-usage.** Ideally, it is better to always use new, clean insulin syringes and needles. However, the ADA says that many people safely reuse their insulin syringes. But it should be avoided if the patient is ill, has any open wounds on the hands or has poor resistance to infection. If the patient will re-use the needle due to financial constraints, instruct the patient to always keep the needle and syringe clean by recapping the needle when it is not in use. Syringe makers will not guarantee the sterility of syringes that are reused. The patient should never use another person’s syringe or allow another person to use their personal syringe.

- **Syringe disposal.** Always dispose of the needles appropriately and safely to avoid anybody else picking up a used needle. The patient should place the needle or entire syringe in an opaque (not clear), heavy-duty plastic bottle with a screw cap or a plastic or metal box that closes firmly.

  - In the elderly patient or one with a sensory impairment, it is important to ensure the patient is safe while administering their insulin.

### Medication modalities for the Type 2 diabetic

The major goal for treating type 2 diabetic patients is controlling the blood glucose level and HbA1c levels, decreasing weight, increasing exercise, normalizing lipid profiles and blood pressure and preventing complications [25]. The treatment laboratory goal for type 2 diabetes is to maintain an HbA1c less than 7 percent and a fasting and pre-prandial blood glucose of 70-130 mg/dl [45].

According to Clinical Diabetes (2002), blood glucose control has been shown to decrease the risk of macrovascular and microvascular complications of type 2 diabetic patients. At this time, it is unknown whether the blood glucose control decreases the risk of cardiovascular mortality, however, the United Kingdom Prospective Diabetes Study (UKPDS) suggests that good glycemic control probably does decrease cardiovascular risk in patients with Type 2 Diabetes [28].

Typically, the initial treatment for type 2 diabetes begins with education on changing the diet and exercising to lower the blood glucose level. In addition, many health care providers typically initiate a single oral diabetic, such as Metformin, as it helps lower the blood glucose and decrease weight. Children are even started on Metformin once they are weaned off insulin if they were initially placed on it due to a hyperglycemic state or DKA [25].

Metformin improves the sensitivity of target cells to insulin, slows the gastrointestinal absorption of glucose and reduces the hepatic and renal glucose production. The dosage can be gradually increased to improve metabolic control. It should only be prescribed under the following conditions:

- Normal liver and kidney function, and no ketosis present.

If Metformin is not well tolerated and/or the patient does not achieve euglycemia and another medication needs to be added, sulfonylurea or meglitinides may be used. However they are not approved for children in the U.S. due to liver toxicity [25].

If the HbA1C is equal or greater than 7 percent, the ADA and European Association (2007) recommends adding either basal insulin (the most effective) or a sulfonylurea (least expensive) [45]. It is important to note that the treatment should be customized to the patient’s risk for hypoglycemia, the very young or older age, end-stage renal disease, advanced cardiovascular or cerebrovascular disease and the life expectancy [45].

In 2005, the FDA approved, Symlin, an injectable medicine to control blood sugar for adults with type 1 and type 2 diabetes. Symlin is to be used in addition to insulin therapy in patients who cannot achieve adequate control of their blood sugars on intensive insulin therapy alone [42]. Since the approval in 2005, Symlin is to be used only in combination with insulin to help lower blood sugar during the three hours after meals. Symlin has a medication guide (FDA-approved patient labeling) and a risk minimization action plan (RiskMAP) due to three areas of concern.

- First, the principle risk associated with Symlin therapy is hypoglycemia, and this risk is greatest in patients with type 1 diabetes and in patients with gastroparesis (motility problems of the stomach, a long-term complication of diabetes).
- Second, the potential for medication errors, specifically mixing of Symlin with insulin in the same syringe, which can alter the activity of the insulin, is addressed in the medication guide and in physician labeling.
- Finally, the potential for off-label use in patients where the benefit/risk profile has not been characterized or demonstrated is also a concern and will be monitored by the sponsor.

Symlin should not be used if patients cannot tell when their blood sugar is low, have gastroparesis (slow stomach emptying), or are allergic to pramlintide acetate, metacresol, D-mannitol, acetic acid or sodium acetate. Side effects associated with Symlin include but are not limited to nausea, vomiting, abdominal pain, headache, fatigue and dizziness. Symlin has not been evaluated in the pediatric population [42].

At this time, there are several distinct classes of antidiabetic (hypoglycemic agents) available, each displaying unique pharmacologic properties designed to correct one or more of the metabolic abnormalities. The patient is typically started at the lowest dose, and then increased every one to two weeks until the patient reaches an acceptable blood glucose level [19]. These classes are the dipeptidyl peptidase IV inhibitors (DPP-4), sulfonylureas, meglitinides, biguanides, thiazolidinediones and alpha-glucosidase inhibitors [10, 68, 82, 83, 84]:

- **DPP-4 inhibitor sitagliptin** was approved by the FDA in 2006. These drugs prolong action of incretin hormones. Sitagliptin can be used as a monotherapy or in combination with metformin or a glitazone. In 2009 the DPP-4 inhibitor saxagliptin was approved and linagliptin in May, 2011. As of this writing, another DPP-4 inhibitor, vildagliptin, is currently under FDA review. DPP-4 inhibitors do not cause the weight gain that other classes (e.g. sulfonylureas) may instigate.

- **Sulfonylureas (SU)** are insulin secretagogue’s, meaning they force the pancreas to increase insulin production. Therefore SU’s are reserved only for patients with some remaining pancreatic beta cell function. The anticipated reductions while taking a sulfonylurea is a 0.8 to 2.0 reduction in the HbA1c and 60 to 70 points lower on the FBG. It is important that the nurse monitors the renal function and speaks with the doctor before administering as there is a crossover for patients with sulfa allergies. In addition, the nurse should educate the patient that the drugs are potentially photosensitizing and hypoglycemia may occur. Hypoglycemia is more likely to occur with Diabinese and Novo-Propramide, due to their longer duration of action. In addition, underweight older adult patients with cardiovascular, liver or kidney impairments are susceptible.

  - **First generation:** acetohexamide (Dymelor), chlorpropamide (Diabinese, Novo-Propramide), tolazamide (Tolinase), tolbutamide (Orinase).
  - **Second generation:** glyburide (Micronase/Diabeta), gipizide (Glucotrol), glimepiride (Amaryl). The second generations are used more frequently than the first generation medications because of a higher risk of hypoglycemia with the first-generation medications.
• **Biguanides** are insulin sensitizers as they reduce hepatic glucose output. The anticipated reductions while taking a Biguanide is a 1.5 to 2.0 reduction in the HbA1c and lowering the FBG by 50 to 70 points. It is important to monitor the creatinine level and to avoid if the creatinine level rises above 1.4. The nurse needs to educate the patient to avoid taking the medication and to inform their physician prior to any radiocontrast use and/or surgery on the day of the procedure and for 48 hours post-recovery. The major risks that may occur if the patient continues the medication is dehydration, impaired renal function and hypovolemia because everything is going through the kidneys, leading to a condition called lactic acidosis. In addition, the nurse should be conscious about signs and symptoms of those conditions, even if the patient is not scheduled for a procedure with radiocontrast and/or surgery. Hypoglycemia may occur if the patient is taking a coinciding SU and/or insulin.
  ○ Metformin (Glucophage) is one of the most common, first-line medications prescribed for type 2 diabetics, metabolic syndrome and/or PCOS because it has amazing results in reducing weight and inducing ovulation. Patients should be educated that diarrhea is a common complaint once the medication is initiated, but it typically resolves. Regardless, the patient should inform their prescribing health care provider to avoid dehydration.

• **Meglitinides** are similar to the SU agents due to their typical short-acting insulin secretagogues. The anticipated reductions while taking a meglitinide is a 1 to 1.5 percent in the HbA1c. The goal of meglitinides is a reduction in the postprandial glucose level as it helps with the absorption of carbohydrates while eating. Therefore, the patient should be instructed to take it one to 30 minutes before eating. During the meal, the medication provides a quick insulin burst approximately 20 minutes after swallowing the pill. Meglitinides should be strongly encouraged if the patient has difficulty managing postprandial blood glucose levels. The main concern is to use with caution in patients with renal or hepatic impairments. Again, similar to SU agents, the major side effect is hypoglycemia, especially with Starlix. Therefore, if the patient skips a meal, he or she should not take a scheduled dose of Starlix to avoid hypoglycemia.
  ○ Repaglinide (Prandin), nateglinide (Starlix).

• **Thiazolidinediones (TZD)** are insulin sensitizers as they work by promoting glucose utilization in the muscles and tissues. The anticipated reduction while taking a thiazolidinediones is 1 to 2 percent in the AIC. TZD’s are potent drugs on the liver; therefore the nurse should monitor the alanine aminotransferase (ALT) before administering the dose as there is a rare risk of hepatic toxicity. In addition, there is a risk of edema, especially if the patient is on a SU or insulin. Therefore, do not initiate it if there are any signs and symptoms of heart failure. If the patient has any cardiovascular risks (as many diabetics do), TZDs should not be used with nitrates as it may exacerbate the risk of developing edema or heart failure. TZDs are not an ideal medication to administer to a female patient taking an oral contraceptive (OC) as it decreases the effectiveness. Another unique feature is the onset of action is delayed; it requires up to 12 weeks of use before attaining the maximum therapeutic level.
  ○ Pioglitazone (Actos), rosiglitazone (Avandia)

In November 2007, the FDA added a box warning for heart-related risks, especially heart attacks in patients taking Avandia. The FDA recommends that patients with type 2 diabetes who have underlying heart disease or who are at high risk of heart attack should talk with their health care provider about the revised warning as they evaluate treatment options. FDA advises health care providers to closely monitor patients who take Avandia for cardiovascular risks. In August 2007, the FDA warned that Avandia may also worsen heart failure in some patients as well [41].

• **Alpha-glucosidase inhibitors** delay the intestinal carbohydrate absorption by reducing postprandial digestion of starches via enzyme action inhibitions, and it helps the dumping effect of carbohydrates. Therefore, the risk of developing hyperglycemia after meals is reduced since the intestinal absorption and digestion of carbohydrates is reduced. The anticipated reduction in the HbA1c is 0.3 to 0.9 percent. Hypoglycemia is rare unless administered with a SU or insulin.
  ○ Acarbose (Precose), miglitol (Glycet)

Byetta is an injectable drug that was approved by the FDA in 2005 as adjunctive therapy to improve blood sugar control in patients with type 2 diabetes who have not achieved adequate control on Metformin and/or a SU. However, since 2007, Byetta has been on the FDA list and has received black box warnings. Starting in 2007, FDA reviewed 30 postmarketing reports of acute pancreatitis in patients taking Byetta. At that time, the FDA encouraged health care professionals to educate patients taking Byetta to seek prompt medical care if they experience unexplained persistent severe abdominal pain, which may or may not be accompanied by vomiting. If pancreatitis is suspected, Byetta should be discontinued. If pancreatitis is confirmed, Byetta should not be restarted unless an alternative etiology is identified. In October 2007, the FDA received reports of six cases of hemorrhagic or necrotizing pancreatitis in patients taking Byetta [43].

### Treatment of gestational diabetes

Any woman with diabetes contemplating a pregnancy should ideally discuss it with her health care provider before conception. The woman with type 1 diabetes will continue on her insulin, while the type 2 diabetic may discontinue her oral antidiabetic agents or begin taking insulin throughout the pregnancy [77]. A pregnant woman with diabetes requires prompt, adequate treatment to normalizes her maternal blood glucose levels and to avoid complications for the infant. The fetal risks are the same for women with all forms of diabetes (type 1, type 2 and GDM); however maternal risks are greater in women with type 1 diabetes [77]. This is because Type 1 creates erratic blood sugar control because of the absolute lack of insulin production and because women are more prone to have vascular, retinal or renal complications. Therefore, to prevent morbidity of the women and fetus, very aggressive treatment is necessary [48].

Although maternal and fetal morbidity and mortality rates have significantly decreased over the years, the risks of developing complications still exist. Research has demonstrated the most common complications that occur [27, 77]:

1. **Maternal**
   - Poor glycemic control around the time of conception and in the early weeks of pregnancy may be associated with an increased incidence of early pregnancy loss in women with a history of diabetes.
   - Pre-eclampsia or eclampsia is exacerbated (four times) in women with diabetes.
   - Hypertensive disorders, such as pre-eclampsia or eclampsia, occur more frequently in women with a prior history of diabetes, especially if she has coinciding renal dysfunction.
- **Hydramnios (polyhydramnios)** (increased amniotic fluid, greater than 2000 milliliters) (ml) occurs more frequently in diabetic patients, causing an overdistention of the uterus. The overdistention of the uterus leads to additional risks, such as increases in the compression of the maternal abdominal blood vessels (vena cava and aorta), leading to hypotension while in the supine position; premature rupture of membranes (PROM); preterm labor; and postpartum hemorrhage.

- **Infections** are exacerbated due to disorders of carbohydrate metabolism that alters the body’s normal resistance to infection. Although infections are prevalent with any form of diabetes, it is increased due to the pregnancy. It is important for nurses to educate the pregnant woman about the risks of infections and other problems that lead to further complications:
  - **During the pregnancy**, urinary tract infections (UTI) increase the risk of pre-term labor.
  - **After the pregnancy**, postpartum infections.

- **Ketoacidosis** typically occurs more frequently in the second and third trimesters when the diabetogenic effect is the greatest. If the pregnant woman has coinciding risks, such as stress or infection, the risk for DKA is exacerbated.

2. **Infant/neonatal**
   - **Congenital anomalies** (occurs in 6 to 10 percent of deliveries) of infants; typically cardiac defects are the most common.
   - **Macrosomia** (large infant). Although the pancreas is working overtime to produce more insulin, it is not lowering the blood glucose levels in the woman’s body, and all of the extra blood glucose is being transported through the blood brain barrier into the placenta for the baby. The baby is unable to metabolize or excrete the extra blood glucose; thus the mom and nurses caring for the baby can expect the baby will continue to get larger (macrosomia). Macrosomia infants tend to have disproportionate increases in the shoulder and trunk, leading to another consequence: shoulder dystocia. Poor glycemic control in the later portion of the pregnancy, especially in women with a history of coinciding vascular disease, increases the risk of macrosomia. Macrosomia occurs in 25-40 percent of diabetic pregnancies. In addition, at birth, the nurse can expect the following:
     - Baby will develop hypoglycemia because its little body is used to the extra glucose.
     - Difficulty breathing due to the increase weight.
   - Other problems that cause neonatal morbidity includes:
     - Spontaneous abortion (two times the risk) in diabetic women.
     - Macrosomia.
     - Hypoglycemia.
     - Respiratory distress syndrome (RDS).
     - Polycythemia (increased hematocrit level).
     - Hyperbilirubinemia (jaundice).

To prevent the potential risks and complications, the nurse needs to educate the woman and her partner about her diabetes (including the disease process, prevention, treatment and possible complications). During the first and second trimesters of pregnancy, the diabetic woman should see her provider every one to two weeks, rather than monthly as for a nondiabetic woman. It is important to establish and convey the importance of collaborating together to recognize early signs of any potential problems to avoid complications. The overall goal is to achieve and maintain euglycemia for a pregnant diabetic woman in the range of 60 to 120 mg/dl [77]. In order to maintain euglycemia, the diabetic woman needs to comply with the combination therapy of checking the blood glucose levels, diet, insulin and exercise throughout her pregnancy [77]:

- **Blood glucose measurements** are completed frequently to assess compliance of the medical regimen throughout the day, such as before breakfast, lunch and dinner. Typically in a woman with true gestational diabetes, fasting blood glucose levels will be normal, while the postprandial blood glucose levels are elevated [27]. The rationale behind this concept is related to the metabolism of large carbohydrate boluses rather than carbohydrate intolerances at the baseline levels [27].

- **Diet** is individualized to the patient based on the blood (not urine) to allow for increased fetal and metabolic requirements.
  - Energy needs are based upon 30-35 calories per kilogram of the ideal body weight with an average of 2,200 calories (first trimester) to 2,500 calories (second and third trimesters).
  - Carbohydrates, protein and fat are important to balance with approximately:
    - 50 to 60 percent of the total calories being carbohydrates (minimum of 250 g per day). Limit simple carbohydrates and encourage complex carbohydrates that are high in fiber to regulate the blood glucose level by releasing more glucose. It may be easier for the pregnant woman to count carbohydrates at meals, educating her to ingest 30 to 45 grams of carbohydrates at breakfast, 45 to 60 grams at lunch and dinner, then 15 grams for snacks [27].
    - 12 to 20 percent should be protein.
    - 20 to 30 percent from fat, with less than 10 percent from saturated fats.

- **Exercise** regimens should be individualized to the patient with the exact protocol per the physician. However, most encourage walking for 15 to 30 minutes four to six times a week about 30 to 40 minutes after eating to enhance the postprandial blood sugar levels [27].
  - A woman with vasculopathy should be encouraged to do only mild exercise to prevent the risk of injury to the placenta.

- **Medications**: Since 2002, the American College of Gynecology (ACOG) and the AAFP has recommended that women with GDM be treated initially with an adequate, nutritious diet designed to achieve normal glycemic levels and to avoid ketoacidosis [71]. There are various perspectives about treating a woman with GDM with insulin or oral agents. However, in January 2009, a meta-analysis was published in Obstetrics and Gynecology based on research conducted over the previous years that did not demonstrate any significant differences in maternal glycemic control, infant birth weight, neonatal hypoglycemia or congenital malformations [73].

1. **Insulin** is imperative to maintain euglycemia and proper metabolism of glucose. In addition, if the previous medical regimen in the type 1 and type 2 diabetic changes, the patient requires adequate education to avoid confusion and potential frustration for the pregnant woman. The following insulins are recommended [77]:
   - The woman will be started on short-acting insulin (Humalog/Lispro or Novolog) in combination with intermediate-acting insulin (NPH) in the morning to cover breakfast and lunch; then short-acting insulin at dinner (Humalog/Lispro or Novolog) [27]. Humalog is ideal for GDM patients to better control the postprandial blood sugar levels with less risk of hypoglycemia developing [27].
   - Several trials have demonstrated a reduced risk of fetal macrosomia if the mother is treated with insulin during the pregnancy. Although insulin treatment is commonly prescribed in GDM, only 9 to 40 percent of treated mothers benefit. Treatment aims to achieve glucose levels of 130 mg per dL one hour postprandial [27].

2. **Oral hypoglycemic agents** may be administered if the glucose levels are lower. In one study, Glyburide provided outcomes comparable to those achieved with insulin in patients with GDM who had failed to achieve adequate glycemic control with diet alone [71].
In the primary intervention study, body weight, A1C, and systolic blood pressure significantly decreased in 51 percent of LAGB patients and 4 percent of no-LAGB patients.

Since 2005, the ADA also has information in regards to a research study published in the Journal of Clinical Endocrinology and Metabolism (2005), focusing on the satiety after achieving the LAGB surgery for 23 patients. The results were as follows [39]:

- Of 23 LAGB patients who attempted the protocol, 17 completed two breakfast tests. Five patients were excluded for failing to consume the meal adequately, three due to regurgitation of food and two due to delayed consumption. These patients were presumably too restricted by their bands to allow passage of the test meal.
- All of the patients became increasingly hungry preprandially, experienced maximal satiation immediately after the meal, and experienced decreasing satiety thereafter.

In 2008, the Journal of American Medical Association (JAMA) conducted a two-year research study on patients recently diagnosed as type 2 diabetic with a BMI of 30 to 40. The patients were randomly assigned to receive conventional medical/behavioral therapy (medical therapy and a focus on weight loss through lifestyle modification) or LAGB, plus conventional medical/behavioral therapy. The results were amazing [33]:

- Complete remission of diabetes was achieved in 73 percent of the type 2 diabetics who underwent the LAGB due to more weight loss (20.7 versus 1.7 in the medical/behavioral group). The percentage of weight loss generally required for diabetes resolution was 10 percent, which was achieved in 86 percent of the surgical patients but in only 1 patient in the medical group.
- Complete remission of diabetes was only 13 percent of those in the medical/behavioral therapy group.
- No serious surgical complications were reported.

Although the research studies exemplify promising news for the future of diabetes, especially for the morbidly obese and/or patients with co-existing hypertension, as the ADA indicates, there are limitations to the studies. The majority of the research conducted is based on a limited number of patients, and further research needs to be conducted [18].

According to the American Society for Bariatric Surgery, remission of diabetes with LAGB is seen in 64-66 percent of patients at one year. At this time, long-term results comparing LAGB with the traditional gastric bypass surgery (surgical incision in the abdomen to make the stomach smaller by creating a small pouch at the top of the stomach using surgical staples or a plastic band) are not yet available. The sleeve gastrectomy is another potential surgical procedure, similar to the LAGB and gastric bypass surgery. During this procedure, the surgeon creates a small, sleeve-shaped stomach that is larger than the stomach pouch created during the Roux-en-Y bypass (traditional gastric bypass surgery) and is about the size of a banana. Sleeve gastrectomy is typically considered as a treatment option for bariatric surgery patients with a BMI of 60 or higher [26].

There are other surgical procedures and transplants that have been implemented to potentially improve the quality of life for the diabetic patient.

Whole pancreas transplantation can be performed in one of the following manners [49]:

- Transplant of the pancreas alone (PTA).
- Transplant of the pancreas and kidney (PAK).
- Simultaneous pancreas and kidney transplant (SPK), ideal for diabetic patients with uremia.

According to the ADA, whole pancreas transplantation is ideal for type 1 diabetic patients with the HLA genetic composition, because it “tricks” the body into accepting the donor organ recipient. Patients with a transplanted organ must take immunosuppressive drugs in order to prevent the immune system from fighting the new organ, and the side effects of these drugs may be worse than the problems caused by diabetes; the operation itself is serious. According to the ADA, one to two people in 10 die within a year of getting a pancreas transplant [17]. On a positive note, if the transplantation works and the body accepts the organ, the patient no longer has diabetes and is unlikely to get it again. Therefore, the patient does not require insulin shots and frequent blood glucose testing. The ADA has suggested that euglycemia levels may prevent further complications or any current co-morbidities from worsening, although many more studies are needed.

Unfortunately, there are not enough cadaver pancreases to go around because not enough people sign up to be organ donors, and each pancreas must meet strict guidelines. When a whole cadaver pancreas is not available, a person can receive a portion of a pancreas from a living relative.
Anytime a patient with diabetes is receiving a kidney transplant from a living relative, it is usually beneficial to perform a partial pancreas transplant at the same time. Since the transplanted kidney will become damaged by diabetes over time, transplanting a partial pancreas from the same donor will help control blood glucose levels and protect the new kidney from further damage. Transplant success seems higher when patients and donors are matched for HLA types, and a pancreas transplanted along with a kidney is less likely to fail than a pancreas transplanted alone.

The ADA website mentions a recent study conducted by JAMA (2003) indicating patients with functioning kidneys who therefore decline the PAK option have survival rates that are worse than those of patients who manage their diabetes with conventional therapy (insulin, diet, etc.). Therefore, the decision to have a pancreas-only transplant should be very carefully considered by both the patient and physician. Because of the lower survival rates seen with pancreas-only transplants and because a pancreas transplanted along with a kidney is less likely to fail than a pancreas transplanted alone, pancreas transplants are nearly always done only in people with type 1 diabetes who are getting or already have a transplanted kidney. Remember that pancreas transplants work only for people with type 1 diabetes. The major problem in people with type 2 diabetes is not a failing pancreas, but the body’s inability to respond to insulin in the right way.

It is important to realize there are many options for the patient, but there also are precise risk factors and history to consider before pursuing any options. The nurse should encourage the patient to discuss the most feasible with his or her primary care provider and consulting surgeon.

**Hyperglycemia and diabetes**

All diabetic patients are at risk of developing acute complications related to their diabetes. However, each realistic, potential acute complication is treatable and preventable with appropriate education and knowledge.

Typically, patients will experience hyperglycemia with any of the following occurrences [75]:
- Caloric intake exceeds their daily allowance (1500 to 2000 calories/day).
- Missing a dose of insulin and/or oral antidiabetic agents.
- Stress and illness causes the release of hormones, such as epinephrine, cortisol, growth hormones and glucagon. The diabetic patient is unable to compensate for the fluctuation and changes in the various hormones being released.

The symptoms of hyperglycemia include the “three polys,” blurred vision headache, lethargy, abdominal pain, ketonuria (if type 1 diabetic) and/or a coma. It is imperative that nurses educate their patients about hyperglycemia to ensure the patient is aware of how to prevent, recognize and treat the problem. However, anytime a patient has hyperglycemia, it is always important to consider two other potential life-threatening conditions, DKA, typically found in type 1 diabetics, and hyperglycemic-hyperosmolar nonketotic syndrome (HHNS), typically found in type 2 diabetics. Although hyperglycemia, DKA and HHNS all have hyperglycemia in common, always remember the following:
- Hyperglycemia can occur without DKA or HHNS.
- DKA will have a blood glucose greater than 300 mg/dl and positive urine ketones.
- HHNS will have higher blood glucose, typically greater than 600 mg/dl, and no urine ketones.

DKA will be elaborated upon with hyperglycemia since the treatment modalities are similar, and then HHNS will be discussed.

1. **Diabetic Ketoacidosis (DKA)** is a complication of hyperglycemia that develops when there is an absolute deficiency of insulin and an increase in the insulin counterregulatory hormones specific to patients with type 1 diabetes during physical or emotional stress despite continued insulin therapy [51]. DKA is a common and potentially life-threatening condition that occurs primarily in children (20 to 40 percent) [25]. Research has demonstrated that the most common causes of DKA include incorrect or missed insulin doses, inaccurate way of administering the insulin, illness, trauma or surgery [25].

DKA (insulin deficiency) is accompanied by an increase in hormones, such as epinephrine, norepinephrine, cortisol, growth hormones and glucagon) that are released when there is not enough glucose delivered into the cells [25]. DKA occurs due to the muscle cells breaking down protein into amino acids that are converted to glucose by the liver, leading to hyperglycemia. The increase in adipose tissue releases fatty acids that are transformed by the liver into ketone bodies [49, 51, 75].

The onset of DKA is typically sudden, and the patient will initially exhibit signs of dehydration (polyuria, polydipsia) that will exacerbate the hyperosmolality process by producing symptoms of anorexia, nausea and vomiting (metabolic acidosis) [25, 53]. The patient will also have positive ketones excreted in the urine. The increased amount of ketones circulating will cause the patient to blow off a “fruity” smell from the mouth. Other characteristic signs that typically occur later include continues dehydration (including warm/dry skin with poor turgor, soft eyeballs, dry mucous membranes, oliguria, malaise, rapid but weak pulse and hypotension), abdominal pain, tachycardia, flushed ears and cheeks, Kussmaul respirations and altered level of consciousness [49, 51]. In addition, children typically exhibit complaints of abdominal or chest pain, nausea and vomiting due to the metabolic acidosis [25]. A patient left untreated will go into a coma, the vascular system will collapse and the patient will go into renal failure, especially when the blood glucose increases between 300 and 800 mg/dl [40].

Although there are a vast array of symptoms that may be exhibited by the patient, it should be noted that the initial symptoms may be a diabetic coma as the other signs may have been masked or pacified by the patient. The patient’s level of consciousness varies based upon the degree of the hyperosmolality [53]:
- If insulin deficiency develops slowly and the patient is able to maintain an adequate intake, the patient will remain alert and the physical symptoms may be minimal.
- In contrast, if the patient is vomiting in response to the ketoacidosis process, the body will begin to compensate to the dehydration, further exacerbating the serum osmolality, less than 320-330 milli-osmole per kilogram (mOsm/kg). Essentially, the body is depleted and unable to maintain homeostasis, inducing the patient to be in a stupor or coma.

The initial diagnostic testing of hyperglycemia begins with the following laboratory findings, especially if DKA is speculated [40, 49, 51]:
- Blood glucose level greater than 250 mg/dl.
- Serum laboratory values:
  - Sodium (may be hypo, normal or hypernatremia).
  - Potassium (initially hyper with acidosis, but hypokalemia with dehydration).
  - Phosphate (low).
  - Bicarbonate (low, typically less than 15 mEq/L).
  - Osmolarity (variable).
  - Elevated BUN and creatinine due to the dehydration.
  - Serum ketones (positive).
- Plasma pH less than 7.35.
- Presence of urine ketones and glucose.
The treatment of hyperglycemia or DKA includes all of the following, pending the severity of symptoms. If the patient is at home, the nurse should instruct the patient to understand the risks and then recognize the potential signs and symptoms of hyperglycemia. If the patient feels different or recognizes any of the signs and symptoms, they should check their blood glucose level. If the level is greater than 300 mg/dl, they should check the urine for ketones and increase their fluid intake [75]. The patient should contact the health care professional who is monitoring their diabetes if their blood glucose is greater than 200 mg/dl for two days or if they are ill or vomiting.

- If the patient is in the hospital, the nurse should always assess the airway, level of consciousness, hydration status, electrolytes (if available) and blood glucose levels depending on the severity of the hyperglycemia and the patient’s condition [49]. The nurse should adhere to the hospital’s protocol in regards to verifying a high blood glucose level with a serum laboratory test. Additional actions of the nurse may include the following, depending upon the hospital protocol, patient’s status and the physician’s orders [49]:
  1. Assess the patient’s vital signs (blood pressure, heart rate and respirations every 15 minutes).
  2. Record intake and output, temperature and mental status every one hour.
  3. Assess the patient’s fluid status. The primary goal is to restore volume and maintain perfusion to the patient’s heart, brain and kidneys. Typically the physician will order one liter of an isotonic saline solution over 30 to 60 minutes. Another goal in replacing fluid therapy is to replace the total body fluid loss by administering a slow, 0.45 percent of normal saline; then when the patient’s blood glucose levels reaches 250 mg/dl, add 5 percent of dextrose to the 0.45 percent of normal saline to prevent hypoglycemia when the serum osmolarity declines rapidly.
  4. In order to lower the serum glucose, the nurse may administer an intramuscular (IM) or intravenous (IV) bolus of regular insulin. Typically, it is administered in an initial IV bolus of 0.1 units/kilogram, followed by an IV drip of 0.1 units/kilogram/hour. Most physicians will prescribe a continuous infusion because of the four-minute half life of IV insulin.
  5. If the patient has any significant changes in potassium and symptoms (fatigue, malaise, confusion, muscle weakness, shallow respirations, hypotension and weak pulse), the patient may have an electrocardiogram (ECG). In hypokalemia, the nurse can anticipate seeing ST-segment depression, flat or inverted T waves and increased U waves on the ECG [51]. Prior to administering an IV bolus potassium, make sure the patient has voided at least 30 ml/hr to prevent developing hyperkalemia.

It is important to assess and monitor for hypokalemia anytime a patient is hyperglycemic because it is a significant cause of death in the treatment of DKA [49].

### 2. Hyperosmolar hyperglycemic nonketotic syndrome (HHNK), also known as hyperosmolar hyperglycemic state (HHHS)

occurs in type 2 diabetics, especially in the older adult who may not even be aware that he or she has diabetes [49]. HHNHS is a significantly dangerous, life-threatening complication with a high risk of mortality due to severe dehydration from prolonged hyperglycemia. Older adults are more prone to mortality, as high as 40 to 70 percent [52]. The development of HHNHS rather than DKA is related to residual insulin secretion. In HHNHS, the patient is able to secrete insulin to prevent the serum and urine ketones, but not enough to prevent hyperglycemia [49]. HHNHS is precipitated by one of the following conditions, although infection is the most prevalent cause [51]:

- Therapeutic agents.
  - Glucocorticoids.
  - Diuretics.
  - Beta-adrenergic blocking agents.
  - Chlorpromazine.
  - Diazoxide.
- **Acute illnesses.**
  - Infection.
  - Gangrene.
  - Urinary tract infection.
  - Burns.
  - Gastrointestinal bleeding.
  - Myocardial infarction.
  - Pancreatitis.
  - Stroke.

- **Therapeutic procedures.**
  - Peritoneal dialysis.
  - Hemodialysis.
  - Hyperosmolar alimentation (oral or parenteral).
  - Surgery.
- **Chronic illnesses.**
  - Renal disease.
  - Cardiac disease, including congestive heart failure (CHF).
  - Hypertension.
  - Previous stroke.
  - Alcoholism.

The patient with HHS may present with subtle, insidious symptoms. However, after the nurse collects the history, it will be noted there has been a decreased consumption of fluids with polyuria, polydipsia and weakness. If the patient presents with the initial symptoms, the patient may not be lethargic, confused or in a coma state as it presents with a serum osmolality greater than 310 mOsm/kg [40, 51].

The patient with HHNHS will be diagnosed by exhibiting the following findings [40]:

- Severe hyperglycemia (typically greater than 600 mg/dl) in the absence of serum and urine ketones. Severe hyperglycemia occurs due to the coinciding severe hyperglycemia and the glucose is not filtered into the urine [49].
- Severe hyperosmolality (310 mOsm/L).
- Dehydration (the patient may lose up to 15 to 25 percent of his or her body fluid) [49].
- Hypokalemia and/or hyponatremia.
- Altered levels of consciousness.

The nurses’ role in treating HHS includes recognizing the signs, symptoms and diagnostic findings, replacing fluids and restoring normal blood glucose levels within 36 to 72 hours, correcting insulin and electrolyte imbalances, assessing urine output and vital signs [40, 49]:

- The first treatment is providing adequate fluid replacement to increase the fluid volume. If the patient is in shock or has severe hypotension, administer a hypotonic intravenous fluid (0.45 percent normal saline). However, if the patient has hypovolemia, then an isotonic solution (0.9 percent normal saline) is required. The patient will typically receive four to six liters of fluid over eight to 10 hours. Ideally, the nurse should expect to see a slow but steady improvement in the central nervous system function.

- The nurse should assess the patient hourly for signs of cerebral edema, abrupt changes in the mental status, abnormal neurological signs and coma. If the symptoms continue, it indicates that the patient is not getting the correct volume of fluid replacement or a rapid reduction in plasma osmolality.
• Administer IV insulin at 10 units/hour to reduce the blood glucose levels. Once the patient’s blood glucose maintains 250 mg/dl, the physician should be notified to change the intravenous fluids to 5 percent Dextrose and 0.45 percent or 0.9 percent normal saline solution.
• Hyponatremia and hypokalemia replacements as needed.
• Ensure urine output is 50 mg/hour or more.

Hypoglycemia and diabetes

Another common, acute complication of diabetes is hypoglycemia (low blood glucose, less than 70 mg/dl), which occurs when there is not enough glucose available in relation to the circulating insulin [75]. Normal insulin secretion decreases when the blood glucose levels drop to approximately 83 mg/dl and the “counterregulatory” hormones (glucagon and epinephrine) are activated at about 68 mg/dl [49]. It is important to educate the patient to prevent hypoglycemia as it may cause neurological damage because the brain starves for glucose [75]. Hypoglycemia can be very dangerous for a type 1 diabetic because [49]:

• After one to five years of diagnosis, the regulation of circulating insulin dissipates because the patient is administering an injection, rather than the pancreas supplying the insulin as needed.
• Another problem is with long-standing hypoglycemia, the patient no longer has warning signs of the impending hypoglycemia. Unfortunately, this occurs in about 25 percent of all patients, and about 50 percent of patients who have had type 1 diabetes for 30 years or more.

Hypoglycemia typically occurs if the patient undereats (skip a meal), administered too much insulin/oral antidiabetic agents and/or exacerbated during exercise. If a nurse is caring for a pregnant woman, it is important to note that she is more likely to develop hypoglycemia because her ideal glucose control is lower (60 to 120 mg/dl) [77].

The most common symptoms of hypoglycemia include hunger, sweating, tremor, blurred vision, headache, irritability, confusion, seizures and coma [49, 77]. If the patient should experience any of the symptoms (which typically occur around 50 mg/dl) or a family member finds the patient in a stupor or coma, confirm the blood glucose level with a SMBG (if at home). If a nurse is caring for the patient in the hospital, he/she should check the accu-check machine and then notify the hospital laboratory to confirm. However, if the nurse is working in the hospital, he/she should not sit around and wait for the laboratory department, and should treat the patient to prevent further lowering of the glucose level.

If the patient is at home or in the hospital setting with a mild case (patient remains alert, hungry, irritable, shaky, weak, headache and a blood glucose less than 60 mg/dl) of hypoglycemia, then treat the patient with a 10 to 15 gram carbohydrate snack, such as [49, 77]:
• Glucose tablets or gel.
• 4 ounces of orange juice.

If the patient is in the hospital with a severe case of hypoglycemia, the nurse should [49]:
• Administer Glucagon IM or SQ and 50 percent of dextrose tablets or gel.
• Ensure urine output is 50 mg/hour or more.
• Notify the physician immediately.

The blood glucose level should be rechecked every 15 minutes; avoid overtreating as it may cause hyperglycemia and rebound hypoglycemia [75, 77]. The nurse’s role in treating DKA includes recognizing the signs and symptoms, collaborating with the treating provider to correct the dehydration process, normalize the electrolytes and correct the acidosis. Throughout the treatment, the nurse will monitor the patient’s blood glucose levels, amounts of insulin being administered, urine volume, vital signs and serum chemistries. Once the DKA has been corrected, the nurse needs to educate the patient and family explicitly about the importance of insulin and providing guidelines for “sick” days to prevent future occurrences.

Long-term complications of diabetes

Failure to properly identify or control any form of diabetes will increase the risk of developing severe, multisystem complications. Over time, uncontrolled hyperglycemia will lead to the following complications [53]:

• Cardiovascular disease is the leading cause of death from type 2 diabetes [28]. Heart disease occurs due to changes in the macrovascular (large blood vessels) and microvascular (small blood vessels) to compensate for the increased flow leading to atherosclerosis, abnormal platelets, red blood cells, clotting factors and changes in the arterial walls [28, 49, 51]. Each of the cardiovascular compensatory mechanisms is exacerbated if hypertension, hyperlipidemia, smoking and/or obesity are coinciding with the diabetes. The macrovascular complications include the following [49]:

○ Coronary artery disease (CAD) is the most common cause of death among diabetic patients; accounting for 40 to 60 percent of deaths. CAD is also a major risk factor in the development of a myocardial infarction (MI), especially in type 2 diabetes.
  • Most diabetic patients will die from a massive MI due to their extensive CAD, cardiomyopathy and abnormal blood clotting factors [49].
  • Heart failure occurs in approximately 50 percent of all patients after an MI [49].

○ Hypertension (greater than 130/80 if diabetic) affects 20 to 60 percent of all people with diabetes, leading to microvascular complications, such as retinopathy and nephropathy. From 2003 to 2004, 75 percent of adults with self-reported diabetes had blood pressure greater than or equal to 130/80 millimeters of mercury (mm Hg) or used prescription medications for hypertension [58].
The overall goal is to maintain the blood pressure at less than 130/80, according to the seventh report of the JNC 7 [45].

- Hyperlipidemia (abnormal blood lipids). The overall goal is to maintain the LDL less than 100mg/dl (may be less than 70mg/dl), TG less than 150mg/dl and HDL greater than 40mg/dl. Therefore the ADA recommends that the patient should have at least an annual lipid profile, then every two years if the patient has a low risk. Interestingly, although the patient is typically prescribed a statin (s) to maintain a lower lipid profile, the ADA does not recommend routine monitoring of liver and muscle enzymes in asymptomatic patients, unless the baseline enzymes were abnormal or the patient is taking drugs that interact with statins [45].

- Cerebrovascular disease
  - Stroke is increased two to six times among older adults with type 2 diabetes because of the risk factors and elevated blood glucose levels. A patient who maintains a high HgbA1c due to elevated blood glucose levels at the time of the stroke could have a greater brain injury and higher mortality [49].
  - Peripheral vascular disease of the lower extremities.

According to the National Diabetes Information Clearinghouse (NDIC) (2008) [58]:
- In 2004, heart disease was noted on 68 percent of diabetes-related death certificates among people aged 65 years or older.
- In 2004, stroke was noted on 16 percent of diabetes-related death certificates among people aged 65 years or older.
- Adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes.

The microvascular complications include retinopathy, nephropathy and neuropathy.

- Diabetic retinopathy is the leading cause of new-onset blindness among adults’ ages 20 to 74 years. Diabetic retinopathy occurs due to the alterations in the blood flow to the eyes, eventually leading to retinal ischemia. Interestingly, almost all patients with type 1 diabetes and 60 percent of patients with type 2 diabetes will have some degree of retinopathy. Diabetic retinopathy causes 12,000 to 24,000 new cases of blindness each year [58]. Retinopathy has been linked to fasting blood glucose levels above 129 mg/dl [49]. The overall goal is to prevent vision loss; therefore the diabetic patient should be encouraged to have dilated eye exams or 7-field 30-degree fundus photography by an ophthalmologist annually. In addition, it is important to maintain the blood glucose levels and blood pressure [45]. Other eye complications related to diabetes include [49]:
  - Retinal hemorrhages, detachments and venous bleeding due to microaneurysms (small capillary wall dilations formed in the retinal vessels, leading to poor circulation).
  - Macular degeneration.
  - Double vision.
  - Open angle glaucoma.

- Diabetic nephropathy is the leading cause of renal failure requiring dialysis or a transplant in the U.S. The condition occurs in about 20 to 40 percent of all diabetic patients. Diabetes is the leading cause of kidney failure, accounting for 44 percent of new cases in 2005. In 2005, 46,739 people with diabetes began treatment for end-stage kidney disease in the United States and Puerto Rico. In 2005, a total of 178,689 people with end-stage kidney disease due to diabetes were living on chronic dialysis or with a kidney transplant in the United States and Puerto Rico [58]. The exact pathologic origin is unknown, but thickening of the basement of the glomeruli eventually impairs renal function. The first indication of nephropathy is the presence of albumin (microalbuminuria) in the urine. The overall goal is to prevent renal failure. Therefore the blood glucose and blood pressure should be controlled, the serum creatinine and microalbuminuria should be screened annually, there should be an annual GFR calculation and the patient should be instructed to limit the protein intake to 0.8 g/kg in patients with any degree of chronic kidney disease (CKD) [45].
  - If the patient tests positive for microalbuminuria, the ADA recommends the patient be started on the following medications [45]:
    - Type 1 diabetic should be on an ACE inhibitor.
    - Type 2 diabetes with hypertension should be on an ACE or ARB.
  - In addition, patients should maintain their blood pressure at less than 130/80 and limit protein to 10 percent of their dietary intake. The patient should be referred to a urologist.

- Peripheral neuropathies (somatic neuropathies) initially appear in the toes and feet, then progress upward into the fingers and hands. The diabetic patient will complain of numbness or tingling and pain that are described as “aching,” “burning” or “shooting,” and feelings of coldness in the feet. About 60 to 70 percent of people with diabetes have mild to severe forms of nervous system damage. The results of such damage include impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, erectile dysfunction or other nerve problems. Almost 30 percent of people over 40 with diabetes have impaired sensation in the feet, and at least one area that lacks feeling.
  - Foot injuries are one of the most common complications of diabetes leading to hospitalizations related to sensory neuropathies, ischemia and infections [49]. Diabetes is the leading cause of amputations worldwide, approximately 60 percent. In 2004, about 71,000 nontraumatic lower-limb amputations were performed in people with diabetes [58]. The five-year mortality rate after a leg or foot amputation ranges from 39 to 68 percent [49].
  - Claw toe is a deformity that causes the toes to hyperextend, resulting in ulceration [49]. Health care professionals, therefore, should visually inspect patients’ feet at every visit, and patients should be instructed to inspect their own feet daily with a mirror and have an annual foot exam by a podiatrist.

Other complications include any of the following [45]:

- Visceral neuropathies (autonomic neuropathies) that involves various entities:
  - Sweating dysfunction with an absence of sweating (anhidrosis) of the hands and feet.
  - Abnormal papillary function (constricted pupils that dilate slowly in the dark).
  - Cardiovascular dysfunction with a fixed cardiac rate that does not change with exercise, postural hypotension.
  - Gastrointestinal dysfunction, including upper gastric motility (gastroparesis) that results in constipation, dysphagia, anorexia, heartburn, nausea, vomiting and altered blood glucose control.
  - Genitourinary dysfunction, resulting in changes in bladder (inability to empty completely or a sensation of fullness) and sexual function (decreased libido, failure to ejaculate or no vaginal lubrication).

- Periodontal disease. Periodontal, or gum, disease is more common in people with diabetes. Among young adults, those with diabetes have about twice the risk of those without diabetes. Persons with poorly controlled diabetes (A1C greater than 9 percent) were nearly three times more likely to have severe periodontitis than those without diabetes. Almost one-third of people with diabetes have severe periodontal disease with loss of attachment of the gums to the teeth measuring 5 millimeters (mm) or more [58].

- Male erectile dysfunction (ED) occurs at an earlier age in men with diabetes (10 to 15 years earlier). Half of all diabetic men experience ED. ED is related to poor glucose control, obesity,
Increased susceptibility to infections.

Diabetes and cultural considerations

Nurses in a diverse America may be challenged whenever they encounter patients who have different beliefs, values and cultures from their own. It is important to be sensitive and respectful to the patient and family and come to know them as individuals. In order to be most effective and respectful toward each patient that we care for, it is imperative for nurses to be culturally competent (learning, understanding and respecting the values and beliefs of others) [44].

Upon admission to a hospital facility, the nurse is required to ask the patient if they have any religious or cultural considerations that may affect their health care. It is important to truly ask the patient and respect their response. In addition, nurses should convey the patient’s concerns to the appropriate disciplinarians and other nurses responsible for the care of the patient. If nurses are working in an outpatient facility, there are no set for health care professionals to ask their patients about their religious or cultural considerations. However, if a nurse works in an outpatient facility, it should be considered and asked of all patients.

The purpose of this section is to familiarize nurses on how to consider patient’s cultural and religious beliefs. If you are caring for a patient, learn about their personal concerns to ensure you customize their care toward things the patient will be most apt to abide by to reduce their risk of developing diabetes and/or complications of diabetes. In addition, always inquire with the individual patient because he or she may not adhere to all of the recommendations of their religious or culture. Although there is a vast array of knowledge to be learned about various cultures, some of the major cultural and religious considerations are listed as follows [44]:

- **Diet**
  - Islam prohibits followers from eating from sunrise to sunset during the month of Ramadan.
  - Judaism requires individuals to fast from sundown to sundown during Yom Kippur and the Day of Atonement.
  - Orthodox Jews are forbidden to eat port, shellfish, and nonkosher red meat and poultry.
  - Hindus and Seventh Day Adventists are forbidden to eat meat.
  - Filipinos enjoy eating rice with every meal and may feel deprived without it.
  - Japanese prefer small amounts of beef or chicken mixed with vegetables and rice or noodles.

Mexican Americans, African Americans and Asian Indians have a high prevalence of developing diabetes in their lives, so it is important to understand the typical food choices that may be a factor contributing to their risk:

- **Mexican Americans** enjoy eating lots of salt and fats in their cooking, which may be a contributing factor for their high development of type 2 diabetes. Therefore, the nurse should consider diabetes treatment and prevention programs for Mexican-Americans to include the following [50]:
  - Foods found in their traditional diet. Traditionally, Mexican-Americans tend to eat diets that are low-fat and high-fiber, which is certainly beneficial.
  - Assess the level of acculturation to American eating practices.
  - Ascertain the integration of folk medicine in consideration of their foods, hot and cold in regards to healing.

- **African Americans** enjoy eating “soul food,” such as food that is breaded and fried, especially in the summer months [50]. Their food choices are based on the following:
  - Health beliefs passed down each generation: “the soul food.”
  - Socioeconomic statuses along with education level.
  - Physical and financial limitation also plays an important role in terms of planning a meal and nutrition education for African-American patients.

A research study conducted by a diabetes clinic in Atlanta, Ga, the Grady Memorial Hospital, concluded that unfamiliar food options was the main reason African Americans did not adhere to low fat, low cholesterol diet recommendations. Therefore, it is critical that patients fully understand and realize the significance of their new diet; otherwise they may very well not follow it, which could lead to serious consequences, such as diabetes, obesity and/or hypertension [50].

- **Asian Indians** living in the U.S. are composed of a very diverse culture that will vary from each family based upon their religion. Although there is a vast array of religions practiced amongst Asian Indians, the most prevalent is Hinduism.

A survey among 73 Asian Indians adults residing in New York City and Washington, D.C., implemented per Diabetes Care (2004) and the ADA, demonstrated the following [50]:

- Acculturation of this population in the U.S. has led to more frequent selection of American or other ethnic foods for main meals and replacement of traditional sweets with cookies, doughnuts and other Western pastries.
- Length of stay in the U.S. had an effect on the choice of fats used in cooking; those who had lived here more than five years appeared to have decreased their consumption of butter and ghee (clarified butter) and used margarine as an alternative. These individuals continued to consume rice, chappati (flat bread), yogurt, dhal (a spiced lentil dish), and curried vegetables. Asian Indians also reported an increase in intake of whole grain breads, fish, poultry, meat, potato chips, cakes, cheese, fruit, and alcoholic and nonalcoholic beverages (other than water) after immigration to the U.S.

Therefore, the Americanized Asian Indians changed their diet radically as they went from a low-fat, high fiber diet to a higher-fat animal protein, low fiber, and high levels of saturated fat. One reason for this dramatic change is the increased tendency for Asian Indians to consume convenience foods at fast food restaurants. In addition, there are other factors to consider such as stress and sedentary lifestyles that increase their risk for developing chronic diseases, increasing their risk of developing diabetes, obesity and/or hypertension.

- **Pregnancy**

It is important to note that many Asian and Hispanic cultures practice a system of hot and cold body balance. During pregnancy, the woman is considered to be in a “hot” condition and she will avoid “hot” foods such as protein. Therefore, it is important for the nurse to inquire during pregnancy for a woman who believes in a hot and cold practice if they are eating protein-rich foods. In addition, many Hispanic women avoid iron supplements and prenatal vitamins because they are considered “hot.”
Nurses caring for patients should always consider nutrition-related cultural variations by asking the patients about their specific food habits. Collaborating with the individual patient and family will provide a wealth of information for the nurse to provide appropriate suggestions for the patient to modify their traditional eating patterns to prevent and treat type 2 diabetes [50]. In addition, always discuss and refer the patient and family to a RD to ensure individual diets can be customized.

Paying for Diabetes

In April 2007, the ADA recognized that there were millions of American children and adults living with diabetes without insurance or limited access to obtaining the supplies, medications and education necessary to successfully manage the disease and prevent diabetes-related complications [6]. Currently, in 2009, the problem is compounded and expected to exacerbate due to the economic hardships encountered by many Americans. The nurse needs to be empathetic, respectful and conscious about the initial costs of the SMBG machines, monthly costs of the supplies (lancets, alcohol wipes, syringes), medications (oral and/or insulin), choosing healthy nutritious foods and any other expenses that may incur. Nurses should never assume that a patient and/or family is “noncompliant” in their health care regimen, but instead take the time to assess the patient and to find out the reasoning.

Throughout the U.S., each state has recognized the major effects diabetes plays and the impact on patients and society. As of January 2009, 46 states and the District of Columbia require mandated health insurance coverage for diabetes treatment. At this time, the laws in Mississippi, Missouri and Washington require only that insurers offer coverage, but not necessarily include the coverage in all active policies. The majority of the states require coverage for both direct treatment and for diabetes equipment and supplies that are often used by the patient at home. The four states that do not have a mandate or insurance requirement are Alabama, Idaho, North Dakota and Ohio [54]. Eleven percent of diagnosed diabetics under the age of 65 were uninsured and most likely to be from low income backgrounds [54]. The other 6 percent of diabetic patients are unaccounted, for according to the National Conference of State Legislatures.

However to date, private health insurance companies are not congruent in the costs and coverage, as it varies in each state. The majority of patients diagnosed with diabetes are either covered by a private insurance company (39 percent) or Medicare (44 percent). Medicare is the leader in providing the most coverage for diabetic patients.

Even with health insurance, Medicare and/or Medicaid, patients may not receive all of their required treatment modalities, such glucose monitors, test strips, lancets, emergency kits and medications. Therefore, it is imperative for physicians, nurses and educators to assess the community resources and programs within their community to find other potential coverage options. For example, Wal-Mart provides $4 prescriptions on various medications; on Wal-Mart’s main web site (2009), the following oral anti-diabetic agents are offered in a 30-day supply for $4 [72]:

- Chlorpropamide 100mg tablets.
- Glimepiride 1mg, 2mg and 4mg tablets.
- Glimepiride 2 and 4mg tablets.
- Glipizide 5mg and 10mg tablets.
- Glipizide 10mg tab.
- Glyburide 2.5mg, 5 mg and micronized 3mg and 6mg tablets.
- Metformin 500mg, 850mg and 1000mg tablets.
- Metformin 500mg extended release tablet.

However, what happens to people who have coverage but then lose their job? The cost of Consolidated Omnibus Budget Reconciliation Act (COBRA) insurance is very pricey, especially for a family or individual who recently lost a job. The NDIC and the ADA recognized in 2004 that a person with diabetes spends an average of $13,243 a year on health care expenses [56]. Therefore, if a patient is not eligible for Medicare, Medicaid, or private health insurance, there are other potential programs available according to, the NDIC, that the nurse can recommend for the patient and family dealing with diabetes (2004) [56]:

- **State Children’s Health Insurance Program**, supported by the U.S. Department of Health and Human Services, established the State Children’s Health Insurance Program (SCHIP) to help children without health insurance. SCHIP provides health coverage for children whose families earn too much to qualify for Medicaid but too little to afford private health insurance.
- **Health care services.** The Bureau of Primary Health Care, a service of the Health Resources and Services Administration, offers health care for people regardless of their insurance status or ability to pay. Encourage the patient to find a local health center by calling 1-800-400-2742 or visit the bureau’s website at www.hphc.hrsa.gov on the Internet.
- **Hospital care** is provided to patients who are uninsured and require hospital care. In 1946, Congress passed the Hospital Survey and Construction Act, which was sponsored by Sens. Lister Hill and Harold Burton and is now known as the Hill-Burton Act. Although the program originally provided hospitals with Federal grants for modernization, today it provides free or reduced-charge medical services to low-income people. The program is administered by the Department of Health and Human Services. For more information, call 1-800-638-0742 or visit www.hrsa.gov/hillburton/default.htm on the Internet.
- **Food and nutrition.** Food, nutrition education and access to health care services are also available through the U.S. Department of Agriculture’s WIC (Women, Infants, and Children) program. Pregnant women who meet residential, financial need and nutrition risk criteria are eligible for assistance. GDM is considered a medically based nutrition risk and would qualify a woman for assistance through the WIC program if she meets the financial need requirements and has lived in a particular state the required amount of time. WIC Phone: 703-305-2746, Internet: www.fns.usda.gov/wic.
- **Local resources** that may be available, include:
  - Lions Clubs help with vision care.
  - Rotary Clubs help with humanitarian and educational assistance.
  - Elks Clubs provides charitable activities for youth and veterans.
  - Shriners offer need-based treatment for children at Shriners hospitals throughout the U.S.
- **Dialysis and transplantation.** In 1972, Congress passed legislation making people of any age with permanent kidney failure eligible for Medicare. To qualify, a patient must need regular dialysis or have had a kidney transplant, and must have worked under Social Security, the Railroad Retirement Board or as a government employee (or be the child or spouse of someone who has), or must already be receiving Social Security or Railroad Retirement benefits. Every American needing dialysis for chronic kidney failure is eligible for dialysis assistance. For more information, call the Centers for Medicare & Medicaid Services at 1-800-MEDICARE (633-4227) to request the booklet Medicare Coverage of Kidney Dialysis and Kidney Transplant Services. This booklet is also available on the Internet at www.medicare.gov under “Publications.”
  - For information on financing an organ transplant, contact the following organization: United Network for Organ Sharing (UNOS) by calling: 1-888-894-6361 or visit the Internet at: www.unos.org.
The future for diabetics

Researchers, scientists and physicians have been diligently attempting to control and cure diabetes for decades. One of the most intriguing developments was presented in April 2009 in Japan with the Diabetes Research Institute. For the first time, scientists discussed a hopeful development on how transplanted insulin-secreting cells called “islets” function when they are inside a living organism, or in vivo. In the past, researchers could only view the islets in a laboratory, or in vitro [38]. In addition, the Diabetes Research Institute and scientists in Stockholm, Sweden, are transplanting human islets into diabetic mice. In a paper, The Anterior Chamber of the Eye Allows Studying Human Islet Cell Biology in Vivo, researchers report the following [38]:

- After transplantation of 500 islet equivalents per eye, recipient mice achieved and maintained normal blood sugar levels for over 150 days.
- Within one month of the transplant, new blood vessels formed around the islet cells to deliver necessary nutrients (a process called “neovascularization”).
- As more blood vessels grew around the islet cells, the mouse’s diabetes gradually reversed.

However, according to the ADA, islet cell transplants were being conducted with great success in laboratory mice in the 1970s [16]. But the excitement that those experiments generated soon turned to frustration, as initial attempts to reproduce that success in humans were largely disappointing. For many years, progress was slow and few transplant recipients were able to stay diabetes-free for more than a few months before the transplanted islet cells failed. However, in recent years, scientists have begun to make rapid advances in transplant technology, and some of the most exciting new research comes from researchers at the University of Alberta in Edmonton, Canada. The scientists there have used a new procedure called the Edmonton Protocol to treat patients with type 1 diabetes, which is elaborated upon in the following [16]:

In this procedure, researchers use specialized enzymes to remove islets from the pancreas of a deceased donor. For an average-size person (70 kg), a typical transplant requires about 1 million islets, equal to two donor organs. Since the islet cells are extremely fragile, transplantation occurs immediately after they are removed. The transplant itself is easy and takes less than an hour to complete. The surgeon uses ultrasound to guide placement of a small plastic catheter through the upper abdomen and into the liver. The islets are then injected through the catheter into the liver. It takes some time for the cells to attach to new blood vessels and begin releasing insulin. The doctor will order many tests to check blood glucose levels after the transplant, and insulin may be needed until control is achieved.

According to Science Daily (2007), reporting in the proceedings of the National Academy of Sciences, that has greatly boosted the number of immune T-cells able to shield transplanted pancreatic islet cells from attack by the immune system [64]. In addition, over the nine-week study of islet transplantation in diabetic mice, no pharmacologic immunosuppression therapy was administered, and the transplanted islet cells stayed healthy and produced insulin throughout the study. This is promising data that may allow physicians to perform islet cell transplants in type 1 diabetics, especially if immunosuppressant therapy is not required because at this time, once a patient has received any type of a transplant, they need immunosuppressants therapy for the rest of their life to prevent their body from rejecting the donor cells.

According to the ADA, pancreatic transplants may treat type 1 diabetics if scientists can develop safe immunosuppressants that always work for the patient. Until safe immunosuppressants are fabricated and delivered, many doctors believe islet cell transplants are a better option.

Islets are clusters of cells that make up 1 to 2 percent of the total pancreas that make insulin. In the patient with type 1 diabetes, islet cells are destroyed. With pancreatic islet transplantation, cells are taken from a donor pancreas and transferred into another person. Once implanted, the new islets begin to make and release insulin. Researchers hope that islet transplantation will help people with type 1 diabetes live without daily injections of insulin.
cells are difficult to proliferate and culture, some researchers have had success in engineering such cells to do this.

Fred Levine and his colleagues at the University of California, San Diego, have engineered islet cells isolated from human cadavers by adding to the cells’ deoxyribonucleic acid (DNA) special genes that stimulate cell proliferation. However, because once such cell lines that can proliferate in culture are established, they no longer produce insulin. The cell lines are further engineered to express the beta islet cell gene, Pdx1 (pancreatic and duodenal homeobox 1), also known as insulin promoter factor 1(PDX-1), which stimulates the expression of the insulin gene. The specific cell lines have been shown to propagiate in culture and can be induced to differentiate to cells, which produce insulin. When transplanted into immune-deficient mice, the cells secrete insulin in response to glucose. The researchers are currently investigating whether these cells will reverse diabetes in an experimental diabetes model in mice.

The investigators report that these cells do not produce as much insulin as normal islets, but it is within an order of magnitude. The major problem in dealing with these cells is maintaining the delicate balance between growth and differentiation. Cells that proliferate well do not produce insulin efficiently, and those that do produce insulin do not proliferate well. According to the researchers, the major issue is developing the technology to be able to grow large numbers of these cells that will reproducibly produce normal amounts of insulin.

Another promising source of islet progenitor cells lies in the cells that line the pancreatic ducts. Some researchers believe that multipotent (capable of forming cells from more than one germ layer) stem cells are intermingled with mature, differentiated duct cells, while others believe that the duct cells themselves can undergo a differentiation, or a reversal to a less mature type of cell, which can then differentiate into an insulin-producing islet cell.

Susan Bonner-Weir and her colleagues reported in 2008 that when ductal cells isolated from adult human pancreatic tissue were cultured, they could be induced to differentiate into clusters that contained both ductal and endocrine cells. Over the course of three to four weeks in culture, the cells secreted low amounts of insulin when exposed to low concentrations of glucose, and higher amounts of insulin when exposed to higher glucose content. The researchers have determined by immunochemistry and ultra structural analysis that these clusters contain all of the endocrine cells of the islets.

**Embryonic stem cells.** The discovery of methods to isolate and grow human embryonic stem cells in 1998 renewed the hopes for doctors, researchers and diabetic patients and their families that a cure for type 1 diabetes and perhaps type 2 diabetes as well, may be within striking distance. In theory, embryonic stem cells could be cultivated and coaxed into developing into the insulin-producing islet cells of the pancreas. With a ready supply of cultured stem cells at hand, the theory is that a line of embryonic stem cells could be grown up as needed for anyone requiring a transplant. The cells could be engineered to avoid immune rejection. Before transplantation, they could be placed into nonimmunogenic material so that they would not be rejected and the patient would avoid the devastating effects of immunosuppressant drugs. There is also some evidence that differentiated cells derived from embryonic stem cells might be less likely to cause immune rejection. Although having a replenishable supply of insulin-producing cells for transplant into humans may be a long way off, researchers have been making remarkable progress in their quest for it. While some researchers have pursued the research on embryonic stem cells, other researchers have focused on insulin-producing precursor cells that occur naturally in adult and fetal tissues.

In 2001, several teams of researchers continued the initial embryonic research, continuing to believe the possibility that human embryonic stem cells could be developed as a therapy for treating diabetes. Recent studies in mice show that embryonic stem cells can be coaxed into differentiating into insulin-producing beta cells, and new reports indicate that this strategy may be possible using human embryonic cells as well. Last year, researchers in Spain reported using mouse embryonic stem cells that were engineered to allow researchers to select for cells that were differentiating into insulin-producing cells.

Bernat Soria and his colleagues at the Universidad Miguel Hernandez in San Juan, Alicante, Spain, added DNA containing part of the insulin gene to embryonic cells from mice. The insulin gene was linked to another gene that rendered the mice resistant to an antibiotic drug. By growing the cells in the presence of an antibiotic, only those cells that were activating the insulin promoter were able to survive. The cells were cloned and then cultured under varying conditions. Cells cultured in the presence of low concentrations of glucose differentiated and were able to respond to changes in glucose concentration by increasing insulin secretion nearly sevenfold. The researchers then implanted the cells into the spleens of diabetic mice and found that symptoms of diabetes were reversed.

Another researcher, Manfred Ruediger of Cardion Inc. in Erkrath, Germany, use the approach developed by Soria and his colleagues to develop insulin-producing human cells derived from embryonic stem cells. By using this method, the noninsulin-producing cells would be killed off and only insulin-producing cells should survive. This is important in ensuring that undifferentiated cells are not implanted that could give rise to tumors.

Utilizing stem cell research is intriguing and provides a lot of hope for diabetic patients. However, at this time is important for researchers to define the protocols, exact mechanisms and potential need for immunosuppressive therapy. Ultimately, type 1 diabetes may prove to be especially difficult to cure, because the cells are destroyed when the body’s own immune system attacks and destroys them. The autoimmunity must be overcome if researchers intend to use transplanted cells to replace the damaged ones. Many researchers believe that at least initially, immunosuppressive therapy similar to that used in the Edmonton protocol will be beneficial. A potential advantage of embryonic cells is that, in theory, they could be engineered to express the appropriate genes that would allow them to escape or reduce detection by the immune system. Others have suggested that a technology should be developed to encapsulate or embed islet cells derived from islet stem or progenitor cells in a material that would allow small molecules such as insulin to pass through freely, but would not allow interactions between the islet cells and cells of the immune system. Such encapsulated cells could secrete insulin into the blood stream, but remain inaccessible to the immune system.

Before any cell-based therapy to treat diabetes makes it to the clinic, many safety issues must be addressed. A major consideration is whether any precursor or stem-like cells transplanted into the body might revert to a more pluripotent state and induce the formation of tumors. These risks would seemingly be lessened if fully differentiated cells are used in transplantation. However, before any kind of human islet-precursor cells can be used therapeutically, a renewable source of human stem cells must be developed. Although many progenitor cells have been identified in adult tissue, few of these cells can be cultured for multiple generations. Embryonic stem cells show the greatest promise for generating cell lines that will be free of contaminants and that can self renew. However, most researchers agree that until a therapeutically useful source of human islet cells is developed, all avenues of research should be exhaustively investigated, including both adult and embryonic sources of tissue [66].
Although diabetes remains a prevalent chronic disease process, nurses can make an enormous difference in the life of the patient and family dealing with it. According to the American College of Physicians (ACP) (2006), many times physicians do not have the time, resources and appropriate levels of patient participation to effectively treat diabetes. Therefore, patients end up struggling with the understanding and complexity of the disease [4]. The ACP and the American College of Physicians Foundation (ACPF) are concerned about the dangers and enormous cost to America, so in 2006 they collaborated to pursue a three-year project engaging both physicians and patients to improve diabetes care in the United States [4]. In 2010, one can hope to analyze their investigation in hope of finding more educational options for patients and families when they are encountering diabetes. In the meantime, it is important to understand there are enormous treatment modalities and options available for the patient. It is just imperative that the patient realize the significant role diabetes plays on the body and the complications that arise over time by not adhering to the recommendations. In addition, although the patient may realize the significance, the nurse needs to assess whether the patient is eager and capable of making the changes.


### DIABETES: A COMPREHENSIVE OVERVIEW

#### Final Examination Questions

Choose True or False for questions 6 through 15 and mark them on the answer sheet found on page 133 or complete your test online at [Nursing.EliteCME.com](http://www.Nursing.EliteCME.com).

6. Diabetes has reached epic proportions worldwide, making it the seventh leading cause of death in the United States.
   - True
   - False

7. There are about 25.8 million children and adults (8.3% of the total United States population) living with diabetes.
   - True
   - False

8. Insulin is a hormone that increases the blood glucose levels any time the blood sugar is low.
   - True
   - False

9. Type 1 diabetes is a multifactorial disease caused by an autoimmune destruction of insulin-producing pancreatic beta cells.
   - True
   - False

10. Type 2 diabetes accounts for 10 percent of all cases.
   - True
   - False

11. Impaired fasting glucose (IFG) is a condition in which the fasting blood sugar level is 100 to 125 milligrams per deciliter (mg/dL) after an overnight fast.
   - True
   - False

12. The classic signs and symptoms of diabetes in general include the “three polys” (polyuria, polydipsia, and polyphagia).
   - True
   - False

13. Diabetes is diagnosed by a fasting blood glucose level greater than 126 mg/dL on two or more occasions.
   - True
   - False

14. The first line treatment of all diabetic patients is insulin.
   - True
   - False

15. The ADA recommends that all diabetics maintain their daily blood glucose levels as follows: Preprandial, 70 to 130 mg/dL; postprandial, less than 180 mg/dL.
   - True
   - False

NIA07DME15

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Chapter 3: Diseases and Disorders of the Gastrointestinal Tract

6 Contact Hours

Written by Adrianne E. Avillion, D.Ed., RN

Learning objectives

Upon completion of this course, the learner should be able to:

- Describe upper gastrointestinal tract disease and disorders pathophysiology, symptomology, and treatments for: diseases of the oral cavity, esophagus, gastric diseases, peptic ulcers, ulcerative colitis, and peptic ulcer disease.
- Describe lower gastrointestinal tract disease and disorders pathophysiology, symptomology, and treatments for: Crohn's disease, inflammatory bowel disease, colorectal and anal cancer, Celiac disease, diverticular disease, intussusception, intestinal obstruction, inguinal hernia, volvulus, rectal prolapse, hemorrhoids, polyps, volvulus, rectal prolapse, hemorrhoids, intestinal polyps, and anorectal abscess and fistula.
- Explain the etiology of proctitis.

Review of the anatomy of the gastrointestinal system

The gastrointestinal (GI) system consists of two major parts: the GI tract, also referred to as the alimentary canal, and the accessory organs. The alimentary canal is a long, hollow, muscular tube that starts in the mouth and ends at the anus. The alimentary canal includes the:

- Oral cavity.
- Pharynx.
- Esophagus.
- Stomach.
- Small intestine.
- Large intestine.
- Rectum.
- Anal canal.

Diseases and disorders of the GI system can range from mild annoyances to life-threatening conditions. It is important that the nurse recognize the numerous abnormalities that can occur, and how to most effectively intervene to help the patient return to a state of maximum health and wellness.

DISEASES OF THE ORAL CAVITY

There are a number of infections that affect the oral cavity. Their impact can range from annoying symptoms that are fairly easily resolved to major problems that can have long-ranging effects.

Stomatitis

Stomatitis is defined as an inflammation of the oral mucosa that may spread to the lips, palate and buccal mucosa. It is a common infection and generally classified as acute herpetic stomatitis or aphthous stomatitis. Acute herpetic stomatitis is caused by infection of the herpes simplex virus and is common in children aged 1 to 3 years. It is usually self-limiting but can be severe, and even fatal, in neonates. Symptoms have an abrupt onset and include malaise, anorexia, irritability, mouth pain and fever, which may last for one to two weeks. The patient’s gums are swollen, bleed easily, and the mucous membrane is painful. Ulcers develop in the mouth and throat that eventually acquire the appearance of “punched-out” lesions with red areolae. Pain usually ceases about two to four days before the ulcers are completely healed. Note that if a child with stomatitis sucks his thumb, the lesions will spread to the hand.

Treatment is focused on symptom relief. Salt-water mouth rinses, topical antihistamines, antacids or corticosteroids may be used to reduce discomfort. Bland or liquid diets may be recommended to reduce the discomfort of eating. In extreme cases, when the patient cannot ingest adequate amounts of food and/or liquids, intravenous therapy may be indicated.

Aphthous stomatitis causes burning, tingling and minimal swelling of the mucous membrane. Single or multiple superficial ulcers with white centers and red borders appear, heal at one site, but then form at other sites. The cause is unknown, and healing generally occurs spontaneously within 10 days to two weeks. Aphthous stomatitis is most common in young girls and female teenagers. Its cause is unknown, but stress, fatigue, anxiety and fever predispose its development. Treatment is geared to symptom relief through the use of a topical anesthetic and reduction of predisposing factors.5

Miscellaneous infections

- Candidiasis (thrush): Fungal infection that causes cream or bluish-white patches of exudates to appear on the tongue, mouth, and/or pharynx. Persons at high risk include premature neonates, older adults, those with suppressed immune systems, persons taking antibiotics, or persons taking steroids for a long period of time. For infants, the oral mucosa is swabbed with nystatin after feedings because feedings wash away the medication. The mother should also be treated to avoid passing the infection back and forth. Older children and adults swish nystatin solutions around the
Gingivitis: Inflammation of the gums. This condition can be an early warning sign of diabetes, blood dyscrasias and lack of vitamins. Gingivitis is occasionally due to the use of hormonal contraceptives. More often, it is due to poor oral hygiene, poorly fitting dentures or other irritants. Signs include redness, painless swelling, bleeding and evidence of gum detachment from teeth. Treatment includes elimination of triggering factors (e.g., improving the fit of dentures), regular dental check-ups, and good oral hygiene. Sometimes oral or topical corticosteroids are recommended.5

Glossitis: Inflammation of the tongue. It can be due to bacterial infection, irritation or injury, or a lack of vitamin B. Spicy foods, smoking and alcohol intake may also promote its development. The tongue becomes red, ulcerated or swollen to the point that the airway is obstructed. Swallowing is difficult and painful, as is chewing. Speech becomes impaired. Treatment focuses on eliminating the underlying cause. Regular dental checkups are important, and good oral hygiene should be encouraged.5

Cancer of the oral cavity
Cheri is a 45-year-old manager of an exclusive, upscale women’s boutique. She attends many social events related to business and drinks about two to three glasses of wine per day. Cheri smokes about half a pack of cigarettes per day as well. About a month ago, she noticed a painless white patch about 1 cm in diameter on the inside of her left cheek. Since it wasn’t causing any discomfort, Cheri dismissed it as “unimportant.” However, today she visited her dentist for her regular six-month check-up. He expressed concern and recommended that she have her family doctor evaluate the white patch. A biopsy showed that Cheri has oral cancer.

Cheri’s story is not uncommon. Nearly 36,000 Americans are diagnosed with oral or pharyngeal cancer every year. Of these 36,000 people, only a little more than half of them will still be alive in five years. About 8,000 Americans die from oral cancer every year. In fact, the death rate for oral cancer is greater than that of cancers that receive much more publicity, such as cervical cancer, Hodgkin’s lymphoma, skin cancer and thyroid cancer. Sadly, the high death rate is not because oral cancer is difficult to diagnosis, but because it is so often identified in its later stages.13

The risk factors for the development of oral cancer include:10,12,13
- Use of tobacco products.
- Frequent alcohol ingestion.
- Exposure to natural or artificial (e.g., tanning beds) sunlight over long periods of time.
- Infection with human papilloma virus (HPV). (Infection has been linked to some oral cancers.)
- Low intake of fruits and vegetables.
- Race: Oral cancer affects twice as many African-Americans as white Americans.

Historically, oral cancer occurred much more frequently in men, affecting six men for every woman. Today, however, the ratio has decreased to two men for every woman. It is believed that this is due to an increase in the number of women who smoke.13

Disorders of the esophagus
The esophagus is a muscular tube about 10 to 13 inches in length and about ¼-inch wide in adults. It connects the pharynx to the stomach and is composed of several layers. One layer is a thick muscular band that contracts rhythmically to propel food to the stomach. The lower esophageal sphincter (LES), located at the bottom of the esophagus, prevents the reflux of stomach contents back into the stomach.4
Esophageal cancer

Esophageal cancer is an aggressive malignancy with a high mortality rate. Esophageal cancer is responsible for 1.5 percent to 2 percent of all cancers diagnosed in the United States, and is the sixth leading cause of deaths caused by cancer throughout the world. Survival at five years is only about 16 percent. It is estimated that more than 16,000 new cases of esophageal cancer will be diagnosed annually.²

There are two main types of esophageal cancer: squamous cell carcinoma and adenocarcinoma.

Squamous cell esophageal cancer is the more common. However, there have been some recent changes in the incidence of the two main types of esophageal cancer. At one time, squamous cell carcinoma accounted for more than 90 percent of esophageal cancers. More recent statistics show that the number of adenocarcinomas is increasing drastically in the United States.⁴,⁵

Lee is a 55-year-old gentleman who arrived in the United States from Asia about 20 years ago. He is a heavy cigarette smoker and retains some of the dietary habits from his native land. His wife tells him that his voice is “different” and hoarse. Lee comments that he is having difficulty swallowing. These symptoms began several months ago and have become gradually, but steadily worse. Lee decides to visit his doctor, who suspects an esophageal disorder. A biopsy of esophageal tissue confirms suspicions of a malignancy.

Esophageal carcinoma is more common in men older than 50, and the risk increases with age. Almost half of all people diagnosed with esophageal cancer are older than 70. This type of cancer is about three and one-half times more common in men than in women, and its incidence is highest in African-American men.⁴ Esophageal cancer is most common in Japan, China, the Middle East and parts of South Africa. In the United States, the disease affects less than five in 100,000 people.⁵

The major risk factors for the development of esophageal squamous cell carcinoma are cigarette smoking and chronic heavy alcohol consumption. In Asian countries, certain dietary habits, such as chewing betel nuts and eating pickled vegetables, are associated with its development.⁴,⁵

Nursing alert! Recent research indicates that there may be a connection between certain types of human papilloma virus (HPV) and squamous cell esophageal cancer. More research is needed to validate this indication.⁴

Risk of the development of adenocarcinoma of the esophagus is associated with obesity and gastroesophageal reflux disease (GERD). A patient who suffers from GERD, uses tobacco and is obese is at even greater risk as a result of this combination of factors.⁴

Nursing alert! Chronic GERD can lead to Barrett’s esophagus, a condition in which normal squamous cells of the esophagus are replaced with glandular cells. Barrett’s esophagus puts a patient at high risk for adenocarcinoma of the esophagus.⁴

Signs and symptoms of esophageal cancer are not particularly distinctive initially. Dysphagia and weight loss are the most common early symptoms. The dysphagia is mild and intermittent at first, but quickly becomes constant. Additional signs and symptoms include chest pain, hoarseness, coughing and the feeling that something is caught in the throat or chest.⁴,⁵

Unfortunately, there are no specific screening guidelines for esophageal cancer. Patients at significantly high risk, such as persons who have Barrett’s esophagus, often have periodic examination via upper endoscopy.⁴

Diagnosis is confirmed via endoscopic examination of the esophagus (esophagogastroduodenoscopy), punch and brush biopsies of suspicious areas, and exfoliative cytologic tests. Magnetic resonance imaging (MRI) of the chest and thoracic region and CT scans are used to help determine disease staging. Unfortunately, the majority of cases are diagnosed at Stage III or Stage IV involving tumors that invade the outermost layer of the esophagus and regional lymph node involvement. Sites of metastasis are most often the liver, lung, stomach, kidney, bone and brain.⁴,⁵

Treatment usually involves a combination of surgery and chemotherapy. Surgical removal of the affected areas of the esophagus and part of the stomach is usually indicated. Efforts are made to maintain a passageway for food by connecting the upper part of the esophagus to the remaining part of the stomach, thus pulling the stomach up into the chest area. If this is not possible, it may be necessary for the patient to have a feeding gastrostomy.⁴,⁵

After surgery, the patient will have chest tubes, a nasogastric (NG) tube, intravenous therapy, an indwelling urinary catheter and supplemental oxygen as needed. The NG tube will remain in place for about five to seven days after surgery. It is used for decompression to facilitate healing of the anastomosis between the stomach and the esophagus.⁴,⁵

Because esophageal surgery involves the pericardium area, there is an increased risk for cardiac arrhythmias post-operatively. Cardiac status must be meticulously monitored.⁴

Chemotherapy may also be part of the treatment regimen. Current research indicates that chemotherapy in combination with radiation therapy improves outcomes, although chemotherapy may be used alone. Usual chemotherapeutic agents are 5-fluorouracil or cisplatin.⁴,⁵

Radiation therapy in conjunction with chemotherapy may be used when surgery is not an option because of the patient’s refusal to undergo surgery or because the patient’s general health is so poor that he is not able to tolerate surgery. Radiation may also be used as a palliative measure in advanced cases of esophageal cancer. There are a number of adverse occurrences associated with external beam radiation to the esophagus. Fatigue and skin breakdown are among the most common. Other side effects from radiation may include:

- Potential damage to the heart, lungs and spinal cord.
- Esophageal or inflammation of the esophagus. This can adversely affect swallowing, making it difficult for the patient to eat. He may need nutritional supplements if he is not able to maintain adequate nutrient intake.
- Esophageal fistula formation. Tissue breakdown from radiation may cause an opening between the esophagus and areas adjacent to it. GI contents leak out of the opening, which can cause serious infection or injury. For example, a fistula to the lung can cause GI contents to move into the lung, and may be fatal.
- Formation of esophageal strictures. Such strictures can be a late radiation side effect. If there is tissue stenosis of the esophagus, the subsequent shrinkage makes it difficult for the patient to swallow. Esophageal dilation may be necessary (on more than one occasion) to maintain a patent esophagus.

The effects of surgery, radiation, and chemotherapy make patients particularly susceptible to compromised nutritional status. Patients must be closely monitored for nutritional problems, including:

- Food aspiration: Make sure that the patient is in Fowler’s position for meals. He should be encouraged to eat slowly to reduce the possibility of aspiration. Some food regurgitation is likely, so his mouth should be cleaned after each meal.
- Dumping syndrome: A disorder that most patients who have undergone surgery experience to some extent. Dumping syndrome occurs when undigested food rapidly leaves the stomach and moves into the small intestine. Dumping syndrome causes nausea, cramps, tachycardia and light-headedness. It is believed that the
Delayed gastric emptying: In contrast to dumping syndrome, sometimes food moves too slowly through the GI tract after surgery. Because the patient’s stomach is now in the chest area that already contains other organs, food may back up from this crowded space.

- Reflux of gastric contents: Patients who have had surgery for esophageal cancer have had the esophageal sphincter removed, making reflux a fairly common problem. Patients should not eat close to bedtime. They should elevate the head of the bed or sleep on several pillows. Medications that function as proton pump inhibitors (e.g., Nexium) may help to control symptoms of reflux.

Patients and families need significant emotional support as well as assistance with the patient’s physical needs. Prognosis is generally not good, and, as the disease progresses, information about home health assistance or hospice may be needed. Organizations that may be of help include the American Cancer Society (www.cancer.org), 1-800-227-2345 and the Esophageal Cancer Awareness Association (www.ecaware.org), 1-800-601-0613.

Mallory-Weiss syndrome

Mallory-Weiss syndrome is characterized by esophageal bleeding from a mucosal tear in the esophagus as the result of forceful vomiting or retching. Although such bleeding usually occurs after multiple episodes of vomiting or retching, it can happen after only a single episode.

Mallory-Weiss syndrome is responsible for about 1 percent to 15 percent of all episodes of upper gastrointestinal bleeding in adults in the United States. It is far less common in children, accounting for less than 5 percent of all upper GI bleeding episodes. Mallory-Weiss syndrome is two to four times more common in men than in women.

Factors that predispose persons to this syndrome include:

- Ulcers.
- Infectious gastroenteritis.
- Pregnancy.
- Hepatitis.
- Cirrhosis.
- Gall bladder disease.
- Renal disease.

The onset of Mallory-Weiss syndrome usually begins with vomiting blood or passing copious amounts of blood through the rectum a few hours to several days following forceful vomiting. The bleeding may range in amounts from mild to massive. Excessive bleeding is more likely to occur when the esophageal tear is near the cardia and may swiftly lead to death.

Treatment depends on the severity of blood loss. Bleeding usually stops spontaneously and simply requires supportive care and monitoring. However, severe blood loss or blood loss that is continuous may require:

- Blood transfusions.
- Administration of proton pump inhibitors or histamine-2 receptor antagonists.
- Administration of vasoconstrictors to decrease blood flow in the esophagus.
- Application of esophageal clips at the site of active bleeding.

Patients and families should be helped to identify predisposing factors and how to avoid them. A careful health history should be taken with careful analysis of dietary habits, medications taken and alcohol intake. Patients should avoid aspirin products and alcohol.

Esophageal diverticula

Esophageal diverticula are out-pouchings or sacs of one or more layers of the esophagus. Although they can occur in infants and children, they are generally a problem later in life and are more common in men than in women.

Esophageal diverticula are the result of muscular abnormalities caused by congenital or inflammatory processes. There are three main types of esophageal diverticula:

1. **Zenker’s diverticulum**: Occurs near the upper esophageal sphincter and is the most common of the three types.
2. **Traction or mid-esophageal diverticulum**: Occurs near the midpoint of the esophagus.
3. **Epiphrenic diverticulum**: Occurs just above the lower esophageal sphincter.

Zenker’s diverticulum produces throat irritation followed by dysphagia and nearly complete obstruction. Food regurgitation is common and may even lead to aspiration of food and resulting pulmonary infections.

Treatment measures include a bland diet, teaching the patient to chew his food thoroughly and eat slowly, and to drink water after eating to “flush out” the out-pouchings or sacs.

**Nursing alert!** Severe symptoms or a large Zenker’s diverticulum may require surgery to remove the sac.

A mid-esophageal diverticulum, which seldom produces symptoms except for occasional dysphagia and heartburn, requires intervention only if there is risk of diverticulum rupture. Interventions include administration of antacids and measures to prevent reflux such as sitting upright for two hours after eating, eating small meals, avoiding tight clothing, and controlling chronic cough.

Epiphrenic diverticulum is generally accompanied by some type of motor disorder, such as spasm. It is necessary to treat the underlying cause. For example, medications may be administered to control spasms. Surgical excision of the diverticulum may be required in cases of severe pain or dysphagia.

Gastroesophageal reflux disease (GERD), often referred to as “heartburn,” is the backflow of gastric and/or duodenal contents into the esophagus past the lower esophageal sphincter (LES). This backflow is not accompanied by belching or vomiting. Many people, even health care professionals, sometimes dismiss “heartburn” as a minor annoyance. However, ongoing reflux may cause inflammation of the esophageal mucosa and complications such as esophageal ulcers, strictures, or Barrett’s esophagus. It is important that all reports of “heartburn” be carefully evaluated.
Incidence

Data show that 25 percent to 40 percent of Americans report symptoms of GERD at some time in their lives, and 7 percent to 10 percent report that they experience symptoms every day. It may be that the actual percentage is even higher because a significant number of people may be self-medicating with over-the-counter preparations and never report their symptoms. GERD tends to be chronic, and relapse is common. Thus many patients require long-term medication maintenance therapy. 

Pathophysiology/etiology

Under normal conditions, the LES sustains enough pressure around the lower end of the esophagus to close it, thus preventing reflux of gastric and/or duodenal contents. The sphincter relaxes after every swallow to permit food to pass into the stomach. In GERD, the sphincter does not remain closed. This is generally due to inadequate LES pressure or if pressure in the stomach propels gastric contents into the esophagus. Stomach contents are very acidic, thus causing pain and irritation when they move into the esophagus. The esophageal mucosa becomes inflamed, which can decrease LES pressure more and more until there is a recurrent cycle of reflux and heartburn.

Risk factors

There are a number of factors that predispose the development of GERD. These include: Pyloric surgery. Nasogastric (NG) tube intubation for more than four days. Hiatal hernia. Conditions that increase abdominal pressure, such as pregnancy, obesity, persistent vomiting or coughing. Medications such as calcium channel blockers, morphine, diazepam, anticholinergics and meperidine.

Signs and symptoms

The most common presenting symptom of GERD is burning pain in the epigastric area, commonly referred to as “heartburn.” The pain may radiate to the arms and chest and even to the neck and jaw. Some patients may think that they are having a heart attack. The pain often occurs after a meal or when lying down. Patients may complain of feelings of fluid accumulation in the throat. A chronic cough may develop as a result of the reflux of gastric contents into the throat. There may also be hoarseness upon awakening in the morning.

Diagnosis

Diagnostic tests focus on identifying the underlying cause of GERD. In addition to a careful history and physical, a number of specific tests are conducted. Esophageal acidity test: Assesses the competence of the LES and measures reflux. Acid perfusion test: Determines whether reflux is the cause of the problem and distinguishes it from cardiac problems. Esophagoscopy: Used to evaluate the extent of the disease and identify pathologic changes. Barium swallow: Used to identify hiatal hernia as a causative factor or esophageal stricture as a complication of GERD. Upper GI series: Used to identify the presence of a hiatal hernia or motility problems.

Treatment

Treatment goals are:

Weight: Obesity increases abdominal pressure, which pushes gastric contents up into the esophagus. Even a moderate weight loss can help reduce symptoms.

Smoking: Nicotine not only relaxes the esophageal sphincter, it promotes the production of gastric acid. Smoking irritates the esophagus and can reduce the effectiveness of digestion by decreasing gastric motility.

Alcohol use: Alcohol increases gastric acid production and decreases LES pressure.

Stress: Stress itself does not cause GERD. However, stress can cause individuals to drink, smoke or overeat, which can trigger GERD symptoms.

Symptom control focuses primarily on lifestyle modifications.

Dietary habits: Avoid foods that trigger GERD symptoms, such as caffeine products, chocolate, spicy food, carbonated beverages, orange juice, alcohol, onions, fatty foods, tomato juice and tomato sauce. Avoid eating large meals, which put pressure on the LES. It is better to eat small frequent meals rather than three large meals.

Positioning: Patients should not lie down for two hours after eating. Sleep with the head of the bed raised six to eight inches. A flat position puts pressure on the LES.
Lifestyle modifications can promote healing of the esophagus and control symptoms. Many patients, however, also take medications for the treatment of GERD. These include:

- Antacids that neutralize acidic gastric contents.9
- Foaming agents (such as Gaviscon) that prevent reflux.9
- H2 blockers that reduce the amount of gastric acid production.1,9 Nursing alert! H2 blockers eliminate symptoms in about 50 percent of patients, but remission is maintained in only about 25 percent of patients.1
- Protein pump inhibitors (PPIs) limit gastric acid secretion and maintenance of healed erosive esophagitis, and
- H2 blockers eliminate symptoms in about 50 percent of patients, but remission is maintained in only about 25 percent of patients.1
- Protein pump inhibitors (PPIs) limit gastric acid secretion and facilitate rapid resolution of symptoms and esophageal healing in 80-90 percent of patients. Examples of fairly recently approved PPIs include Prilosec, Nexium and Kapidex.9,16,17 Kapidex, for example, is a delayed-release capsule taken once a day orally for the treatment of heartburn associated with symptomatic, nonerosive GERD, the healing of erosive esophagitis, and
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Within the last several years, the U.S. Food and Drug Administration (FDA) has approved some new devices for the treatment of GERD. These include:9

- Bard EndoCinch system: An endoscopic device that puts stitches in the LES to make it stronger. This device is inserted for chronic GERD.
- Stretta system: Electrodes make tiny cuts on the LES via an endoscopic device. As the cuts heal, resulting scar tissue makes the LES stronger.
- Enteryx: A solution that is injected during an endoscopy. It becomes “spongy” to support the LES and prevent reflux. This procedure is approved for patients with GERD who respond to proton pump inhibitors.

Patient education is very important to the control of GERD symptoms and its treatment. Some important teaching topics include the following:1,9

- Positioning: Teach patients to sit upright and avoid lying down for two hour after eating. Patients should sleep with their heads elevated at least six to eight inches. Teach them that flat positions place increased pressure on the LES.
- Clothing: Patients need to avoid constricting clothing, such as tight belts, girdles and other types of garments that cinch the waist.
- Weight: A weight-loss program may be indicated. Extra weight increases abdominal pressure that pushes stomach contents up into the esophagus. Patients should not simply be told to lose weight. They should have a dietary consult and, as appropriate, be placed on a medically supervised weight loss program.
- Diet: It may be helpful to initiate a dietary consult for patients with GERD. Patients should be counseled to eat small, frequent meals rather than three large meals and to avoid eating before going to bed. Foods such as caffeine, chocolate, spicy foods, citrus juices, tomato sauce and alcohol all stimulate gastric acid production and should be consumed in very limited quantities.
- Smoking: Nicotine products stimulate gastric acid production, relax the esophageal sphincter and reduce digestion effectiveness. Patients should be referred to smoking cessation programs. Many patients need the help and support of organized programs to stop using nicotine products.
- Medication: Patients need to be taught about the medications they take, the importance of taking them, and any medication side effects that may occur.

In addition to helping patients adhere to their treatment regimen, nurses must be alert, and teach their patients to be alert, to the possibility of developing a potentially fatal disease closely associated with GERD: Barrett’s esophagus.

Barrett’s esophagus is a disorder characterized by the replacement of “normal” tissue that lines the esophagus with tissue similar to the lining of the intestine. This is referred to as intestinal metaplasia. Barrett’s esophagus does not produce signs or symptoms. Its cause is unknown, but it is often found in persons with GERD. The disorder affects about 1 percent of adults in the United States. It affects men about twice as often as women, and Caucasian men are diagnosed more often than men of other races.11

It is estimated that about 10 percent to 15 percent of patients with chronic GERD symptoms develop Barrett’s esophagus. Because there are no specific signs and symptoms, physicians may recommend that patients over the age of 40 who have a lengthy history of GERD be screened for Barrett’s.11

Why is such a recommendation made for a disorder that causes no signs or symptoms? The answer is that a small percentage (less than 1 percent annually) of patients with Barrett’s esophagus develop a rare, often deadly form of cancer called esophageal adenocarcinoma. Because of the lack of symptoms, this cancer is often not detected until it is in an advanced stage.11

Barrett’s esophagus is diagnosed via an upper endoscopy and biopsy. After insertion of the endoscopic tube, the physician can inspect the lining of the esophagus and note the presence of abnormal lining. However, a biopsy of the lining of the esophagus is necessary to confirm the presence of a malignancy.11

There are several treatment options for Barrett’s esophagus with severe dysplasia or malignancy. The focus of these options is destroying or removing the section of the lining that has dysplasia or is cancerous. Two endoscopic therapies may be used to treat Barrett’s esophagus under these conditions.

- Photodynamic therapy (PDT): Photofrin (a light-sensitizing agent) and a laser are used to kill precancerous and cancerous cells. Photofrin is injected into a vein. Forty-eight hours later, the laser light is passed through an endoscope and the Photofrin is activated, thus destroying the affected tissue of the esophagus.11
- Endoscopic mucosal resection (EMR): During an EMR, the Barrett’s lining is lifted up and a solution is injected under it, or suction is applied to it. Then the affected lining is incised and removed through the endoscope. Complications can include bleeding or tearing of the esophagus. EMR may be performed in conjunction with PDT.11

Surgical removal of the majority of the esophagus may be recommended in cases of severe dysplasia or malignancy. The surgery is extensive, and older or debilitated patients may not be able to tolerate it. Surgery may, however, offer the best hope of a cure. Surgery generally involves removal of most of the esophagus and pulling a portion of the stomach up into the chest and attaching it to the remainder of the esophagus.11

Research into the cause and treatment of Barrett’s esophagus is necessary. The National Institute for Diabetes and Digestive and Kidney Diseases (http://www2.niddk.nih.gov) and the National Cancer Institute (www.cancer.gov) are involved with such research. For information about current research projects visit www.ClinicalTrials.gov.11
The word hernia refers to a condition that exists when an internal body part moves or “pushes” into anywhere it does not actually belong. Hiatal hernia, also referred to as hiatus hernia, is a deficiency or defect in the diaphragm that allows part of the stomach to pass through the opening in the diaphragm into the chest.

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### Etiology

Hiatal hernia is generally due to muscle weakening that occurs with the aging process. It may also be due to injury, trauma or be secondary to esophageal cancer. Increased abdominal pressure caused by coughing, straining during bowel movements, pregnancy or significant weight gain may also contribute to the development of hiatal hernia.

### Incidence

Hiatal hernia risk increases with age and occurs most often in persons over the age of 40. It occurs more often in women than in men and in persons who smoke and who are overweight.

### Signs and symptoms

A paraesophageal does not usually cause symptoms. It is generally found almost “accidentally” during a barium swallow or similar diagnostic tests. Because the stomach is displaced or stretched, there may be feelings of fullness in the chest or chest pain similar to angina. This type of hernia requires surgical intervention because there is danger of strangulation of the stomach as it becomes caught above the diaphragm.

A sliding hernia that does not produce symptoms does not require treatment. However, if the sliding hernia does produce symptoms, they are usually similar to gastric reflux. Such symptoms include heartburn, chest pain due to reflux of gastric contents, dysphagia, and bleeding.

A potentially severe complication of paraesophageal hernia is severe pain and shock due to incarceration. Incarceration occurs when a portion of the stomach is caught above the diaphragm and can lead to gastric perforation and strangulation and even gangrene of that portion of the stomach. Emergency surgery is necessary if this complication occurs.

### Diagnosis

Diagnosis of hiatal hernia is confirmed via various diagnostic studies. A barium swallow may show a hernia as an outpouching at the lower portion of the esophagus. However, small hernias may be difficult to detect. Endoscopic studies allow the examiner to identify hiatal hernias and other gastroesophageal problems.

### Treatment

Asymptomatic hiatal hernias may not require any treatment. However, sliding hernias may produce symptoms of gastric reflux similar to those of GERD. In this case, treatment focuses on relieving and controlling symptoms through the use of medications, avoiding constrictive clothing, eating small, frequent meals instead of three large ones, and avoiding alcohol, spicy foods, tomato juices, citrus juices and nicotine products. For details about reducing symptoms produced by gastric reflux see the preceding section on GERD.

Surgical intervention is necessary if the hiatal hernia has the potential to become constricted or strangulated. In this case, the hiatal hernia must be “reduced” or put back in its proper place. The surgeon may have to make an incision in the abdomen or thoracic area, but may also be able to repair the hernia by laparoscopic surgery, which is much less invasive and shortens the period of time necessary for recovery.

Laparoscopic surgery involves making about five or six abdominal incisions about five to 10 millimeters in length. Surgical instruments as well as the laparoscope are inserted through the incisions. The surgeon is able to repair the hernia by viewing the internal organs via the laparoscope. Patients are usually able to ambulate the day after surgery, eat a normal diet and resume regular activities within a week. Heavy lifting should be avoided for several weeks.

Nursing alert! There is no complete assurance that the condition will not reoccur, even with surgical intervention.

Because of the possibility of reoccurrence, patients must be taught to recognize the warning signs of the life-threatening complication of hernia strangulation. These signs include severe chest or abdominal pain, nausea and vomiting, or inability to have a bowel movement or pass gas.

### GASTRITIS

Gastritis is a common condition characterized by inflammation of the lining of the stomach. Gastritis may be acute or chronic. In most people, gastritis is not serious. However, some people may develop gastric ulcers and increases the risk for stomach cancer.

### Pathophysiology and etiology

When the stomach’s protective layer is weakened or injured, gastric digestive juices penetrate the stomach and damage and inflame the gastric lining. There are several factors that can damage the stomach’s protective layer and predispose a person to the development of gastritis. Bacterial infection: Helicobacter pylori (H. pylori) is a common cause of chronic gastritis. It is estimated that 50 percent of...
Drug use: Regular use of drugs such as aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen (e.g., Advil) and naproxen (Aleve) can cause both acute and chronic gastritis. Such drugs should not be taken more than is necessary.  

Alcohol use: Alcohol has the potential to irritate and erode the lining of the stomach, increasing the risk of gastritis. Ingesting excessive amounts of alcohol is more often linked to acute gastritis. 

Smoking: Nicotine products irritate gastric lining and can lead to chronic gastritis. 

Older age: The risk of gastritis increases with age because the gastric lining of older adults generally thins with age, and older people are more likely to be infected with H. pylori.

Signs and symptoms of acute gastritis are abrupt in onset and include indigestion, abdominal cramps, nausea, vomiting and hematemesis (bloody vomit). These signs and symptoms can last from a few hours to several days. Chronic gastritis may produce similar signs and symptoms or may cause only mild discomfort such as slight pain or an inability to tolerate fatty or spicy foods. Patients with chronic gastritis may not have any signs or symptoms at all.

Diagnosis

There are several diagnostic tests used to confirm a diagnosis of gastritis.

- Upper gastrointestinal endoscopy: This allows visualization of the stomach lining and removal of tissue samples for biopsy.

Tests for occult blood: Stools and vomitus can be tested for the presence of blood, indicating gastric bleeding.

Blood tests: Hemoglobin and hematocrit levels are assessed to determine whether the patient has developed anemia from gastric bleeding.

Treatment

Treatment focuses on eliminating the cause that triggers the gastritis. Antibiotics are administered to treat bacterial gastritis. Histamine-2 receptor antagonists are given to block gastric secretions. Over-the-counter antacids may be administered to buffer the effects of the acidity of gastric secretions. If antacids do not provide adequate relief, acid blockers such as cimetidine (Tagamet), ranitidine (Zantac) or famotidine (Pepcid) may be prescribed. In the event of severe blood loss, blood replacement may be necessary.

Lifestyle changes may also be helpful in reducing the signs and symptoms of gastritis.

- Diet: Patients should avoid foods that trigger or exacerbate signs and symptoms, such as fatty or spicy foods. Eating small, frequent meals may be better tolerated than three large meals a day. A dietary consult may be helpful in assisting the patient to adopt or maintain a healthy diet.

- Tests for occult blood: Stools and vomitus can be tested for the presence of blood, indicating gastric bleeding.

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Gastroenteritis

A “stomach flu” is prevalent in a small college town. Denise, a 20-year-old college sophomore, develops abdominal cramps, nausea, vomiting and diarrhea, which lasts for about 24 hours. Denise makes a speedy recovery, and is back attending classes within 48 hours of the onset of symptoms.

Denise’s 1-year-old cousin, Jason, also develops similar signs and symptoms. After several hours of vomiting and diarrhea, Jason becomes dehydrated and is taken to the local hospital. He is admitted and given intravenous fluids. Jason recovers quickly and is able to go home the next day.

Denise’s 85-year old grandfather also develops gastrointestinal “flu” symptoms. After experiencing severe vomiting and diarrhea for nearly 24 hours, he becomes severely dehydrated and exhibits confusion and decreasing levels of consciousness. He is rushed to the hospital and is admitted in critical condition.

The preceding examples show that what is often referred to as a mild illness can, in fact, have devastating consequences. Gastroenteritis is generally a self-limiting illness characterized by irritation and inflammation of the stomach and intestines, which produces nausea, vomiting, diarrhea and abdominal cramping. The very young and the very old are especially susceptible to complications of this disease as are people who are in a debilitated state. As shown in the introductory examples, the very young and the elderly can quickly become severely dehydrated and also experience electrolyte
imbalances as a result of vomiting and diarrhea. These populations must be carefully monitored and may require emergency medical intervention to restore fluid and electrolyte balance.\textsuperscript{5,9}

Gastroenteritis, which affects all age groups, is commonly referred to as intestinal flu, traveler’s diarrhea or viral enteritis.\textsuperscript{5} In the United States, the disease ranks second only to the common cold as the leading cause of lost work time due to illness and is actually the fifth leading cause of death in young children.\textsuperscript{5}

### Causes

There are a number of causes of gastroenteritis. Here are some of the most common.

- **Bacteria:** There are several types of bacteria that cause gastroenteritis. Escherichia coli, salmonella and Staphylococcus aureus are common examples. They can cause food poisoning and traveler’s diarrhea (from contaminated food and unclean water).\textsuperscript{5,21}
- **Amebae:** Entamoeba histolytica are one of the most common types of amebae that can cause gastroenteritis.\textsuperscript{7}
- **Viruses:** Viral outbreaks can also cause traveler’s diarrhea and spread rapidly through close contact. In fact, 30-40 percent of cases of gastroenteritis in children are viral in nature.\textsuperscript{21}

### Symptoms

Signs and symptoms of gastroenteritis vary depending on the cause, age and general health of the person affected. Typical symptoms include:\textsuperscript{5,21}

- Low grade fever (less than 100 degrees F).
- Nausea.
- Vomiting.
- Diarrhea.
- Malaise.

The disease is usually self-limiting with complete recovery. However, in severe cases, it may be necessary to seek emergency medical attention. If blood is present in vomit or stool, vomiting or diarrhea lasts more than 48 hours, a fever greater than 101 degrees F is present, the abdomen is swollen, abdominal pain is in the right lower abdominal quadrant or signs of fluid and electrolyte imbalance are present, the patient should seek immediate medical attention.\textsuperscript{21}

**Nursing alert!** Remain alert to the signs and symptoms of dehydration and electrolyte imbalance, especially in children, the elderly and debilitated patients.

Signs and symptoms of dehydration include:\textsuperscript{22}

- Thirst.
- Poor skin turgor.
- Dry skin.
- Fever.
- Dizziness.
- Weakness.

### Treatment

In most cases, treatment is supportive until the signs and symptoms resolve themselves. Patients need rest and nutritional support. Lost fluid and electrolytes can be replaced with broth, ginger ale, ice chips and lemonade as tolerated. Milk and milk products should be avoided because they may exacerbate vomiting and diarrhea.\textsuperscript{1}

Patients and their families should be taught preventive measures to reduce the risk of gastroenteritis. These measures include:\textsuperscript{5,22}

- Encourage frequent hand washing.
- Patients should be taught to avoid touching their eyes, nose and mouth because germs are easily spread via these routes.
- When traveling to foreign countries, teach patients to avoid drinking water or eating raw fruits and vegetables.
- Explain the importance of cooking food thoroughly and refrigerating perishable foods such as dairy products, mayonnaise and cream.

### GASTRIC CANCER

Once the second most common cancer in the world, the rates of gastric or stomach cancer have significantly decreased in most developed countries.\textsuperscript{23} This malignancy affects all races, but there are some unexplained geographic and cultural variations in incidence. There is a higher mortality rate in Japan, Iceland, Chile and Austria. Over the past 25 years, the incidence of gastric cancer in the United States has decreased by 50 percent, and the death rate is one-third what it was 30 years ago.

Incidence is actually one-third of what it was 30 years ago. Incidence in Hispanic native and African-Americans is twice that compared to...
white, and generally higher in men over the age of 40. Gastric cancer is more common in people with type A blood compared to those with type O blood. Prognosis depends on the stage of the disease at diagnosis, but the overall five-year survival rate is about 19 percent. About 50 percent of stomach cancers are located in the pyloric area, but any area may be affected. Gastric cancer travels quickly to regional lymph nodes, liver and lungs.

Causes

The exact cause of gastric cancer is not known. However, a number of factors have been identified that are associated with the disease.

- **Diet**: Diets high in foods that are pickled, smoked or salted seem related to the development of gastric cancer. Red meat, especially if barbecued or cooked “well-done,” is linked to an increased risk of cancer.1,2

- **Smoking**: Smoking is associated with an increased risk for gastric cancer. If smoking is discontinued, the risk decreases.2,3

- **Bacterial infection**: Chronic infection with helicobacter pylori (H pylori) is associated with a significant risk of gastric cancer. It is believed that this infection increases gastric inflammation and predisposes the development of gastric cancer.2,3

- **Previous gastric surgery**: Retropective research studies indicate that previous gastric surgery increases the risk of gastric cancer. It is believed that the surgery changes the normal pH of the stomach, which may cause potentially malignant changes in gastric cells.2,3

- **Genetic predisposition**: It is estimated that about 10 percent of gastric cancers have a genetic link.2,3

- **Alcohol**: Alcohol may cause alterations in gastric cells that ultimately trigger the development of cancer.3

Signs and symptoms

Signs and symptoms are not specific and may indicate a number of other conditions. Early symptoms include chronic dyspepsia (indigestion), heartburn and epigastric discomfort. Later signs and symptoms include weight loss, anorexia, anemia, fatigue and a feeling of fullness after eating. There may also be blood in stools.5

Diagnosis

Because a number of other gastric problems can mimic gastric cancer, it is necessary to confirm the diagnosis via specific diagnostic studies.

- **Esophagogastroduodenoscopy**: Allows visualization of the esophagus, stomach and duodenum (first part of the small intestine). It has a 95 percent diagnostic accuracy, provides a permanent color photographic record of any lesions or suspicious areas, and is the primary way to obtain a tissue specimen for biopsy.2,3

- **Barium x-rays**: These are x-rays of the gastrointestinal tract (GI) and are obtained to show problems such as tumors, filling defects, loss of gastric flexibility and abnormalities in the gastric mucosa.5

- **Gastric acid stimulation test**: Determines whether the stomach is secreting gastric acid properly.3

- **CT scan and/or MRI**: Conducted to view chest, abdomen and pelvis to assess not only local disease but also to identify possible areas of metastasis.2,3

- **Endoscopic ultrasound**: Conducted to assess preoperative tumor stage.2,3

Treatment

Surgery is generally the treatment of choice. The malignant area(s) are removed, and if the surgeon is able to determine clear margins surrounding the cancerous area(s), some of the stomach may be left in place. However, depending on the extent of the disease, it may be necessary to perform a total gastrectomy. The patient who has a partial gastric resection may eventually be able to eat normally. However, the patient who has a total gastrectomy will have a slow recovery and the ability to eat a normal diet is limited. After total gastrectomy, patients must eat small meals for the rest of their lives.5

Nursing alert! Factors that are necessary to vitamin B12 absorption are part of gastric secretions. Life-long replacement vitamin and iron supplements are necessary for patients who have had gastrectomies.5

Various chemotherapy agents may be administered as part of the treatment regimen. Examples of such agents include fluorouracil, paclitaxel and cisplatin. Radiation in combination with chemotherapy may be beneficial.5

In 2009, clinical studies of the breast cancer drug trastuzumab (Herceptin) showed that it improved the survival of patients with advanced gastric cancer. Adding Herceptin to standard chemotherapy helped patients survive longer than patients who received chemotherapy alone.2,3

APENDICITIS

Daniel is a 22-year-old college senior. He and a group of friends are studying for final exams when he begins to complain of pain in the right lower area of his abdomen and nausea. Daniel’s friends are not very sympathetic. One of them comments, “You really overdid it last night! I’ve never seen you drink so much beer at one party!” As their study session progresses, the pain becomes worse and Daniel is doubled over in pain. His friends decide to take him to the campus infirmary. The nurse on duty listens to Daniel’s complaints and finds rebound tenderness over his right lower abdomen. She arranges for Daniel to be immediately transferred to the local hospital. Daniel has appendicitis.

Appendicitis is inflammation of the appendix and is the most common disease that requires emergency surgery. It can occur at any age but has a peak incidence in late teens and early 20s. About 250,000 cases of appendicitis are reported every year.5

Causes

Appendicitis is due to obstruction of the appendiceal lumen (inside of the appendix) that is caused by viral infection, stricture, fecal mass or ingestion of barium.3,9

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Signs and symptoms

Typical signs and symptoms include:

- Abdominal pain that can be localized to the right lower quadrant or generalized over the abdomen. Rebound tenderness is common. Rebound tenderness is elicited when the nurse or physician removes pressure from the abdomen rather than when pressure is applied (as in palpation). In other words, the nurse applies pressure during palpation, and when that pressure is released and pain occurs, rebound tenderness is present.
- Anorexia.

- Nausea or vomiting.
- Low-grade fever.
- Elevated white blood cell count with an increased number of immature cells.

CT scan or abdominal sonography may be used to visualize the appendix. Diagnosis is based on patient history and diagnostic test results.

Nursing alert! Abrupt termination of abdominal pain suggests perforation or infarction of the appendix.5

Treatment

The only treatment for appendicitis is removal of the appendix or appendectomy. Laparoscopic appendectomies reduce recovery time and enhance the speed of recovery.

Nursing alert! An ice bag may be used for pain relief prior to surgery. NEVER apply heat to the right lower abdominal quadrant because heat may cause rupture of the appendix. Never give enemas or laxatives because these may also rupture the appendix.

Peritonitis

Peritonitis is an inflammation of the peritoneum (the membrane that lines the abdominal cavity and covers the internal abdominal organs).

Peritonitis can be acute or chronic and is associated with a 10 percent mortality rate.5

Causes

Under normal conditions, the peritoneum is sterile. Peritonitis occurs when bacteria enter the peritoneum as a result of appendicitis, diverticulitis, peptic ulcer, ulcerative colitis, abdominal cancers, strangulated obstruction or stab wounds.5

Chemical inflammation may also cause peritonitis. Chemical inflammation occurs with events such as perforation of a gastric ulcer or rupture of a fallopian tube. At times, it may be associated with peritoneal dialysis.5

Signs and symptoms

Signs and symptoms of peritonitis include:

- Abrupt, severe and widespread abdominal pain. This pain generally intensifies and localizes in the area of the case (e.g., right lower quadrant with appendicitis) with accompanying rebound tenderness.
- Excessive diaphoresis.
- Weakness.
- Pallor.
- Cold skin.

- Hypotension.
- Tachycardia.
- Fever of 103 degrees F or higher.
- Distention of the abdomen.
- Decreased intestinal motility.
- With accompanying intestinal obstruction, there will be nausea, vomiting and rigidity of the abdomen.

Diagnosis

In addition to patient history, the following are used to identify peritonitis:5,9

- Abdominal x-rays: Reveal distension of the small and large intestine due to gas and edema; if internal organs are perforated, air may be noted underneath the diaphragm.
- Chest x-ray: May reveal elevated diaphragm.
- Blood studies: Reveal leukocytosis.
- Paracentesis: Shows the presence of bacteria, blood, pus or urine.
- Laparotomy: Used to determine the underlying cause of the peritonitis.

Treatment

Prevention of the disorder is obviously desirable. Gastrointestinal inflammatory conditions should be carefully monitored and treatment initiated promptly. Preoperative and postoperative antibiotic therapy (as appropriate) can help to prevent the development of peritonitis.5 However, if peritonitis arises, it is a medical emergency requiring immediate treatment. Antibiotic therapy, dependent upon the organisms causing the infection, is initiated. Patients are not to receive food or drink by mouth. Fluids and electrolytes are administered intravenously.

Supportive measures include administration of analgesics, insertion of a nasogastric (NG) tube for bowel decompression, and if needed, a rectal tube to promote the passage of flatus.5 If peritonitis is due to a perforation (e.g., a perforated fallopian tube) surgery must be performed as soon as possible. The goals of surgery are to remove the contents spilled into the peritoneum from the perforation and to insert drains to facilitate this removal.5

PEPTIC ULCERS

Angela is a 55-year-old breast cancer survivor. She is self-employed as a management consultant. Her job is quite stressful, and she smokes about a pack of cigarettes a day. For the past several months Angela has been experiencing heartburn and indigestion, particularly after meals. She also notices that the discomfort intensifies after drinking orange juice or coffee. She attributes these symptoms to job stress and is self-medicating with antacids. However, because of her previous diagnosis of cancer, she becomes concerned and decides to seek medical help. Her physician orders an upper GI and small bowel series. She suspects that Angela may have a peptic ulcer.
Definition and incidence

Peptic ulcer disease (PUD) is defined as an erosion of the GI mucosa.\(^2\) Peptic ulcers are circumscribed lesions that can develop in the lower esophagus, stomach, pylorus (area of the stomach that “connects” to the small intestine), the duodenum (the first portion of the small intestine that connects to the stomach), or the jejunum (the portion of the small intestine that’s located between the duodenum and the ileum), the lowest portion of the small intestine that connects to the large intestine.\(^3\) Approximately 80 percent of all peptic ulcers are located in the duodenum.\(^3\) Peptic ulcers can have serious, even fatal, consequences. In the United States, an estimated 14.5 million people have been diagnosed as having PUD, with about 1.6 million people developing the disease every year.\(^2\) This disease kills an estimated 4,000 and disables about 328,000 annually.\(^2\)

Gastric ulcers develop most often in middle-aged and elderly men, particularly those who are chronic users of nonsteroidal anti-inflammatory drugs (NSAIDs), alcohol or tobacco.\(^5\)

Pathophysiology

Under normal circumstances, a thick layer of mucus protects the stomach from chemical trauma, mechanical trauma and autodigestion. This mucus acts as a barrier that prevents harmful effects of gastric acid and digestive enzymes. Prostaglandins also provide a measure of gastric protection. When the gastric mucosal barrier is damaged or destroyed, gastric ulcers can develop.\(^2\)\(^9\)

Causes

There are three main causes of PUD.

1. **Infection with Helicobacter pylori (H. pylori):** These bacteria are present in the gastric mucosa of about 20 percent of Americans under the age of 40 and in about 50 percent of Americans over 60 years of age. Since most people with H. pylori do not develop gastric ulcers, additional (at this time unknown) factors must influence their development. In susceptible persons, the bacteria contribute to the breakdown of the gastric mucosal barrier and facilitate ulcer development.\(^2\)

2. **The use of NSAIDs:** These drugs facilitate the formation of ulcers by interfering with the secretion of prostaglandins, which provide some measure of protection of the gastric lining.\(^3\)

3. **Effects of certain illnesses:** Certain illnesses are associated with the development of PUD. These include pancreatitis, hepatic disease, Crohn’s disease, pre-existing gastritis and Zollinger-Ellison syndrome (increased gastrin production from non-beta islet cell tumors of the pancreas).\(^5\)

There are also a number of predisposing factors for PUD.

- Blood type is associated with specific types of ulcers. Gastric ulcers tend to develop in persons with type A blood, while duodenal ulcers tend to develop in persons with type O blood.\(^5\)
- Physical trauma, emotional stress and the normal processes of aging are also contributory factors.\(^5\)
- Irritants such as alcohol, coffee and tobacco may increase the risk of ulcer development by accelerating gastric acid emptying that facilitates mucosal barrier breakdown.\(^2\)\(^5\)

Signs and symptoms

A gastric ulcer attack usually begins with heartburn and indigestion. Eating may both cause and relieve pain. For example, eating causes the gastric wall to expand and may cause pain as the affected area stretches. If eating causes pain, there may be weight loss. In severe cases, there may be significant GI bleeding.\(^2\)\(^5\)

Duodenal ulcers also cause heartburn and localized mid-epigastric pain. Eating relieves this pain. Weight gain is likely because patients eat to diminish the pain. An unusual sensation of hot water bubbling in the back of the throat is characteristic of duodenal ulcers.\(^5\)

Duodenal ulcer attacks usually take place about two hours after meals or whenever the stomach is empty. Attacks may also occur after ingesting orange juice, aspirin or alcohol. Such attacks occur several times a year, then diminish into remission.\(^3\)

Complications

**Nursing alert!** Ulcers can penetrate the pancreas and cause serious back pain. Perforation of the ulcer may occur, causing abrupt, severe pain, a rigid abdomen, grunting respirations and diminished bowel sounds.\(^2\) Patients should seek immediate medical help if these symptoms develop.

Ulcers may cause significant bleeding that can lead to hypovolemic shock. Bloody vomitus or stools, low hemoglobin and hematocrit levels, tachycardia and hypotension may signal this serious complication. Patients need emergency medical intervention for severe hemorrhage.\(^2\)\(^5\)

Gastric dumping syndrome is also a potential complication of PUD. Dumping syndrome is characterized by abdominal distension, nausea and vomiting. If an ulcer is close to the pylorus, the mucosa can become inflamed and edematous, eventually blocking passage into the small intestine. This causes stomach distension. As secretions build up in the stomach there is bloating, indigestion, nausea, vomiting, feelings of fullness and abdominal pain. Dumping syndrome is managed by inserting an NG tube to withdraw accumulated gastric secretions and decompress the stomach. As measures are taken to heal the ulcer that causes dumping syndrome, the blockage is decreased or eliminated and normal passage from the stomach to the small intestine is restored.\(^5\)

Diagnosis

Diagnosis is made by taking a careful patient history and evaluating the findings of certain diagnostic tests.

- **Esophagogastroduodenoscopy:** Verifies the existence of an ulcer and allows biopsy to rule out cancer or H. pylori.\(^5\)
- **Barium swallow, upper GI series, and small bowel series:** Verifies the presence of an ulcer. This is most likely the first test(s) performed if signs and symptoms are not severe.\(^5\)
- **Hemoccult test:** Laboratory analysis of a stool specimen is conducted to detect the presence of occult blood in stools.\(^1\)
- **White blood cell count:** Elevated counts indicate infection.\(^2\)
- **Hematocrit and hemoglobin:** Low levels indicate bleeding.\(^2\)
- **H. pylori antibody assay:** A positive finding indicates infection. However, this test cannot indicate how recently the infection occurred.\(^2\)
Treatment

Treatment focuses on destruction of H. pylori and protecting the lining of the stomach. Experts in the treatment of PUD recommend treatment with two antibiotics (e.g., tetracycline, bismuth subsalicylate or metronidazole) to eliminate H. pylori. Additional treatment measures to heal and protect the lining of the stomach include:

- Administration of proton gastric acid pump inhibitors to decrease secretion of gastric acid.
- Administration of a prostaglandin analog such as misoprostol to inhibit the secretion of gastric acid and increase mucus production in order to protect the lining of the stomach.
- Administration of histamine-2 blockers to reduce gastric acid secretion and anticholinergics to inhibit the action of acid-secreting cells.

Additional treatment measures for PUD include:

- Administration of blood products if extensive GI bleeding occurs.
- Avoidance of caffeine, alcohol, nicotine products and other items that encourage the secretion of gastric acid and irritate the lining of the stomach.
- Avoidance of NSAIDs because they irritate the lining of the stomach.
- Avoidance of stressful situations that may predispose ulcer development.

Nursing alert! In the event of severe GI bleeding, emergency measures must be initiated. These include insertion of an NG tube for iced saline lavage, administration of blood products and possibly surgery if perforation is suspected.

Inflammatory Bowel Disease

Ulcerative colitis and Crohn’s disease are both types of inflammatory bowel disease. However, they affect different portions of the GI tract. Differentiating between the two conditions can be problematic in about 10 percent of reported cases. Both are identified as inflammatory bowel disease (IBD), and both are chronic with periods of exacerbation and remission. However, ulcerative colitis is confined to the colon, while Crohn’s disease can affect the entire GI tract. In order to properly diagnose and treat inflammatory bowel disease, it is important to determine the exact nature of the disease affecting the bowel.

Ulcerative colitis

Cathy is 19 years old and attends a prestigious university on a full basketball scholarship. She has begun to experience abdominal cramping and frequent episodes of diarrhea that is bloody and contains large amounts of mucus. She is losing weight and finding it difficult to play her best during basketball games. Cathy attributes her problems to the stress of keeping up with her academic studies and the demanding schedule of practice and big-league games. She tries to hide her condition from her coach and friends but eventually becomes so weak that she faints during a practice session in the gym. Her coach insists that she receive immediate medical attention. After a diagnostic work-up, Cathy is diagnosed as having ulcerative colitis.

Incidence

Ulcerative colitis can occur at any age but occurs primarily in young adults, particularly in women. It is also more common among persons of Jewish ancestry. There may be a genetic component to both types of IBD. It is estimated that about 10 percent to 20 percent of patients with IBD have at least one relative who also has the disease. Although the exact incidence is unknown, research suggests that 10 to 15 out of 100,000 people may be affected by ulcerative colitis. Most patients first experience symptoms as teenagers or young adults. There is a peak between the ages of 15 and 30. However, there is also another peak incidence between the ages of 50 and 70.

Cause

The exact cause of ulcerative colitis is unknown. In addition to possible genetic influences, it is believed that ulcerative colitis development is related to abnormal immune response in the GI tract. This response may be linked to food or bacteria such as Escherichia coli.

Signs and symptoms

Ulcerative colitis is usually a chronic disease with periods of remission and exacerbations. It is characterized by episodes of bloody diarrhea that often contains pus and mucus. Patients may have as many as 10 to 20 bloody stools per day. The disease often causes feelings of a constant need to pass stools (even though the bowel may be empty), accompanied by cramping, pain and straining. These feelings are referred to as tenesmus.

Additional symptoms include:

- Feelings of urgency to pass stools.
- Weight loss related to malabsorption.
- Weakness related to possible anemia and malabsorption.
- Anorexia.
- Nausea.
- Vomiting.

Complications

There are a number of complications associated with ulcerative colitis. These include:

- Hemorrhage.
- Infection.
- Anal fissure or fistula.
- Perirectal abscess.
- Toxic megacolon.
- Coagulation deficit.
Another complication is fulminant colitis. This problem occurs when the lesions associated with ulcerative colitis penetrate the muscle of the bowel. The patient experiences abrupt, violent diarrhea accompanied by rebound tenderness, abdominal pain and toxemia. Fulminant colitis may also trigger toxic megacolon (toxic dilation of the colon) or perforation of the bowel.5

Nursing alert! A diagnosis of ulcerative colitis increases the risk for future development of colorectal cancer.3

Diagnosis
A number of diagnostic tests are used to diagnose ulcerative colitis. These include:

- **Sigmoidoscopy:** Because ulcerative colitis generally develops in the rectum first, sigmoidoscopy may be the first diagnostic procedure performed. Ulcerative colitis shows mucosal friability (inflammation), decreased mucosal detail, mucosal flattening, evidence of pinpoint hemorrhages and thick inflammatory exudates. Biopsy can help to confirm the diagnosis.5,8,9

- **Lab studies:** Ulcerative colitis may cause decreased serum potassium, magnesium and albumin levels; decreased white blood cell count; decreased hemoglobin level; and a prolonged prothrombin time.5,9
- **Stool specimens:** The specimen should be evaluated for the presence of bacteria, parasites and ova. In the case of ulcerative colitis, blood and pus are present but not disease-causing organisms.5,9
- **Colonoscopy:** Colonoscopy is performed to determine the extent of the disease process and to assess strictures and polyps, if present. Biopsy of suspicious areas is performed.5,9
- **Barium enema:** May also be performed to determine the extent of the disease and the presence of complicating factors, such as malignancy.5

Nursing alert! Barium enemas and endoscopies are contraindicated if the patient has active signs and symptoms or indications of complications because these can cause bowel perforation.5,9

Treatment
The primary treatment goals are to control inflammation, reduce signs and symptoms, replace blood loss, replace loss of fluids, electrolytes and other nutrients, and to prevent the development of complications.5

Supportive measures are initiated in an effort to control the disease and avoid surgery.

Sulfasalazine (Azulfidine) is the drug of choice and is administered for its anti-inflammatory and anti-microbial action. Other drugs with these properties include olsalazine, mesalazine and balsalazide. Steroids such as prednisone and hydrocortisone are given to control inflammation, and immunodulators or 5-aminosalicylates may be administered to decrease the frequency of exacerbations. Iron supplements may be used to correct anemia.5,9

Nursing alert! The use of antispasmodics and anti-diarrheal agents may cause toxic megacolon (dangerous dilation of the colon) and are usually contraindicated. Such drugs are used only in those patients with controlled ulcerative colitis but who have frequent, loose stools.5,9

Bedrest, IV fluid replacements and a clear-liquid diet are indicated during acute attacks. Debilitated, dehydrated patients may be given total parenteral nutrition and receive nothing by mouth to rest the intestinal tract, decrease diarrhea and restore fluid and electrolyte balance. Blood transfusions may be necessary for patients who experience significant blood loss.5,8,9

For patients who do not respond to medications and supportive measures, surgery may be necessary. It is estimated that about 25 percent to 35 percent of patients need some type of surgery.5

Special nursing considerations
- Monitor intake and output meticulously. Remain alert to signs of fluid and electrolyte imbalance.8,9
- Monitor lab studies for evidence of electrolyte imbalance and decreased hemoglobin and hematocrit levels.8,9
- Provide good skin care after each bowel movement, gently cleansing the area around the rectum. Help the patient to turn frequently if on bedrest to avoid skin breakdown. Place a sheepskin on the bed or use an air mattress to help avoid compromise of the skin integrity.8,9
- Provide good patient education about care of the ostomy if necessary. Patients need explanations about its care and good emotional support.5,9
- Explain the importance of regular medical follow-up.5,9

There are several surgical options.

- **Proctocolectomy with ileostomy:** The colon, rectum and anus are removed and the end of the small intestine (ileum) is brought through a stoma in the abdominal wall to allow the drainage of intestinal waste products from the body. An external bag is worn over the stoma, which is usually located in the right lower abdomen just below the belt line to the right of the naval.26
- **Restorative proctocolectomy (ileoanal pouch anal anastomosis or IPAA):** Developed about 20 years ago, this procedure eliminates the need for an ostomy bag. The procedure is performed in two parts. The first operation involves removal of the colon and rectum. The anus and anal sphincter muscles are left intact. The ileum is made into a pouch and connected to the anus. A temporary ileostomy is performed to allow the new pouch to heal. In about 10 to 12 weeks (after the pouch has healed), the temporary ileostomy is closed and stool passes through the anus. There are several possible complications that can occur after an IPAA is performed. These include pouchitis (inflammation of the pouch), bowel obstruction and pouch failure, which necessitates removal of the pouch and performing a permanent ileostomy.26
- **Kock pouch or continent ileostomy:** Usually performed prior to the development of the IPAA. It is not considered a good primary operation. A pouch is formed from a small loop of the terminal ileum and a valve from the distal ileum. This results in a stoma located just above the pubic hairline. The pouch is emptied periodically via a catheter that is inserted in the stoma.5,26

CROHN’S DISEASE

Crohn’s disease (also referred to as regional enteritis and granulomatous colitis) is also an IBD. But unlike ulcerative colitis, which is confined to the colon, Crohn’s disease is an inflammation of any portion of the GI tract that usually extends through all layers of the wall of the intestine.8,9

The inflammation associated with Crohn’s disease has a slow, steady progression. Lymph nodes enlarge and hinder lymph flow in the submucosa. Obstruction of lymph flow causes edema, ulceration of the mucosa and the development of fissures and abscesses, sometimes referred to as granulomas.
Nursing alert! The pattern of ulcerations in Crohn’s disease is not continuous (referred to as skipping), compared to the continuous pattern of ulcer lesions found in ulcerative colitis. This is a characteristic that helps to differentiate the two types of IBD.

The lining of the small intestine develops oval shaped elevated patches of lymph follicles called Peyer’s patches. The wall of the bowel thickens, and there is narrowing of the affected areas of the intestine. This narrowing causes intestinal obstruction of varying degrees of seriousness. Loops of the bowel that are inflamed attach to other loops, both diseased and normal. The diseased segments of the bowel become thicker, shorter and narrower.

Incidence

The number of cases of Crohn’s disease has steadily increased over the past 50 years, now affecting seven out of every 100,000 people. It is most common among adults between the ages of 20 to 40. It is less common in blacks and two to three times more common in persons of Jewish ancestry.

Cause

The exact cause of Crohn’s disease is not known. However, a genetic link is suspected. For instance, the disease is sometimes found in identical twins, and 10 percent to 20 percent of patients with the disease have relatives who have been diagnosed with Crohn’s disease. Recent research findings show a mutation in the gene NOD2. The gene is found twice as often in persons with the disease as compared to the population in general. This gene is believed to change the body’s ability to fight bacterial infection. As of this writing, there is no realistic screening method to check for this mutation.

Signs and symptoms

Early symptoms of Crohn’s disease may be mistaken for bowel obstruction or appendicitis. Symptoms include a steady, colic-like pain in the right lower abdomen, cramping and tenderness. Signs include weight loss, diarrhea, bloody stools, steatorrhea (the presence of excessive amounts of fat in stools), and the presence of a palpable mass in the right lower abdominal quadrant.

Complications

Complications associated with Crohn’s disease include:

- Intestinal obstruction.
- Nutritional deficiency.
- Fistula of the anus.
- Perineal abscess.
- A variety of fistulas, including to the bladder, vagina or skin in the area of an old scar.
- Fluid imbalance.
- Peritonitis.

Diagnosis

Diagnosis depends on the patient’s history, physical examination and the findings from various diagnostic studies.

- **Barium enema:** This test shows what is called a “string sign” if Crohn’s disease is present. This sign is caused by segments of stricture separated by portions of normal bowel. The narrowing of the bowel (or strictures) causes the string-like appearance.
- **Stool analysis:** A fecal occult blood test shows small amounts of blood in the stools.
- **Small bowel x-rays:** X-rays show ulceration, stiffening and irregular intestinal mucosa.
- **Blood studies:** An elevated white blood cell count is present, red blood cell analysis may indicate anemia, and there may be decreased levels of potassium, calcium, and magnesium.
- **Sigmoidoscopy and colonoscopy:** These studies may show patchy (discontinuous) areas of inflammation that help to distinguish it from ulcerative colitis, which causes continuous areas of inflammation.

Treatment

Treatment focuses on controlling the inflammatory process of the disease and reducing signs and symptoms. Supportive measures including medications, dietary changes, rest and stress reduction are the first steps taken. Surgery is never a first initiative because it does not provide a cure, and recurrence of symptoms after surgery is common.

Initial measures include:

- Administration of medications such as sulfasalazine to reduce inflammation.
- Administration of immunosuppressants to reduce the response to antigens.
- Administration of infliximab, an anti-tumor necrosis factor agent for disease that does not respond to conventional therapy.
- Administration of anti-diarrheal drugs to suppress diarrhea. Note that such drugs are contraindicated if bowel obstruction is present.
- Administration of an opioid analgesic for the control of both pain and diarrhea.
- Reduction of stress. Patients may need education regarding stress reduction measures.
- Encouragement of adequate rest to facilitate bowel healing.
- Implementation of dietary changes: Foods that are to be eliminated vary from patient to patient. However, foods that are commonly found to be irritating and thus need to be removed from the diet include dairy products, spicy foods, fatty foods, caffeine and carbonated beverages.

Surgery

Medications and supportive measures are the first interventions for patients dealing with Crohn’s disease. Nevertheless, approximately 66 percent to 75 percent of patients with Crohn’s disease eventually require surgical intervention. Surgery is indicated to correct bowel perforation, in the event of massive hemorrhage, fistulas, acute intestinal obstruction, toxic megacolon, or for patients who do not respond to medication and supportive measures.

There are several surgical options for the patient with Crohn’s disease.
• **Strictureplasty**: When the small intestine is the area affected by Crohn’s disease, portions of diseased intestine alternate with portions of normal bowel. The affected areas narrow, forming strictures, which may interfere with the passage of digested food. Pain occurs when normal segments of the intestine “push” against the affected areas in an effort to promote passage of digested food. During strictureplasty, the surgeon makes a lengthwise incision along the affected area(s) and then sutures the incision crosswise. This widens the stricture without removing any part of the small intestine.\(^{27}\)

• **Resection**: In the event of a particularly long stricture or if there are many strictures close to each other, the surgeon may need to remove the affected area of the intestine. The two “ends” of the normal or unaffected intestine are joined together (anastomosis). A resection may provide many years of relief from the symptoms of the disease. Unfortunately, the disease can recur at or close to the site of the anastomosis.\(^{27}\)

• **Colectomy (removal of the colon) or both colon and rectum (proctocolectomy)**: Patients with severe disease that affects the colon may need to have the entire colon removed. If the rectum is unaffected, the surgeon may be able to join the end of the small intestine to the rectum, thus allowing for passage of stool through the rectum. However, if the rectum is affected, and both colon and rectum are removed, the patient requires an ileostomy and must wear an external bag for the collection of body waste.\(^{27}\)

**Nursing alert!** Even if the diseased section of the intestine is surgically removed, the inflammation can reoccur in a previously unaffected segment of the intestine.\(^{27}\) About half of adults who undergo a resection have a recurrence of Crohn’s disease within five years of surgery.\(^{27}\)

**Special nursing considerations**

- Patients need emotional support as they deal with the effects of Crohn’s disease and its chronic nature.\(^{5,9}\)
- Intake and output should be meticulously monitored.\(^{5,9}\)
- Monitor for fluid and electrolyte imbalance.\(^{5,9}\)
- Monitor hemoglobin and hematocrit levels.\(^{5,9}\)
- Promote rest and avoidance of foods that trigger attacks.\(^{5,9}\)
- For patients requiring a resection, arrange for a visit by an enterostomal therapist.\(^{9}\)

**COLORECTAL CANCER**

Colorectal cancer is the third most common cancer in the United States as well as in Europe.\(^{3,5}\) Nearly all colorectal malignancies are adenocarcinomas.\(^{5}\)

Colorectal cancer generally grows slowly and often remains localized for a long period of time. Early diagnosis before involvement of the lymph nodes has about a 90 percent cure rate. The five-year survival rate for persons with adjacent organ or lymph node spread is about 60 percent.\(^{5}\)

Colorectal cancer includes cancers that affect both the colon and the rectum. Colon cancer refers to malignancies that occur below the small intestine and above the last six inches of the GI tract. Rectal cancer refers to malignancies that occur in the last six inches of the GI tract.\(^{3}\)

**Incidence**

More than 130,000 people are diagnosed with colorectal cancer every year in the United States. It causes more than 50,000 deaths annually and is the second-leading cause of cancer death in the United States.\(^{5}\)

**Cause and risk factors**

The exact etiology of colorectal cancer is not known. However, research shows that there is a higher incidence of the disease in areas of higher economic development, which may indicate a relationship to a diet high in saturated animal fat such as found in red meats and processed meats (e.g., hot dogs and processed luncheon meats).\(^{3,5}\)

Additional risk factors include:\(^{3,5}\)

- Cigarette smoking.
- Obesity.
- Sedentary lifestyle.
- Adult-onset diabetes.
- Age (older than 40).
- History of ulcerative colitis.

**Nursing alert!** The average period of time between diagnosis of ulcerative colitis and the development of colorectal cancer is 11 to 17 years.\(^{5}\)

Research indicates that the development of colorectal cancer is linked to alterations in several genes. The majority of colon cancers stem from adenomatous polyps. However, other polyps may become malignant, and it is impossible to say which polyps will become cancerous. Complete removal of all colon polyps dramatically decreases the risk of a polyp causing malignancy.\(^{3}\)

**Signs and symptoms**

Signs and symptoms of colorectal cancer depend on the location and stage of the malignancy. Although disease in its early stages may not cause any signs or symptoms, the following are associated with the disease as it advances.

- **The right (ascending) colon**: Black, tarry stools, anemia due to insidious blood loss (which may be the first sign of colon cancer), abdominal cramps or pressure, vomiting, weakness, fatigue, anorexia and weight loss.\(^{5}\) Stool in the right or ascending colon is liquid, so tumors in this area can actually become very large before blocking stool movement.\(^{3}\)
- **Transverse colon**: Tumors in this area can interfere with the movement of more solid stool and can cause cramps and constipation that last for more than several days.\(^{3}\)
- **The left (descending) colon**: Intestinal obstruction, abdominal distention, pain, vomiting, cramps, rectal pressure, constipation, diarrhea, dark red or bright red blood in stools, and pencil-shaped or ribbon-shaped stools.\(^{9}\)
- **Sigmoid colon**: Passage of bright red blood via the rectum, changes in bowel habits and ribbon-like stools.\(^{3}\)

Signs and symptoms of rectal cancer include:\(^{28}\)

- Diarrhea.
- Constipation.
- Narrow stools (“ribbon” shaped) or a change in the shape of stools.
- Feeling that the bowel isn’t emptying even after bowel movements.
Dark or bright red blood in the stool.
Abdominal cramps, bloating, gas pains.
Changes in appetite.
Weight loss.
Fatigue.

Diagnosis
In addition to a history and physical, a number of diagnostic tests are conducted to identify colorectal cancer.

- **Digital rectal exam (DRE):** DRE is conducted to palpate for any rectal masses. DRE detects nearly 15 percent of colorectal cancers.\(^5,^9\)
- **Fecal occult blood test:** This test is conducted to look for the presence of blood in stools.\(^5,^9\)
- **Scopes:** Proctoscopy, sigmoidoscopy and colonoscopy are performed to visualize tumors, detect polyps, remove polyps and biopsy suspicious tissues and lesions.\(^5,^9\)
- **CT scans:** CT scans are generally conducted to identify areas of metastasis.\(^5,^9\)
- **Barium x-rays:** These x-rays can show the location of lesions that cannot be detected visually or manually.\(^5,^9\)
- **Carcinoembryonic antigen:** This is a blood study used as a tumor marker. It is not specific enough for early diagnosis, but is used to monitor patients before and after treatment.\(^7\)

Treatment
Surgery is the most effective treatment for colorectal cancer. In very early cases, polyp removal and analysis of adjacent tissues to determine whether the disease is localized may be sufficient. Lymph nodes may also be removed to determine whether the cancer has invaded the lymphatic system.\(^5\)

Depending on the extent of the disease, colon resection (removal of parts of the colon) may be necessary. In some cases, a permanent stoma with an external collection device may be necessary.

Metastatic disease or inoperable tumors indicate the need for chemotherapy, such as fluorouracil with leucovorin, irinotecan and oxaliplatin. Monoclonal antibody therapy may be initiated to inhibit the growth of cancer cells. Radiation therapy may be used before or after surgery or in combination with chemotherapy.\(^5\)

ANAL CANCER
Anal cancer is a rather rare cancer that affects the anal canal. About 5,290 new cases of anal cancer were expected to be diagnosed in 2009 in the United States, 3,190 in women and 2,100 in men. It is estimated that 710 people will have died from anal cancer in 2009.\(^29\)

Anal cancer is not colorectal cancer. Unfortunately, many people, including health care professionals, equate anal cancer with colorectal cancer. The rectum is the lowest portion of the colon. The anal canal houses the sphincter that controls the passage of stool from the body.\(^29\)

Anal cancer is closely linked to human papillomavirus (HPV) infection, a sexually transmitted disease. It is believed that HPV is associated with 90 percent to 99 percent of all anal cancers. The infection is most often diagnosed in white females.\(^29\)

Risk factors
A number of factors are linked to an increased risk of anal cancer.\(^29,^30\)

- **HPV infection:** HPV infection increases the risk of a number of cancers, including anal and cervical cancer. HPV can also cause genital warts.
- **Older age:** The majority of reported cases of anal cancer are diagnosed in persons 50 years of age and older.
- **Multiple sexual partners:** Risk of anal cancer is greater in men and women who have multiple sexual partners throughout their lifetimes.
- **Anal sex:** The risk of anal cancer is greater in persons who engage in anal sex.
- **Smoking:** Smoking cigarettes may increase the risk of anal cancer.
- **Immunosuppressant drugs:** Persons who take drugs that weaken the immune system, such as persons who have received organ transplants, may have an increased risk of anal cancer.
- **Corticosteroids:** Long-term use of corticosteroids may also increase the risk of anal cancer.
- **HIV infection:** HIV infection suppresses the immune system and increases the risk of anal cancer.

Signs and symptoms
Signs and symptoms are not specific to anal cancer and may mimic other problems. Signs and symptoms associated with anal cancer include:\(^30\)

- Pain in the anal area.
- Bleeding from the anus or rectum.
- A mass in the anal canal.
- Anal itching.

**Nursing alert!** Some patients may assume that these symptoms are not serious and think that they may be caused by common problems such as hemorrhoids. Therefore, they don’t seek medical help. Encourage patients to always seek medical intervention for their symptoms.\(^30\)

Diagnosis
Diagnosis is made depending on the findings of a history and physical exam and diagnostic tests. A digital rectal exam (DRE) is performed, and an anoscope may be inserted to inspect the anal canal. Ultrasound may also be conducted, and a biopsy of suspicious tissue or masses is performed.\(^30\)
Celiac disease is two-fold disease. It is a disease of malabsorption and an immune reaction to gluten. When gluten is ingested, there is injury to the villi in the upper portion of the small intestine. This leads to a reduction in surface area and malabsorption of most nutrients.

Under normal conditions, villi allow absorption of nutrients from food into the bloodstream. If villi are not healthy, nutrients cannot be absorbed. This causes the patient to become malnourished, no matter how much food is eaten.

Complications of celiac disease include:
- Anemia secondary to malabsorption.
- Syncope, angina and heart failure due to anemia.
- Bleeding disorders due to vitamin K deficiency.
- Intestinal lymphoma.

Celiac disease, which may also be autoimmune in nature, seems to occur in people who have other autoimmune diseases such as:
- Type 1 diabetes mellitus.
- Thyroid disease.
- Addison's disease.
- Rheumatoid arthritis.

Other conditions associated with celiac disease include anemia, lactose intolerance and osteoporosis. Other conditions associated with celiac disease include:
- Anemia due to malabsorption.
- Bone pain due to calcium loss and vitamin D deficiency.
- Osteomalacia, osteoporosis, and bone pain due to calcium and vitamin D deficiency.
- Paresthesia, seizures, peripheral neuropathy.
- Dry skin, eczema, and dermatitis.
- Brittle nails.
- Amenorrhea, hypometabolism and adrenocortical insufficiency.
- Irritability, lethargy, and mood changes.
- Malabsorption effects: Loss of calories, fat-soluble vitamins (A, D, K), calcium, minerals, electrolytes and malabsorption of fat, carbohydrates and protein.
- Musculoskeletal effects: Osteomalacia, osteoporosis, tetany and bone pain due to calcium loss and vitamin D deficiency.
- Neurologic effects: Paresthesia, seizures, peripheral neuropathy.
- Skin effects: Dry skin, eczema, psoriasis, dermatitis, brittle nails.
- Endocrine effects: Amenorrhea, hypometabolism and adrenocortical insufficiency.
- Psychosocial effects: Irritability, lethargy, and mood changes.

Celiac disease is found in people all over the world. More than 2 million people in the United States have celiac disease, which affects one of every 133 people in this country.

Celiac disease affects women and girls twice as often as men and boys. There is a strong genetic association among persons who have the disease. For people who have a first-degree relative (e.g., parent, sibling, or child) with celiac disease, the incidence may be as high as one in 22 people. The disease is found primarily in whites and persons of European ancestry. It is also more common in people with other genetic disorders, such as Down syndrome.

Celiac disease is also referred to as idiopathic steatorrhea, nontropical sprue, gluten enteropathy and celiac sprue, is a disease that damages the small intestine. It is characterized by an inability to properly absorb food and an intolerance of gluten, a protein found in wheat, rye products, rye and barley. Gluten is found in a wide variety of foods but may also be found in everyday items such as vitamins, lip balms and some medicines.

There are a wide variety of signs and symptoms associated with celiac disease. The disease affects people in different ways because of the amount of damage to the small intestine, a person’s age and the length of time the patient has had symptoms without being diagnosed and treated.

- GI effects: Damage to the small intestine may cause cramping, recurrent diarrhea, abdominal distention, weakness and an increase in appetite without weight gain.
- Hematologic effects: Anemia due to malabsorption of folate, iron, and vitamin B12.
- Malabsorption effects: Loss of calories, fat-soluble vitamins (A,D,K), calcium, minerals, electrolytes and malabsorption of fat, carbohydrates and protein.
- Musculoskeletal effects: Osteomalacia, osteoporosis, tetany and bone pain due to calcium loss and vitamin D deficiency.
- Neurologic effects: Paresthesia, seizures, peripheral neuropathy.
- Skin effects: Dry skin, eczema, psoriasis, dermatitis, brittle nails.
- Endocrine effects: Amenorrhea, hypometabolism and adrenocortical insufficiency.
- Psychosocial effects: Irritability, lethargy, and mood changes.
DIVERTICULAR DISEASE

Bradley is a 70-year-old retired nurse. He is active and healthy, and since his retirement, enjoys traveling throughout the United States. On a recent visit to his son in Arizona, he suddenly developed left lower abdominal quadrant pain and bloody diarrhea. Bradley’s son insists on taking him to the emergency room for evaluation. The cause of Bradley’s rectal hemorrhage is determined to be due to diverticulitis.

Diverticula are most found in the sigmoid colon, but can develop anywhere from the proximal end of the pharynx to the anus.5,9 When the pouches become inflamed, it is referred to as diverticulitis. Diverticulitis may cause potentially fatal complications, such as obstruction, infection or hemorrhage. In diverticulosis, diverticulitis exist, but do not cause any symptoms.5,32 Together, diverticulosis and diverticulitis are referred to as diverticular disease.5,32 It is estimated that 10 percent to 25 percent of people with diverticulosis get diverticulitis.22

Meckel’s diverticulum is diverticular disease of the ileum and is the most common congenital anomaly of the GI tract. It is characterized by a “blind tube,” similar to the appendix, that opens into the ileum. It is found in about 2 percent of the population, usually in males. Meckel’s diverticulum, if uncomplicated, is asymptomatic. If complications occur, the patient experiences abdominal pain, usually around the umbilicus, and dark red melena. Complications may lead to peptic ulcer, perforation, peritonitis and bowel obstruction.5

Causes and incidence

Diverticula are most likely due to high pressure exerted on a portion of the GI wall where blood vessels enter. Diet is believed to contribute to the development of diverticulosis because inadequate fiber diminishes fecal residue, narrows the lumen of the bowel and exerts high intra-abdominal pressure during elimination of feces.9 When diverticulitis occurs, undigested food and bacteria build up in the diverticular sac. The food and bacteria become a hard mass that inhibits blood supply to the walls of the sac. This lack of blood makes the sac susceptible to bacterial infection and inflammation. This may lead to perforation, obstruction, peritonitis or hemorrhage. Sometimes the inflamed portion of the colon may adhere to organs such as the bladder, causing a fistula to form.5,9

Diverticulosis is most prevalent in developed or industrialized countries, especially the United States, England and Australia where low-fiber diets are common. Areas where people consume diets high in fiber, such as Asia and Africa, have a rare incidence of the disease.5,5,9,32

High-fiber diets make stools soft and easy to eliminate from the body. Lack of fiber decreases stool bulk and makes stools harder and more difficult to pass from the body. If stools are hard, people strain when eliminating stool during a bowel movement. Straining increases colonic pressure, which may cause the lining of the colon to bulge out through weak areas in the wall of the colon.32

Diverticular disease is most common in men more than 40 years of age and in persons who lack fiber in their diet. Incidence increases with age. However, about 20 percent of patients are younger than 50. About half of older adults develop diverticulosis.5

Complications

There are several potentially lethal complications of diverticular disease that stem from diverticulitis.

- **Rectal hemorrhage:** Rectal hemorrhage due to diverticulitis is relatively uncommon. However, when it does occur, it can cause massive blood loss. It is believed that such bleeding is the result of blood vessel(s) in a diverticulum that weaken and burst. Bleeding can range from minimal to severe, but it may stop by itself without medical intervention. However, some persons experience severe hemorrhage requiring swift medical intervention, blood transfusion and colonoscopy to identify the site and cause of bleeding.5,32 **Nursing alert!** All rectal bleeding, even small amounts, must be medically evaluated as soon as possible. The cause may be self-limiting and minor in nature, or quite serious. Encourage all patients to seek prompt evaluation for rectal bleeding!

- **Fistula:** A fistula, or abnormal opening or connection of tissues between two organs or between organ and the skin, can be a complication of diverticulitis. In the case of infection related to diverticulitis, the infection may travel outside of the colon, causing the tissue of the colon to adhere to nearby tissues. This most often involves tissue of the bladder, small intestine and the skin, with a fistula between the colon and the bladder being the most common. Such a fistula is found in men more frequently than women and can lead to severe urinary tract infections. Surgery may be necessary to remove the fistula and the part of the colon that is affected.32

- **Intestinal obstruction:** Infection may cause significant scarring that may lead to intestinal obstruction. Complete obstruction is a medical emergency requiring immediate surgical intervention.32

Here are some Web sites that persons dealing with celiac disease may find useful.

- American Celiac Disease Alliance
  (www.americanceliac.org).
- American Dietetic Association
  (www.eatright.org).
- Celiac Disease Foundation
  (www.celiac.org).
- Gluten Intolerance Group of North America
  (www.gluten.net).
- National Foundation for Celiac Awareness
  (www.celiaccentral.org).

Nursing alert! Because this is a significant dietary change, patients need dietary consults and excellent patient education. Initially, the diet consists of proteins and is slowly expanded to include other foods.5

Here are some tips for patients as they adapt to their new way of eating, which must continue for the rest of their lives:

- Read all food labels carefully! Many foods contain gluten in varying amounts.5
- Ask pharmacists whether prescribed medications contain wheat or other gluten products.5,32
- Some non-food products, such as lipstick, may contain gluten as an additive. Find out about the contents of any product that can be ingested through the GI tract! If ingredients are not provided on the label or package insert, contact the manufacturer for a product list.5,32
- When eating out, ask the waiter if a gluten-free menu is available.5,32

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- **Intestinal obstruction:** Infection may cause significant scarring that may lead to intestinal obstruction. Complete obstruction is a medical emergency requiring immediate surgical intervention.32
• Abscess: Abscess is a localized infection that can cause swelling and destruction of tissue. A small abscess may be confined to the colon wall and resolve itself with antibiotic treatment. Failure to respond to antibiotics may require an incision and drainage of the abscess.\(^{32}\)

• Perforations and peritonitis: Infected perforations spread infection from the colon to the abdominal cavity causing peritonitis. Symptoms include severe nausea, vomiting, fever, and abdominal tenderness. Peritonitis is a medical emergency requiring surgery to treat the infection and remove the damaged portion of the colon.\(^{32}\)

**Signs and symptoms**

The patient with diverticulosis does not usually have any symptoms. This is generally true until, and if, the patient develops diverticulitis. In that case, symptoms may be listed according to severity of the problem.

• **Mild diverticulitis:** Left lower abdominal quadrant pain, mild nausea, gas, low-grade fever, leukocytosis and irregular bowel habits.\(^{5,9,32}\)

• **Severe diverticulitis:** Diverticular rupture characterized by abdominal rigidity, left-lower abdominal quadrant pain, high fever, chills, hypotension and shock.\(^{5}\)About 20 percent of patients develop diverticular that rupture and cause abscesses or peritonitis.\(^{5}\) Minimal to severe rectal hemorrhage may occur from ruptured diverticular.\(^{9}\)

• **Chronic diverticulitis:** Constipation, ribbon-shaped stools and intermittent diarrhea. Fibrosis and adhesions narrow the lumen of the bowel, which may cause intestinal obstruction. Such obstruction causes abdominal rigidity and pain, vomiting and reduced or absent bowel sounds.\(^{5,9,32}\)

**Diagnosis**

Diagnosis depends on a history and physical exam, including a rectal digital exam. Many times diverticular disease, which often produces no symptoms, is identified during an upper GI series performed as part of a differential diagnosis.\(^{5}\)

An upper GI series can confirm (or rule out) diverticular disease of the esophagus and upper bowel. A barium enema can confirm (or rule out) diverticular disease of the lower bowel.\(^{5}\)

**Treatment**

If diverticulosis does not produce signs or symptoms, treatment is not usually necessary. However, if signs and symptoms are present, treatment depends on their severity. The first step is to increase the amount of fiber in the diet. This may reduce or prevent symptoms and prevent complications such as diverticulitis.\(^{5}\)

Fiber keeps stools soft and lowers the pressure within the colon, thus facilitating movement of feces through the bowel. High-fiber foods include whole-grain cereals and breads, fruits and vegetables. Fiber products (bulk-forming cathartics) such as methylcellulose (Citruce\(l\)) or psyllium (Metamucil) may be recommended by health care providers.\(^{32}\)

Some physicians recommend that patients avoid nuts, popcorn and seed products such as sunflower, pumpkin and sesame seeds. These products may enter, block or aggravate diverticula.\(^{32}\)

Patients with diverticulosis who experience pain, mild GI distress or constipation may be placed on a bland or liquid diet and stool softeners are recommended to help relieve symptoms and minimize the possibility of the development of diverticulitis. After symptoms diminish, high-fiber diets and fiber products may be recommended.\(^{5,9}\)

Patients whose disease progresses to diverticulitis need to take additional measures. Persons experiencing mild diverticulitis without evidence of perforation need to rest their colons. A liquid diet and stool softeners are recommended. Antibiotics may be administered to prevent or control infection.\(^{5,32}\)

If the diverticulitis is severe, a variety of interventions may be necessary, depending on the problems the diverticulitis is causing. The following interventions may be initiated, depending on the signs and symptoms present and the degree of severity of the disease.\(^{5,9,32}\)

• Blood transfusions may be needed in the presence of severe hemorrhage.

• Analgesics are administered to control pain and relax smooth muscles.

• Antispasmodics are administered to manage muscle spasms.

• Surgery: Colon resection may be performed to remove affected segment of the colon.

• Surgery: Temporary colostomy may be performed to drain abscesses and remove infection and give the colon a rest. This procedure may be indicated in the event of obstruction, fistula, perforation or peritonitis.

**Special nursing considerations**

Because diverticular disease is relatively common, especially as people age, nurses should encourage their patients to consume enough dietary fiber. Patients should also be taught to recognize early signs and symptoms of diverticular disease, even though the disease itself is often asymptomatic.

If patients are taking bulk-forming cathartics such as Metamucil, they should be taught to take them with plenty of water. If these agents are not taken with enough liquid, they may absorb moisture in the mouth and throat and swell, thus blocking the esophagus or trachea.\(^{5}\)

**Additional information about diverticular disease may be found on the following Web sites:**

• American College of Gastroenterology (www.acg.gi.org).

• American Gastroenterological Association (www.gastro.org).

• International Foundation for Functional Gastrointestinal Disorders (www.iffgd.org).

**INTUSSUSCEPTION**

Shannon is an experienced pediatric nurse who recently relocated from a large urban area to a small community in another state. After spending many years specializing in pediatrics, Shannon decides to explore a new employment opportunity as a nurse in a large outpatient...
family practice setting where she now cares for adult patients as well as children. On a warm summer afternoon, Mr. Williams arrives for an appointment with his physician and sits uncomfortably in the waiting room. He complains of vomiting, diarrhea and colicky abdominal pain. His pain radiates from the right lower abdominal quadrant to the back and increases after he eats. One of Shannon’s colleagues comments, “I’ll bet he has that awful GI flu that’s going around.” Shannon disagrees and hurries to see Mr. William’s physician. She tells her, “I’ve seen this a lot in infants. It’s really rare in adults, but I think Mr. Williams has an intussusception. He needs to be seen now!”

Intussusception is a serious, potentially fatal condition in which a portion of either the small intestine or the colon moves into another part of the intestine. This movement is referred to as “telescoping” and can cause a blockage of the intestine, thus preventing the passage of food and fluids as well as cutting off the blood supply to the affected portion of the intestine. Fatalities occur most often if treatment is delayed for more than 24 hours.5

When the bowel segment (the intussusception) moves into another part of the intestine, referred to as invagination, it is moved along the intestine via peristalsis. This movement pulls even more bowel along with it. Invagination causes edema, hemorrhage, incarceration and obstruction. If treatment is not initiated within 24 hours, strangulation of the affected areas of the intestine occurs, resulting in shock, perforation and gangrene.5,9

Causes and Incidence

Intussusception is seen most often in infants between the ages of 6 months to 1 year. It is twice as common in male infants compared to female infants. Although it can affect adults, the occurrence of intussusception in adults is rare.5,33

The exact cause of the intussusception is unknown. But because there are seasonal peaks, in the spring-summer time period that coincides with enteritis and in the mid-winter period when respiratory tract infections are prevalent, there may be an association with viral infections.5,33 In children, a malignant or benign growth in the intestine may trigger the problem.5,33

Signs and symptoms

As noted in the scenario that introduced this topic, intussusception can occur in adults as well as children. Because this is a rare occurrence, nurses must be knowledgeable about presenting signs and symptoms in persons of all ages.

Nursing alert! In infants and children there are four primary signs and symptoms of intussusception!5

- The first sign of intussusception in an infant might be abrupt, loud crying. The infants pull their legs up to their abdomens, become pale and diaphoretic, and have grunting respirations. The pain is intermittent, initially occurring at 15- to 20-minute intervals. As time passes, the episodes occur more frequently and last longer.5,33
- Stomach contents are vomited. Patient eventually vomits bile-stained contents or fecal material.5
- The infant’s stools have a “currant-jelly” appearance and contain blood and mucus.5,9

Diagnosis

Barium enema is performed to confirm intussusception. Findings show a characteristic “coiled spring” appearance. Barium enema also shows the extent of intussusception. Additional findings include a palpable abdominal mass as well as the signs and symptoms identified in the preceding section.5,33

Treatment

For children, treatment is generally either hydrostatic reduction or surgery. In adults, however, surgery is always the treatment of choice.5

Hydrostatic reduction involves dripping a barium solution into the rectum from a height of no more than three feet. Fluoroscopy is used to follow the progression of the barium. The goal is to have the barium backwash into the ileum, causing the mass to resolve itself. If this is not accomplished, the patient must have surgery.5

If surgery is necessary, the surgeon first attempts to manually reduce the intussusception by “milking” or stroking the intussusception back through the bowel. If this attempt fails, or if complications such as strangulation, gangrene or perforation are present, a resection of the affected portion of the bowel is performed.5,330

INTESTINAL OBSTRUCTION

Intestinal obstruction is a complication of various GI disorders and diseases. A common condition, it is estimated that at least 1 in 1,000 patients is diagnosed with this condition annually.54

Intestinal obstruction can be partial or complete blockage of the lumen in either the small or large intestine. The site in 90 percent of patients with intestinal obstruction is the small bowel, which is usually more serious than large bowel obstruction. Untreated complete obstruction,
Intestinal obstruction can be classified in three categories: 5
1. **Simple**: Intestinal contents cannot move through the bowel, but there are complications or blood flow alterations.
2. **Strangulated**: Blood supply is cut off to the affected section of bowel. This may be partial or complete.
3. **Close-looped**: both ends of a portion of the bowel are blocked, thus isolating it from the rest of the intestine.

Obstruction of the intestine causes GI secretions, gas and swallowed air to accumulate near the location of the obstruction. Peristalsis increases above and below the obstruction as the bowel tries to force its contents through the blockage. This damages the intestinal mucosa and leads to distention at and above the area of blockage. Distention interferes with venous blood flow and blocks normal absorption. The inability to absorb causes the bowel to secrete water, sodium and potassium into fluids collecting in the lumen. 5,35

Small bowel obstruction leads to metabolic alkalosis due to dehydration and loss of acidic gastric contents (gastric hydrochloric acid). Obstruction in the lower bowel causes a loss in alkaline fluids leading to metabolic acidosis. 5

### Causes

In developed countries, the leading cause of small bowel obstruction is adhesions followed by malignancy, Crohn’s disease and hernias. 5,35 Large bowel obstruction is generally due to malignancy. 5

Mechanical obstruction is due to blockage from foreign objects, such as gallstones or fruit pits; bowel wall compression due to such problems as intussusception; or tumors. Non-mechanical obstruction is due to physiologic alterations such as electrolyte imbalances, the effects of medications that slow peristalsis (e.g., opioids), thrombosis or paralytic ileus. 5,34

Paralytic ileus is a form of small bowel obstruction that develops after abdominal surgery. Paralytic ileus causes a decrease or absence of intestinal motility and usually resolves itself within two to three days. 5

### Signs and symptoms

Signs and symptoms can begin with pain, nausea and vomiting and, if untreated, progress to shock, sepsis and death. They can vary depending on the location of the obstruction and whether it is partial or complete.

- **Small intestine obstruction**: Nausea, vomiting, constipation, abdominal distention and colicky pain. Extreme thirst, malaise, and dry oral mucous membranes and tongue may develop. Bowel sounds are heard upon auscultation. These may be quite loud, and may even be heard without the use of a stethoscope. There is pain upon abdominal palpation and rebound tenderness if strangulation of the bowel is present. Untreated obstruction may cause hypovolemic shock. If the small bowel is completely obstructed, extreme peristalsis may develop as the bowel attempts to move its contents through the obstruction. Bowel contents may be moved toward the mouth, and vomitus contains gastric juice, then bile, and eventually, the contents of the ileum. 5

- **Large intestine obstruction**: Symptoms progress more slowly because the large bowel can absorb fluid and distend well beyond its typical size. At first, constipation may be the only sign. Then colicky abdominal pain may develop quite swiftly, producing frequent spasms. There is significant abdominal distention. Eventually, vomiting occurs. The vomitus may contain fecal matter; continuous abdominal pain develops, and peritonitis may occur. If the obstruction is partial, these symptoms can occur but in a less severe form. Liquid stool may leak around the obstruction. 5

### Diagnosis

In addition to findings from a history and physical, lab studies may show decreased sodium, chloride and potassium levels due to vomiting and an elevated white blood cell count due to infection (e.g., peritonitis). 5

Diagnostic tests such as CT scans, barium enema, upper GI and small-bowel series, and abdominal films are conducted. Small bowel obstruction findings include alternating levels of fluid and gas, sometimes referred to as a “stepladder” pattern. 5,35 Large bowel obstruction findings include a distended, air-filled colon. 5

### Treatment

Initially, immediate treatment includes fluid resuscitation, correction of electrolyte imbalances and administration of analgesics and anti-emetics as indicated. Bowel decompression is accomplished by the insertion of a nasogastric tube to suction GI contents and avoid aspiration. Antibiotics that are effective against gram-negative and anaerobic organisms are prescribed. 15

Strangulated obstruction requires blood transfusions. Patients must be monitored closely for evidence of shock indicated by pallor, tachycardia and hypotension. If the patient’s condition does not improve or if it deteriorates, surgery is needed. 5

Surgical interventions may include removal of tumors and other masses, hernia repair or bowel resection. 35 For large bowel obstruction, surgical resection with anastomosis, colostomy or ileostomy may be necessary. 5

### Special nursing considerations

- **Monitor closely for signs and symptoms of metabolic alkalosis**: Changes in levels of consciousness, tetany, twitching, shallow respirations, cardiac arrhythmias and confusion. 36
- **Monitor closely for signs and symptoms of metabolic acidosis**: Headache, lethargy, deep, rapid respirations (Kussmaul’s respirations), hypotension, anorexia, stupor. 36
- **Monitor intake and output meticulously**: Record amount and color of NG tube drainage. 5
- **Monitor for signs of dehydration**: Thick, swollen tongue, dry oral mucous membranes and poor skin turgor.
**INGUINAL HERNIA**

An inguinal hernia occurs when intra-abdominal fat or a portion of the small intestine protrudes through a weakened area in the lower abdominal wall. This type of hernia is located in the groin because the fat or intestine moves through a weak area at the inguinal ring, which is the opening to the inguinal canal. An inguinal hernia appears as a bulge on one or both sides of the groin.\(^5\)\(^7\)

Inguinal hernias are usually reduced (manipulated back into place) without much difficulty. However, the hernia may become incarcerated due to adhesions that interfere with intestinal flow or strangulated, meaning that the hernia becomes twisted or edematous. In the event of strangulation, normal blood flow and peristalsis are impeded and may lead to intestinal obstruction.\(^5\)\(^9\)

**Causes and incidence**

There are two types of inguinal hernias: direct and indirect. Each type has different causes.

1. **Indirect inguinal hernia:** Indirect inguinal hernias are congenital in nature and are more common in males than in females and more common than direct hernias. This is because in a male fetus, the spermatic cord and both testicles descend, under normal conditions, through the inguinal canal into the scrotum. But if for some reason the entrance of the inguinal canal does not close just after birth, a weakness is created in the abdominal wall. This allows fat or part of the small intestine to move through weaknesses into the inguinal canal, causing an inguinal hernia. In females, an indirect inguinal hernia occurs when the female organs or the small intestine slides into the groin through a weakness in the abdominal wall.\(^5\)\(^7\)

2. **Direct inguinal hernia:** Direct inguinal hernias are due to degeneration of the connective tissue of the abdominal muscles, which leads to weakening of the muscles during adulthood. Direct inguinal hernias only occur in males.\(^7\) The hernia passes thorough the weak muscles into the groin. A direct hernia develops as a result of continuous stress on the muscles.\(^5\)\(^9\) Sudden twists or pulls, lifting heavy objects, straining with bowel movements, weight gain and chronic coughing may all worsen the hernia.\(^7\)

**Nursing alert!** There are a number of common sites of hernia. These include:

- **Femoral:** Develops when a fatty deposit within the femoral canal grows and creates an opening large enough for part of the peritoneum and bladder to move through.
- **Umbilical:** Common in neonates, but also occurs in obese women, or in women who have had a number of pregnancies. It is due to abnormal muscular structure around the umbilical area.
- **Incisional hernia:** Occurs at the site of a previous surgery due to a weakness in the abdominal wall, inadequate wound healing or an infection.

**Signs and symptoms**

Typical signs and symptoms of inguinal hernia include:\(^5\)\(^7\)

- A lump or bulge over the herniated area when the patient is in a standing position or strains. The lump or bulge disappears when the patient is lying down.
- Sharp, steady pain in the groin that is exacerbated with lifting, straining or exercising, and is relieved with rest or being in the supine position.
- Feelings of weakness or pressure in the groin.

Strangulation of the hernia, a medical emergency that can lead to partial or complete bowel obstruction, produces the following signs and symptoms:\(^5\)\(^7\)

- Severe pain.
- Redness in the area of the hernia.

**Diagnosis**

Upon inspection, a large hernia is evident by swelling, bulging or the presence of a lump in the inguinal area. A small hernia may just appear as an unusual “fullness” in the groin. Signs and symptoms and patient history all help in the diagnosis of inguinal hernia.

An important part of the physical exam in a male patient is essential to confirmation of the diagnosis. The patient is asked to stand with the leg on the same side as the hernia (ipsilateral) slightly flexed and his weight on the other leg. The examiner inserts his/her gloved index finger into the lower part of the scrotum moving the finger through the external inguinal ring to the internal ring throughout the inguinal canal. The patient is asked to cough. If the examiner notes pressure against his/her fingertip, an indirect hernia is present. If pressure is felt against the side of the finger, a direct hernia is present.\(^5\)

**Treatment**

The treatment of choice for infants, adults and healthy elderly patients is herniorrhaphy. Herniorrhaphy is a surgical procedure during which the contents of the hernia sac are replaced into the abdominal cavity. This procedure is often performed under local anesthesia in a short-term unit.\(^5\)\(^7\)

Another surgical option is hernioplasty, during which the weakened area is reinforced or supported with steel mesh, wire or fascia.\(^5\)

For elderly or debilitated patients who are not able to tolerate surgery, a truss may be used to keep the abdominal contents from protruding into the hernia sac. This is not a curative measure, but is an option for relieving the discomfort of the hernia.\(^5\)

Some patients, especially if the hernia is not causing significant discomfort, may delay surgery. They should be cautioned about the potential complications of the disorder and be taught to recognize the
signs and symptoms of strangulation and bowel obstruction. Ideally, patients will respond to the need for surgical repair before such complications occur.

After surgery, patients should be taught how to recognize signs and symptoms of infection and to avoid lifting heavy objects or straining during bowel movements.

INACTIVE COLON

Connie is a 50-year-old small business owner. She recently fulfilled a long-wished-for dream and opened a craft shop specializing in knitting and embroidery products. Prior to opening her shop, Connie worked as a buyer for an exclusive women’s boutique. Connie is accustomed to a stressful work situation and to working long hours, but enjoys the challenge of an active career.

She also has to deal with something just as challenging but a lot less enjoyable: chronic constipation. Connie has suffered from constipation for most of her adult life and just shrugged it off as “something I have to live with. It's probably because of my stressful career.”

What Connie doesn’t realize is that the stress and long hours also contribute to her having little or no time to exercise, and she usually eats fast food or skips meals altogether. The constipation seems to be getting worse, and she feels bloated and uncomfortable several days a week. Connie finally decides to tell her doctor about this problem and seek some relief for an issue that has troubled her for years.

Connie is not alone in having to deal with chronic constipation, also referred to as inactive colon, lazy colon, colonic stasis or atonic constipation. Besides causing feelings of bloating and abdominal discomfort, inactive colon can also lead to fecal impaction.

INACTIVE COLON

Constitution is a very common gastrointestinal complaint in the United States. More than 4 million Americans complain of frequent constipation. Persons who report constipation (and seek medical intervention) are most often women and adults 65 years of age and older. Pregnant women also report constipation fairly often, as do women after giving birth and persons who have just had surgery.

Nursing alert! Elderly patients generally experience reduced intestinal motility and a slowing of neural impulses in the gastrointestinal tract, which can increase the risk of constipation. This same population often limits the amount of fluids they drink to avoid or reduce incontinence. Inadequate fluid consumption also increases the risk of constipation as well as dehydration. Patients who are limited in their physical activity due to age or illness are also at risk for constipation.

When a person does not drink enough fluids, more fluid is absorbed from the intestine and stools become hard and dry. Adequate hydration as well as a diet high in fiber causes water to be pulled into stools by osmosis, thus keeping stools soft and facilitating their movement through the intestine.

What is constipation?

Constipation means different things to different people. Bowel habits vary among people. Some people believe that unless they have a bowel movement every day, they are constipated. For others, having a bowel movement every other day is normal. Actually, there is a wide range of what is considered to be normal.

Causes and incidence

Constipation is a very common gastrointestinal complaint in the United States. More than 4 million Americans complain of frequent constipation. Persons who report constipation (and seek medical intervention) are most often women and adults 65 years of age and older. Pregnant women also report constipation fairly often, as do women after giving birth and persons who have just had surgery.

Nursing alert! Elderly patients generally experience reduced intestinal motility and a slowing of neural impulses in the gastrointestinal tract, which can increase the risk of constipation. This same population often limits the amount of fluids they drink to avoid or reduce incontinence. Inadequate fluid consumption also increases the risk of constipation as well as dehydration. Patients who are limited in their physical activity due to age or illness are also at risk for constipation.

When a person does not drink enough fluids, more fluid is absorbed from the intestine and stools become hard and dry. Adequate hydration as well as a diet high in fiber causes water to be pulled into stools by osmosis, thus keeping stools soft and facilitating their movement through the intestine.

Diagnosis

A history of dry, hard, infrequent bowel movements suggests inactive colon. A proctoscopy may show that the patient has an unusually small colon lumen with abnormal amounts of mucus and the presence of prominent veins.

It is imperative that a thorough history and physical be conducted to rule out serious disease processes such as malignancies. Testing stool for occult blood, a rectal exam, an upper GI series, barium enema and colonoscopy may be performed.

Treatment and nursing considerations

Treatment depends on results of the physical examination, the patient’s age and general health, and his/her ability to participate in lifestyle modifications. These initiatives can be preventative as well as used for treatment. Here are the most common interventions for inactive colon or chronic constipation.

- **Increase fluid intake:** Adequate fluid intake is critical to maintaining homeostasis and avoiding dehydration. Persons should drink at least eight to 10 glasses of liquid on a daily basis. Fluid helps keep stools soft for easy movement through the intestine and facilitates passage from the rectum. Advise patients to drink a hot beverage, such as coffee or tea, or prune juice before or with breakfast to help stimulate the bowel. Some patients prefer to drink such beverages in the evening. In this case, advise them to drink decaffeinated beverages to avoid interfering with sleep. Older patients or patients with incontinence should avoid drinking large amounts of fluid before bedtime as this increases the possibility of incontinence. Encourage these patients to consume their beverages during the day and early evening.

Nursing alert! Caffeine-containing liquids and beverages that contain alcohol can contribute to dehydration. Encourage the...
Eat a diet high in fiber: The most common causes of constipation are a diet low in fiber or one that is high in fats such as those contained in cheese, eggs and red meats. Fiber, the part of fruits, vegetables and grains that cannot be digested by the body, takes on a soft, gel-like texture in the intestines, helping to make stools soft and easily eliminated from the body. The recommended daily dose of fiber is 20 to 35 grams a day. Unfortunately, Americans consume only a daily average of five to 14 grams of fiber. Good sources of fiber include fresh fruits with skins, raw and course vegetables, and whole grain cereals.

Avoid foods that are highly refined: These foods include white rice, Cream of Wheat, pasta, candy, cookies and ice cream. Avoid eating such foods because they do not help relieve constipation and are often sources of fat.

Participate in regular exercise as authorized by health care providers. Moderate physical exercise, such as a walking routine, should be incorporated into daily activities. Persons have different tolerance levels for exercise because of age and general health. All persons should consult their health care providers prior to initiating an exercise regimen.

Identify medications that might contribute to constipation: As noted in the section pertaining to causes of constipation, many medications contribute to the problem of constipation. This includes over-the-counter as well as prescription medications. Patients with inactive colon should discuss and review ALL medications they are taking and include, in addition to prescription and over-the-counter, herbal supplements, vitamins, minerals and weight-control products.

In cases of severe inactive colon, take laxatives under the direction of health care providers. Bulk-forming laxatives are considered to be among the safest, but can interfere with the effectiveness of certain other medications. That is why it is so important to consult with a physician regarding adding any medication to a treatment regimen. Examples of bulk-forming laxatives include Citrucel and Metamucil. Stool softeners, which moisten stool, or lubricants, which grease the stool and facilitate its movement, may also be prescribed.

Nursing alert! If a fecal impaction is present, an oil-retention enema is usually administered prior to its removal.

It is important that patients be advised to avoid the overuse of laxatives. People who believe that they “must” have a bowel movement every day may rely on laxatives to make this happen. Overuse makes the bowel dependent on laxatives to have a bowel movement.

Overuse of enemas is also contraindicated. Frequent use of enemas can make the bowel dependent on enemas to eliminate stool. In particular, frequent use of sodium biphosphate should be avoided because it is a hypertonic solution that can absorb a significant amount of the colon’s sodium or pull intestinal fluids into the colon, thus causing dehydration.

To help establish a normal pattern of bowel evacuation, a person should include maintaining a regular time for bowel movements (e.g., in the morning after breakfast). Privacy is important. Using a small footstool to enable thigh flexion while sitting on the toilet may facilitate bowel evacuation. Patients should also be told to respond as soon as possible to the urge to have a bowel movement.

Nursing alert! Remind patients that there is a wide variation in what is a normal pattern of bowel elimination. This range can vary from three times a day to three times a week.

VOLVULUS

David is a 45 year-old electrician. He has just spent a relaxing Sunday with his wife, daughter and son. They enjoyed watching his daughter play in her first soccer tournament and celebrated her team’s victory with dinner at their favorite restaurant. Later that evening, David suddenly develops episodes of vomiting and abdominal distention. He blames it on “something I ate” at the restaurant. However, he soon experiences an abrupt onset of severe abdominal pain. His wife insists that she take him to the emergency room, where diagnostic studies indicate a severe bowel problem, possibly volvulus.

Causes and incidence

Volvulus may be due to an abnormality of rotation, ingestion of a foreign body or an adhesion. The specific cause may never be determined, however. In adults, the most common site of the disorder is the sigmoid colon. In children, the small bowel is a more common site. Other sites include the stomach and the cecum. In patients with cystic fibrosis, volvulus may occur secondary to meconium ileus (an intestinal blockage due to cystic fibrosis).

Acute gastric volvulus has a significant mortality rate of 42 percent to 56 percent. There are no known racial differences, and males and females are equally affected. About 20 percent of cases of volvulus are noted in infants younger than 1 year. Peak incidence is noted in people between the ages of 40 to 50.

Signs, symptoms, and complications

Volvulus causes vomiting and a rapid, noticeable distention of the abdomen with abrupt onset of severe abdominal pain. Bloody stools, constipation and shock may also occur. Immediate treatment is necessary to prevent life-threatening complications. Such complications include strangulation of the twisted portion of the bowel, ischemia, infarction, perforation and fatal peritonitis.

Diagnosis

The symptoms of volvulus may mimic other disorders. The onset of severe pain, abdominal distention and a palpable abdominal mass suggest volvulus. Appropriate diagnostic studies include:

- X-rays: Obstruction may be evident as well as the classic double-bubble sign. The double-bubble occurs when duodenal obstruction leads to gastric and duodenal distension with a
prominent duodenal bulb and air-fluid levels in the proximal duodenum and stomach.\textsuperscript{10}

- **CT scans:** Evidence of intestinal obstruction may be evident.\textsuperscript{5}
- **Upper GI series:** Signs of volvulus include incomplete duodenal obstruction.\textsuperscript{5,39}
- **Barium enema:** Barium enema can show specific areas of the colon that are affected. In volvulus of the cecum, barium fills the colon distal to the affected area. In sigmoid volvulus, findings vary in children and adults. In children, the barium may twist and appear as a "point." In adults, the barium may take on the appearance of the "ace of spades," mimicking that configuration from a deck of playing cards.\textsuperscript{5}
- **White blood cell (WBC) count:** Strangulation generally causes the WBC count to surpass 15,000/ul. If the bowel is infarcted, the WBC count exceeds 20,000/ul.\textsuperscript{5}

### RECTAL PROLAPSE

Rectal prolapse is the protrusion of one or more layers of the mucous membrane of the rectal tissue slides through the anal orifice.\textsuperscript{5,40} There are two types of rectal prolapse: partial and complete.

1. Partial rectal prolapse occurs when only the rectal mucosa and a small mass of radial mucosal folds are involved.\textsuperscript{5}

#### Causes and incidence

The exact cause of rectal prolapse is not known, but it is associated with conditions that affect the pelvic floor or rectum. Nearly 50 percent of reported cases of rectal prolapse are caused by chronic straining with bowel movements and constipation.\textsuperscript{40}

Increased intra-abdominal pressure causes the protrusion of the layers of rectal tissue.\textsuperscript{5} Additional conditions that increase the risk of rectal prolapse include:\textsuperscript{5,40}

- Diarrhea.
- Benign prostatic hypertrophy.
- Chronic obstructive pulmonary disease (COPD).
- Cystic fibrosis.
- Malnutrition and malabsorption.
- Pertussis (whooping cough).

#### Signs and symptoms

Protrusion of rectal tissue when walking or during elimination of stool is the primary sign of rectal prolapse. Other symptoms include:\textsuperscript{5,40}

- Ongoing sensations of fullness in the rectum.
- Constipation.
- Fecal incontinence.

#### Diagnosis

**Nursing alert!** Rectal prolapse is often a symptom. The underlying cause must be identified and corrected.\textsuperscript{40}

History, inspection and clinical signs confirm diagnosis. Imaging studies such as a barium enema may be performed to rule out diseases of the colon and/or rectum or the presence of tumors.\textsuperscript{40}

#### Treatment

Sometimes, correcting the underlying cause is the only treatment needed. First, the rectal mucosa may be reduced with gentle digital pressure. The patient is placed in a knee-chest position, and a soft, warm, wet cloth may be used to gently push the mass through the anal opening. Gravity should facilitate the return of the prolapse to its proper place.\textsuperscript{5} However, the presence of edema of the bowel may make manual reduction problematic. In these types of cases, granulated sucrose may be applied topically to the mucosal surface. This may reduce edema and allow for successful manual reduction.\textsuperscript{40}

In children, prolapsed rectal tissue lessens as the child grows. Older patients may require injection of a sclerosing agent that causes a fibrotic reaction and fixes the rectum in its proper place.\textsuperscript{5}

Surgery may be necessary for cases of severe or chronic rectal prolapse. During surgery the sphincters are strengthened or tightened with wire or by anterior or rectal resection of the tissue that prolapsed.\textsuperscript{5}

Children with midgut volvulus undergo surgical treatment, often with the Ladd procedure. During this surgical procedure a transverse incision is made through the right rectus muscle in the right upper quadrant, which facilitates visualization and access to the intestine. The volvulus is corrected in the majority of patients by rotating the intestine in a counterclockwise direction.\textsuperscript{39}

Sometimes, in adults with sigmoid volvulus, a non-surgical reduction is successful. A proctoscope examination is done to check for the presence of incarceration. A sigmoidoscope or long rectal tube is carefully, gently inserted to deflate the bowel. Success is indicated by passage of gas and swift relief from abdominal pain.\textsuperscript{5}

#### Potential complications

Potential complications of rectal prolapse include rectal ulceration, bleeding, incontinence and rectal wall necrosis.\textsuperscript{5,40}

- Pelvic infections.
- Neurological disorders.
- Previous trauma to the anal or pelvic area.

Many cases of rectal prolapse are not reported, making it difficult to determine actual incidence. Rectal prolapse occurs most often in children under the age of 6 and in adults in their 60s and 70s. Females experience rectal prolapse more often than males, with females accounting for 80 percent to 90 percent of cases that are reported.\textsuperscript{5}

**Nursing alert!** In children with cystic fibrosis, the incidence of rectal prolapse is nearly 20 percent.\textsuperscript{40}

**Nursing alert!** Hemorrhoids and/or rectal polyps may exist in conjunction with rectal prolapse.\textsuperscript{5}

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Patient education

It is important that patients understand what measures to take to avoid rectal prolapse or the recurrence of the disorder. Prevention of constipation is very important. Teach the patient to:

- Drink an adequate amount of fluid every day and to eat a diet that has adequate amounts of fiber and only moderate amounts of fat.
- If ordered, explain how to take medications such as stool softeners to help avoid constipation.
- Explain that rectal incontinence may be a permanent complication of surgery.

Patients with severe rectal prolapse and incontinence should be advised to wear a perineal pad.

Teach patients perineal strengthening exercises. For example, the patient should repeatedly squeeze and relax the buttocks while sitting in a chair.

Nursing alert! It is important that prevention of constipation and to avoid straining during defecation be taught to all patients. Straining can lead to a number of adverse consequences!

HEMORRHOIDS

Hemorrhoids are varicosities or enlarged veins in the lower part of the rectum and the anus. Internal hemorrhoids cannot be felt and are found inside the lining of the rectum. External hemorrhoids are found underneath the skin that surrounds the anal area. These types of hemorrhoids are felt when they swell, and they may cause itching or pain as well as bleeding. A thrombosed external hemorrhoid is the result of blood clotting within veins and can cause the patient significant pain.

Internal hemorrhoids are covered by mucosa and actually protrude into the rectal lumen. They may prolapse when the patient has bowel movements. External hemorrhoids are covered by skin and protrude from the rectum. These hemorrhoids are more likely to thrombose than internal hemorrhoids.

Hemorrhoids can be classified according to their severity.

- First-degree hemorrhoids: These are confined to the anal canal.
- Second-degree hemorrhoids: These prolapse when the patient strains (e.g., during defecation) but reduce spontaneously.
- Third-degree hemorrhoids: These are prolapsed hemorrhoids but must be manually reduced after each bowel movement.
- Fourth-degree hemorrhoids: These hemorrhoids are severe and cannot be reduced.

Causes and incidence

Hemorrhoids are most likely due to increased venous pressure. Factors that predispose the development of hemorrhoids include:

- Prolonged periods of sitting or standing.
- Straining during defecation (often associated with constipation).
- Straining during coughing, sneezing or vomiting.
- Heart failure.
- Liver disease.
- Alcoholism.
- Anal/rectal infections.
- Rectal surgery.
- Pregnancy.
- Anal intercourse.
- Loss of muscle tone (often due to old age).

Hemorrhoids are quite common. They are more common in caucasiens, those who are of higher socioeconomic status, and those who live in rural areas. The exact incidence of hemorrhoids is unknown because many people do not seek medical help for the problem. However, it is estimated that hemorrhoids occur in up to 50 percent of the population by age 50.

Signs and symptoms

Hemorrhoids may not cause any symptoms at all. But symptoms generally increase with the severity of the problem. First-degree hemorrhoids, although they may be painless, characteristically cause painless, intermittent bleeding with defecation. The patient may report bright red blood on the toilet paper or on stool. Bleeding occurs as the result of injury to the mucosa that covers the hemorrhoids. These hemorrhoids may cause itching if anal hygiene is poor.

Second-degree hemorrhoids result in more severe characteristic symptoms with the addition of hemorrhoid prolapse, which spontaneously resolves itself after the patient has a bowel movement. These hemorrhoids are usually painless.

Third-degree hemorrhoids cause ongoing discomfort and prolapse whenever there is an increase in intra-abdominal pressure. These third-degree hemorrhoids must be manually reduced.

Thrombosis of external hemorrhoids causes abrupt rectal pain and a large, firm lump that can be felt by the patient. Such hemorrhoids may cause bleeding that is severe enough to cause secondary anemia. In these cases, the patient may complain of fatigue and weakness, exhibit significant pallor and ultimately lead to secondary anemia.

Nursing alert! Tell patients that ALL occurrences of rectal bleeding must be evaluated by a health care professional. Rectal bleeding may be a symptom of a serious problem, such as cancer. All too often, people assume that rectal bleeding is due to hemorrhoids and fail to report it.

Diagnosis

Physical examination confirms the diagnosis of external hemorrhoids. It is important that a proctoscopy be performed to diagnosis internal hemorrhoids and to rule out polyps or other conditions.

Treatment

Treatment depends on the type and severity of the hemorrhoids. For hemorrhoids that are not severe, lifestyle modifications are often the foundation of treatment as well as measures initiated for symptoms relief. The goals of treatment are to reduce or eliminate pain, fight swelling and congestion, and to facilitate defecation without straining.

One of the first steps is to eliminate constipation and teach patients measures to prevent constipation and straining during defecation. Patients should drink adequate amounts of fluids and increase the amount of fiber in their diets by increasing their intake of raw vegetables and fruit and whole grain cereals. They should take stool softeners as recommended by their health care providers.
Intestinal polyps are masses of tissue that project from the surface of the mucous membrane. They may develop in the colon or rectum where they protrude into the GI tract. Most polyps do not cause symptoms except for minor rectal bleeding, which is not usually detectable by observation (occult bleeding). Although most polyps are usually benign, they may become cancerous.5,42

Nursing alert! It is important to encourage patients to undergo screening colonoscopies as they reach the age of 50 and periodically thereafter as recommended by their physicians. Patients with a history of polyps, a family or personal history of colon cancer, or those who are having symptoms may need to begin having colonoscopies at an earlier age.

There are several types of polyps, including polypoid adenomas, villous adenomas, hereditary polyposis, focal polypoid hyperplasia and juvenile polyps. As noted, most polyps are benign. However, villous and hereditary polyps have a significant inclination to become cancerous.5

Causes and incidence

Polyps occur as a result of unrestrained cell growth in the upper epithelium. Factors that increase the risk of polyp development include age, infection, high-fat, low-fiber diet, and heredity.9

The incidence of polyps for both males and females increases after the age of 70. Juvenile polyps are most commonly found in children less than 10 years of age. Villous adenomas are most commonly found in men over the age of 55. Polypoid adenomas are most prevalent in white women between the ages of 45 and 60.5,9

Signs, symptoms, and diagnosis

Most patients with polyps are asymptomatic, although rectal bleeding may occur. Diagnosis requires visualization via proctosigmoidoscopy or colonoscopy.9

Polyps are generally removed for biopsy during procedures such as colonoscopy. Further treatment depends on the results of the biopsy. Benign polyps generally require no further treatment after their removal except for adherence to screening colonoscopies as recommended by their health care providers. If a malignancy is diagnosed, treatment depends on the type of cancer and its stage.

Treatment

Proctitis is an inflammation of the rectal mucosa. It can be acute or a chronic condition. Proctitis causes discomfort, bleeding, and at times, the discharge of pus or mucus.1

Causes

There are several factors that lead to the development of proctitis.

- Proctitis can be caused by a sexually transmitted disease (STD), especially among those who participate in anal intercourse. STDs that can cause proctitis include gonorrhea, herpes, Chlamydia and lymphogranuloma venereum. Amebiasis is also a causative factor and can be transmitted via anal-oral sex.5,43
- Autoimmune response can also cause proctitis and is associated with disorders such as Crohn’s disease and ulcerative colitis.5,43
- Proctitis may be a side effect of medications, radiation treatment or the insertion of foreign objects or chemicals into the rectum.5,43
- In children, the most common example of non-sexually transmitted proctitis is infection with beta-hemolytic streptococcus, the same bacteria that cause strep throat.5,43
- Nursing alert! Patients receiving radiation therapy, especially for treatment of cancers of the cervix or uterus, need to be taught to be alert to the signs and symptoms of proctitis.5

The risk of proctitis increases with certain factors that have the potential to irritate the rectal area. These include:5,9

- Food allergies, particularly an allergy to milk.
- Chronic constipation.
- Habitual or overuse of laxatives.
- Injury to the rectum.
- Interference with normal muscle control.
- Emotional distress.
### Signs and symptoms

Signs and symptoms include: 5,9,44

- Stools that contain blood and mucus.
- Constipation.
- Rectal discharge containing pus.
- Rectal pain.

- Pain when having a bowel movement (tenesmus).
- Feeling of rectal fullness.
- Left-sided abdominal cramps.
- Intense urge to have a bowel movement.

### Diagnosis

A detailed patient history is obtained, including questions about the patient’s sexual practices.  

**Nursing alert!** It is important to remain objective, supportive and non-judgmental. Sexually transmitted diseases still carry a negative stigma, particularly those that are associated with anal sex. All patients deserve compassionate care delivered to the best of the health care professionals’ abilities.

A sigmoidoscopy may be performed that reveals, in acute proctitis, shiny, thick, bright red or pink rectal mucosa that may be ulcerated. In chronic proctitis, results may include thickened mucosa, rectal lumen stricture and loss of normal vascular patterns. 5

### Treatment

Antibiotics specific for the organisms causing the disorder are administered in the presence of infection. If the proctitis is the result of radiation therapy, steroid suppositories or soothing enemas may help to relieve symptoms. Tranquilizers may be helpful for patients having difficulty dealing with emotional stress. 5,9

### ANORECTAL ABSCESSES AND FISTULAS

An anorectal abscess is due to inflammation of the soft tissue near the rectum or anus. Pus collects in the localized area of inflammation.

**Causes and incidence**

The development of an abscess may start when the lining of the anal canal or rectum is torn or suffers an abrasion and subsequent infection with Escherichia coli, staphylococci, or streptococci. 5 Additional causes include: 5,9,44

- Trauma.
- Treatment of internal hemorrhoids.
- Puncture wounds (e.g., from ingested fish bones as they are eliminated from the body).
- Pre-existing lesions.
- Systemic illnesses such as ulcerative colitis and Crohn’s disease.

- As the production of pus increases, a fistula may develop in the soft tissues beneath the sphincters’ muscle fibers. This is most likely to occur beneath the muscle fiber of the external sphincter. 5

Anorectal abscesses have a peak incidence among adults in their 30s and 40s. However, there is also a high rate of occurrence in infants. It is estimated that about 30 percent of patients have a prior history of anorectal abscess. Such abscesses are two to three times more common in men than in women. 5,9

**Nursing alert!** Anal fissures in children may be a sign of sexual abuse. 44

**Signs and symptoms**

Characteristic signs and symptoms of anorectal abscess include: 5,9,44

- Rectal pain that is often described as throbbing, burning, cutting or tearing.
- Hard, painful lump that causes discomfort when sitting.

- Pus and/or mucous discharge from the rectum.
- Pain with bowel movements.

**Nursing alert!** Spasm of the anus is highly suggestive of an anal fissure. 44

**Diagnosis**

An anorectal abscess is detected upon rectal examination. Sometimes the abscess drains by forming a fistula. If so, the pain subsides and intense itching occurs. The external opening of the fistula looks like a pink or red elevated ulcer near the anus. Additional signs and symptoms depend on the severity of the co-existing infection. These include chills, fever, nausea, vomiting and fatigue. 5

A palpable indurated tract may be noted upon rectal digital exam, and pus may be evident on the examiner’s gloved finger. It may be necessary to perform a proctosigmoidoscopy to rule out other diseases. 5,9

**Treatment**

The anorectal abscess must be surgically incised under caudal anesthesia to promote drainage of infected material. Fistulas are treated by removing the fistula and granulated tissue (referred to as a fistulotomy) under caudal anesthesia. Warm sitz baths, analgesics and antibiotics may also be part of the treatment regimen. 5,44

**Nursing considerations**

Nurses need to be aware of several considerations. These include: 5,9,44

- Teach the patients the importance of perianal cleanliness. This may be an embarrassing topic for some patients. Nurses should be tactful and objective while providing information about perianal hygiene.
- Teach the patient to be alert to the signs and symptoms of abscesses and fistulas and to seek prompt medical attention.

- Patients may suppress the urge to have a bowel movement for fear of pain. This could lead to constipation and even fecal impaction. Teach the importance of a diet that consists of adequate fluid intake and fiber. Facilitate the administration of stool softeners as ordered.
16. The accessory glands and organs of the GI system consist of the salivary glands, liver, gallbladder and bile ducts, and the pancreas.

   - True
   - False

17. Alcohol increases gastric acid production and decreases lower esophageal sphincter pressure, which can exacerbate symptoms of GERD.

   - True
   - False

18. Chronic infection with helicobacter pylori (H pylori) is associated with a significant risk of gastric cancer.

   - True
   - False

19. Crohn’s disease and ulcerative colitis are names for the same disease.

   - True
   - False

20. An important part of the treatment for celiac disease is an increase in products containing wheat, barley, rye, and oats.

   - True
   - False

DISEASES AND DISORDERS OF THE GASTROINTESTINAL TRACT

Final Examination Questions

Choose True or False for questions 16 through 20 and mark them on the answer sheet found on page 133 or complete your test online at Nursing.EliteCME.com.
Chapter 4: Horizontal Violence In Health Care Organizations: Why Peers Bully Peers

6 Contact Hours

Written by Adrianne E. Avillion, D.Ed., RN

Learning objectives

Upon completion of this course, the learner should be able to:

- Identify the characteristics of persons who commit horizontal violence.
- Explain the causes of horizontal violence.
- Implement strategies to reduce and prevent horizontal violence.

Introduction

What first comes to mind when health care employees hear the words “violence” and “workplace”? Many might say they think of an out-of-control emergency department patient under the influence of drugs or alcohol who attempts to harm staff members. Others may remember a confused, frightened patient who tried to strike them. Still others may think about an angry visitor who verbally abused them.

These scenarios are not uncommon and are understandable. In fact, a 2011 U.S. Department of Justice special report published findings that showed workplace violence in this country is responsible for about 900 deaths and 1.7 million nonfatal assaults annually. In the hospital setting, research shows that 35 percent to 80 percent of hospital staff members have been physically assaulted at least once during their careers.

The phenomenon of horizontal violence

Jackie is the nurse manager for two surgical units in a 500-bed medical center. She has been a manager for nearly three years and has been able to initiate unit-based councils on both of her units. Jackie is grooming her staff to become more autonomous, assume more responsibility for identifying goals and objectives to advance patient outcomes, and to initiate and participate in nursing research.

Members of her nursing staff excel at their jobs and have worked with the medical center’s nurse researchers on studies that have strengthened evidence-based practice and led to improved patient outcomes. When vacancies are posted for Jackie’s units, she receives numerous applications from nurses already employed at the medical center who want to transfer to her units.

However, Jackie has noticed that the more her nurses grow professionally and patient outcomes improve, the more she feels isolated from and ostracized by her fellow nurse managers. If she passes fellow managers in the hallway or in elevators, they do not speak to her and avoid eye contact. During management meetings her comments or ideas are either ignored or ridiculed.

Jackie approaches one of her colleagues who was once a good friend and asks why she is being treated in this fashion. The former friend replies, “How do you expect us to act? You with all of your new ideas showing us up when we’ve been managers a lot longer than you have! You’re either with us or against us, and it seems to me that you’re more concerned with making yourself look good than in being one of us! And you’re stealing nurses from other units. You better stop this stuff, or you’re going to be sorry you ever took a management job!”

However, there is another type of violence, commonly referred to as horizontal violence, which also has far-reaching, serious consequences. These consequences affect recruitment and retention, can increase the risk of errors, decrease patient outcomes, and adversely affect the health and well-being of its victims. Horizontal violence, also known as HV, is aggression against peers, co-workers who are on the same hierarchical level of an organization. And some researchers believe that this type of violence has reached epidemic proportions.

HV is sometimes referred to as lateral violence, and it causes more harm than any other type of aggression in the workplace, including bullying of nurses and other health care professionals by physicians, supervisors and subordinates.

Adam is a physical therapist. He works at a prestigious rehabilitation hospital where he specializes in the therapy of patients who have suffered neurological impairment caused by spinal cord injury, brain injury and stroke. Adam is respected by his colleagues and his manager as a hard worker who is progressive in his ideas and innovative in developing plans of patient care.

He is very interested in clinical research and evidence-based practice. Because of his interest in research and his innovative clinical skills, Adam is asked to serve as the physical therapy representative on the interdisciplinary neurologic research committee. Adam is eager to learn more about clinical research and participate in clinical research investigations.

At first, his co-workers share Adam’s enthusiasm. However, once a month Adam attends a research committee meeting, during which time his patients are covered by another therapist. As part of his duties as a member of the research committee, Adam must also, in conjunction with his manager and co-workers, schedule time to teach peers about research and participate in research projects. His peers begin to resent the time Adam is “given” for such projects, even though his new responsibilities require significant work on Adam’s part.

Adam’s peers begin to complain about him, making comments that he is not “pulling his weight” as a patient-care provider. They start to avoid Adam and often fail to include him in off-duty social activities. Adam attempts to discuss these problems with his peers, but they only comment that they are tired of doing his work. One of them explains, “You’re so into this research thing that you are forgetting that you are just a therapist like the rest of us. You think you’re better than we are.”

9
Adam is shocked and asks his manager for guidance. The manager replies, “Just try not to take it personally. They’ll get over it after some time has passed and they have more chances to participate in research. Just don’t let it get to you.” Adam is upset, however, and begins to have trouble concentrating on his work.

Bernadette is a newly licensed RN. She is thrilled to have been hired to work on a large inpatient pediatric unit. Bernadette is assigned to work with Christine, an RN with 10 years of experience as a pediatric nurse, who will be her preceptor. Christine is an excellent clinician and has the respect of her co-workers. The nurse manager of the unit often refers to Christine as “my best nurse.”

However, as Bernadette’s orientation progresses, she finds that her co-workers not only respect Christine’s clinical knowledge but are intimidated by her as well. Christine has a reputation for criticizing her peers and subordinates in front of others if she feels that they are “asking stupid questions” or “just don’t know as much as they should.”

Christine constantly criticizes Bernadette as well, making negative comments in front of patients and telling co-workers that “I have my work cut out for me with this new nurse. They come out of school with all these fancy ideas but can’t carry a full patient load for weeks.” One of her colleagues tells Bernadette, “We’re sorry you’re going through this, but that’s just Christine. If we try to help you, she’ll turn on us, too.”

Bernadette makes an effort to talk to Christine privately about these kinds of comments. But Christine walks away from her and stops the nurse manager in the hallway. Rolling her eyes and laughing, Christine says, “I guess I’m in trouble. Our new little nurse has hurt feelings!”

Bernadette has had enough and quietly walks up to Christine and her manager. “I am willing to work hard and learn. However, Christine’s actions are interfering with my ability to learn and provide my best patient care. If these behaviors do not stop immediately, I expect to be assigned another preceptor. If this does not happen, I will file a grievance.”

Christine is astonished. No one has ever had the courage to confront her like this. The manager looks embarrassed and says that perhaps assigning another preceptor would be best.

The preceding scenarios illustrate some of the behaviors associated with HV. Horizontal violence, as already noted, is aggressive behavior directed toward one’s peers. Such behavior can involve verbal abuse, interfering with ability to work effectively, attempts to embarrass a peer, derogatory facial expressions, and attempts to undermine a peer.2,20

The following definitions help to clarify HV and just how destructive the phenomenon can be. Some of these behaviors occur in other types of workplace violence, but for the purpose of this program, these definitions are written within the context of HV. Note that some behaviors can overlap and may fall under more than one category.

- **Assigning unrealistic patient assignments:** This involves assigning certain nurses to the most difficult patients on an ongoing basis or to an unfair workload and then refusing to help when needed.20
- **Backstabbing:** Backstabbing occurs when someone complains about a peer to others instead of speaking directly to that person about a concern or problem. This type of behavior undermines trust and confidence.19
- **Bullying:** Bullying is a set of behaviors designed to make a victim feel threatened, humiliated, insulted and helpless. These behaviors can be verbal, suggest the threat of physical harm, or even be physical actions designed to intimidate or cause physical harm. Bullying is not an isolated event. It is usually persistent, ongoing and systematic.2,19
- **Covert behaviors:** The word covert means something that is concealed or disguised. As it relates to HV, covert behaviors refer to those behaviors that are not obviously aggressive or threatening.2 Examples include being “too busy” to show a new employee where supplies are kept, excluding a colleague from social gatherings, and “forgetting” to tell a colleague about a schedule change. These kinds of behaviors can be especially hard to pinpoint because they can often easily be explained as innocent oversights. The victim of covert HV may have a hard time convincing a manager that he/she is experiencing HV if the majority of the behaviors are covert.
- **Disruptive behaviors:** Disruptive behaviors are designed to interfere with a peer’s job performance, which can increase the risk for errors and patient harm.19 Disruptive behaviors can include all types of verbal and physical aggression and threaten the safety of both its victims and patients alike.16
- **Overt behaviors:** Overt behaviors are those actions that are obviously aggressive and can be seen or heard. Overt behaviors include disgusted facial expressions, rolling of eyes, shouting, laughing at someone, criticism, fault-finding, gossiping, ridiculing and arguing.2,3,16
- **Sabotage:** Sabotage is behavior designed to deliberately undermine or prevent someone else from succeeding.2,16
- **The silent treatment:** Refusing to speak to a colleague, speaking abruptly, and withholding information are all behaviors that fall under the umbrella of the silent treatment.20
- **Taking the credit:** Taking credit occurs when the perpetrator of HV takes credit for someone else’s work.20
- **Verbal abuse:** Verbal abuse consists of spoken words that are meant to be unkind, belittling or humiliating. Verbal abuse is meant to cause distress, embarrassment and suffering.7

Consider how these various behaviors are presented in the scenarios at the beginning of this section. Jackie, the nurse manager, is an innovative leader whose actions have helped to establish a work environment in which her staff thrives and patient outcomes are achieved. These accomplishments have angered her peers to the point that they instigate a number of behaviors that qualify as HV.

They avoid speaking to her and avoid making eye contact. Such behaviors may be classified as covert because it can be difficult to prove that they are deliberately not speaking to her and avoiding eye contact. However, some of their other actions verge on verbal threats and intimidation. They ridicule her ideas, accuse her of “stealing” their staff nurses, and come close to overtly threatening her with the statement, “You better stop this stuff or you’re going to be sorry you ever took a management job!”

Some staff members may not realize that managers are also victims of HV. They may assume that the phenomenon only exists at the staff level. Sadly, HV occurs at all levels of the organization. Jackie’s peers may be jealous, fearful that her success threatens their own jobs, or simply resentful of change.

Whatever the reason or reasons, Jackie is dealing with HV at its worst. If she appeases her peers, it is likely that patient outcomes and job performance may be compromised. If she continues to fulfill her management role as she believes best, her peers may make it difficult for her to continue working within this organization.

Now evaluate the situation that Adam, the physical therapist interested in clinical research, finds himself facing. At first, his colleagues are supportive and share his enthusiasm for the research process. Then, as workload increases related to research participation, his peers begin to resent Adam, claiming that he now thinks he is “better” than the rest of them.

Adam’s manager seems to want to ignore the problem, telling him, “Just don’t let it get to you.” This type of managerial response is one reason that HV exists and a reason that victims fail to report it. Because of the HV, Adam is starting to have trouble concentrating on his work, which increases the possibility of error. What began as an
exciting career opportunity has turned into a frustrating barrier to job satisfaction and the potential for compromised patient care.

Finally, review the scenario that describes the problems a newly licensed nurse had to deal with during her orientation. HV committed by a preceptor and other, more experienced colleagues, is one of the most common occurrences of HV. An experienced nurse, reported to be an excellent clinician, is acting as the preceptor for a new nurse. This preceptor intimidates her co-workers, and probably her nurse manager as well.

**Incidence and prevalence of horizontal violence**

Diana and her husband have recently relocated across the country so that her husband can take advantage of a work-related promotion. She is a social worker with several years of experience in the acute hospital setting. Diana interviews for a position in a large community hospital, hoping to continue working with intensive care unit (ICU) patients and their families. She has heard rumors that the social workers who work in the ICU are a close-knit group who do not necessarily welcome newcomers.

During her interview with the director of the department, Diana asks about the orientation process and the hospital’s policies relating to HV. The department director laughs and says, “That’s a problem pretty much confined to nursing. You don’t see it in other departments.” Diana wonders if the director is naïve or just reluctant to address the issue.

Edward is an information technology (IT) specialist in a large urban medical center. He notices that one of his colleagues seems to make it especially tough on new employees. Frank is one of the best IT specialists Edward has ever worked with, but he has the reputation of being a bully, and more than one employee has resigned because of his intimidating manner.

Edward discusses the issue with his wife, a nurse, who tells him that Frank is committing HV and needs to be stopped. Edward admits that he never thought much about the effects of Frank’s behavior until now. He always thought it was just Frank’s personality, but now wonders if it’s a lot more serious than that.

HV is not a new phenomenon, and as the preceding examples show, it can affect any and all health care professions. In fact, its occurrence and negative impact seems to be growing. It is difficult to objectively determine whether this growth indicates an actual increase in occurrence or an increase in reporting by victims.

What research has been conducted on the phenomenon of HV? To date, the majority of published findings deals with research conducted on nurses, and much of that research was initiated in the United Kingdom and Australia. However, American experts such as Kathleen Bartholomew are swiftly becoming well known and have published articles and books that deal with incidence and prevalence of HV, why it occurs, and what can be done to stop it.

**Choosing victims**

How does one become a victim of HV? How are victims chosen by those who commit HV? Consciously or unconsciously, victims are usually carefully selected by their perpetrators. Victims are usually among the most vulnerable of staff members. They may be newly licensed professionals or newly hired colleagues who lack confidence and are without power or workplace friends who could help them adjust to their new environment or protect them from those who commit HV.

Researchers have identified certain factors that may make someone more vulnerable to HV. These include being:

- A new graduate or newly hired staff member.
- Someone who has received a promotion or honor that causes resentment or envy among co-workers.
- A person who has problems working well with others or who has trouble acquiring new skills.
- Someone who receives special attention or recognition from supervisors or physicians.
- Someone who appears to lack confidence.

Bernadette, the new nurse, confronts the preceptor and the manager about the HV. Bernadette took action that all too few victims of HV have the courage to do: She confronted the perpetrator and the manager who seems to be willing to ignore the HV and the impact it has.

The preceding examples show just a few of the many ways that HV is committed. Note that persons who witness or know about HV and fail to do anything to stop it are just as responsible for the continuance of the problem as are those who directly commit HV.

The following information on incidence and prevalence of HV and other types of bullying was obtained from nursing investigations. As of this writing, Internet searches regarding HV and other health care professions produced only a few articles on the topic, and those dealt primarily with how to deal with its occurrence. Estimates of HV in the nursing workplace range from 46 percent-100 percent. Results from one nursing study showed that one-third of the nurse respondents perceived that they experienced emotional abuse during the last five shifts they worked. International studies indicate that one in three nurses intends to leave her present position because of HV. The results of a United Kingdom study of 4,500 nurses showed that one in six had experienced what was described as “workplace mistreatment,” and 33 percent planned to resign from their present jobs because of being verbally abused. A survey of 1,100 nurses employed by a National Health Service Community Trust in England reported that 30 percent of those nurses reported being victims of HV on a daily or near daily basis. A study of emergency department nurses indicated that about 27 percent of participants had experienced workplace bullying within the last six months. The staff of the professional journal Nursing 2011 conducted a survey of 950 nurses, asking them to identify the frequency with which nurses experience or witness HV. Eighty-two per cent of respondents reported experiencing or witnessing at least one type of HV on a weekly or daily basis.

Despite the growing incidence and prevalence of HV or lateral violence, some administrators, managers, and even staff members fail to recognize or acknowledge it as a serious problem. Amazingly, even some perpetrators do not realize that their behaviors are actually a form of workplace violence. This lack of recognition makes it even more difficult to control HV. As Bartholomew, one of the experts in this field, points out, “Bullying behaviors are like gangrene – when tolerated from a few physicians or nurses with strong personalities, the behaviors spread and infect the entire team – and eventually, the patient.”

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**HV Warning! Severe or chronic understaffing contributes to the risk of HV.**

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Characteristics of persons who commit horizontal violence

Roseanne is a pediatric nurse who has extensive knowledge and expertise in this specialty. She has a reputation for being “hard” on her colleagues. She is quick to criticize her colleagues, and the new nurses she helps to orient often resign before completing orientation.

Roseanne does not see herself as intimidating. She sincerely believes that she is acting in the best interest of the patients by “protecting” them from nurses who are not as “smart” as she is.

When Roseanne arrives at work, the nurse manager asks to speak to her in private. He tells Roseanne that she has been named in a grievance filed by one of her colleagues who recently requested transfer to another unit. Both the manager and Roseanne have been named in the grievance as committing HV, Roseanne for her HV behaviors and the manager for failing to stop the behaviors even after the nurse brought them to his attention.

Roseanne is outraged. “I’m only doing my job! I haven’t done anything wrong!”

Most people, especially victims of HV, assume that those who commit HV know exactly what they are doing when they bully and intimidate others. However, many of those perpetrators of HV do not acknowledge their behaviors as damaging nor do they see themselves as bullies. In fact, many abusive, disruptive actions are committed without awareness; persons committing HV often do so without awareness. Consider the many causes of HV discussed earlier in this program. These reasons give clues to the characteristics of those who commit HV. These characteristics include:

- **A need for power and control.** Persons who have power and control at work are often willing to behave disruptively in order to maintain them. Persons who aspire to have power and control may likewise use aggressive tactics to acquire them.
- **Belief that patients need protecting.** Some persons believe that they are the only ones who know how to take proper care of patients. Their actions, in their minds, are justified because they are acting in what they see as the best interests of the patients.
- **Fear.** Persons who are fearful of being overshadowed by younger, less experienced colleagues may target these colleagues to secure their own places within an organization.
- **Unhappiness at work or at home.** Persons who are unhappy at work or at home may treat others badly. Without knowing it, they may be trying to make others as unhappy as they are.
- **Inability to see the effects of their behaviors.** Perpetrators of HV often refuse to see that their behavior has a negative impact on coworkers, patient outcomes and the work environment.

The preceding characteristics are not all-inclusive. They do, however, offer some awareness of the types of persons who are likely to commit HV.

### Possible causes of horizontal violence

There are numerous possible causes of HV. They vary depending on the person committing the violence and the workplace environment. There may be more than one trigger of HV. In fact, it is usual to have several factors that come together to instigate HV.

- **Envy**
  - Lisa is a highly skilled critical care nurse. She is accustomed to being seen as the “expert” by her colleagues. About two years ago, Lisa helped to orient Sophie, a nurse who is now referred to as “one of the best nurses” by colleagues, the manager and physicians alike. Lisa liked Sophie when she was a new nurse who was in awe of Lisa and her clinical skills. Now Lisa is afraid that Sophie is taking her place as the clinical leader on the intensive care unit. The two women are assigned to work on developing a research proposal. The day the proposal is to be presented to the institutional review board (IRB), Sophie is sick. Lisa presents the proposal as entirely her own work and implies that Sophie did nothing to help with its development.

  The preceding example illustrates one possible cause of HV: envy. Envy or jealousy is an attitude that is usually accompanied by bitterness and resentment. Envy may be related, as in Lisa’s case, to jealousy of a colleague’s clinical skills and the fear that the role of acknowledged clinical expert is going to be lost. Other work-related reasons for envy that leads to HV may include jealousy of persons who seem to have developed professional friendships with managers or other administrative personnel, jealousy of persons who have received promotions or other career advancement opportunities, and jealousy of persons who have the opportunity to pursue education opportunities such as graduate education.

  But envy does not have to be limited to jealousy of work-related issues. Perpetrators of HV may be jealous of a peer’s personal life. They may envy someone who has a loving spouse or significant other, children, or a close circle of friends. This envy may cause them to retaliate by committing HV against those whom they envy.

- **Control and power**
  - Jason is the manager of a physical therapy department in a small rural hospital. He has been the manager for more than 15 years and has more managerial experience than most of the managers of other departments. Seniority and experience are greatly valued in this hospital, and the chief executive officer (CEO) supports Jason as one of the key decision-makers of the organization. Jason is confident in his ability and in the professional rapport he has established with the CEO. Jason gets a lot of satisfaction knowing that his experience is valued.

  He controls his department strictly and is rather autocratic in his management style. Jason discourages change and innovation, and most of the other managers would rather agree with him than “get on his bad side.” He believes that his way is best because his department has a record of achieving patient outcomes, the respect of the physicians, and a low incidence of adverse occurrences.

  Turnover is low, and Jason knows it is likely to remain low because his hospital is the only one in the immediate geographic area. However, things start to change when the CEO retires and a new administrator assumes responsibility for fulfilling a mandate from the board of directors: expand outpatient services by establishing an outpatient therapy clinic. Several new managers are hired for various departments, including occupational therapy, nursing and cardiac rehabilitation. These managers are eager to initiate planned changes to fulfill the board of directors’ mandate. They have skills and ideas that are openly praised by the new CEO.

  Jason believes he is losing control over the organization that he has helped to guide for many years. In an effort to maintain this control, Jason begins to target the new managers by complaining about them behind their backs and telling the new CEO that “these new people don’t know what they’re doing.” Jason’s behavior causes a great deal of discontent among the management staff and effectively slows progress on development of the outpatient services.

  The need for control often co-exists with envy. In Jason’s case, he may be envious of the new managers’ skills and ideas that are obviously valued by the new CEO. He is also determined not to lose control over his work situation. He is equally determined not to lose the power he has had for many years, thanks to his seniority and friendship with the former CEO.
Fear is a powerful motivator. Fear of change, fear of loss of respect, and, as in JoAnne’s case, fear of job loss all contribute to fear as a cause of HV.2,4,7 Fear is closely aligned with envy and a need for control. Some perpetrators of HV commit aggressive acts in an effort to gain or maintain control over situations that they perceive to be threatening or harmful.

The need to belong

Henry is an occupational therapist who works at a prestigious spinal cord injury center. He is a member of an interdisciplinary team that has a national reputation for excellence. The work is hard but rewarding, and there are multiple applicants for every vacancy that is posted.

When Henry was hired almost two years ago, he had to struggle long and hard to be accepted by the team. He experienced a variety of HV actions committed by members from the occupational therapy, physical therapy and nursing departments. He tries to convince himself that his colleagues’ behaviors made him a better therapist because he had to excel to prove himself to be a competent member of the team. Henry is relieved that after nearly two years, he is an accepted member of the team.

Recently, a new occupational therapist joined the organization, and Henry observes that many of the colleagues who were “hard” on him are bullying and intimidating the new therapist. Henry would like to help his new colleague but is afraid that if he does, he will lose the acceptance he worked so hard to gain. He tells himself that his new colleague will survive and that this is just something all new hires must go through. But he feels guilty and a bit ashamed of his own failure to try to put a stop to the aggressive actions of others.

The need to belong is powerful and, as in Henry’s situation, it is often accompanied by fear. This can be fear of loss of friendship, fear of not being “part of the team,” and fear of retaliation. If Henry would try to help his new colleague, would he once again become a victim of HV?

Some former victims of HV may participate in it in an effort to appease the person or persons who commit HV. Persons like Henry may ignore or go along with HV in an effort to avoid becoming victims again.2,20

HV Warning! Persons who ignore HV are just as guilty of aggression as those who actually commit this type of aggression.

- Blaming the victim for the occurrence of horizontal violence

Stephanie is a critical care nurse who works in a large trauma center emergency room. The work is extremely challenging, and only those nurses with excellent trauma skills and stamina survive the hectic pace and demanding work schedule. Stephanie is assigned to participate in the orientation of most newly hired nurses. She criticizes them in public and ridicules them for asking “too many questions.” She also criticizes even her experienced peers in this manner. The turnover rate is quite high and many of those who resign mention that Stephanie’s behavior was a major factor in their decision to leave.

Stephanie’s manager asks to speak to her in private. The manager shows Stephanie documentation that links her behavior to the resignation of 10 highly qualified nurses during the past 12 months. Stephanie responds by rolling her eyes and saying “If they can’t stand the pressure and a little honest criticism, then they don’t belong here. They deserved what they got. I’m not here to babysit new nurses!”

This scenario is a good example of blaming the victim, a justification sometimes used by those who commit HV. In other words, it’s the victim’s fault that he or she was subjected to HV.2,5,17 Persons who commit HV may justify their behavior with excuses such as:

- These people who are complaining that they are poorly treated are just looking for ways to excuse the fact that they can’t do the jobs they were hired for.
- Some people just can’t take criticism.
- I was just kidding around. They can’t take a joke.
- If they can’t take the pressure of working here, then they should just leave. It’s their fault if they can’t work up to my standards.

In the minds of these perpetrators, their victims were “asking for it.” They truly believe that the victims, not the persons who commit HV, are at fault. In other words, “they brought it on themselves.”

- Initiation or rite of passage

Sarah is a new social worker. She works in an outpatient oncology clinic. After another hard day at work during which she was assigned the most difficult patients, ignored by her co-workers, and asked to work on Saturday even though this should have been her weekend off, Sarah thinks, “I feel as though I’m back at college and going through ‘hazing’ week in order to be initiated into my sorority. I didn’t think people acted like this in the real world.”

Initiation or rite of passage as an excuse for HV may seem, as Sarah thinks, like going through the hazing process conducted by college fraternities and sororities. Viewed by some who commit HV as “paying your dues,” this concept justifies HV as something that every employee must go through to prove they are worthy of the responsibilities assigned to them and that they “have what it takes” to work on a particular unit, in a certain department or for a specific organization.

Persons who use rite of passage or initiation as an excuse to commit HV have probably had to go through a similar “initiation” themselves. Therefore, in their minds, because they were once treated poorly, everyone who follows them must also be treated poorly.2,5,20

- Opposition to change

Louis is a respiratory therapist. He has worked at a large, long-term care facility for several years. Louis enjoys his job and likes
having the chance to get to know patients and families as opposed to the hectic pace of acute care.

When he arrives at work one morning, his manager tells him that the owners of the facility have decided to build an addition to the building. This addition will be the location of a new program that will offer short-term stays for patients needing rehabilitation after suffering a stroke and other debilitating conditions. Louis is told that he and the other therapists will need to “rotate” through this unit to provide respiratory care to these short-term patients.

Louis is annoyed and immediately begins to wonder whether this change will lead to more change and more “problems.” He worries that his job responsibilities will change and that he may not be able to deal with acute patient rehabilitation needs. How will these changes affect his work schedule? Will his job be in jeopardy?

### Generational differences

The term “generation gap” has been around for a very long time. Conflicts among generations come from differences in upbringing, education and experiences of world events. For example, older adults remember a time when homes and cars could safely remain unlocked, while young colleagues can’t imagine a world in which not only homes and cars must be secured but even school buildings as well.

Baby boomers entered a workplace in which employees saw themselves in terms of the organizations for which they worked. Succeeding generations who saw their parents downsized, sometimes after years of working for one organization, developed a loyalty to themselves, not to their places of employment. They are usually accustomed to change and consider it the norm, not the exception.

Professionally, they see themselves in terms of their professions, not in terms of their employers. The newest members of the workforce expect flexibility in work hours and a work environment that offers time for “fun” as well as time for serious discussion. They are accustomed to conducting life at breakneck speed, thanks to the instant means of communication (e.g., Internet, texting, iPads and so on) and learning opportunities now available.¹

No matter what generation an employee represents, there are certain principles that apply to everyone when it comes to a healthy work environment and to the reduction of HV. Here are some guidelines to help bridge the generation gap.¹

### Oppression theory

Oppression theory is based on the belief that whenever two or more groups co-exist and one group has more power than another, a power imbalance exists. This imbalance leads to the development of a dominant group and a subordinate group. When the values of the subordinate group are ignored, ridiculed or repressed, oppression occurs.²

Experts in the field of HV often apply oppression theory to HV in the nursing profession. Why is this so? Some believe that from its conception, the members of the nursing profession were told to assume a subordinate position, which almost automatically predisposed them to oppression.²

Some experts believe that academic education may be ineffectual in preparing nurses to deal with bullying at all levels. It is imperative that, as part of their basic education preparation, nurses be taught to project confidence and deal with conflict effectively.²⁰ Without this preparation, nurses are in danger of completing their entry level education feeling uncertain and dependent.

When nursing was initially established as a profession, all or nearly all of its practitioners were women at a time when women had few, if any, legal rights. In most countries they could not vote, own property, or in some cases, even inherit money or property. Women were not expected to work unless absolutely necessary, and work opportunities were limited to domestic service, teaching and other jobs that were deemed “acceptable” for women.

Nursing offered another opportunity for women to earn their own livings, but, again, in order to be considered respectable, nursing was advertised as a “calling” or a desire to do “God’s work.”² Such beliefs led to the image of nurses as: ²

- Always caring and compassionate.
- Being “angels of mercy.”
- Willing to work long hours without reward.
- Never complaining.
- Fulfilling a subordinate role.

Although the preceding beliefs, thanks to advancements in nursing education and training, are beginning to fade, research shows that some people, even health care colleagues in other disciplines, continue to uphold these beliefs. This prolongs what is sometimes referred to as the culture of oppression in nursing.²

Persons who believe that they are members of a subordinate group may feel that they are oppressed and powerless. According

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Managers may be reluctant to implement policies and procedures. One way of gaining control is to oppress others, whether it be out of frustration, anger or simply the desire to subordinate others as a way of responding to subordination that HV perpetrators are experiencing themselves. It is wrong to assume, however, that other disciplines do not experience oppression. It is also wrong to assume that male nurses do not experience oppression. This phenomenon can affect anyone depending on the work environment and other factors that contribute to the development of HV. It has been suggested that one reason for a lack of HV research in professions other than nursing is a failure to admit that HV exists. Sadly, some health care managers and staff members ignore the problem, try to hide its existence, or simply refuse to believe that HV behaviors are harmful. Consider just how powerful this failure can be as a trigger for HV.

### Failure to admit that HV exists

Paula is an RN who has worked on various oncology units for the last seven years. She recently relocated from a small city to a large urban area. She interviews at several hospitals. Two questions Paula routinely asks the manager and staff members are “How do you deal with horizontal violence?” and “What hospital policies and procedures are in place to discourage workplace violence, including HV?” If either a manager or his/her staff members deny that HV exists, Paula knows that she does not want to work for their organizations. She knows that HV exists, to varying degrees, in all organizations. Paula expects an honest appraisal of the problem and information about hospital policies and procedures pertaining to HV. Having experienced HV in the past, Paula has learned to evaluate how potential employers work to reduce or eliminate the problem.

There are many reasons that HV is not recognized or acknowledged and even some excuses for its occurrence. Here are some managerial reasons and excuses for allowing the problem to continue. 2,5,19,20

- Managers may be reluctant to implement policies and procedures on HV because they are afraid that their departments may acquire a reputation for unpleasant working conditions, which may interfere with recruitment efforts.
- Managers may ignore or downplay the problem of HV for fear of offending the perpetrators. Persons who commit HV may be some of the most experienced clinicians. Some managers are willing to put up with bullies who instigate HV if they are valued by management for their clinical expertise or other job-related skills.
- Managers may fail to acknowledge HV for fear that their supervisors and administrative staff will believe that they cannot deal with personnel problems.

### The impact of horizontal violence

The impact of HV is toxic to patients, victims and the organization in which it takes place. 3 HV takes a toll on the physical and mental health of its victims, puts patients’ safety at risk by increasing the potential for error, and costs the organization thousands upon thousands of dollars. 3,10 Any plan to reduce and prevent the occurrence of HV must begin with an analysis of the impact of HV.

### Impact on patients

Veronica is a physical therapist with several years of experience in acute care settings. She has worked with orthopedic patients for several years but has always been especially interested in the physical rehabilitation of stroke patients. She works in a large health system that consists of a large acute care hospital, several outpatient clinic, and a rehabilitation hospital.

A vacancy in the rehabilitation hospital would allow her the opportunity to work with stroke patients and expand her knowledge of neurologic physical therapy. She applies for and is hired to fill the position in the rehabilitation hospital. However, her new colleagues are less than welcoming. She receives little orientation to her new duties, and her co-workers are always “too busy” to help her adjust to her new job. She overhears them complaining about her. Apparently, they wanted another candidate to fill the vacancy for which Veronica was hired. She hears them conspire to make things difficult for her so that she will “go back to orthopedics where she belongs.”

Part of making things difficult includes failing to communicate some essential patient information about one of Veronica’s patients. This patient began a new medication that may cause him to have trouble concentrating until he adapts to its effects. Not knowing about the medication, Veronica continues to teach the patient how to transfer from wheelchair to toilet. The patient is unable to concentrate and loses his balance. Veronica is able to stop him from falling, and as she attempts to lower him back to his wheelchair she calls out for help. Her colleagues take their time coming to her assistance, and when they arrive, they find both Veronica and the patient on the floor. The patient has a laceration of the forehead and Veronica suffers muscle damage to her lower back.

HV interferes with effective communication among colleagues. Experts agree that inadequate communication interferes with the exchange of information critical to the safety and well-being of patients. 2,3,5,10 The potential for errors increases, and if errors occur, patients can be injured and desired outcomes compromised. The preceding scenario may seem extreme, but, unfortunately, similar situations have been known to take place. It is doubtful that Veronica’s colleagues wanted to see either her or her patient suffer injury. But sometimes those who commit HV are so intent on intimidating their...
victims, they fail to consider just how serious the consequences of HV can be.

The Joint Commission has made references about the impact of HV on patient care and safety. The blog The Joint Commission Journal on Quality and Patient Safety noted that “Whether conflicts openly threaten a major disruption of hospital operations or whether unresolved conflicts lurk beneath the surface of daily interactions, unaddressed conflict can undermine a hospital’s efforts to ensure safe, high-quality patient care.”

Impact on physical health

Leslie is an occupational therapist who works in a large medical center. The occupational therapy (OT) department is divided into units, and each unit is responsible for specific specialty areas. Leslie was just promoted to the position of manager of OT for the spinal cord center. She is excited about this new career opportunity. However, her managerial peers are less than welcoming, and she becomes a victim of their HV.

Leslie becomes anxious and stressed, and in her words, “I seem to ‘catch’ every cold and virus that is going around.” One of her peers comments that “Leslie sure takes a lot of sick time. And when she is at work, she always seems to have a cold or a sore throat or something. I don’t even like to be around someone who is sick all of the time!”

Tim is a nurse on the pediatric unit. He has five years of experience in the specialty, and his performance evaluations are consistently excellent. However, one of his peers, Kathy, a nurse with 30 years of experience as a pediatric nurse, dislikes Tim. She believes that it is “unnatural” for a man to want to work in pediatrics but is careful not to say so at work. She rolls her eyes when he speaks during staff meetings and goes out of her way to make sarcastic “jokes” about him to their peers.

Tim has attempted to discuss her behavior with her, but she claims she isn’t doing anything wrong. Their nurse manager tells Tim that unless Kathy does something that can be proven as HV, there is nothing that can be done. Tim begins to avoid Kathy as much as possible.

He notices that he is experiencing a rapid heart rate and some “skipped beats” that he attributes to caffeine intake, even though he rarely drinks caffeinated beverages. His wife encourages him to see his physician. Tim reluctantly does so. After a thorough physical exam, his physician begins to suspect that Tim’s rapid heart rate and minor arrhythmia are stress related.

Impact on psychosocial health

Jay is a neuropsychologist who works in a prestigious medical center in a large American city. The work environment is quite competitive, and the incidence of HV is high as Jay and his colleagues compete for career advancement. Jay, the youngest member of the staff, is often subjected to HV by his older colleagues who resent their younger, highly skilled colleague.

Jay finds himself becoming quite irritable and is increasingly short-tempered with his wife and children. One evening Jay’s 5-year-old son forgets to put his toys away as he has been learning to do. Jay shouts at the boy and tells him that as a punishment he is going to give away the boy’s new tricycle. The boy bursts into tears and runs to his room. Jay’s wife is furious and tells him, “I’ve had enough! It’s the horrible people at work who are giving you trouble, not me or the kids! Either figure out a way to solve the problem or you can find someplace else to live!”

Wendy is a nurse practitioner who works in a large outpatient clinic. She excels at her job and has the respect of her supervisors and peers. Five years ago, Wendy was the victim of HV so severe that she filed a lawsuit against her former employer. Wendy still has nightmares about the HV and sometimes finds herself suffering from periods of severe anxiety when she remembers the abuse she suffered.

Raymond is an RN working in a neurologic intensive care unit. The work environment is quite stressful. There is little trust among members of the nursing staff, who always seem ready to discredit a colleague in an attempt to gain the attention of the physicians and nurse manager.

Raymond usually has a couple of glasses of scotch every evening to “relax” after work. Lately, his friends notice that instead of “a couple” of drinks, Raymond has taken to drinking so much that he has to be driven home because he is too drunk to safely drive.

HV can cause serious psychosocial problems as well as physical illness. These problems can range from slight anxiety to major depression, substance abuse and damage to interpersonal relationships. The following psychosocial effects have been reported by some victims of HV:

- **Feelings of anger, irritability and aggression.** Victims of HV often find themselves experiencing and displaying anger and irritability to an unusual degree. Aggressive behaviors such as road

HV Warning! Sick days not only have an impact on the person who is ill but on the organization as well. Sick days cost the organization a considerable amount of money, and research suggests that this amount could run into many thousands of dollars annually. Results from an Australian study show that 34 percent of nurses who experience HV take more than 30 sick days per year!\(^2,5,10\)
Damage to interpersonal relationships. The first scenario also shows that Jay’s aggressive behaviors at home are having a damaging impact on his relationships with his wife and children. This kind of damage does not have to be limited to spouse and children. All types of interpersonal relationships can suffer, including those with a significant other, friends, parents and siblings.

Depression. Clinical depression may also occur as a result of HV. Depression can impact all facets of a person’s life. Depression can become so severe that the person loses interest in work, leisure activities and interpersonal relationships. Suicidal thoughts may even occur.

Decreased self-esteem and self worth. Feelings of worthlessness may occur. The victim of HV may begin to believe that he or she is unable to live a productive life. Confidence is destroyed. These kinds of feelings are also symptomatic of depression.

Feelings of loss of control over many aspects of life. These feelings may begin with a loss of control over their work environment as the perpetrators of HV assume toxic control over the workplace. These feelings may spread into the victim’s personal life as well.

Decrease in motivation. The victim of HV may lose interest in work. He or she believes that the workplace is so toxic that there is no point in trying to do a good job. This lack of motivation may also affect the victim’s personal life. Family and friends may notice that the affected individual has no interest in home and family or in the pursuit of leisure activities. He or she may seem lethargic and apathetic and have no interest in their normal activities. These feelings and behaviors can also be symptomatic of depression.

Substance abuse. Raymond, in the preceding third scenario, has begun to use alcohol to relax and forget about his problems at work. There are a variety of substances that can be abused. In addition to alcohol, prescription drugs and illegal drugs may also be abused. Food is another substance that can be abused. Overeating may be a coping mechanism when trying to deal with the effects of HV.

Post-traumatic stress disorder (PTSD) is a mental health disorder that can develop as a result of experiencing a traumatic event such as HV. PTSD is characterized by ongoing anxiety, panic attacks, aggressive outbursts, having nightmares about the traumatic event, having “flashbacks” during which the event is relived, and avoiding situations and activities that remind the person of the stressful event. To qualify as PTSD, these symptoms must last for at least one month following the traumatic event.

Impact on the organization

Cheryl is a nurse manager who has been having trouble managing her unit’s budget. She is summoned to the director of nursing’s office. The director tells her that her unit is significantly over budget. Turnover is high, and the unit is developing a reputation for conflict among staff members. It is estimated that Cheryl spends as much as 30 percent of her time dealing with conflict and that this is costing many tens of thousands of dollars.

The preceding scenario is, unfortunately, not fictitious. A study conducted by the American Management Association on the cost of conflict in the workplace estimates that managers spend about 20 percent to 50 percent of their time dealing with conflict in the work place. This translates to hundreds of thousands to even a million dollars annually depending on the work place and the extent of conflict.

Costs are associated with many factors of management and organizational effectiveness. Here are some of the factors that seem most closely associated with HV.

Recruitment and retention

Amanda is a newly licensed RN who is interviewing for her first job as a registered nurse. During the interview she asks questions about turnover and the policies and procedures that are in place to deal with HV. The human resources director and nurse manager are surprised. They are not prepared to answer questions about these sensitive issues.

Health care organizations can quickly acquire a reputation for having a dysfunctional work environment. Word of mouth and social networking sites all contribute to the ease with which information about an organization can spread.

Health care professionals are becoming more knowledgeable about asking questions concerning work environment, including the occurrence of workplace violence. If managers and human resources personnel deny the problem exists or are unable to explain the policies and procedures that govern the problem, candidates may very well choose to work elsewhere.

As of this writing, information regarding recruitment and retention and HV was found only in the nursing literature. Here are some statistics from the nursing literature pertaining to recruitment and retention and HV.

○ The turnover rate for clinical practicing nurses is between 33 percent and 37 percent in the United States.

○ The turnover rate for newly licensed RNs in the United States ranges from 55 percent to 61 percent.

○ It is estimated that about 60 percent of newly licensed nurses in the United States resign from their first positions within the first six months of employment because of some type of HV.

○ Job dissatisfaction contributes to both turnover and HV. A study of 43,329 nurses from Canada, England, Germany, Scotland and the United States showed that job dissatisfaction was high in all countries represented except for Germany.

The preceding statistics indicate that turnover related to HV is a significant problem. The costs associated with recruiting, orienting and retaining health care professionals can range from tens of thousands to hundreds of thousands depending on the organization. Additional costs include paying staff members overtime to ensure adequate staffing, advertising job openings, and interviewing and selecting candidates to fill vacancies. All of these add up to huge budgetary expenses that can force an organization to cut spending throughout the organization.

Sick time

As previously noted, HV has an adverse effect on physical and mental health. Deterioration of physical and mental health leads to illness and an increased number of sick days. The organization must not only pay sick time but also pay overtime for employees who must cover until the employee who is ill can return to work.
Quality and appropriateness of patient care

Research shows that the effects of HV interfere with concentration and focus as well as communication among staff members. These issues contribute to an unsafe environment for staff members and patients alike. Research also shows that in this type of environment there are increases in adverse occurrences, such as medication errors and patient complaints, and a decrease in desired patient outcomes.\(^1^,\(^2\)

Legal ramifications

HV also makes an organization more vulnerable to malpractice lawsuits. If there is an increase in errors, patient dissatisfaction and patient injury, there also may be a corresponding increase in malpractice lawsuits. Lawsuits or the threat of lawsuits increase employee stress and increase the financial burdens that face health care organizations.

Employees who are victims of HV and commit errors that result in patient harm may try to establish a link between their maltreatment and the committing of errors. For example, suppose organizational policies and procedures pertaining to HV exist but are not followed. This failure to follow organizational mandates may increase the risk for legal action against an organization and its administrators and managers. Victims of HV may attempt to show that HV contributed directly to any errors that were made, and that the organization failed to follow its own mandates.

As of this writing, few laws specific to bullying exist, although there are laws against harassment. However, as the public becomes more and more aware of the effects of HV, interest in legal protection grows. Some states’ legislators are proposing laws that would allow workers to sue for physical, psychological or economic injury from abusive treatment at work.\(^20\)

Managers and administrators have a legal and ethical duty to their employees. Consider how the four elements of malpractice might be applied to a situation in which HV exists. In the clinical setting, elements of malpractice for health care professionals include duty to the patient, breach of duty owed to the patient, injury or harm to the patient, and causation, meaning that there is a direct link between the breach of duty and the injury or harm experienced by the patient.\(^23\) Consider how these elements may apply to administrators and managers in relation to their employees.

Duty to the employee: An organization, via its administrators and managers, assumes a duty and responsibility for employees. Part of this duty and responsibility is an obligation to provide a workplace environment that is safe and appropriate.

Breach of duty to the employee: A breach of duty might exist if an employer fails to provide a safe and appropriate work environment. An example of such a failure might be a failure to follow policies and procedures related to HV.

Harm or injury to the employee: A victim of HV may experience physical or mental illness or injury.

Causation: Causation indicates an ability to demonstrate a direct link between the harm or injury experienced by the employee, the occurrence of HV, and the organization’s failure to follow policies and procedures established to stop the occurrence of HV.

(LEGAL WARNING: THIS EDUCATION PROGRAM IS NOT INTENDED TO SERVE AS LEGAL ADVICE OR COUNSEL. QUESTIONS CONCERNING THE LEGAL RAMIFICATIONS OF HV SHOULD BE DISCUSSED WITH QUALIFIED LEGAL COUNSELORS. AS OF THIS WRITING, LEGISLATION SPECIFIC TO HV HAS NOT BEEN ENACTED.)

Strategies to reduce or prevent horizontal violence

Communication tips

Ellen is just completing her first year of employment as an RN. She is a rather shy person and has been subjected to HV throughout this first year. HV behaviors consisted mostly of criticism in front of coworkers and gossip behind her back.

Ellen recently enrolled in an assertiveness training course. Instead of quietly trying to ignore the behaviors of her peers, Ellen now confronts them. She stands erect and maintains eye contact. She speaks clearly and in a firm tone of voice. Ellen tells colleagues who are criticizing her that she is as willing to learn as anyone but will not tolerate being embarrassed in front of others. When she learns of the gossip being spread about her, she confronts those who are responsible. Her peers are surprised at her newfound confidence and the HV begins to stop.

Earlier in this education program, information about who were the most likely targets of HV was offered. It is important to project an air of confidence. How one communicates with others has a lot to do with stopping or preventing HV. But communicating assertively is not the only means of communication designed to stop HV. Active listening is also an important part of reducing this type of workplace violence. Here are some suggestions for projecting both an attitude of confidence and willingness to listen to what others have to say.\(^2,\(^3\),\(^12\),\(^13\)

- **Posture:** Stand or sit erect with arms at your sides. Avoid crossing your arms or leaning your fists. These actions give the impression of anger and being closed to the ideas of others.
- **Eye contact:** Maintain eye contact as culturally appropriate. For most Americans, eye contact indicates an interest in what the other person is saying.
- **Tone of voice:** Speak clearly. Speak loudly enough and slowly enough to be understood easily. Don’t speak too rapidly.
- **Facial expressions:** Don’t frown or roll your eyes. Maintain a pleasant expression. Avoid showing amusement unless the person with whom you are communicating is genuinely trying to be funny. Laughing at someone is never appropriate.
- **Self-analysis:** Be aware of your communication style. Do you cross your arms without being aware of doing so? Are you maintaining eye contact? What about tone of voice? Record yourself speaking and really listen to what you sound like. Do you speak too quickly? Too softly? Too loudly?
- **Personal space:** Personal space varies among countries and cultures. In the U.S., personal space is usually about three feet. Be aware of how closely you sit or stand next to someone.
- **Active listening:** In addition to maintaining eye contact, respond to what someone else is saying. Nodding your head, asking for clarification and making comments such as, “I understand that you are concerned about the work schedule,” or “I am interested in your ideas about purchasing new IV pumps,” show that you are really listening to the concerns and ideas of others. Never appear to be bored or in a hurry. Don’t tap your foot, glance at your wristwatch or stand with one hand on the doorknob when talking to someone else.
- **Willingness to learn:** Always show that you are willing to learn. No one knows all there is to know about a particular profession. The fact that you are willing to learn (and say you are willing to learn) will go a long way to enhancing professional rapport with colleagues.
- **Willingness to help:** Help a colleague whenever possible. In general, peers will remember who came to their rescue on a bad day and will reciprocate when needed.
The preceding tips are good suggestions for projecting confidence as well as a desire to listen to what others have to say. Good communication does help to reduce the incidence of HV. However, there are always colleagues, for whatever reason, who seem to be the primary instigators of HV. It is important to be prepared to deal directly with those who commit HV.

Dealing directly with persons who commit HV

Sarah is an RN who works on one of several medical/surgical units in a large community hospital. This morning she is asked to “float” to another medical/surgical unit that is short-staffed. As soon as she arrives, she asks for a brief orientation to the unit and a report on the patients she will care for. An older, more experienced colleague, Norma, rolls her eyes and complains that if Sarah doesn’t know what she’s doing, “she might as well go back to her own unit.”

The nurse manager intervenes and tells Norma to provide Sarah with the information she needs. Norma does so, but reluctantly. She tells a patient that Sarah “doesn’t usually work on this unit, but I guess she’ll know how to take care of you.” Norma walks out of the room and Sarah overhears her tell other nurses that “This nurse they sent us is really a pain. She expects to be treated like royalty.”

Sarah finishes providing care to the patient and leaves the room. She asks to speak to Norma privately. Norma rolls her eyes and steps into the nurses’ lounge. “Hurry up, I don’t have all day.” Sarah responds by saying, “I am more than willing to help take care of patients since you are short-staffed. However, I will not tolerate the comments you are making about me in front of patients and to other nurses. This must stop now.”

It is not easy to talk to the person who is committing HV. The encounter will be difficult and, most likely, emotional. It is important that a victim of HV remain calm and address the problem without shouting or crying. If you are a victim of HV, it may be helpful to practice what you will say and how you will say it.

The most important strategy to combat HV is to deal with the problem the first time it occurs. Do not ignore it. Ignoring the problem will only make the perpetrator believe that he or she can get away with it, and the problem will probably escalate. It is critically important that the victim of HV makes it clear that this behavior will not be tolerated. In the preceding scenario, Sarah confronts Norma as soon as possible.

Here are some suggestions when confronting persons who commit HV.

- **Stay calm.** If you become angry, defensive or cry, the persons committing HV will assume that you can’t defend yourself. In this case, the HV will more than likely continue.

- **Confront the perpetrator in private.** Don’t address the issue in front of an audience. If the person committing HV refuses to speak to you in a private location, you may need to speak to him or her in a more public setting, but NEVER in front of patients. Refusing to speak in a private setting may be a bully’s way of avoiding having to deal with the problem. If forced to confront the person in a hallway, do so as quietly as possible.

- **Deal with the situation as soon as possible.** Obviously, patients cannot be left unattended in order to confront a bully. But do not allow an entire shift or longer to go by. The longer the perpetrator gets away with it, the longer and more virulent the HV will become. HV often continues because its instigators are so seldom confronted about it.

- **Set boundaries.** Sarah, in the preceding scenario, calmly explains what will not be tolerated. Notice that it is best to start by indicating an appropriate action. Sarah starts by saying she is willing to help during a period of short staffing. A new orientee might start by saying that he or she is willing and eager to learn. The next sentence should be a calm, definite statement that the HV will not be tolerated. Be specific. For instance, Sarah states that she will not tolerate the negative statements being made in front of patients. In some circumstances, it may be necessary to say what steps will be taken if the behaviors do not stop. For instance, a new employee may say that if behaviors do not stop, she/he will request a new preceptor. Don’t threaten. Start by saying what behaviors have occurred and that they will not be tolerated. If they continue, another confrontation will be necessary, and at that time, you should indicate what the next step will be (e.g., ask for a new preceptor, file a grievance).

- **Focus on behaviors, not personalities.** When setting boundaries, talk about the behaviors that are not acceptable. Avoid “you” statements, such as “you are making fun of me,” or “you are criticizing me in front of other nurses.” Instead, give examples, such as “Comments that I don’t know what I am doing in front of patients upset the patients and embarrass me. I will not tolerate these comments.”

It’s never easy to have these types of conversations. But the person instigating the HV must be confronted as soon as possible after it occurs.

Documentation

Persons who experience HV should keep a documentation record of the events. These are personal records, and HV should not be documented in a patient’s medical record. Note the date, time and location of the event. Document what was said or done and who was responsible for the HV behaviors.

It is important to be objective. For example, don’t document that on “July 1, 2012, at 10 a.m. my preceptor embarrassed me in front of a patient.” Instead, document that on “July 1, 2012, at 10 a.m. in room 228, I was changing a sterile dressing, under the supervision of my preceptor, Karen Saunders, on Ms. Evens, a patient who had undergone an abdominal hysterectomy. During the procedure, Ms. Saunders rolled her eyes and commented, ‘I guess we’ll be here all day since you’re so slow.’ She then addressed Ms. Evens directly and stated, ‘You have to understand that these new nurses just don’t know as much as they should.’”

By being objective and specific an accurate account is recorded. This type of personal record may be needed if it becomes necessary to approach a nurse manager or to file a grievance in accordance with organizational policies and procedures.

Zero tolerance HV policies and procedures

It is important that all employees, including managers and administrators, be aware of policies and procedures that deal with HV and other types of workplace violence. If someone is a victim of HV and confronting the abusers directly fails to stop the abuse, it is important that policies and procedures be followed. In many cases, the next step (if confronting the perpetrator does not put an end to the problem) is for the victim to meet with his or her immediate supervisor. When doing so, it is probably helpful to bring the written record of the HV to the meeting. This helps to keep the meeting objective and prevent displays of emotion, such as anger or tears, that may interfere with coming to a satisfactory conclusion on how to stop the problem.
The Joint Commission has published guidelines for the prevention of disruptive workplace behaviors. These guidelines include the following recommendations.\textsuperscript{20}

- All employees should receive education about disruptive behaviors to be avoided as well as those appropriate behaviors that foster respect and professionalism in the workplace.
- It should be made clear, as part of written standards such as policies and procedures, that all employees and others who work within the organization are accountable and responsible for their own behavior.
- There should be written policies and procedures that guarantee zero tolerance for behaviors that are disruptive or intimidating and adversely affect the organization.

**Conflict management styles**

It is important that all employees be helped to recognize the various conflicting management styles and what styles are appropriate under what conditions. Here are examples of some of the most common styles.\textsuperscript{11,13,17}

**Thomas** is a member of an interdisciplinary research committee. He is one of the committee’s newest members. The group is discussing sample selection for a research project. Thomas respectfully questions the proposal for sample selection currently under review. He believes that it lacks objectivity and may have an adverse impact on the reliability of the results of the research. However, the person who proposed the selection is a colleague who has served on the committee for many years and has the respect of the group. There is significant support for the proposal as it is currently written. Thomas apologizes and agrees to go along with the group’s recommendations even though he believes the proposal will hamper effective research.

This is an example of accommodation. Accommodation exists when one person or group gives in to the demands of another person or group. “Giving in” may compromise patient care, organizational standards, or other important factors. Accommodation is appropriate only if the person who gives in realizes that he/she has made an error. Giving in to avoid conflict may be seen as weak and ineffective by others.

**Stella** and Maureen are senior physical therapists. They have a friendly rivalry for the respect and attention of their less experienced colleagues. During a staff meeting, they take opposite sides of a discussion pertaining to a new scheduling format. Neither is willing to discuss or listen to the other’s viewpoint.

This is an example of competition. This is a negative approach to resolving conflict. With competition, neither involved party is concerned with achieving the best possible outcome. The only concern is winning. In completion, there is always a winner and always a loser.

**Arlene** is the nurse manager of several medical units. She knows that there is conflict among the units about staffing and the budgetary allotment for unit resources. Staff members have asked for a multi-unit staff meeting to resolve the issues. Arlene is reluctant to schedule a meeting that she fears will further disrupt professional rapport. She hopes that eventually each unit will determine a way to deal with the resources they have.

- Persons who report disruptive or intimidating behaviors must not be reprimanded or subjected to any form of retaliation for doing so.
- Organizational leaders must be trained and educated to recognize disruptive, intimidating behaviors, to stop such behaviors, and to uphold standards of acceptable behavior.
- Organizational leaders must establish a system for dealing with disruptive, intimidating behaviors. This system must include a process for monitoring and reporting such behaviors.
- Any and all actions taken to stop disruptive, intimidating behaviors must be documented.
- A code of conduct must be written. This code must define what are considered to be acceptable behaviors and what behaviors are disruptive and intimidating.

This is an example of avoidance. Avoidance means that the conflict is being completely ignored in the hope that it will eventually resolve itself or even disappear entirely. But ignoring conflict seldom, if ever, results in a happy ending. Avoiding conflict usually prolongs it and often causes it to escalate.

**Linda and Victor** are social workers whose patient population is primarily elderly persons who have had strokes or other debilitating conditions. Linda believes that Mrs. Burns, a stroke patient, should be taken in by one of her many children after discharge. Victor believes that her care is so extensive that she should be discharged to a long-term care facility. They cannot come to an agreement, and family members are arguing among themselves about what to do. Linda and Victor decide to present the option that each of the children take turns having Mrs. Burns in their homes on a trial basis. If none of them are able to care for her, she will then go to a long-term care facility. Neither social worker is happy with this option.

This scenario is an example of compromise, which means that all parties involved in the conflict give up something in order to resolve it. Since neither party is really comfortable with the outcome, compromise is usually only a temporary resolution of the problem and conflict still exists to some extent.

**The nurses** who work on a busy surgical unit are forming a unit-based council. One of their first projects is to initiate self-scheduling. It is a difficult process, but all agree that the first consideration must be adequate staffing. After discussing, sometimes forcibly, a variety of options, the group comes up with a way of scheduling that allows nurses to work only one weekend a month as well as a system that has each nurse taking her turn to work overtime or additional shifts when needed without scrambling at the last minute to find coverage.

This scenario is an example of collaboration. It is also referred to as negotiation and results in a win-win situation. Collaboration means that a solution that is satisfactory to everyone involved is found.

When working with diverse groups of colleagues, it is helpful to identify one’s personal conflict management style. In this way, collaboration, rather than styles that often escalate conflict, can be implemented.

**Education**

Education is essential to the reduction and elimination of HV. All employees, including administrators and managers, must participate in education and training about HV. Remember that this phenomenon occurs in all departments, not just those whose staff members are direct patient care providers, and at every level in the hierarchy. Work with the organization’s professional development department (also known as staff development or education) to plan, implement and evaluate such education.

Before education can take place, effective policies and procedures must be written with a statement that there is zero tolerance for disruptive behaviors, including HV. (See the recommendations for these policies and procedures above.) Every employee should be
required to read these documents, agree to uphold their standards, and sign a documentation record that they have done so.

What should HV education consist of? How should it be presented? Everyone is busy and finds it hard to leave their departments to attend education. But attendance should be facilitated and should also be mandatory. Remember that all such education and training does not have to be done entirely in a classroom. Computer-based learning, staff meeting presentations and distribution of case studies can all be used so that the actual time in the classroom is limited to manageable amounts.

Information to be presented should include: 2,5,8,16

- An explanation of what HV is and what it is not. Role play, case studies and actual examples, preferably from situations that have been witnessed within an organization, are good ways of making the HV “real” and not just a theory. But be sure that scenarios used as examples do not include names, specific units or other items that would specifically identify the victims or those who commit it. This will embarrass some and make others angry and only escalate the problem.

- An overview of the organization’s policies and procedures that deal with disruptive behaviors.

- How to deal with HV. Use a variety of strategies to show how to deal with HV. Don’t just have people listen to a lecture or read a policy. Role play and case studies should show effective and non-effective ways of dealing with the problem. This type of contrast can show what works and what does not.

- Presentation of organizational data related to HV. This could include statistics about turnover, the effects of HV, and the cost of the problem to the organization. On a department level, actual data showing how HV has impacted patient care, recruitment and retention could be presented. HV must be made “real” to the employees, especially those who don’t believe it exists.

- How to recognize HV when it is seen or when it is committed. Remember that earlier in this program it was mentioned that some people don’t even realize that their behaviors constitute workplace violence. Every employee should have to perform a self-analysis of his/her own behavior.

These are just some ideas to “kick off” an education campaign to stop HV. But a one-time education session is not enough. HV education must be ongoing and occur during various points in employees’ careers, such as, during:

- Orientation: The topic of HV should be addressed during orientation of all new staff members and include information as described above. Some may argue that this will scare new employees and give them a bad impression of the organization. On the contrary, knowing about HV and what to do about it only empowers a new employee. It also shows that the organization has a commitment to put a stop to disruptive behaviors.

- Mandatory training: All health care organizations have some type of mandatory training. Updates on HV, how to recognize it and how to stop it should be part of every employee’s annual mandatory training.

- Continuing education: Ongoing information about HV and other types of workplace violence should be part of every organization’s continuing education endeavors. Education could include updates from the literature, information based on analysis of the organization’s own efforts to stop HV and other forms of workplace violence, and how successful the organization has been in stopping HV.

**HV warning! Ask employees for input on the kind of education they need about HV. Do they want more opportunities for role play and discussion? Is there interest in conducting research about HV? What is it, from their viewpoints, that should be done to help stop HV and to help employees deal with it when it does occur?**

### Conclusion

HV is not a new phenomenon, but it is one that is becoming more well-known and more openly acknowledged by accrediting bodies. All persons who work within the health care field must take responsibility for putting a stop to HV. To provide a safe work environment for employees and an environment that is conducive to the best possible patient care, HV must be recognized and a zero tolerance for its occurrence be upheld by administration, management and staff.

Education is a critical part of developing and maintaining such an environment, and education should be mandatory for everyone who works in health care. It is essential that the leadership of the organization serve as role models for appropriate behavior, and that those who commit HV, no matter what their role in the organization, be held accountable for their actions.

### References

Final Examination Questions
Choose True or False for questions 21 through 25 and mark them on the answer sheet found on page 133 or complete your test online at Nursing.EliteCME.com.

21. Among the most vulnerable to HV are those who are older workers with many years of experience.
   ○ True  ○ False

22. Persons who ignore HV are just as guilty of aggression as those who actually commit this type of aggression.
   ○ True  ○ False

23. Oppression theory as a cause of HV is most often linked to the discipline of physical therapy.
   ○ True  ○ False

24. If a person experiences PTSD as a result of HV, the symptoms of PTSD end as soon as the victim finds another job.
   ○ True  ○ False

25. The most important strategy to combat HV is to deal with the problem the first time it occurs.
   ○ True  ○ False

NIA06PBE15
Chapter 5: Nutritional Updates For Nurses

10 Contact Hours

Release Date: 09/15/2013
Expiration Date: 09/14/2016

Audience
This course was designed and developed for nurses, advanced practice nurses, nurse practitioners, and other licensed professionals who provide patient care in multiple settings along the healthcare continuum.

Purpose statement
The link between health and nutrition has increasingly been recognized and reported in evidence-based literature. Chronic disease is a costly epidemic in United States; diet and nutrition play a significant and therapeutic role when managing cardiovascular disease, congestive heart failure, arthritis, and diabetes. Nurses in every care setting need to understand and teach patients about nutrition in relation to patient disease processes. The purpose of this course is to provide nurses with current evidence-based information as a comprehensive overview of nutrition.

Learning objectives
Upon completion of this course the learner should be able to:

- Describe the role of nurses in improving the nutritional states of patients.
- Identify the MyPlate icon.
- List three examples of whole foods.
- List three vegetarian sources of protein.
- List two benefits that phytochemicals provide.
- Identify three healthy foods for pregnant women.
- Describe nutritional interventions for two chronic health conditions.
- List three foods that help protect against cancer.
- Describe two effects a plant-based diet had on patients with diabetes.
- Describe three factors that interfere with nutrition among elderly patients.

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Author disclosure
Patricia Bratiano has disclosed no pertinent financial relationships or other conflicts of interest relevant to the content of this course.

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Curriculum disclosure
The Curriculum Planner has disclosed no pertinent financial relationships or other conflicts of interest relevant to the content of this course.

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- Read the entire course, which requires a 10-hour commitment of time.
- Depending on your state requirements you will be asked to complete either:
  - An attestation to affirm that you have completed the educational activity.
  - OR Complete the test and submit (a passing score of 70 percent is required)
- Note: Test questions link content to learning objectives as a method to enhance individualized learning and material retention.
- Provide required personal information and payment information.
- Complete the MANDATORY Self-Assessment and Evaluation form and submit.
- Print the Certificate of Completion.

Overview of nursing and nutrition
A report by the American Medical Association released in July 2013 stated that Americans are living longer – but they are not living healthier lives. Instead, Americans are living longer while suffering from chronic diseases such as cardiovascular disease, arthritis, and diabetes. The study identified obesity as one of the main causes of the failure of Americans to live healthier lives.

People in the United States spend more than $8,000 annually per capita on health care. That is the highest dollar amount of any nation, yet the health ranking of Americans continues to decline when compared with other nations.

Healthy nutrition is an essential component of health maintenance, illness prevention, and treatment of disease. Research and statistics show that most health problems are related to poor quality diets and nutritional imbalances.

The American Cancer Society estimates that more than 1.2 million new cancer cases will be diagnosed in the United States this year. It says that more than one-third of those cancers are nutrition related.

Virtually all experts agree that poor diet contributes strongly to circulatory disease and early death from cardiac illness.

Poor nutrition combined with sedentary lifestyles hastens development of the most prominent illnesses and causes of death in the United States. Rates and progression of heart disease, stroke, diabetes, and cancer are all directly linked to diet.

Most Americans obtain more than 60 percent of calories from sugar, fat and alcohol. More than two-thirds of the deaths in the United States are due to illnesses that are influenced directly by dietary choices.

Despite the availability of accessible information, Americans continue to make poor nutritional choices. The most widely advertised foods tend to be high in calories and low in nutrients, and there are few ads for healthy foods, such as fruits, vegetables, whole grains and beans. Adding to misinformation, people find making lifestyle changes, such as improving their nutrition, difficult. Busy work schedules often leave little time to prepare healthy meals at home.

A bewildering array of diets is promoted today. People find it overwhelming to determine which dietary choices are best for their individual needs.

Most popular diets scapegoat a particular type of food as being responsible for ill health or weight gain. Carbohydrate-rich foods, high-fat foods, and low-protein foods have all been targeted as culprits for the nation’s high rates of obesity, cancer and cardiovascular disease. Most popular diets give distorted information about what foods should be consumed. Instead, they emphasize what should be avoided to lose or maintain weight. The greater long-term goals of using food to live longer and to perform better are overlooked.

Nurses are in positions to provide accurate information about nutrition. But sometimes they are unsure of what to recommend and prefer to refer patients’ questions to dietitians. The fact of the matter is that nurses have more opportunities to interact with patients, and most patients are not referred to dietitians.

Nurses are able to provide patients with information about healthy eating. Teaching them about nutrition is an essential component of health maintenance and illness prevention and is within the nurse’s scope of practice. As health care moves from a model of treating illness to a model of prevention, nurses will be expected to include dietary teaching as part of wellness promotion activities.

Patients with illnesses or who are at risk for development of disease need teaching that contains information geared to treat their illness and improve their general level of wellness.

What makes one diet plan better than another? A good diet strategy should help achieve and maintain a healthy weight, be affordable, and ensure better long-term health. It must include foods that are commonly available and pleasurable to eat.

There is a great deal of evidence available from large epidemiologic studies that indicates food has a major impact on disease development, quality of life and life expectancy. Occurrences of low birth-weight babies, preeclampsia, birth defects, age-related macular degeneration, cataracts, colon cancer, cardiovascular disease, diabetes, kidney stones, osteoporosis, and stroke have been shown to decrease with proper nutrition.

We will examine nutritional options and learn about nutrition for a variety of health conditions and age groups. We will explore the benefits of specific nutrients and find out about nutritional benefits that herbs offer.

By program completion, you will have comprehensive knowledge to empower you to offer your patients current nutritional information that will help them make healthy food choices to optimize their level of health. By teaching your patients to eat healthy foods now, they will enjoy healthy bodies throughout their years.
In 1894, the U.S. Department of Agriculture published Dr. Wilbur Olin Atwater’s nutritional guidelines. It was updated in 1904. That edition, entitled Principles of Nutrition and Nutritive Values of Food, included advice that recommended including a variety of foods in the diet. Dr. Atwater maintained that a healthy diet consisted of easily prepared, affordable, nutrient-rich foods. He wrote about caloric needs and advised moderation in food consumption. Dr. Atwater said a healthy diet contained less fat, sugar and starch than most foods consumed at that time.

A guide, Food for Young Children, was published in 1916 by Carolyn Hunt. She recommended that children be provided foods from five categories.

In 1917, a new guide, How to Select Food, stated that the five groups previously recommended for children be consumed by adults as well. These were milk and meat; cereals; vegetables and fruits; fats and fatty foods; and sugars and sugary foods. The guidelines were unchanged until the Great Depression.

Because of the economic situation, malnutrition and starvation were very real threats during the 1930s. The government published nutritional guides based on four different economic levels.

In 1941, the government began recommending specific nutrient values for various nutrients and vitamins. Recommended daily allowances were identified, specifying the minimal levels of specific nutrients that people should consume to prevent serious deficiency diseases, such as scurvy, beriberi, and rickets.

In 1943, the concept of the “basic seven” was introduced in an effort to meet basic nutrition in the face of wartime rationing.

During 1950s, the U.S. government recommended that Americans consume foods based on a model of four basic food groups. The recommendations were essentially unchanged until the late 1970s. No recommendations were included on fat, sugar, and caloric intakes.

By 1977, a U.S. Senate subcommittee report identified that despite the recommendations on the basic four, poor nutrition remained the No. 1 health issue in the United States. As a result, a new guide was published in 1979, and it contained many changes. It recommended that alcohol be consumed only in moderation. Calorie reduction was advised for overweight people. It suggested that 48 percent of a person’s daily calories be obtained from whole grains, fresh fruits, and vegetables. It said less than 10 percent of calories consumed should come from sugar.

The guide recommended that fat consumption be limited to 30 percent of calories consumed each day and said 10 percent of the total caloric intake of fats should be consumed by eating from each of three categories of fats. These categories are polyunsaturated, monosaturated and saturated fats. Cholesterol intake should be limited to 300 grams daily. Sodium was advised to be consumed at less than 5 grams per day.

A food wheel was introduced in 1982. It included dietary recommendations for three caloric levels.

The food pyramid was introduced in 1992. In 1994, an optional Mediterranean pyramid was introduced. The pyramid was updated in 2005 and is still in use. Practitioners sometimes use it in conjunction with the new MyPlate visual aid.

Increased consumption of plant-based foods and a decreased intake of fats was recommended when the pyramid was introduced, and the benefits of decreased fat intake were identified. Decreased fat intake was shown to reduce occurrences of certain cancers, heart disease, and obesity.

Other benefits of a plant-based diet included increased fiber, increased beta-carotene, and increased vitamin C. Experts realized that those nutrients provided protection against cardiovascular disease, cancer, and diabetes mellitus.

The pyramid advised limiting amounts of nutrient-poor, high-calorie foods, like sweets and fatty foods. Variety, proportion and moderation were stressed.

In 2011, MyPlate was introduced.

MyPlate

MyPlate was introduced as a consumer-friendly visual aid to promote healthy dietary habits of Americans. It is touted as being visually pleasing and simpler to use than the pyramid.

In addition to MyPlate, the U.S. Department of Agriculture updated nutritional guidelines in the 2010 Dietary Guidelines for Americans document.

Developers of MyPlate propose that its icon will remind consumers to eat healthy. The plate serves as a graphic image of how to choose foods to eat during meals and the proper proportion that should be consumed in each food group.

There are several resources available on the website www.choosemyplate.gov. Suggestions for healthy food choices, meal suggestions for various calorie requirements and tips for weight loss are available. Dietary recommendations for different age groups and for common health conditions are offered, too. Permission is granted to copy materials for sharing with patients.

Healthy eating plate

The Harvard Medical School proposed that MyPlate does not provide basic nutritional information that affects the quality of food choices. In response, the Harvard Medical School created the “Healthy Eating Plate.”

Instead of equal amount of fruits and vegetables, experts at Harvard recommend that more vegetables be consumed than fruits. They do not consider starchy vegetable dishes, such as french fries, to be a vegetable portion. Both the USDA MyPlate and Harvard’s Healthy Eating Plate were designed to serve as a visual reminder to make healthy food choices.
Eating Plate recommend that fruits and vegetables comprise one-half of a meal.

The Harvard Healthy Eating Plate uses whole grains instead of simply “grains” on one-fourth of its plate.

Healthy protein sources are recommended by the Harvard model. It offers suggestions about a variety of protein sources, including proteins from vegetables. It also lists protein sources that should be limited, such as bacon, red meat, and cold cuts.

The Harvard plate does not contain a separate place for dairy. Instead, the beverage recommended is water, coffee, or tea. Harvard researchers recommend limiting consumption of juice and dairy products. They advise that beverages be unsweetened or minimally sweetened.

The experts at Harvard have added an additional category that is not part of the MyPlate icon. Designers at Harvard depicted a small oil decanter on their icon as a reminder to use healthy fats in the diet.

**Healthy whole foods**

Before we go into detail about diets, specific classes of foods, and their benefits, let’s define what healthy foods are.

Here is an example of a whole food compared with a processed food. Whole-wheat flour contains the entire wheat grain. Each part of the grain offers nutritional benefits. White flour has had part of the grain removed and is chemically and physically processed. As a result of processing, nutrients are lost.

Some nutrients may be artificially added back to white flour. The label on white flour packages at the grocery store says “enriched.” Unfortunately, not all of the nutrients are replaced. Those that are replaced are not in a natural form but added as chemically based vitamins. Most of the fiber is lost. White flour is exposed to bleaching and other chemical processes that make soft white flour. Unfortunately, it is nutrient-poor when compared to the natural state the whole grain was in before milling.

Some nutritious whole grains are millet, quinoa, buckwheat, brown rice, barley, oats, amaranth and whole wheat. Whole grains are excellent sources of phytochemicals, fiber, vitamins, and minerals.

Whole foods have few or no preservatives, chemicals, and toxins. Examples include raw fruits and vegetables, whole grains, legumes, nuts and seeds.

Healthy diets include healthy fats in reasonable amounts. The quantity and quality of fats is extremely important in the prevention of many illnesses. Dietary fats can increase or decrease inflammation within the body. Inflammation is linked to the development of a vast array of illness processes.

Frying is unhealthy because it produces excess calories. High temperature frying converts healthy fats into unhealthy fats. Nutrients are preserved best when foods are eaten raw, steamed or baked. Raw foods generally contain the highest amounts of vitamins and other nutrients.

Whole food diets contain less fat, more fiber and less refined sugars than conventional Western diets. Eating lower on the food chain is healthier for people and the planet. A whole foods diet is richer in nutrients and offers increased dietary variety and satisfaction.

Genetically modified food consumption should be limited. Genetically modified foods have been linked to many illnesses, including allergies and other autoimmune conditions. They also have potential negative effects on the environment.

The researchers at Harvard developed the Healthy Eating Plate because they recognized that food quality is not considered when MyPlate is employed. For example, MyPlate could include a greasy hamburger on white bread with french fries on the plate. While not a healthy choice, the areas indicating protein, grain, and vegetable would be occupied. The food groups would be represented, yet the meal would be high in calories, low in fiber, and laden with unhealthy fats.

In contrast, if using the Harvard plate model, the same meal would be not be viewed as healthy because the bread is not whole grain; the hamburger, an unhealthy protein; and the french fries not viewed as a vegetable.

If people do not have access to a wide variety of foods, then MyPlate is useful in that it ensures a variety of foods from all of the food groups will be consumed. However, the foods eaten may be unhealthy forms of carbohydrates, proteins, and fats. In an area where the goal is to ward off starvation and prevent deficiency diseases, MyPlate is useful. As an aid to promote optimal nutrition, however, it is limited unless the materials available on the MyPlate website are utilized.

**Organic foods**

Organic foods frequently cost considerably more than their counterparts raised by non-organic methods. Organic foods cost more because they may decompose faster, and they are more labor-intensive to produce. Organic meats are costly because the food required to feed
the animals is more expensive than foods fed to animals raised by conventional methods.

However, organics offer some advantages: Organic products reduce levels of pesticide, herbicide, and chemical exposures. All of these chemicals are detoxified via the liver and other organs of detoxification. Organic foods reduce the toxic load of the body. Reducing toxic exposure is especially important for patients undergoing chemotherapy and those with liver and kidney disease.

Organic products are grown and produced under the strictest of quality standards. Soil used to grow organic fruits and vegetables is tested for the use of chemical fertilizers and pollutants. Organic growing methods promote the health of the soil. Rich soil produces nutrient rich fruits, vegetables, and grains.

Cows producing organic dairy products are raised free of antibiotics and artificial hormones. Most experts recognize that part of the reason antibiotic resistance is so prevalent is because people are exposed to antibiotics in the food they eat. Antibiotics are often added to poultry feed and food for other animals that will be used as meat.

Milk cows are sometimes injected with hormones that increase their milk supply. Non-organic dairy foods contain hormones excreted in the cow’s milk. Hormone disruption may result. Imbalances of hormone levels are a risk factor for breast cancer and many other illnesses.

Many people say organic foods just taste better, and they may be right. Organic produce must be consumed quickly because chemical

## Popular dietary options

We live in a land where dietary choices abound. It seems like every week, a new diet plan promises perfect weight, longevity, increased energy, and enhanced vitality.

In the past, people ate what was available. Fortunately, we now have an unprecedented number of options.

Most people eat in patterns similar to the ones they age growing up. Food choices often are determined by economics and ease of preparation.

Because health and illness prevention rely heavily on nutritional choices, patients need to be encouraged to think about their eating options. Simply paying attention to individual goals related to food may help determine dietary guidelines.

## Vegetarian

Not too long ago, it was unusual to be a vegetarian in the United States. Now, vegetarianism is on the rise for multiple reasons. “A diet rich in fruits and vegetables plays a role in reducing all of the major causes of illness and death,” wrote Walter Willett, who heads the nutrition department at the Harvard School of Public Health.

Vegetarian diets are among the healthiest diets worldwide. People are simultaneously becoming knowledgeable about the health benefits of plant-based foods and learning the health hazards of high-fat meats. And the availability of plant-based protein sources is increasing.

Some people have concerns about the use antibiotics and hormones in the production of meat. Some have ethical concerns about eating meat and concerns about the treatment of animals in the wake of highly publicized cases of animal abuse. Some religious traditions forbid the ingestion of meat.

More than 8 million Americans are vegetarians. They do not eat the flesh of animals; lacto-ovo vegetarians eat cheese or consume dairy products. Several million others are not vegetarians but have reduced their intake of meats. Many people do not consume red meats. Pesco-vegetarians are plant eaters who eat fish. Raw food diet aficionados are called vitarins.

Approximately 2 million Americans consider themselves to be vegans. Vegans are vegetarians who do not consume any foods or products produced from animals. While vegetarians may eat eggs or drink milk, vegans do not. Vegans do not consume honey, milk or dairy products.

In 2009, the American Dietetic Association concluded that vegetarian and vegan diets are healthy, if properly planned. It stated in a position paper that vegetarian diets are nutritionally adequate and may help to prevent or treat some diseases.

Vegetarian diets typically are lower in saturated fats and cholesterol than diets that include meat. Vegetarians generally consume higher amounts of vitamins C and E than meat eaters. The healthy vegetarian diet is a rich source of fiber, folic acid, and phytochemicals. Phytochemicals include antioxidants and a multitude of other health-promoting compounds.

However, simply eliminating meat does not automatically make a diet healthy. For example, if a person stopped eating bacon but continued to eat primarily doughnuts, potato chips, and frozen pizza, he or she might be a vegetarian, but would still have an unhealthy diet. Like all other health-promoting diets, the vegetarian diet must contain nutritious foods.

Multiple large and small studies worldwide demonstrate that consuming a vegetarian diet reduces the risk of cardiovascular disease, including the occurrence of myocardial infarctions, by 20 to 25 percent. Cardiovascular disease is reduced because the vegetarian diet is low in saturated fats and high in fiber.

Vegetarians deficient in vitamin B12 are at risk for ischemia and elevated homocysteine levels. Deficiency of B12 is associated with neural tube defects, congenital heart defects, and dementia, including Alzheimer’s dementia. Most vegetarians do have adequate levels of vitamin B12, but vegans may not. A British study of preschoolers revealed that deficiencies of vitamin B12 were not apparent in...
vegetarians but were noted among vegan children. Supplementation of vitamin B12 may be needed for vegans.

Vegetarians have lower levels of LDL (low density lipoprotein) cholesterol because fats from plants do not contain cholesterol. Blood pressure, body mass index (BMI), and risk factors for many ills are reduced.

A Norwegian study found that a vegetarian diet benefited people suffering from rheumatoid arthritis. An American study documented success using a vegetarian diet to relieve symptoms of chronic fatigue immune dysfunction. Several studies report a decrease in symptoms of premenstrual syndrome (PMS).

Plant-based diets reduce the risk of developing cancer. However, a large British study revealed that fish eaters had lower rates of cancer occurrence than vegetarians.

People who do not eat red meat but are not necessarily vegetarians have a decreased risk of developing colon cancer. Vegetarians have lower levels of pesticides in their colons. Because pesticides are clearly linked to cancer, it is likely that vegetarians may have an even lower risk of developing colon cancer than people who simply do not eat red meat. Further studies are ongoing.

Research indicates that a vegetarian diet may protect against the development of type 2 diabetes. A 2006 study by Barnard found that blood glucose levels among type 2 diabetics decreased further by following a vegan diet than by the American Diabetes Association (ADA) diet. Hemoglobin A1c levels and weight improved significantly in the vegan group.

In 1998, Ornish found that coronary stenosis, angina, and LDL cholesterol levels improved among vegetarians.

Lacto-ovo vegetarians, those who consume eggs and dairy, consume adequate amounts of calcium. However, the EPIC-Oxford study found that 75 percent of vegans got less than the recommended amounts of calcium. However, 525 mg. of calcium taken as a supplement was found to prevent bone fractures among vegans at risk for fracture. Recent studies indicate that calcium in plants may be more bioavailable than previously believed. Further research is needed.

Research indicates that plant-based calcium is retained better than calcium obtained from animal sources. Two reasons for that have been proposed.

If people consume calcium and eat meat, the protein in meat hastens calcium loss from bones. Plant-based diets are high in potassium and magnesium, and both minerals are calcium sparing. They lower the acidity of the urine, making calcium excretion less.

Studies are under way to ensure that vegetarians obtain enough vitamins D and K. Soy milk, some brands of orange juice, and breakfast cereals are often fortified with vitamins D and K. Dark, green, leafy vegetables are good sources of vitamin K as well.

A study of vegetarian children in Britain revealed that they had levels of vitamin C equal to that of their omnivore counterparts. Levels of vitamin E and beta-carotene were higher in the vegetarian children. Studies conducted in several countries showed that vegetarians consume adequate amounts of protein.

Vegetarians obtain enough dietary iron. Absorption of non-heme, plant-based iron is not as bioavailable as the iron from red meat. But absorption is enhanced by vitamin C and other acids commonly found in plants that contain iron. Phytic acid contained in legumes may decrease the absorption of iron, however.

A British study found that vegetarian diets for preschool children met all of their nutritional needs except the need for iron. Ferritin levels were especially reduced in children younger than 3 years old. Reduced levels of sodium, fat, and cholesterol coupled with increased fiber intake appeared potentially beneficial, however.

Phytic acid may diminish zinc levels, but American vegetarians do not usually have deficiencies of zinc. A British study revealed that vegetarian children had levels of zinc similar to meat-eating children.

DHA and ALA are omega 3-fatty acids, and may be lacking in vegans. DHA and ALA may be obtained via algae, such as spirulina. Fortified breakfast bars and milk substitutes contain DHA. ALA (alpha-linolenic acid), found in flaxseed, walnuts, canola, and soy, converts to DHA in the body, so supplementation is often unnecessary.

In addition to providing health advantages for humans, vegetarian diets provide benefits for people and the planet in ways that no other dietary choices do.

Water depletion and pollution are reduced. Manure runoff pollutes waterways as do the chemicals used to grow feed for animals raised for meat and meat products. Manure creates methane, which contributes to global warming. More than 400 gallons of water is used to produce 1 pound of meat.

More than 70 percent of the grain produced in the United States is fed to animals. It takes enormous amounts of human energy and fuel to produce a pound of meat compared to a pound of plant-based protein.

In a world of rapidly increasing numbers of people and dwindling resources for health care, there simply are not enough resources to continue eating the quantities of meat that some Americans consume.

**Paleolithic**

The Paleolithic diet is based upon food that humans ate before the agricultural era. Researchers say the Paleolithic era was from 100,000 to 1.5 million years BC. People of the Paleolithic era were hunter-gatherers. They consumed wild plants and animals.

Paleolithic diets have been studied with interest as a means of preventing age-related degenerative diseases. It is believed that the original Paleolithic diet consisted mainly of lean meat, fish, bugs, leafy vegetables, nuts, and fruits. Starchy root vegetables would have been limited because they would have required more labor and cooking.

**PALEOLITHIC DIET**

![PALEOLITHIC DIET](image)

Current proponents of the Paleolithic diet eliminate dairy, margarine, refined oils, refined fats, and refined cereals from the diet. They believe that casein from milk is what promotes atherosclerosis. People following ancestral diets believe that processed oils precipitate the
Saturated fats are contained in butter, milk, cream, eggs, red meat, and lard. A high intake of saturated fats can lead to high LDL levels and increase the risk of developing coronary artery disease. The use of saturated fats should be minimized. A Paleolithic diet is low in sodium. It contains high amounts of protein, vitamins, folic acid, magnesium, and potassium because food preparation methods are simple, involving minimal cooking.

Meats make up approximately 20 to 35 percent of calories of the Paleo diet and are from grass-fed animals and are lean. The fats in grass-fed animals consist of balanced amounts of omega 3 fatty acids. In contrast, grain-fed animals contain a higher proportion of pro-inflammatory omega 6 fatty acids.

A wide variety of vegetables are consumed, so multiple plant compounds and antioxidants are eaten. Plants are eaten organic. There are three main types of fats: Saturated, polyunsaturated and monounsaturated. Most saturated fats are unhealthy fats. However, coconut oil is a healthy saturated fat, and butter contains compounds that protect against cancer formation.

Polyunsaturated fats include some brands of margarine and shortening. Products containing hydrogenated or partially hydrogenated vegetable oil contain trans fats, which are very unhealthy fats. They are chemically processed to transform liquid fats into solid fats. Overheating liquid oils or reusing oil results in trans fat formation as well. Trans fatty acids increase unhealthy LDL levels while decreasing healthy HDL levels of cholesterol. They significantly raise the risk of developing coronary heart disease.

Unfortunately, trans fats are very common because they increase the shelf life of prepared food products. They are used to prepare popular fast food items such as french fries, pizza, potato chips and bakery goods.

Omega fatty acids are naturally occurring, healthy polyunsaturated fatty acids. They are classified as essential fatty acids. Essential fatty acids are fatty acids the body needs to function but cannot produce. Therefore, they have to be acquired from foods.

They provide diverse benefits to multiple systems of the body. Including fats and foods rich in essential fatty acids in the diet reduces cholesterol levels and improves HDL to LDL ratios. Essential fatty acids lessen inflammation, thereby reducing the risk of cardiovascular accidents and myocardial infarctions.

Fats

Americans consume too many unhealthy fats. In a three-year period from 1997-2000, the average daily consumption of added fats increased by 16 percent. The average daily intake of total fat in the United States is 96.5 grams for men and 67.3 grams for women. Men consume about twice as much fat as recommended; women consume approximately one and one-half times as much as is needed.

Fats provide our most concentrated sources of energy and are essential for all bodily functions. Consuming proper amounts of healthy fats is critical for circulatory and nervous system health. Fats ensure normal brain development prenatally and during childhood, and children under age 2 require higher percentages of fats than any others. The body uses saturated fats to manufacture cholesterol.

Unfortunately, consumption of the wrong kind of fats and too many fats leads to serious health issues. Heart disease, several cancers, obesity, high blood pressure and multiple health challenges may develop.

There are three main types of fats: Saturated, polyunsaturated and monounsaturated.

Saturated fats are hard at room temperature. Animal fats, such as butter and lard, are saturated fats. A high intake of saturated fats can lead to high LDL levels and increase the risk of developing coronary artery disease. The use of saturated fats should be minimized. Saturated fats are contained in butter, milk, cream, eggs, red meat, chocolate, and solid shortenings.

Polyunsaturated fats are fatty acids the body needs to function but cannot produce. Essential fatty acids are naturally occurring, healthy polyunsaturated fatty acids. They are classified as essential fatty acids. Essential fatty acids are fatty acids the body needs to function but cannot produce. Therefore, they have to be acquired from foods.
Researchers who studied Eskimos in Greenland for decades discovered that the Eskimos had lower risks and sometimes absence of myocardial infarctions, diabetes, asthma, multiple sclerosis, and psoriasis. Additional studies demonstrated that omega 3 fatty acids improve all of the above conditions.

Omega 3 fatty acids have been found to benefit hepatic health. When Omega 3 fatty acids are consumed by people infected with the hepatitis C virus, ALT levels are reduced.

Research indicates that a high intake of omega 3 fatty acids found in fish or fish oil offers diverse health benefits. Wild, deep-water fatty fish from cold climates are rich sources of essential fatty acids; mackerel, salmon, bluefish, and albacore are examples of healthy fish. Halibut, sardines, trout and herring contain large amounts of omega 3 fatty acids as well. Farm-raised fish are not as healthy for humans as wild fish.

The essential fatty acids ALA, EPA and DHA promote mental health. Negative and positive moods as well as levels of anxiety are affected by omega 3 fatty acid levels. Schizophrenics sometimes have low levels of the omega 3 fatty acids.

A less known omega is the omega 7 fatty acid. It can be hard to include in the diet because it is not found in many plants. Macadamia nut oil is a delicious oil that contains omega 7 fatty acids. Sea buckthorn is an herb that has the highest concentration of omega 7.

**Carbohydrates**

Complex carbohydrates contain high amounts of potent antioxidants, including vitamin A in the form of beta-carotene. Antioxidant vitamins C and E are commonly found in complex carbohydrates as well.

Antioxidants help remove free radicals, which are normal byproducts of metabolism. They also result from exposure to toxins from sources such as x-rays, pesticides, and air pollution. Excessive exposure to sunlight promotes development of free radicals as well. Free radicals damage cells and accelerate the aging process. They also contribute to the development of cancer, heart disease and other ills.

**Fiber**

Fiber is found in whole grains, fruits, vegetables, and legumes. Foods high in fiber can be beneficial for weight management because they help a person to feel satiated.

Approximately 10 grams of fiber are found in 1 cup of cooked dried beans, peas, or lentils. One-half cup of wheat or oat bran contains 10 grams as well.

Benefits of fiber include:
- Increased metabolic rate.
- Increased intestinal motility.
- Decreased constipation.
- Improved dilution, binding, deactivation, and elimination of carcinogens.
- Decreased colon cancer risk.
- Less overeating.
- Prevents absorption of some fats.
- Decreased LDL cholesterol levels.
- Stabilization of blood sugar levels.
- Improved efficiency in eliminating toxins.

**Types of fiber**

There are two main types of fiber, soluble and insoluble. Some foods contain both types.

**Soluble fiber** absorbs water and improves bowel motility. It lowers cholesterol levels and removes excess estrogen from the body. Psyllium, flax, oats, sesame seeds, bananas, apples, grapes, potatoes and beans are excellent sources of soluble fiber.

**Insoluble fiber** is found in wheat bran, apples, pears, tomatoes, carrots, strawberries, peas, whole grains, beets, eggplant, and potatoes. Insoluble fiber facilitates elimination of waste from the colon by reducing transit time. Minimal fluids are absorbed. It aids in removal of toxins and reduces LDL cholesterol levels.

**Cellulose** is a type of insoluble fiber contained in the outer layer of fruits and vegetables. It is beneficial for people suffering from treatment of hemorrhoids, varicose veins, and colitis with constipation because it is astringent and soothing. Cellulose helps remove cancer-causing toxins from the wall of the colon.

Hemicelluloses are insoluble, complex carbohydrates. They absorb water. Hemicelluloses are used to promote weight loss and reduce constipation, actions that can reduce colon cancer development. Hemicelluloses reduce levels of carcinogens in the GI tract.

Sources include apples, bananas, beans, beets, cabbage, corn, green leafy vegetables, pears, peppers and whole grains.
Fennel seed is an herb rich in mucilage. Fennel seed helps rid the digestive tract of gas and mucus. It has traditionally been used to decrease the appetite.

Oat and rice bran reduce LDL cholesterol levels. They are mild flavored and easy to add to foods to boost fiber content.

Tips for helping people get fiber into their diet

- Instruct patients to eat a variety of foods high in fiber.
- Encourage patients to consume fiber as part of their diet instead of in supplement form, when possible.
- Instruct patients to consume fiber supplements separately from other medications or supplements because they can interfere with effectiveness of medications or other supplements if taken simultaneously.
- Inform patients that an initial increase in fiber intake may temporarily make them feel “gassy.” If gassiness occurs, recommend that they increase their fiber intake gradually.

The good stuff

Everyone needs a treat now and then or else healthy eating gets boring and tasteless. If patients do not like their food, they will rapidly resume unhealthy patterns of eating. Fortunately, some of the most popular treats have healing benefits. You can tell your patients that they can still have chocolate or a glass of wine while adopting a healthy lifestyle.

Dark chocolate/Theobroma cacao

Many patients have heard that chocolate has health benefits. They may not know that some chocolate is beneficial—and some is not. Here are facts that you can give them about the health benefits of chocolate.

- Chocolate is an herb. Coffee and tea are herbs, too. The word Theobroma means “food for the Gods.”
- Dark chocolate is the only chocolate that offers health benefits; milk chocolate, white chocolate, and Dutch processed cocoa do not. Combining milk with chocolate reduces the availability of the healing compounds within chocolate.
- Encourage patients to read labels when purchasing chocolate. Suggest that they purchase organic, ethically grown chocolate. Unfortunately, much chocolate is grown in ways that destroy endangered rain forests or using methods that exploit native peoples.
- One ounce of dark chocolate may be eaten daily as part of a healthy diet. Chocolate increases serotonin and dopamine and endorphin levels. The result can be an improved mood and reduced pain.
- Let patients know that chocolate can be part of a healthy weight loss plan because it helps the body to burn fat more efficiently.
- Chocolate possesses anti-inflammatory properties. Inflammation plays a role in the development of cancer, cardiac disease and allergies. Research continues to reveal inflammation’s links with several other conditions as well.
- Chocolate contains antioxidants and bioflavonoids that reduce blood pressure and improve circulation throughout the entire body. Flavenoids are pigments that give fruits and vegetables their colors. Flavenoids in chocolate impede formation of cataracts and reduce the aging process.
- Dark chocolate can help to prevent dental cavities.
- Chocolate is an aphrodisiac. Nutrients in chocolate ensure healthy sperm development. It improves circulation throughout the body, including the male sexual organs.

Red wine

- Alcohol in excess destroys health and lives. For patients who drink alcoholic beverages, encourage them to drink it in the form of red wine.
- Red wine has been promoted as a healthy beverage for centuries. Physicians used to commonly recommend it for cardiac patients. Research now shows that the physicians and ancients were correct in purporting that red wine offers health benefits.
- Red wine is a component of the Mediterranean diet, one of the healthiest eating traditions worldwide.
- Red wine contains resveratrol, antioxidants, and flavonoids.
  ○ Resveratrol helps to reduce levels of LDL cholesterol. Resveratrol prevents damage to blood vessels. It improves glucose utilization, which benefits diabetics and those with pre-diabetes. Resveratrol helps prevent formation of the plaque that inhibits communication in the brains of people suffering from Alzheimer’s dementia. Resveratrol may help to prevent the development of the disease.
  ○ Antioxidants found in red wine may reduce the formation of free radicals that promote aging and illness. They have been shown to have a role in the prevention of breast, lung and other cancers.
  ○ The flavenoids and antioxidants in red wine have been found to improve immune function. Resistance against respiratory illnesses, such as the common cold, is enhanced.
- Red wine may help slow the development of osteoporosis and tooth decay and reduce inflammation.

- Provide patients with a list of high-fiber foods. Include whole grain cereals and flours; brown rice, bran, fresh and dried fruit; nuts, seeds, flaxseed, lentils, peas and beans; and vegetables on the list.
- Advise patients to leave the skin on organic produce to increase fiber and nutrient consumption.
- Teach patients tips for adding foods in bran for baking and adding high-fiber grains and ingredients to baked goods.
- A minimum of 25 to 35 grams of fiber should be consumed daily.

Lignans are useful for diabetics. They help to reduce the risk of colon cancer. Sources include Brazil nuts, carrots, green beans, peaches, peas, potatoes, strawberries, tomatoes and whole grains.

Pectin slows the absorption of nutrients and foods after meals. It relieves diarrhea, can help stabilize blood sugar levels, and enhances the removal of toxins. It has been used to reduce side effects of radiation treatments. Pectin reduces LDL cholesterol levels. Pectin may reduce the likelihood of developing cardiovascular disease and formation of gallstones.

Sources of pectin include apples, bananas, beets, citrus, dried peas, and okra.
• Other alcoholic beverages do not offer the same benefits as red wine. Grape juice without added sugar can be consumed for some of the same benefits as red wine.

Proteins
Proteins are made of chains of amino acids. There are 20 amino acids. Essential amino acids cannot be made by the body and must be consumed to be obtained. There are nine essential amino acids.

Proteins help create all of the cells and tissues of the human body and are needed for enzyme formation and hormone creation. Antibodies are comprised of proteins. Proteins help maintain fluid balance, aid liver regeneration and help to reduce ammonia levels. Lipoproteins aid transport of fats and fat-soluble vitamins.

Proteins must be bioavailable to be utilized. An average 150-pound adult requires 75-105 grams of protein per day.

Sources of protein from animals include meat, fish, poultry eggs, fish, milk, yogurt, and cheese.

Contrary to what was previously believed, eating up to two eggs daily does not increase the risk of cardiovascular disease. One large egg contains 75 calories, and eggs are excellent sources of vitamins B12, D and K. They contain choline, choline, folate, carotenoids and iron.

Fish are low in calories and fat. Some fish contain healthy fats, rich in omega fatty acids, vitamins B6, B12, and B3 are found in fish.

Meats from grass-fed or wild animals, such as bison, wild turkey and venison, are less processed and healthier than ordinary grocery store meats.

Vegetable-based proteins are healthy options to meat and dairy foods. However, most vegetable proteins are incomplete proteins and lack some of the essential amino acids.

Vitamins
A healthy diet can provide adequate amounts of vitamins for most people. However, many people do not consume healthy diets or have digestive problems that interfere with absorption and utilization of nutrients. Elders are at risk for vitamin deficiency, and people suffering from acute and chronic illnesses require increased amounts of vitamins to restore health.

Vitamins help regulate body processes. They aid the release and utilization of nutrients from foods. Vitamins act as co-enzymes, activating chemical processes needed to maintain health.

Vitamins must be balanced to work optimally. Vitamins obtained from the diet are naturally balanced. If supplementation with vitamins is done without respect to balance, vitamin deficiency of related vitamins may occur. For example, consuming high doses of some B vitamins may cause depletion of the remaining B vitamins.

Definitions
• **Recommended daily amount (RDA):** Bare minimum requirement of a vitamin needed to prevent serious deficiency diseases.
• **Optimum daily amount (ODA):** The ODA is the amount of a vitamin needed for maintenance of the highest level of health. ODA recommendations can be dependent upon goals.
• **Synergy:** Two or more vitamins combine to create a stronger vitamin function. Example: Vitamin C needs bioflavonoids to work properly.

• **Water-soluble:** Most vitamins dissolve in water. Overdose is unlikely.
• **Fat-soluble:** Vitamins that are stored in body fat. Overdose can occur. Vitamins A, D, E, and K are fat-soluble vitamins.
• **Synthetic:** Vitamins produced from isolated chemicals.
• **Natural:** Vitamins derived from foods.
  ○ Chemically, there are no major differences between synthetic and natural vitamins. However synthetics may contain unhealthy additives. Natural ones may contain other beneficial nutrients that we do not know enough about yet. For example: A vitamin C tablet obviously contains vitamin C. An orange also contains vitamin C but also provides fiber, carbohydrates, antioxidants, and plant pigments that benefit the immune system.
  ○ A natural food source is the preferred source of vitamins when possible.

• **Protein-bonded vitamins are better absorbed.** Taking vitamins with meals ensures a good supply of co-vitamins. Oil soluble vitamins are absorbed best when taken before meals. Water-soluble or multiple vitamins are taken after meals.

Remind patients to store vitamins in a cool, dry place out of the reach of children.
Vitamin A and carotenoids

Carotenoids are related to vitamin A. Beta forms create natural vitamin A.

- **Benefits:**
  - Healthy eyes, skin, mucus membranes, and immune system.
  - Benefis multiple body systems.
  - Protects against toxins and carcinogens.
  - Heals gastrointestinal ulcers.
  - Antioxidant.

- **Sources:**
  - Liver, fish oil, green and yellow fruits and vegetables, papaya, rosehips, raspberry, peppermint and dandelion greens.

B complex vitamins

B complex vitamins are a group of vitamins that work together. For treatment of specific disorders, up to 2-3 times as much of individual B vitamins may be safely used in conjunction with recommended amounts of the remaining B vitamins. The most important thing to remember is that there has to be a basic balance of the B vitamins for them to do their job. Absorption of B vitamins decreases with age. There have been false diagnoses of Alzheimer’s disease and other dementias that have turned out to be deficiencies of B vitamins.

- **Benefits:**
  - Ensure proper function of the nervous and integumentary systems.
  - Protect against the harmful effects of lead exposure.
  - Maintain muscle tone of the gastrointestinal tract.
  - Produce energy.
  - Alleviate depression.
  - Reduce pain.
  - Helpful in the treatment of herpes.
  - Prevent fat buildup in blood vessels.

Vitamin B1 thiamine

- **Benefits:**
  - Energy, carbohydrate metabolism.
  - Growth of children.
  - Blood formation.
  - Aids digestion, brain function.
  - Antioxidant.

- **Sources:**
  - Whole grains, legumes, brown rice, sunflower seeds.
  - Brewers yeast.
  - Egg yolk, liver, pork, poultry, parsley.

- **Cautions:**
  - Antibiotics, sulfa, oral contraceptives and muscle relaxants reduce thiamine levels.
  - Stress, alcohol, cooked foods, caffeine, tobacco, excess sugars, and shellfish deplete thiamine levels.
  - Patients recovering from surgery may benefit from thiamin and B complex supplementation.

Vitamin B2 riboflavin

- **Benefits:**
  - Production of red blood cells and antibodies.
  - Prevention of fatigue and cataract formation.
  - Metabolism of food, aids the digestive tract, and absorption of iron and vitamin B6.
  - Healthy skin and hair.
  - Works closely with the amino acid tryptophan and niacin.
  - In combination with B6, can help relieve carpal tunnel syndrome.

- **Precautions:**
  - Overdose does not occur with natural beta-carotene, however toxic amounts of vitamin A can damage the liver.
  - Antibiotics, laxatives, some cholesterol medications, weight loss products, contraceptives, steroids, mineral oil, alcohol, most medications, coffee, air pollution, and interior lighting can all decrease absorption and utilization.
  - People who have hypothyroidism cannot efficiently convert beta-carotene to vitamin A, so must use the vitamin A form.

- **Dose:**
  - Less then 10,000 international units daily.
  - Reduce dose if pregnant or liver disease is present.
  - Children should not receive more than 18,000 IU of vitamin A in a month.

Vitamin B3 niacinamide

- **Benefits:**
  - Helps circulation. Helps prevent high cholesterol, high blood pressure, and resultant myocardial infarction.
  - Aids digestion and utilization of carbohydrates for energy, growth, and learning.
  - Antioxidant.
  - Aids mental health.
  - Involved in sex hormone production.
  - Reduces fatigue.
  - Balances blood sugar levels.

- **Sources:**
  - Cheese, egg yolk, fish, legumes, meat, milk, spinach, whole grains, yogurt, sea vegetables, hops, peppermint.

- **Cautions:**
  - Oral contraceptives and strenuous exercise increase the need for riboflavin.
  - Ultraviolet light, antibiotics and alcohol destroy vitamin B2.
  - Pregnant women must consume adequate amounts of niacinamide to prevent fat buildup in blood vessels.

Vitamin B5 pantothenic acid

Pantothenic acid is found in all of the cells of the body. Pantothenic acid is touted as the anti-stress vitamin.

- **Benefits:**
  - Aids stamina.
  - Involved in antibody and cortisone production.
  - Maintains adrenal and pituitary glands.
  - Enhances utilization of other vitamins.
- Helps prevent anemia, depression, and anxiety.
- **Sources:**
  - Whole grains, brewers yeast, sunflower seeds, egg yolk, legumes, brown rice, liver, pork, poultry, sage, parsley.
- **Cautions:**
  - Depletion can occur in the presence of caffeine, oral contraceptives, antibiotics, alcohol, sleeping pills, estrogen, excess sugar, refined foods, and sulfa drugs.

Vitamin B6 pyridoxine

Vitamin B6 is involved in more body functions than any other single nutrient.

- **Benefits:**
  - Aids protein utilization.
  - Involved in the production and utilization of antibodies.
  - Enhances vitality.
  - Helps ensure digestive health.
  - Aids the function of enzymes.
  - Promotes formation of RBCs.
  - Helps maintain sodium/potassium balance.
  - Needed for proper brain function.
  - Helps protect against radiation damage.
  - Inhibits formation of cancer.
  - Protects the heart and kidneys.
  - Aids relief of asthma, allergies, and arthritis.
  - Essential for proper glucose and insulin interactions.

- **Sources:**
  - All foods have some pyridoxine. Whole grains, brewer’s yeast, and nuts are the richest sources.

- **Cautions:**
  - Depletion can occur in the presence of caffeine, antibiotics, sleeping pills, estrogen, excess sugar, refined foods, and sulfa drugs.
  - Oral contraceptives and alcohol can cause severe losses of vitamin B6.

Vitamin B9 folic acid

- **Benefits:**
  - 400 mcg of folic acid daily before conception and during the first trimester of pregnancy prevents the majority of neural tube defects from occurring. Neural tube defects include spinal bifida and anencephaly. Folic acid is needed for proper development and function of the nervous system.
  - Folic acid helps prevent premature birth.
  - Known as “brain food.”

- **Sources:**
  - Green leafy vegetables, mushrooms, sprouts, brewer’s yeast, wheat germ.

- **Cautions:**
  - Works best when combined with vitamins C and B12.
  - Folic acid deficiency can result from eating only cooked fruits and vegetables, not enough fruits and vegetables, or in the presence of malabsorption problems.
  - Signs of deficiency include sore red tongue, digestive problems, weakness, and paranoia.
  - Alcohol, oral contraceptives, Dilantin, high temperatures, coffee, stress, sulfa, tobacco, estrogen and food processing all reduce folic acid levels.
  - Advise patients not to take high doses of vitamin B9 for extended periods if a hormone-related cancer or convulsive disorder is present.

**Vitamin B12**

- **Benefits:**
  - Helps prevent anemia and nerve damage.
  - Works with folic acid to regulate formation of red blood cells; helps with iron utilization.
  - Aids digestion, memory and learning.

- **Sources:**
  - Seafood, brewer’s yeast, eggs, herring, kidney, liver, milk, dairy, soy, sea vegetables, wheat germ, meat, almonds.

- **Cautions:**
  - Vegans must supplement their diet with B12 from food sources or take a supplement. The body can store B12 for up to five years, but deficiency will eventually develop without supplementation.
  - Medications for treatment of gout, anticoagulants, and potassium all block absorption.
  - Calcium is needed for assimilation.
  - Vegetarians, alcoholics and the elderly are at risk for B12 deficiency.
  - Vitamin B12 is depleted by laxatives, alcohol, antibiotic, aspirin, diuretics, antacids, tobacco, caffeine, estrogen, sleeping pills, contraceptives, parasites, and cooking.
  - Deficiency is most often caused by absorption problems, especially in the elderly.
  - Symptoms of deficiency include abnormal gait, depression, dyspnea, ringing in the ears, anemia and hallucinations.

**Biotin**

- **Benefits:**
  - Biotin is essential for cell growth and metabolism of food.
  - It helps the body utilize the other B vitamins.
  - Aids nerve tissue and bone marrow.
  - 100 mg daily may help prevent hair loss in some men.

- **Sources:**
  - Biotin can be produced by the body when foods such as brewer’s yeast, egg yolk, meat, milk, poultry, fish, soy, sprouts, liver, and whole grains are eaten. Because of this, deficiency is rare.

- **Cautions:**
  - Fats and oils that have been heated inhibit biotin absorption.
  - Antibiotics, including sulfa drugs, and saccharin inhibit availability of biotin.
  - Biotin is depleted by processed foods, mineral oil, estrogen, and sugar.

**Choline**

- **Benefits:**
  - Optimizes brain function.
  - Improves hepatic system function, helpful in prevention of gallstones.
  - Involved in hormone production and utilization.

- **Sources:**
  - Essential for DNA formation.
  - Aids production of antibodies.
  - Helps maintain the health of the sex organs.
  - Useful in the treatment of depression and anxiety.
  - Helps reduce cervical dysplasia.
  - Lowers homocysteine levels to help prevent heart disease.

**Choline**

- **Benefits:**
  - Enhances memory.
  - Aids fat metabolism.
  - Improves capillary health.
Vitamin C ascorbic acid

**Benefits:**
- Vitamin C is an antioxidant that aids tissue growth and repair.
- Essential for adrenal health function.
- Maintains healthy mucus membranes.
- Helps production of anti-stress hormones.
- Involved with metabolism of micronutrients.
- Enhances wound healing.
- Aids reduction of cholesterol and high blood pressure.
- Fights the effects of pollution.
- Enhances immunity.
- Fights infection.

**Sources:**
- Fruits, vegetables, green peppers, cherry juice, plantain.
- Herbs rich in vitamin C include cayenne, peppermint, paprika, and parsley.

**Precautions:**
- Alcohol, analgesics, stress, antidepressants, anticoagulants, diuretics, and steroids decrease vitamin C levels.
- Smoking drastically depletes vitamin C levels.
- Sulfur drugs and diabetic medications should not be taken at the same time as vitamin C because the drug’s effectiveness will decrease.
- High doses of vitamin C can produce a false negative when stools are tested for the presence of blood.

Vitamin D

**Benefits:**
- Regulates metabolism of vitamins and minerals.
- Involved in circulatory health.
- Aids skeletal structure by enabling mineralization of the bones.
- Essential for function of clotting mechanisms.
- Promotes calcium absorption in the gastrointestinal tract.
- Helps maintain serum calcium and phosphate levels.

**Sources:**
- Fortified breads, dairy, and cereals.
- Sunlight.

**Cautions:**
- Deficiency causes rickets in children and osteomalacia in adults.
- 400-600 IU daily is recommended for adults.
- 800 IU is the daily recommendation for adults over 70.

Vitamin E

**Sources:**
- Cold-pressed vegetable oils, dark green leafy vegetables, legumes, nuts, seeds, whole grains, brown rice, cornmeal, sea vegetables, wheat, sweet potatoes, and dandelion greens.

**Benefits:**
- Helps prevent cancer, heart disease, aging, PMS and fibrocystic disease.
- Reduces scarring. It is important for tissue repair.
- Improves athletic performance, healthy nerves and muscles.
- Prevents anemia and formation of age spots.
- Vitamin E protects the B vitamins from destruction.
- Helps prevents cataract formation and eye problems in newborns.

**Precautions:**
- Deficiencies of vitamin E lead to an increased incidence of heart disease. This is linked to an overconsumption of refined foods, which are poor in vitamin E and other nutrients.
- Deficiency of vitamin E can result in damage to red blood cells, and a shortened lifespan for the red blood cells.
- Infertility, nerve damage, menstrual problems, miscarriage, uterine problems, bowel and breast cancer are all linked to insufficient vitamin E consumption.
- Advise patients not to exceed recommended doses of vitamin E. This is particularly important for people with diabetes, rheumatic heart disease, or hyperthyroidism.
- Vitamin E is a fat-soluble vitamin that can accumulate in tissues, causing toxicity.
- Zinc must be present for proper blood levels of vitamin E to be maintained.

**Cautions:**
- Depletion can occur in the presence of caffeine, oral contraceptives, antibiotics, alcohol, sleeping pills, estrogen, excess sugar, refined foods, and sulfa drugs.
Iron and vitamin E should be taken at different times of the day. Ferrous sulfate, the inorganic form of iron, destroys vitamin E.
People taking anticoagulants should not consume more than 1,200 international units of vitamin E daily.

Advise patients with a history of high blood pressure to start
Selenium, vitamin C, and manganese all enhance the effectiveness of vitamin E supplementation.
Estrogen, birth control pills, chlorine, mineral oil, inorganic iron, and heat from food processing destroy vitamin E.

Minerals
Osteoporosis is a serious public health issue worldwide. It affects more than 75 million people in the United States, Europe and Japan. Worldwide, almost 9 million people suffer from fractures annually due to osteoporosis. Bones affected with osteoporosis show demineralization-related changes.
The World Health Organization defines osteopenia as being one standard deviation below that of an average young adult female. The WHO defines osteoporosis as 2.5 standards below a young adult female. Densities are determined by the use of a DXA (dual-energy x-ray absorptiometry) scan.
Osteoporosis may be undiagnosed until a fracture occurs. Spinal compression fractures result in pain, loss of height, loss of mobility, and deformity. Other common fracture sites include the forearm, proximal humerus, and the hip. Sometimes people say, “I fell and broke my hip,” when in fact what happened is that their hip broke and they fell as a result of the fracture. Vitamin D and calcium play critical roles in maintaining healthy bones.

Calcium
- Benefits:
  - Provides structure of bones, teeth, and connective tissue.
  - Helps ensure proper function of nerves.
  - Helps maintain healthy tissues throughout the entire body.
  - Helps maintain digestive health.
  - Helps prevent colon and breast cancers.
- Sources:
  - Milk – Whole, skim and reduced fat milk contain similar amounts of calcium. Soy, rice, hemp, and almond milks have varying degrees of calcium content. Encourage patients to read labels if using milk alternatives.
  - Yogurt – Yogurt is easier to digest than milk. It is an excellent alternative to milk for patients who have difficulty tolerating milk or do not like milk.
  - Cheese – Hard cheeses contain more calcium than soft cheeses and generally have a lower fat content.
  - Kale and dandelion greens, edamame – These vegetables contain freely absorbable calcium and are rich sources of many other nutrients.
  - Soy products – Soybeans, tofu, and other soy products contain natural calcium. Encourage patients to read labels for actual content levels.
  - Shellfish – Clams, shrimp, oysters, and mussels are calcium-rich.
  - Seaweeds – All sea vegetables contain calcium in a bioavailable form. They are excellent sources of trace minerals and low in calories.
  - Canned fish – Sardines and salmon have a great deal of calcium and are rich in essential fatty acids.
  - Almonds.
  - Enriched foods, including orange juice, bread and cereal.
- Cautions and additional information about calcium:
  - If patients choose to use a calcium supplement, suggest they purchase one that contains vitamin D and magnesium because calcium needs those nutrients for proper utilization.
  - A recent study states that plant-based calcium is absorbed and usable at a rate of 80 percent versus a minimal amount of non-plant-based calcium sources. Many other studies support the same data. Calcium is found in several food groups but is not always in a usable or easily absorbed form. Dark green leafy vegetables contain calcium, however most have high levels of oxalic acid, which binds with calcium, making the mineral less available. Recommend that patients use kale, dandelion green or edamame when choosing greens.
  - Studies show that soy can increase bone density by up to 6 percent over a six- to 12-month period.
  - Salt, sugar, and soft drinks and high protein diets promote the loss of calcium.
  - The Institute of Medicine recommends that adult females ages 19-50 and males ages 51-70 obtain 1,000 milligrams of calcium daily. They recommend that females over age 51 and males over age 71 increase their intake to 1,200 milligrams daily.

Phytochemicals
Phytochemicals are complex compounds found in plants that afford a powerful array of health benefits. Plant pigments, the chemicals that give plants their colors, are among the most powerful phytochemicals. Fiber and enzymes are phytochemicals.

Some phytochemicals act like vitamins. Beta-carotene is an example of a vitamin-like phytochemical. It converts to vitamin A in the human body.

Phytochemicals are antioxidants themselves. They also serve to increase the potency of other antioxidants, such as vitamins C and E. Phytochemicals are chemopreventative, meaning they help protect the body from developing cancer.

Fruits and vegetables
Fruits and vegetables of similar colors often contain similar phytochemicals. Encourage patients to eat a wide variety of colorful fruits and vegetables so they can reap the advantages that each group offers.

Every edible fruit, vegetable, flower, and grain contains phytochemicals that benefit human health. Diets rich in fruits and vegetables help prevent the major killers of our time. These include cancer, stroke, and cardiac disease. Scientists are able to directly link
reductions in some diseases to individual nutrients, however much remains unknown. It may be the interaction of the compounds within the fruits and vegetables as a whole offer the most protection.

In general, the most intensely colored fruits and vegetables are the richest sources of nutrients. Age and quality of the fruit and methods of preparation influence actual values.

There are thousands of phytochemical compounds. The following is a list of a few of the most researched ones. The more research reveals about phytochemicals, the more apparent it becomes that whole foods need to be the basis of the healthiest diets.

Fruits and vegetables can be divided into five color groups: red, yellow/orange, white, green and blue/purple. Each color group provides unique phytochemicals and antioxidants that provide system wide health benefits.

Red  
- **Phytochemicals:**  
  - Lycopene.  
  - Anthocyanins.  
- **Benefits:**  
  - Urinary health.  
  - Memory.  
- **Sources:**  
  - The best sources of lycopene include watermelon and tomatoes. Cooked tomatoes have more concentrated amounts of lycopene than raw tomatoes.  
  - Beets, radishes, red onions, red potatoes, pink grapefruit, raspberries, strawberries, cranberries, red apples, red peppers, cherries, red grapes, and red plums.

Yellow/orange  
- **Phytochemicals:**  
  - Vitamin C.  
  - Bioflavonoids.  
  - Carotenoids.  
  - Coumarin.  
  - Limonoids.  
- **Benefits:**  
  - Beta-carotene is converted to vitamin A.  
  - Eye health.  
  - Immune health.  
  - Flavonoids and carotenoids are antioxidants; potent free radical scavengers.  
  - Anti-tumor actions.  
  - Enhance efficiency of detoxification pathways.  
  - Help block carcinogens.  
- **Sources:**  
  - Citrus pulp and peels contain potent bioflavonoids, which bind with cancer cells so they can be deactivated and excreted by the body.  
  - Sweet potatoes, squash, cantaloupe, mangoes, papayas, peaches, yellow watermelon, rutabagas, sweet corn, yellow apples, bananas, citrus fruits, pineapple, and carrots.  
  - Coumarin is found in citrus and carrots. It is also abundant in celery, fennel and beets.

White/brown  
- **Phytochemicals:**  
  - Allicin in the onion family.  
  - Several potent immune-enhancing compounds of various types.  
- **Benefits:**  
  - Antibacterial actions.  
  - Cholesterol lowering effects.  
  - Enhance immune function.  

Green  
- **Phytochemicals:**  
  - Lutein and indoles are key phytochemicals in green vegetables, such as broccoli.  
  - Indoles.  
- **Benefits:**  
  - Antioxidant.  
  - Promote eye health.  
  - Enhance skeletal and connective tissues.  
  - Promote healthy teeth.  
- **Sources:**  
  - Spinach, zucchini, okra, green cabbage, asparagus, leeks, snow peas, avocados, green apples, green grapes, honeydew, kiwifruit, limes, green pears, artichokes, asparagus, green peppers, broccoli, brussels sprouts, chard, collard greens, cucumbers, honeydew melons, kale, lettuce, mustard greens, peas, turnip greens, bok choy, celery, fennel, and cranberries.

Blue/purple  
- **Phytochemicals:**  
  - Anthocyanins.  
  - Phenols.  
  - Ellagic acid (a phenolic compound).  
- **Benefits:**  
  - Urinary health.  
  - Memory.  
  - Help prevents age-related changes.  
  - Antioxidant.  
  - Modulate hormone receptors.  
  - Help block formation of carcinogens.  
  - Ellagic acid is found in many berries and nuts. Research shows that it inhibits cancer formation and mutation of cells. It is especially beneficial in the prevention of lung cancer in smokers.  
- **Sources:**  
  - Blackberries, blueberries, dried plums, purple grapes, raisins, red cabbage, eggplant, beets, cherries, currants, red onions, red plums and radishes.  
  - Grapes and pomegranates are rich sources of ellagic acid.

**Fruits and their phytochemicals**

Citrus fruits contain phytochemicals activate enzymes that serve as detoxifiers. They also contain phytochemicals that enhance hepatic health and protection against cancer. Studies show that phytochemicals in citrus fruits may inhibit the development of colon, lung, liver and prostate cancers. Compounds that help protect against melanoma are present as well. Lycopene, found in tomatoes and watermelon, helps protect the prostate from cancer.

**Cruciferous vegetables**

Many patients have heard that consuming vegetables in the cabbage family is good for them. They may not know what the actual benefits are and how to prepare them in a way that will preserve their phytochemicals.

Here are some tips that you can share with your patients about Brassicas, the cabbage family:

- **Cabbage, broccoli, brussels sprouts, cauliflower, kale, collards, turnips and radishes are common cruciferous vegetables.**
- **It is best to cook cruciferous vegetables because they contain high amounts of goitrogens, which suppress thyroid function. This can be problematic for patients with hypothyroidism.**
- **Phytochemicals in cruciferous vegetables are strong inhibitors of cancer formation.**
Cruciferous vegetables contain fiber, minerals, and vitamins A, C, and E. All are known to be protective against cancer.

Broccoli sprouts contain the highest percentage of cancer protective phytochemicals of all of the cruciferous vegetables.

**Herbs and spices**

Many culinary herbs add flavor to healthy meals without adding calories. Most culinary herbs contain concentrated amounts of phytochemicals. Historically, herbs were used to prevent rancidity of foods before refrigeration was available, and they did help preserve foods because they are very rich in antioxidants and other potent compounds. Here are some traditional uses for herbs. Their uses have been backed up by modern scientific studies.

**Lemon balm:** Also known as Melissa, it is a member of the mint family. Lemon balm makes a fine tea that possesses antidepressant and antiviral properties. Lemon balm soothes the nervous system and is relaxing to the whole body.

**Mint:** This plant has antispasmodic properties that soothe the digestive tract. Mint is a rich source of B vitamins, calcium and potassium.

**Oregano:** Its name means “joy of the mountains.” This Mediterranean plant was used by ancient Egyptians as a flavoring, preservative and antidote to poisons. Today, we enjoy it on pizza and other foods. Oregano has powerful antiseptic constituents and is a very concentrated source of phytochemicals. A wide array of studies validates its powerful antioxidant properties.

**Rosemary:** Rosemary may enhance mental clarity and alertness. It is an energizing herb that has been used to mediate respiratory and digestive disorders. Rosemary is packed with antioxidants. It has anti-tumor properties as well.

**Basil:** Basil was historically used to treat digestive, respiratory, and nervous system ills. It has antioxidant and anti-tumor factors. Tasty basil is packed with health benefits. Herbalists use basil to aid concentration and relaxation and it has traditionally been used to relieve anxiety, depression, and headaches. It has anti-inflammatory actions similar to non-steroidal anti-inflammatory drugs (NSAIDs). The herb helps regulate blood sugar levels and relieves spasms. Basil enhances circulatory health. Besides great flavor, basil is a rich source of vitamin A, vitamin C, magnesium, iron and potassium.

**Thyme:** Thyme is a potent herb. It has a history of use in the treatment of infections and respiratory illnesses.

**Horseradish:** The use of horseradish for healing has been documented for hundreds of years. Current scientific studies indicate that horseradish has compounds that benefit the respiratory, urinary, and immune systems. It aids digestion and circulation, too. It is considered to be a warming herb by practitioners from many traditions.

This herb is a rich source of vitamin C and several minerals. Horseradish contains several antioxidant compounds and elements that may relieve depression and fight cancer. It aids function of the detoxification pathways of the entire body. Horseradish possesses expectorant, decongestant, and antibacterial principals, and has been used to relieve respiratory and urinary tract infections. Horseradish promotes sweating, which helps to reduce fever.

Because horseradish possesses a strong flavor and potent compounds, limited consumption of horseradish is recommended for children under age 4, people with gastric ulcers, and those who are pregnant or nursing.

**Sage:** Sage has properties that help prevent cancer and aid in controlling hot flashes. Sage is rich in antioxidants.

Some studies indicate that broccoli sprouts contain 50 times as many phytochemicals that help protect the body from cancer as full-grown broccoli.

**Fennel:** Fennel is antispasmodic and relieves gas. It is a great herb for children to take because it has an appealing anise flavor. Fennel has traditionally been employed to relieve colic and increase the flow of breast milk in nursing mothers.

**Dill:** Dill has been used for centuries to comfort babies with colic and adults who ate too much dinner.

**Sorrel:** Sorrel is a tart herb that is very nutritious and excellent in soups and salads.

**Cilantro/coriander:** Cilantro and coriander come from the same plant. Cilantro consists of the leaves used fresh, while coriander is the seed and used dried. Both are antioxidant rich.

**Garlic:** Many studies have concluded that garlic effectively fights infections. Garlic may prevent hardening of the arteries and gastrointestinal cancers. Garlic has been the subject of countless research studies. It lowers the risk of heart disease and helps to reduce LDL cholesterol and triglycerides while increasing HLD cholesterol levels. Garlic helps reduce blood pressure and prevent atherosclerosis. It enhances the peripheral circulation; some people who have leg cramps caused by poor circulation in the legs may find garlic helpful in preventing this painful condition. Onions, shallots, leeks and chives all contain similar constituents, but to a lesser degree.

Garlic has been a popular folk medicine for centuries. The herb contains allicin, a natural antibiotic. It is best used fresh or lightly cooked. Garlic is metabolized partially by the respiratory system and is beneficial for respiratory health. Garlic is rich in antioxidants, iodine and sulfur. A clove daily is beneficial for heart health. It helps to promote the flow of bile. It contains compounds involved with mood regulation and hormone production. Garlic has been used to expel pinworms.

Advise patients to check with their primary health care provider before using garlic medicinally if they are on blood thinners or if surgery is planned because garlic possesses anticoagulant actions. Odor-free supplements are available for people who want to reap the benefits of garlic but do not consume it as food.

**Ginger:** Ginger is used to help combat several types of nausea, including nausea caused by pregnancy and chemotherapy. Caution should be used if taking blood thinners because ginger prevents blood clots from forming. It aids the function of cardiac muscle tissue, which can reduce hypertension. Ginger has also been used to treat osteoarthritis. Ginger benefits the entire body. It even helps relieve cramps.

**Parsley:** Parsley is packed with vitamins. It has antioxidant and anti-tumor factors. Documents from ancient Rome record it being used then to promote health.

**Cayenne:** Fiery cayenne pepper helps increase the strength of the heart’s contraction without increasing blood pressure. Studies show that cayenne may help prevent myocardial infarctions from occurring. It helps prevent platelets from clumping and causing harmful blood clots and lowers cholesterol levels. It has antispasmodic, antibacterial and astringent properties. Cayenne is a rich source of vitamin C.

Advise patients to handle cayenne with care because it is very hot and may cause burns. People with digestive ills should consult their health care provider before using large amounts of cayenne. Patients taking MAO or ACE inhibitors should check with their prescriber if they consume large amounts of cayenne.
Recognize signals of satiety. Correcting chemical imbalances raises
and other biochemicals, need to be balanced for the individual to
within the hippocampus, which controls serotonin, dopamine, cortisol,
the sensation of fullness. The result is overeating. Neurotransmitters
known to promote relaxation. In addition, without proper levels of
Biochemical deficiencies, such as a lack of tryptophan, precipitate binge
diagnosed with depression and anxiety may eat to feel better.
levels precipitate feelings of hunger. The result is overeating. People
"Eating makes me happy," are speaking the truth. Low serotonin
mood, and it also has a role in appetite control. People who say,
Serotonin is a neurotransmitter that is responsible for having a good
problems.
Several theories have been proposed to explain overeating. Most
researchers agree that multiple factors determine whether a person
will be a healthy weight or be too thin or too heavy. Important factors
include body type, biochemical imbalances, knowledge of nutrition,
and access to healthy foods. Biology plays a major role in the
development of large appetites.
Many overweight people are born with more fat cells than other
people. Children who are obese develop additional fat cells. These
people may have a very difficult time maintaining a healthy weight.

Weight management

Theories on weight management and obesity
Everyone knows that obesity and junk food is unhealthy, yet more
American are obese than ever before.
Hunger, cravings, stress and lack of time all contribute to weight gain,
obesity, sluggishness, and poor body image. Some people are born
with larger appetites than others. Other people develop unhealthy
habits attributed to work and daily commitments. Overeating is not
caused by weak self-discipline, but by a combination of physical,
emotional, economic, and social factors.

Warming herbs have traditionally been used in the treatment of
respiratory illnesses, such as cold or flu. Practitioners of traditional
Chinese medicine and Ayurveda believe that stimulating herbs help
prevent colds and flu from developing. Ironically, black pepper may
help to reduce low-grade fevers by stimulating the body’s natural
defense mechanisms. Black pepper also may help inhibit production of
excess mucus, reducing congestion of lung and sinus tissues, and may
reduce sore throat pain.

Black pepper stimulates the circulation. This can improve blood
pressure and prevent cholesterol buildup. As a stimulating herb,
black pepper promotes circulation of lymphatic fluid. Digestion of
carbohydrates is enhanced by the use of black pepper, which also
stimulates the flow of saliva, which in turn begins the breakdown of
carbohydrates. Black pepper may stimulate the appetite. It prolongs the
life of antioxidants, allowing them to work for longer periods of time.
Well-known herbalist Michael Tierra L.Ac.; O.M.D. recommends 1/8
tea spoon ground black pepper combined with honey as a preventative
of respiratory ills such as cold or flu. He recommends that it be
administered 3-4 times daily.

Black pepper exerts an anti-hepatoxic effect by working
synergistically with other nutrients. Research shows that they are able
to perform their functions more effectively in the presence of black
pepper.

Turmeric: Turmeric contains powerful plant compounds that benefit
the entire body and has been extensively studied. Turmeric possesses
antioxidant and anti-tumor factors. Scientists have shown that turmeric
helps prevent and reverse tumor growth. It helps stop the growth and
spread of the disease at many stages of cancer formation using several
different mechanisms. Turmeric also aids liver detoxification. More
than the spice used to prepare curries, the healing benefits of turmeric
have been recognized for millennia. Turmeric has hepatoprotective
actions and helps prevent blood clots formation. Some studies indicate
that turmeric may hinder the progression of multiple sclerosis
and Alzheimer’s disease. It stops the growth and spread of the disease
at many levels.

Black pepper: Spicy, inexpensive black pepper tastes good. It also
offers health benefits. Black pepper is used in combination with
turmeric in traditional Indian cuisine. They work as a team, providing
benefits to all of the systems of the body, including immune and
cardiovascular benefits. In traditional Chinese medicine, black pepper is
considered to be warming and stimulating.

Size of fat cells is a factor that influences weight. People with
metabolic syndrome, who are at risk for developing diabetes and
cardiac disease and gain weight around the midsection, often have
large fat cells.

Many people have a combination of too many fat cells and large fat
cells. This puts them at risk for developing obesity and related health
problems.

Serotonin is a neurotransmitter that is responsible for having a good
mood, and it also has a role in appetite control. People who say,
“Eating makes me happy,” are speaking the truth. Low serotonin
levels precipitate feelings of hunger. The result is overeating. People
diagnosed with depression and anxiety may eat to feel better.

Biochemical deficiencies, such as a lack of tryptophan, precipitate binge
eating. The body craves carbohydrates. Tryptophan is a biochemical
known to promote relaxation. In addition, without proper levels of
tryptophan and other neurotransmitters, the brain does not recognize
the sensation of fullness. The result is overeating. Neurotransmitters
within the hippocampus, which controls serotonin, dopamine, cortisol,
and other biochemicals, need to be balanced for the individual to
recognize signals of satiety. Correcting chemical imbalances raises
self esteem and can help people remain committed to eating nutritious
foods and implementing healthy lifestyle changes.

Many researchers believe that fluctuating biochemical messages and
miscommunication within the brain combined with communication
errors between the brain and the rest of the body may precipitate diet
failure.

Some studies indicate that each person has his or her own weight “set
point,” believed to be primarily genetic in origin. Theorists believe
that set point varies based upon the number of fat cells people have in
conjunction with their basic metabolic rate.

The basic metabolic rate, BMR, is the amount of calories a person
needs to maintain life. A person’s resting metabolic rate, RMR, reflects
the rate that calories are burned during daily activities. Basic and
resting metabolic rates are not fixed; they can be changed. The BMR
and RMR are influenced by eating and exercise patterns.

The hypothalamus controls appetite, food intake, and use of energy
from food that is consumed. Once the body’s set point is established,
the body tries to maintain it.

Consuming excess fat results in a decreased metabolic rate. It is easier
to gain weight on a high-fat diet than on a high complex carbohydrate
and protein diet of equal calories.

It takes four to five times more energy for the body to convert protein
and carbohydrates to fat storage as it does for fats to be converted to
fat for storage.

The fat thermostat is a weight regulating mechanism within the body
that is involved in the determination of weight. When dieters hit a
plateau, it is partly due to the fat thermostat and resulting set point.

Plateaus are when dieters get stuck at a weight and can’t lose more
weight even if fasting or on a very low calorie diet. The body
“thinks” that it must maintain its current weight to avoid starvation.

Periods of weight loss alternated by weight gain, like the kind of
pattern that yo-yo dieters experience, reinforces the body’s set point,
making weight loss harder.

When people develop patterns of weight loss followed by weight gain,
such as crash dieters, their metabolic rates decrease. This process
results in an enhanced ability to store fat and adds on extra pounds to
prevent future “starvation.”
To overcome the set point of the body, dieters must reduce their consumption of fats, increase carbohydrates and participate in regular exercise.

The World Health Organization considers a BMI between 18.9-24.9 to be normal.

Diabetics and people with hypothyroidism may have increased difficulty controlling appetite and weight.

People who have appetite and weight control issues metabolize fat at a slower rate than people who are slender or toned. Their bodies store fat rather than convert it to energy. Sluggishness and additional hunger and weight gain may occur.

An exercise program is an essential part of any weight management program. As the percentage of muscle increases, weight loss is enhanced. An increase in muscle mass results in more efficient fat burning. Exercise has appetite-depressing benefits as well.

The amount of calories consumed must be less than calories burned for weight loss to occur.

Advise patients to consume fresh fruits and vegetables. Small amounts of healthy fats may be eaten. Protein may be consumed as lean meat, legumes, or other plant-based proteins. Low fat dairy products or dairy substitutes are recommended. Whole grains should be consumed as well.

Overeaters

In addition to the biochemical and purely physical causes of overeating, mind-body factors are involved as well.

There are four basic types of overeaters. Help patients who are struggling with weight gain identify what kind of overeater they are to increase their likelihood of success when dieting. People can be more than one kind of overeater. For those who are more than one type, employ the strategies for all of the kinds of overeating in which they indulge. If possible, help them identify the main category in which they fall.

Stress overeaters overeat when stress levels are elevated. Teach these overeaters to recognize signs of stress. Explore and educate them about stress management techniques.

Ask them to document feelings of stress and whether they respond to stress by eating. Encourage stress eaters to find alternative methods of relieving stress instead of eating. If not eating increases stress levels, encourage the person to eat healthy fruits or vegetables initially until they can become more skilled at managing stress.

Fatigue overeaters tend to overeat from 3 p.m. until bedtime. Encourage fatigue overeaters to utilize time management skills that reduce fatigue. Explore energy-saving strategies and ways to ensure that meals are eaten regularly throughout the day. Teach fatigue overeaters to keep healthy snacks containing complex carbohydrates available so they can snack before they are fatigued.

Addictive overeaters crave sugar-laden foods. They seek to elevate their mood via overeating. Identify signs of depression. Help addictive overeaters become aware of the pattern and discuss alternatives to eating that elevate mood. Refer them for counseling or antidepressant medications, if needed.

Escapist overeaters eat alone to escape unpleasant reality and avoid uncomfortable situations. Discuss lifestyle choices and options available to improve the person’s quality of life. They may need mental health counseling.

Simply identifying patterns of overeating is often helpful to overweight individuals. By identifying the pattern, the person becomes aware of his or her behavior. With awareness, a person can make a conscious choice whether to choose to eat or seek alternative comfort. Rather than a mindless activity, the person is empowered to choose.

Tips for weight loss

There are many different diets available. The best ones are inexpensive, simple to follow, and convenient. Help the patient select a diet that meets the lifestyle and dietary requirements for the individual.

Eating breakfast is an important component of a weight management program. Breakfast precipitates a specific dynamic effect that increases metabolism immediately after breakfast then decreases throughout the day. After establishing a pattern of eating breakfast, people find that they are hungry at lunch. This indicates that their metabolic pump is working well.

Fasting often results in increased weight gain. And fasting is not necessarily going without food for several days. To the body, fasting can mean skipping breakfast or going all day without eating. The body “thinks” that it is starving. People who skip breakfast or fast all day convert a higher percentage of food to fat even if they only fast during the day and eat a large meal at night. Some studies show that people gain 30 percent more weight if fasting than if they consume the same number of calories in small frequent meals.

Nutrition before and during pregnancy

Counsel women who are considering pregnancy to eat well before conceiving. Pregnant women must eat well throughout their pregnancy to ensure their own health and the health of their unborn child. By choosing healthy foods, a woman reduces the risks of birth defects and prevents some of the discomfort that pregnancy may precipitate.

Healthy food choices for pregnancy

Greek yogurt with active cultures is an excellent source of protein and calcium. Yogurt can soothe or relieve nausea and heartburn for some women. Many women find yogurt more palatable and easier to digest than other dairy products. Pregnant women sometimes suffer from yeast infections caused by hormonal changes. Active cultures in yeast promote balance of healthy vaginal flora.
Whole grain breads and cereals provide fiber that prevents constipation and hypertension, and whole grains help the body to eliminate excess cholesterol. Gallstones are primarily made of cholesterol. Pregnancy is a risk factor for gallstone development and inflammation, and whole grains may hinder gallstone development and flare-ups.

Whole grain products fortified with iron provide iron needed for fetal development. Iron is especially important during the second and third trimesters as the body prepares for labor. They also are excellent sources of folate, which is essential for prevention of neural tube defects, such as spina bifida. Neural tube defects occur during the first trimester of pregnancy, so consuming fortified whole grains is essential throughout the entire pregnancy. They are also rich in B complex vitamins and many other nutrients.

Berries are nutrient-dense foods. During pregnancy, blueberries are especially beneficial. They are rich sources of vitamin C, bioflavonoids and rutin. Rutin and other phytochemicals contained in blueberries benefit the cardiovascular and immune systems, and rutin strengthens veins, which can minimize varicose veins. Vitamin C helps prevent infections. Blueberries are also rich sources of fiber and antioxidants.

Herbal teas contain micronutrients and may provide relief of discomforts associated with pregnancy. Multiple studies document the use of ginger tea to relieve nausea and vomiting during early pregnancy. Some experts recommend it in the treatment of hyperemesis gravidarum. Compounds in peppermint alleviate heartburn. Herbalists recommend raspberry leaf tea as a uterine tonic. It is a good source of trace elements, calcium, and magnesium and non-heme iron. However, encourage women to check with their health care provider before using herbal teas and herbal medicines.

Protein needs may be met by consuming lean meats, or plant-based proteins. Lentils, dried peas, dried beans, soy, and eggs are inexpensive sources of protein. Eggs that are high in omega 3 fatty acids are available in grocery stores. Quinoa is a grain that contains very high-quality complete protein. It cooks quickly and may be prepared in a variety of ways.

Greens are rich sources of fiber, vitamins, iron and calcium. Kale, collard, dandelion, and turnip greens are superior to other greens because the iron and calcium are in bioavailable forms.

Health experts often recommend that pregnant women consume a minimum of three cups of dairy or dairy substitute daily. They recommend at least three cups of vegetables and two of fruit. Between 5 to 6 ounces each of grains and protein are also recommended. The dietary needs of a pregnant women may require different recommendations based upon her individual needs.

Vegetarians generally meet the nutritional requirements of pregnancy without special modifications. However, vegans are at risk for vitamin B12 and essential fatty acids deficiencies. Fatty acids may be obtained by consuming flaxseed, flax oil, and walnuts. Vegans should obtain most of their calories from foods that are rich in folic acid, calcium, vitamin D, B12, and iron. They must be sure to consume enough protein because requirements double during the final trimester.

All pregnant women should be encouraged to eat regular meals that include high quality foods. Encourage them to include a wide variety of food items to ensure they are getting a full array of trace elements and phytochemicals.

A prenatal multivitamin is recommended for all women. Vegans should have an iron-containing prenatal vitamin and may require additional supplementation of vitamin B12.

**Caffeine during pregnancy**

Several research studies have examined the effects of caffeine during pregnancy. Some studies indicate that caffeine inhibits conception. One large study followed 60,000 women over a 10-year period. The researchers found that caffeine consumption increased occurrences of low birth-weight babies.

Animal studies indicate that caffeine may be linked to cardiac issues and other birth defects. Some animal studies show that caffeine consumption precipitates premature labor. Conflicting studies exist on whether caffeine causes miscarriage rates to increase in humans. More research is needed.

Caffeine is able to pass through the placental barrier. The baby’s immature systems cannot deactivate the caffeine during early pregnancy.

Small amounts of caffeine are present in breast milk.

Caffeine is found in hidden places. Many over-the-counter headache and cold remedies contain caffeine. Chocolate, black tea, green tea, guarana, and yerba mate possess caffeine. Coffee, cola, and other beverages contain significant amounts of caffeine.

The World Health Organization recommends that pregnant women consume a maximum of 300 milligrams of caffeine per day. A daily maximum of less than 200 milligrams of caffeine is recommended by the March of Dimes.

Here are some examples of caffeine content:

- Coffee, 8 oz. regular blend – 140 mg.
- Tea, black or green 8 oz. – 40-50 mg.
- Cola, 8 oz. – 30 mg.
- Dark chocolate, 1.5 oz. – 30 mg.
- Milk chocolate, 1.5 oz. – 10 mg.
- Aspirin with caffeine headache remedy, one dose – 65 mg.

Coffee shops and tea rooms often sell beverages in large portions that are loaded with caffeine. Espresso is an example of a beverage with a very high percentage of caffeine. The caffeine levels in instant teas and cold remedies contain caffeine. Chocolate, black tea, green tea, guarana, and yerba mate possess caffeine. Coffee, cola, and other beverages contain significant amounts of caffeine.

Whole grain products may hinder gallstone development and flare-ups. Whole grain breads and cereals provide fiber that prevents constipation and hypertension, and whole grains help the body to eliminate excess cholesterol.

### Breast-feeding

Breast-feeding offers incredible benefits for both mom and baby. Here are some nutritional benefits of breast-feeding.

Colostrum is perfectly formulated for newborns. Colostrum is a source of antibodies that protect the baby from illness.

Mother’s milk is the best-tolerated food by babies. It is natural and has the right amount of nutrients to ensure healthy development.

Breast-fed babies have decreased rates of digestive upsets, such as constipation and colic.

**Human milk contains enzymes that support growth of healthy intestinal flora.**

**Breast milk has the optimum amount of essential fatty acids to promote brain development and ensure cardiac health.**

**Breast milk contains compounds that protect the child from developing allergies later in life.**
**Egg allergy**

Egg allergies are one of the most common food allergies that afflict children. While most frequently seen in children, allergies to eggs can persist throughout the lifespan, but often disappear during adolescence. Like other allergies, reactions may be mild or life-threatening.

Symptoms of egg allergy are diverse. They usually appear shortly after ingestion of eggs or foods containing eggs. Most reactions follow a classic allergic response, such as hives, runny nose and scratchy throat. Some children experience digestive disturbances.

Anaphylaxis can occur, and if it does, emergency measures should immediately be started. Teach parents how to identify signs of anaphylaxis. Ensure that they know how to obtain emergency assistance and provide first aid to their child, if needed.

The protein in egg whites is usually what precipitates an allergic reaction, but the yolk can provoke an allergic reaction as well. Babies who are sensitive to eggs may react if a breast-feeding mother consumes eggs.

**Gardening and nutrition**

School-based gardens are becoming quite popular. According to a two-year study at Harvard Medical School, a school gardening program can promote healthy weight maintenance in students. Many studies report that they improve nutrition and multiple other aspects of children’s lives. Children are making healthier food choices and sharing their knowledge with their families. In addition, they are learning socialization skills and developing respect for the environment. Other benefits include improved attitudes toward attending school and higher grades.

School-based gardening programs are frequently incorporated into the entire curriculum. Reading, math, history, and science are taught using the school garden as a laboratory. Across the country, even in colder climates where most gardens hibernate during the winter, schools are using greenhouses and root cellars to cultivate crops.

**Nutrition for a healthy nervous system**

A healthy diet regulates neurotransmitters, protects the brain, and can help regulate moods.

**Feeding the nervous system**

High-fiber foods such as whole grains, nuts, fruits and vegetables are excellent sources of magnesium and carbohydrates. Complex carbohydrates are best because they stabilize blood sugar levels, which prevent mood swings, anxiety, headaches and irritability as well as fatigue and overeating.

High-fiber foods promote a feeling of fullness and prevent a “sugar high” with a subsequent “crash” and are a good choice for sustaining energy levels. Complex carbohydrates may help to reduce fatigue and promote calm feelings during periods of stress.

The role of fatty acids and their role in the health of the nervous system have been the focus of many studies for decades. Findings are conflicting. Some experts purport that omega 3 fatty acid consumption or supplementation has a positive effect on mood. Others do not.

One researcher found that depression among residents of the Arctic increased when traditional diets, high in essential fatty acids, were replaced with “modern” diets that contain lower levels of essential fatty acids. Discussion arose on whether the increased rates of depression were caused by an increased consumption of processed food or the lack of essential fatty acids.

**Headaches**

Headaches are a common complaint. Share these self-care suggestions with patients who suffer from headaches.

- **Stress headaches.**
  - Foods that are rich in calcium, magnesium, and B vitamins may help to relieve stress headaches. Whole grains, and a variety of fresh fruits and vegetables are beneficial. Dark green vegetables, such as kale, are an excellent source of calcium.

- **Migraine headaches.**
  - Food allergies or specific foods, such as processed meats, red wine, chocolate, and some cheeses, are common triggers.
Encourage patients to identify triggers. Taking 2,000 mg of vitamin C sometimes helps when taken immediately when the headache starts.

Nutrition for healthy circulation

Circulatory health is based upon several factors. Fortunately, nutritional choices can provide important health benefits for the heart and blood vessels.

Long-term studies about the role of nutrition and cardiovascular health abound. Heart disease is the leading cause of death for adult men and women in America. Cardiovascular disease is a preventable condition with strong dietary links.

Obesity is a risk factor for heart disease. Diabetics are at a higher risk of having circulation problems. Control of diabetes is essential for good cardiac health.

Cholesterol and triglycerides

Cholesterol is produced by animals, including humans; plant fats do not contain it. Cholesterol in proper proportions benefits the human body. It is used to form hormones and is essential for proper utilization of vitamin D. Cholesterol helps to regulate mood.

Some studies have shown that people with cancer sometimes have low levels of cholesterol.

People who have normal levels of low-density lipoprotein (LDL) cholesterol have flexible blood vessels. Blood pressure is often within normal limits, and the heart is not stressed.

Low-density lipoprotein cholesterol is a sticky substance that builds up on the walls of blood vessels. Too much low-density lipoprotein cholesterol contributes to hardening of the arteries, high blood pressure, blood clots, myocardial infarctions, and cerebral vascular accidents. Blood flow to the brain and throughout the body is compromised. Reducing low-density lipoprotein levels helps reduce the risk of myocardial infarctions, cerebral vascular accidents, and pulmonary emboli that cause serious illness or death.

HDL, high-density lipoprotein cholesterol, is cardio-protective. High-density lipoprotein cholesterol possesses anti-inflammatory properties and helps to stabilize low-density lipoprotein. The ratio of HDL to LDL is more important than individual cholesterol levels.

Genetics play an important role in cholesterol formation. Triglycerides are blood fats. Elevated triglycerides are actually more indicative of risk of circulatory damage than cholesterol levels. One of several reasons that diabetics are at increased risk of cardiovascular disease is that elevated glucose levels cause triglyceride levels to rise. Consuming diets rich in complex carbohydrates and fiber reduces triglyceride levels.

Dietary interventions are important in the management of hypertension, cholesterol and triglyceride levels. A meta-analysis of data of 1 million people revealed that among adults ages 40 to 69, each increase of 20 mm Hg of systolic blood pressure and 10 mm Hg of diastolic blood pressure doubles the risk of death from ischemic heart disease and stroke.

The DASH (dietary approaches to stop hypertension) diet was developed as a result of the meta-analysis. It is a plant-based diet rich in fruits and vegetables. Sodium and fats are restricted on the DASH diet.

Nutritional choices for cardiovascular health

- Whole grains, nuts, and fiber-rich fruits and vegetables are packed with protective phytonutrients and fiber. Make them the mainstay of the diet. Fiber helps to eliminate excess cholesterol.
- Healthy fats, such as olive oil, walnut, canola, or macadamia oils, are cholesterol-free and contain fatty acids that prevent low-density lipoprotein cholesterol from depositing in the blood vessels. Substitute coconut oil for butter in baking.
- Cold-water wild fish, such as mackerel, herring, tuna and salmon, contain high-quality protein and healthy fats.
- Red wine and unsweetened grape juice contains resveratrol, which offers multiple benefits to the cardiovascular system, including relaxation of the blood vessels. Red wine and grape juice contain potent antioxidants and various phytochemicals that are cardioprotective.
- Include a variety of vegetables in the diet. Organic cooked tomatoes are rich sources of lycopene, a beneficial nutrient for the circulatory system. Onions, garlic, leeks, and shallots relax the heart and blood vessels. They lower cholesterol levels and help to prevent clotting.
- Kitchen herbs and spices are rich in antioxidants, and micronutrients stabilize unhealthy fats.
- Choose lean cuts of meat. Choose white meat poultry or fish instead of red meats. Wild game and meats from grass-fed animals are leaner and more nutritious than conventionally farmed meats. Substitute bison for beef; it contains less fat and cholesterol than beef. Use meat in limited amounts. Pay attention to portion sizes of meat.
- Obtain protein primarily from plant sources. Soy, dried peas, dried beans, lentils, and dark green leafy vegetables are healthy cholesterol-free options. Soybeans hinder the development of low-density lipoprotein (LDL) and cholesterol.
- Drink non-dairy milk, such as soy, hemp, coconut, or rice milk.
- If using cow’s milk and dairy products, limit consumption and use fat-free varieties. Use low-fat Greek yogurt instead of sour cream. Hard, intensely flavored, low-fat cheeses contain less fat and more flavor than soft cheeses. Limit consumption of all cheeses.
- Nuts are cholesterol-free, nutrient rich, filling alternatives that may be used in small amounts as meat substitutes or extenders. They contain heart-healthy fats.
- Shiitake mushrooms have been shown to help decrease blood pressure. They are useful as meat substitutes and meat extenders.

Cayenne pepper – herb for the heart

Fiery cayenne pepper is as powerful as its taste. Traditional medical practitioners consider cayenne a warming herb. It has been employed for its health benefits since antiquity.

Cayenne increases the contractility of the heart without raising the blood pressure. It is beneficial for patients with congestive heart failure. It prevents spasms of the coronary arteries that results in angina. Cayenne reduces the risk of myocardial infarction because it

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inhibits clot formation and prevents platelets from clumping. The herb lowers LDL cholesterol levels. This prevents damage to the circulatory system and lowers blood pressure.

Cayenne can help to prevent atherosclerosis. It dilates the veins and relaxes and reduces the painful leg cramps caused by impaired circulation.

### Digestive health

Healthy foods directly impact the health of the digestive tract more than any other system. The opposite is also true. Between 30 to 40 percent of adults over age 50 have diverticulitis. Many more suffer from constipation, flatulence, pain, and other gastrointestinal disturbances. Much of it is due to the standard American diet, appropriately called SAD by many. People who consume a low-fiber diet double their risks of many gastrointestinal diseases.

### Smoothies

Smoothies are an excellent method of consuming nutrient-packed foods quickly. They are fast options for people rushing to get to work, children who do not always eat well, and debilitated patients. Unlimited variations in flavor combinations exist. Ingredients can be geared for individual health needs.

### Food intolerances

Food intolerances may occur at any age, but they increase as people grow older. Intolerances occur for a variety of reasons. Hydrochloric acid levels diminish as we grow older. Stress levels of adulthood may cause a “nervous” stomach. Unhealthy eating habits wreak havoc on the body. Years of smoking and consuming alcohol are all contributing factors.

### Lactose intolerance

Many adults consider themselves to be lactose intolerant. Lactose is a milk sugar that is broken down in the presence of the enzyme lactase. As people age, levels of lactase diminish. If not enough lactase is present, lactose does not break down. Instead of the body assimilating the sugar, bacteria within the gastrointestinal tract consume the lactose. Gas, bloating, pain, nausea, vomiting, and diarrhea may result. Many experts believe that adults do not need to consume milk products. It is possible to get calcium, protein, and other nutrients found in milk from alternative sources. Dark green leafy vegetables, sardines, milk substitutes and calcium supplements are options. Lactose intolerant individuals who like milk may purchase a supplement or dairy products with lactase added to it. Some people report that they can tolerate cultured dairy products better than uncultured ones. Hard cheeses are often tolerable, too. Yogurt, cheeses, and sour cream may be more digestible for some people.

### Educating patients about celiac disease

Magazines are showcasing articles and recipes for gluten-free foods at a rate never before seen. Celiac disease and non-celiac gluten intolerances are being diagnosed fairly often. There seems to be an epidemic of people who think they may have celiac disease. The nurse can help clarify questions that patients have about gluten and celiac disease.

Celiac disease is an immune disorder. It causes the villi within the small intestine to lose their normal fingerlike projections. Instead, the villi become flattened, damaged and unable to absorb nutrients. Pain and diarrhea may result. Iron and calcium deficiencies may be present. Some researchers believe that impaired permeability of the intestinal wall increases the risk of development of autoimmune disorders, such as lupus and chronic fatigue, among people with celiac disease. People with celiac disease have a gene that is activated and precipitates development of the condition. Patients who have celiac disease often suffer from fatigue, likely due to nutritional deficits. A gluten-free diet will help them regain their energy – but advise your patients that a gluten-free diet is not a quick fix.

Celiac disease diagnoses have increased dramatically. About 2 million Americans have been diagnosed with celiac disease. Many more may have it but are not diagnosed yet. A vast number of other people are sensitive to gluten.

Gluten may cause symptoms in people who do not have celiac disease. Many people think that they are sensitive to gluten because they have symptoms similar to the ones that patients with celiac disease experience. Patients should be tested for celiac disease if they have a family member with celiac disease. Celiac disease is suspected in the presence of iron deficiency anemia, chronic diarrhea, abdominal pain, and chronic flatulence and bloating.

Diagnostics is done with a blood test for transglutaminase. If the blood test is positive, the patient has a 30 percent chance of having celiac disease. A biopsy provides a definitive diagnosis providing the patient was not on a gluten-free diet. Patients are urged to get a biopsy to confirm the diagnosis and to rule out other serious illnesses such as Crohn’s disease, peptic ulcer disease or colon cancer. Patients with irritable bowel syndrome should be tested for the presence of celiac disease.

Celiac disease presents a small risk factor for the development of certain cancers. Research is ongoing. Currently, patients with celiac disease should be advised that they have slightly higher than normal risks for development of lymphoma, intestinal cancer, and possibly esophageal cancer.

It is important to instruct patients not to eliminate gluten until they have been diagnosed. Diagnosis of celiac disease is hampered when a gluten-free diet is implemented before diagnosis. Gluten is a protein found in wheat, rye, barley, spelt, kamut, and triticale.

People who follow a Paleolithic diet do not consume gluten, so the Paleo diet is an option for people suffering from celiac disease. More and more gluten-free products are found in grocery stores.

Tell patients that just because something is labeled as gluten-free, it is not necessarily a healthy food. Potato chips are gluten-free, but not healthy.

Many foods are labeled as gluten free. Advise patients to think before they purchase gluten-free foods. Some manufacturers place gluten-
HEPATIC HEALTH AND NUTRITION

Gallstones

One in five women and eight out of 100 men over age 40 develop gallstones. Most gallstones are determined to be mixed stones. Mixed stones contain cholesterol, bile salts, calcium, and other compounds.

Oral contraceptives and pregnancy increase gallstone formation and symptoms. Food allergies, obesity, and a high intake of cholesterol-containing foods increase the risk of development of gallstones.

Genetics plays a minor role. Advanced age and alcoholic cirrhosis are precursors. Native American women have an elevated risk. People who have illnesses that interfere with absorption, such as Crohn’s disease or cystic fibrosis, have an increased likelihood of gallstone formation.

Excess sun exposure has been shown to be a risk factor as well. The combination of UV radiation with cholesterol and bile salts hastens gallstone development.

Nutrition for Hepatitis C

People with hepatitis C require higher amounts of dietary protein unless advanced cirrhosis is present. Protein should be obtained from plant-based sources. People with advanced cirrhosis who eat protein from plant-based sources have a lower risk of encephalopathy than people who consume animal-based proteins.

Iron is less available in plant-based proteins. This is beneficial as well for patients with hepatitis.

The caloric needs are elevated. To calculate the caloric needs that a person with hepatitis C requires, multiply their weight in pounds by 14 to 16. The resulting number is the number of calories needed daily.

Limited amounts of fats should be consumed because digestion and fat absorption may be impaired. Fats eaten should come from sources rich in omega 3 fatty acids. Some practitioners recommend that patients use coconut oil as their source of dietary fat.

Sodium intake should be minimized.

Small frequent meals rich in complex carbohydrates improve glucose utilization.

Steatosis/fatty liver

More than 50 percent of people diagnosed with hepatitis C have steatosis, also known as fatty liver. Other factors can precipitate development of steatosis as well. Diabetes, obesity, excess alcohol consumption and the presence of insulin resistance are risk factors.

As little as a decrease of 5 percent of body weight can decrease the degree of steatosis in obese patients. ALT levels and insulin levels decrease in proportion to weight loss.

HCV-infected patients with steatosis have lower response rates to interferon-based therapy.

Inside – outside: Nutrition for the integumentary system

The integumentary system consists of skin, mucus membranes, hair, and nails. The skin represents 15 percent of the body’s total weight.

Nutritional guidelines for healthy skin

Healthy skin depends on proper nutrition. Foods that aid digestion optimize nutrient absorption. Hydration is essential, and water is the best source of hydration. Alcohol and caffeinated beverages dehydrate skin. Avoid them or consume them in limited amounts.

Healthy fats reduce inflammation and provide nutrients that prevent aging of the skin. Foods containing omega 3 and omega 7 fatty acids provide skin with nutrients needed for cell repair and renewal. Omega 3 fatty acids provide lubrication and also reduce inflammation and redness.

Cold-pressed olive oil has constituents that reduce inflammation and promote a supple texture. It is a rich source of prostaglandins. Oily
fish, such as mackerel, halibut, sardines and salmon, are rich sources of healthy fats that help the skin to function well.

Consuming nuts, whole grains, and flaxseeds on a regular basis enhances flexibility and improves the texture of skin. Whole grains are rich sources of B vitamins that function as co-enzymes that aid the skin to function at an optimum level. They are needed for cellular repair and for the sebum in skin to be produced. Flaxseed is rich in omega 3 fatty acids.

Raw nuts and seeds are rich sources of zinc and healthy fats. Zinc has antibacterial properties that facilitate efficient production of sebum. Raw nuts and seeds are rich sources of the antioxidant vitamin E.

Colorful fruits and vegetables, rich in antioxidants and bioflavonoids, provide protection from sun damage. Nutrients in fruits and vegetables promote skin repair and maintain hydration protection from the elements. Fruits and vegetables contain vitamins that fight aging. Moisture in fruits and vegetables plumps up skin cells, making them look younger.

Nutritional interventions for patients with COPD

Patients suffering with COPD (constrictive occlusive pulmonary disease) come from many backgrounds, but there are proportionally more patients who come from a poor economic status than those who have many financial assets. Providing care to a patient with COPD can be challenging, especially if socio-economic problems make obtaining services, food, or medicine difficult to acquire.

Patients may have difficulty obtaining nutrient dense food as a result of the disease process, shortness of breath, fatigue, or mobility issues.

Nurses providing care to patients with COPD traditionally focused on teaching patients ways to conserve energy while eating and during food preparation. Coffee was sometimes recommended to open up airways. Milk was minimized in an effort to reduce secretions. Many people with COPD were provided with supplemental packaged beverages to help meet their often-deficient nutritional needs. All of those interventions were useful and continue to be beneficial strategies while providing care to patients with COPD.

However, there is much more nurses can offer patients about nutrition strategies.

While many patients with advanced COPD suffer from malnutrition and have subnormal weights, some are obese. A national British study identified strong connections between obesity and COPD. Obesity makes the work of breathing even more difficult; excess intra-abdominal fat prevents full expansion of the lungs.

Obesity influences the development of asthma. Sleep apnea is more common in obese patients than in those who maintain a healthy weight.

Allicin, found in garlic and other members of the onion family, prevents free-radical damage from sun exposure and pollutants. Free radicals contribute to aging of the skin’s tissues.

Include herbs in the diet because they are excellent sources of protective antioxidants.

Active cultures in yogurt and fermented foods, such as kimchee, miso, kefir, and natural sauerkraut, maintain healthy intestinal flora. Digestion and assimilation of nutrients needed for skin health is enhanced. Healthy digestive functioning also expedites elimination of toxins that can irritate skin. Foods containing active cultures help prevent acne flare up and other skin irritations. In addition to the benefits of probiotics, yogurt provides protein needed for skin regeneration and repair.

Cruciferous vegetables, members of the cabbage family, support detoxification. Skin is an organ of detoxification. People are exposed to toxic chemicals on a daily basis, plus the body produces toxins that need elimination. Consuming foods that support detoxification improves the functional ability of the skin and enhances its appearance.

Nutrition for respiratory wellness

Our respiratory tract automatically brings in the elements we need and discards those we don’t, every second of our lives. We do not even need to think about it. Most of the time, we are not even aware that we are breathing.

Herbs for respiratory health

Common kitchen herbs contain potent compounds that fight infections, soothe sore throats and relieve coughs. Antioxidants and other compounds in garlic, oregano, thyme and basil possess antibacterial properties. In vitro tests indicate that extracts of oregano, garlic, thyme, and basil inhibit growth of methicillin resistant Staphylococcus aureus (MRSA) bacteria.

Health care practitioners and folk healers have used garlic, ginger, onions, cayenne, and horseradish to fight respiratory illnesses for centuries.

Teas taken for respiratory illness should be consumed hot because the heat will hasten drainage of sinus congestion. Local honey added to medicinal teas with lemon or other citrus fruits provide additional healing benefits.

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growth of community gardens and farmer’s markets in areas of cities where there is a lack of such resources. Many people with COPD consume the majority of their fruits and vegetables from a can. Frozen vegetables are often better quality than canned, but fresh is essential to obtain the best quality and array of nutrients.

Many patients with COPD are malnourished because of the process of the disease. Patients often lose muscle mass and may be cachexic. The actual process of cachexia is poorly understood, but it is likely caused by several factors.

One factor is that if the COPD is not well controlled, patients simply do not have the energy to eat. The act of eating may increase dyspnea. Chewing and swallowing may be difficult because of secretions and dyspnea.

Some patients choose not to eat or drink regularly because they do not want to have to go to the bathroom, which is exhausting and increases episodes of coughing and dyspnea. Many patients with COPD have co-morbidities that increase their debility.

The nurse must use observational assessment skills and establish rapport with patients to ascertain the cause of decreased intake.

Patients with COPD are prone to oxidative stress. Free radicals within the body are released at an elevated rate. Cell membranes are damaged. A graphic illustration of what happens when oxidative stress occurs in an inanimate object is when metal exposed to the elements rusts; rusting is oxidation. Eventually the object gets “eaten up” by the rust and simply falls apart.

The process of oxidation within the human body is actually quite similar. As oxidative stress increases, cell membranes break down and muscle is lost. Unfortunately, tissue breakdown leads to even further oxidative stress, and the rate of muscle loss continues to increase as the disease progresses. Sarcopenia is a common trait among elderly patients with COPD, and is loss of muscle mass as well.

Malnutrition is also promoted by hyperinflation of the lungs. Patients with COPD often say, “I try to eat, but I take two bites and I am full.” Hyperinflation of the lungs causes the diaphragm to flatten. Patients feels they are full because of the pressure of the lungs on the stomach and intestines.

A patient with COPD also may say, “Nothing tastes good.” Chronic mouth breathing, excessive secretions, and medications all contribute to alterations in taste. These patients may have sensory deficits related to taste. Those who are unable to smell may not want to eat either. Nausea and vomiting may result from spasmodic coughing. Acute hypoxia may result in temporary confusion. Confusion may prevent the patient from eating.

The body contains a compound called adipokine visfatin, which promotes weight loss. Patients with COPD have elevated amounts of the compound. Cytokines may play a role as well. The World Health Organization accepts the body mass index (BMI) as an indicator of nutritional status, but some researchers say it is not always accurate, especially among the elderly. The World Health Organization considers a BMI between 18.9-24.9 normal. A person is considered underweight if the BMI is less than 18.5. A person with a BMI of 30 or above is considered obese, but a high BMI does not rule out malnutrition.

Eating to promote immune health

While each system of the body requires communication with other systems for optimum health, the immune system communicates intimately with the rest of the body using mechanisms unlike any other system. It works closely with neurotransmitters and the circulatory systems. The immune system is not confined to vessels or organs within a clearly defined system. Immune messengers flow and interact directly with the entire body.

The immune system is the internal defense system of the body. It is comprised of the spleen, thymus and lymphatic tissue. Interferon and complement are compounds found in lymphatic fluid. White blood cells, the lining of the human gut, and bone marrow have a role in the immune response.

Other screening tools are not widely accepted or validated as accurate.

Some studies show positive outcomes, such as short- and long-term weight gain and improvement in nutritional markers among patients who receive nutritional counseling and support. A high-carbohydrate, high-protein diet is recommended. Foods rich in omega 3 fatty acids are recommended to help reduce inflammation. Flaxseed and oily fish are economical sources.

Patients with COPD are often deficient in riboflavin, a B complex vitamin. Whole grains and fortified cereals are good sources of B vitamins, but a patient may not consume enough via the diet. A broad spectrum vitamin and mineral compound is advisable. Supplements of B complex must be taken on a continual basis; it is not stored in the body, and levels drop if supplementation is discontinued.

Vitamin D is often lacking in patients with COPD. Clinical trials are under way to determine whether vitamin D supplementation is beneficial for patients with COPD. Vitamin D is needed for bone strength, and also is associated with lung function.

Patients with COPD often require treatment with corticosteroids. Corticosteroids promote bone loss and resultant fractures; osteoporosis is common among patients with COPD who have a high risk of vertebral bone fractures. In addition to being painful and interfering with mobility, spinal fractures impair pulmonary function. Bisphosphonate is recommended to reduce the risk of fracture. Calcium-rich foods may provide some level of protection as well.

Strategies that nurses may incorporate to improve nutrition and enhance comfort while the patient is eating include the following:

- Help the patient to sit in an upright position.
- Provide pillows to support the arms.
- Encourage patients to rest before and after meals. Provide meals at times when the patient feels that he or she has the most energy.
- Provide small, frequent meals. Offer foods that the patient chooses.
- Teach family members safe feeding techniques if indicated.
- Encourage patients to eat before and after meals. Provide meals at times when the patient feels that he or she has the most energy.
- Limit salt to prevent fluid retention. Encourage patients to drink fluids after they have eaten to avoid filling up on liquids.

Some experts recommend enteral or parenteral feedings if patients are malnourished or at risk of malnourishment. This can be a difficult decision for patients and family members to consider because COPD is a progressive condition. Quality-of-life issues and discussions about the duration of artificial feedings need to be addressed. Possible concerns are whether the intervention is to be used temporarily during an acute illness, such as pneumonia, or for long-term nutritional support needs. The patient’s wishes about future discontinuance of therapy need to be considered as well.

Nursing a patient with COPD requires creativity, advocacy and patience. A nurse who is knowledgeable about nutritional strategies and options can be invaluable to patients in their struggles to live with COPD. Symptom management and patients’ quality of life may improve. They may be even able to live longer.
Stress of any origin affects immune health. Examples of stress include exposure to toxins, poor diet, illness, and lack of sleep.

Multiple research studies prove that eating healthy foods, laughing, positive imagery, and other behaviors that reduce stress optimize immune function.

The immune response is activated within milliseconds of recognizing “danger.” It responds in similar manner, without respect to the type of or location of the threat to the body. When a threat is sensed, the immune system isolates the substance to prevent it from affecting the rest of the body.

Autoimmune disorders occur when the immune system misidentifies tissues of the human body as foreign and attacks them.

The health of the immune system is greatly influenced by a person’s nutritional status. A low-fat, primarily vegetarian, diet rich in whole grains is recommended. The diet should be low in refined sugars, and protein consumption should not be excessive.

Many experts recommend that a multivitamin be taken in addition to a healthy diet. One of the most common causes of poor immune health is nutrient deficiency. A vast number of study results reveal that a deficiency of even a single nutrient can result in impaired immunity. All aspects of immune function are impaired when protein intake is deficient.

Cell-mediated immunity is one branch of the immune system’s functions, responsible for fighting infections. High intake of sugar and elevated blood sugar levels reduce the activity of white blood cells. Theorists believe that activity may be reduced for two reasons. The sugars occupy sites on the cell membrane that would be occupied by protective vitamin C under other circumstances, and sugars elevate insulin levels. Both mechanisms interfere with the transport of vitamin C into cells where its antioxidant activity fights infection.

Obesity leads to impaired immunity. Bactericidal activity of lymphocytes is reduced. Elevations in cholesterol and triglycerides reduce phagocytosis and the efficiency of the antibody response. Excess alcohol intake profoundly diminishes the immune function of the entire body on many levels.

Folic acid deficiency, the most common vitamin deficiency in the United States, results in diminished white blood cell production and activity. Vitamin B12 deficiency reduces phagocytosis and bactericidal actions.

Vitamin A can enhance many activities of the immune system, and is involved in the induction of cell-mediated cytotoxicity of cancerous cells. It activates natural killer cell activity and the antibody response. Vitamin A protects the thymus gland and can actually stimulate its growth.

Vitamin C helps the body to be able to resist infections. It also has antiviral and antibacterial activities.

Vitamin E offers diverse benefits to immune health. It is protective to the spleen and thymus and a superior free radical scavenger. It activates T cells and several other components of the immune system.

Selenium and zinc possess widespread benefits for immune health. Zinc is especially important for the health of the thymus gland.

Much is still unknown about the immune function. What is clear is that immune health depends greatly upon a healthy diet.

Shiitake mushroom/Lentinus edodes

These delicious mushrooms are loaded with immune enhancement compounds. They may be used fresh or dried. Traditional Chinese medicine physicians use shiitakes to reduce cholesterol, triglycerides, and other fats. They enhance urinary tract health and relieve stomach irritation.

Shiitakes have been studied extensively. They possess unique phytochemicals that fight cancer and reduce hypertension and are an ingredient in a preparation administered to patients undergoing chemotherapy. Research shows that those patients tolerate chemotherapy with fewer side effects. Shiitakes are used in the care of patients suffering from hepatitis and cancer.

Shiitake mushrooms have been shown to shrink cancerous tumors. An extract of shiitake was shown to increase survival rates of patients with cancer by a couple of years. Another study demonstrated that an extract of shiitake reduced viral activity better than some potent antibiotics. Shiitake mushrooms activate the immune response and increase cellular immune health of all cells.

The mushrooms are a healthy addition to a diet for patients with health issues as well as part of a diet designed to enhance general wellness.

Seafood allergies

Seafood allergies are common. A patient may be allergic to fish, shellfish or both. Seafood allergies are more prevalent in adult males than children or women; however anyone can develop a seafood allergy. Shellfish allergies are the most common serious food allergy in the United States. Often they develop in adults who could formerly eat shellfish. More than 7 million Americans have a shellfish allergy. More than 2 percent of Americans are affected.

Most seafood allergies are mild and can be avoided simply by not eating fish and shellfish. However, some people suffer life-threatening anaphylaxis simply by being in close proximity to seafood.

Shellfish allergies are a type of seafood allergy. The most common shellfish allergies are caused by crustaceans, such as lobster, crab, and shrimp. Fewer people suffer from reactions to mollusks, which include clams, oysters and mussels. Sometimes people who are allergic to crustaceans are able to safely eat mollusks. An allergist should be consulted before attempting to consume them.

Cross-contamination is a risk for people who suffer from seafood allergies, especially if eating in restaurants. An example of cross-contamination could occur if a person allergic to clams orders haddock that is accompanied by clams. The person does not eat any clams, but the clams have come into contact with the haddock and an allergic reaction ensues.

Advise patients suffering from seafood allergies that hidden sources of seafood include Worcestershire sauce, seafood flavoring, and Caesar salad dressing.

Highly allergic patients may need to avoid restaurants and kitchens where seafood is prepared to avoid airborne allergens.

PROMOTING URINARY HEALTH THROUGH NUTRITIONAL APPROACHES

The urinary tract is responsible for removing wastes from the body and managing fluid and electrolyte balance. The kidneys work closely with the circulatory system to maintain blood pressure.
Cranberries and blueberries possess qualities that prevent bacteria from clinging to the walls in the bladder. Instead of lodging and multiplying, bacteria are excreted. This property is called anti-adhesion. The acidic nature of blueberries and cranberries inhibits bacterial growth. Cranberries also reduce the formation of some types of kidney stones. The majority of kidney stones are comprised of calcium, and cranberry juice inhibits calcium-based stones. However, the development of stones comprised of uric acid or other compounds is not inhibited by the consumption of cranberry juice.

Research shows that cranberries help prevent urinary tract infections by three mechanisms. Blueberries provide similar protection.

- Cranberries and blueberries possess qualities that prevent bacteria from clinging to the walls in the bladder. Instead of lodging and multiplying, bacteria are excreted. This property is called anti-adhesion.
- The acidic nature of blueberries and cranberries inhibits bacterial growth.
- Cranberries and blueberries inhibit urinary infections by direct antimicrobial actions.

Cranberries and blueberries for urinary health

Improving insulin sensitivity

Insulin resistance is characterized by the body’s inability to recognize insulin and allow glucose into cells. The result is an overproduction of insulin, as evidenced by high insulin levels. Twenty to 25 percent of Americans are insulin resistant. Approximately one-third of patients with chronic hepatitis C are insulin resistant or diabetic. The prevalence of diabetes has increased drastically worldwide. Diet and lifestyle factors such as obesity and inactivity are directly linked to its occurrence. People who come from societies that traditionally have low rates of diabetes rapidly increase their risk factors and occurrence of the disease when they adopt a standard American diet.

The conventional dietary treatment for diabetes has been to reduce the intake of carbohydrates. Over the past couple of decades, experts recommended loosening restrictions on carbohydrate intake and began advising diabetics to decrease their intake of unhealthy fats. In addition, patients were instructed to follow diets that included moderate amount of carbohydrates. Practitioners recommended carbohydrate counting and tight control of blood glucose levels coupled with exercise to prevent complications of diabetes from arising in the future.

An interesting study was conducted by Barnard et.al. Randomized trials showed that vegetarian and vegan low-fat diets improved glycemic control, improved lipid levels, and body weight. Some studies indicated that the vegan and vegetarian interventions had better results than those that followed standard recommendations. Vegetarian diets were known to be associated with increased insulin sensitivity and a decreased need for the use of hypoglycemic agents. Barnard and associates noted that Seventh-day Adventists had a lower rate of diabetes than the general public. Most Seventh-day Adventists did not smoke or consume alcohol. Approximately 50 percent ate meat; the rest were vegetarians. Seventh-day Adventists had a rate of diabetes that was less than half that of the general population. The rate of diabetes among meat-eating Adventists was one and one-half times to twice as high among the meat eaters as the vegetarian Adventists. A long-term (17-year) study demonstrated that Adventists who consumed meat at least once weekly developed diabetes at a rate of almost 30 percent more frequently than the vegetarians. Among those who consumed processed meats, almost 40 percent were likely to develop diabetes. They found that long-term adherence to a vegetarian diet reduced the likelihood of developing diabetes by almost 75 percent. Several studies have been conducted using low-fat, plant-based diets to improve glycemic control. The studies consistently revealed that low-fat, plant-based diets have positive effects for diabetics that reduce risk factors for complications of diabetes. As a result of the studies, the American Dietetic Association has approved the use of low-fat, plant-based diets as therapeutic diet options for diabetics. Weight loss associated with high-fiber, low-fat, plant-based diets improves insulin sensitivity and glycemic control. A small study of patients following a vegan diet revealed that the vegans had 31 percent less fat within the cells of the heart muscle compared to the control group.

Stores of heme-iron from meat are positively correlated with insulin resistance, hyperglycemia, and development of type 2 diabetes. Conversely, patients who consume plant-rich diets obtain their iron in the form of non-heme iron, which improves insulin sensitivity, lowers blood sugar, and reduces the risk of diabetes development. The iron in vegetable protein is usually less bioavailable than the iron in animal proteins. Vegetable iron is 2-5 percent absorbable, while animal sources are between 10-20 percent absorbable.

Diabetics have multiple cardiac risk factors. Reduced lipids, less obesity, and improved glycemic control all reduce the risk of cardiovascular disease among diabetics. A well-known study and program formulated by Dr. Dean Ornish in the 1990s demonstrated reversal of coronary artery stenosis and atherosclerosis. The program consisted of a plant-based, low-fat diet coupled with an exercise program.
A study compared the drug lovastatin with a vegetarian diet in their ability to reduce LDL cholesterol. Within four weeks, LDL cholesterol levels of the lovastatin group decreased by 30.9 percent. The vegetarian group did almost as well. Their LDL cholesterol levels diminished by 28 percent.

It is essential that carbohydrates consumed be whole grain and high in fiber. Diabetics who consume sugary foods and primarily refined carbohydrates may have transient elevations in triglyceride levels and VLDL (very low density lipoprotein) cholesterol even if they eat diets that are primarily plant-based.

Hypertension is reduced and elasticity of blood vessels is improved, further improving cardiovascular health.

**NUTRITION FOR WOMEN’S HEALTH**

**Hormones**

Hormones initiate the beginning and ending of woman’s child-bearing years. Each month, a carefully orchestrated hormonal process repeats itself. Primary hormones include estrogen and progesterone, but other hormones are involved as well. If pregnancy occurs, the hormonal pattern changes throughout the pregnancy. After several decades, more hormonal changes precipitate the onset of menopause.

When progesterone levels are out of balance, a woman may experience breast tenderness and disrupted ovarian function. The risk of breast cancer elevates.

Healthy levels of estrogen protect against cardiovascular disease and osteoporosis. Estrogen enhances sexual desire, lubricates the vagina, prepares the uterine lining to support a pregnancy and ensures that breast milk is produced.

Infertility, cancer, uterine fibroids and other detrimental conditions result from estrogen imbalance. Hot flashes, amenorrhea, and irregular, excessive menses may result. Estrogen imbalance is a major contributor to breast and other hormone-dependent cancers.

Women make three types of estrogen. They must be in balance with each other to prevent distress and disease. Current research indicates that we are exposed to too much estrogen. And too much estrogen causes havoc in women’s bodies.

We live in a world where hormonal disruptions are becoming more prominent. There are several reasons why estrogen exposure and hormone disruption is increasing:

- Girls are maturing earlier. Earlier menarche means prolonged exposure to estrogen.
- Plastics, pesticides, and other chemicals contain unhealthy estrogens. Pesticides have compounds that mimic estrogens.
- Synthetic pharmaceutical drugs, such as birth control pills and hormone replacement therapies, are used to relieve present health risks, including an elevated risk of blood clot formation.
- Estrogens are widely administered to dairy cows to promote growth and increase milk production. Many farm animals are exposed to pesticides. The estrogen-like hormone disrupters from pesticides are consumed when their meat is eaten because the chemicals are contained in their flesh. Fish and fowl often contain abnormal estrogens from pollutants and poor-quality feed.
- Many people consume diets low in fiber. Diets lows in fiber do not bind and eliminate excess estrogens from the body.

**Healthy foods for women**

Healthy estrogen-like compounds may be obtained from many plants called phytoestrogens. Phytoestrogens work by binding to estrogen receptor sites that excess or harmful forms of estrogen would otherwise occupy. Harmful or excess estrogens are eliminated instead of lodging within the body where they could create hot flashes, aid in fibroid tumor growth, or development of breast cancer. Common food and herb sources include turmeric, soy, legumes, and licorice.

Soy, which is rich in phytoestrogens, has been the object of a vast number of research studies. Soy has been proven to be beneficial for cardiovascular health. It is a rich, low calorie source of protein. Soy supplements do not offer the same benefits. The best soy products are edamame, soy milk, and tofu. Soy burgers, hot dogs and other processed soy products do not contain the same percentage of active beneficial compounds as unprocessed sources of soy.

Seaweeds are rich sources of trace minerals and micronutrients. There are many kinds of seaweeds; kelp, wakame, nori, and dulse are just a few. Wakame contains the largest concentration of phytonutrients.

Seaweeds may be eaten as a vegetable or used as a condiment. They provide trace minerals that benefit the entire body. Many people say that they would not eat seaweed, but that they love sushi. Most sushi contains seaweed.

Diabetics are at risk for development of renal disease. Approximately 40 percent of diabetics show some degree of renal illness. A plant-based diet may slow the loss of renal function.

Neuropathic pain was eliminated or partially relieved among patients following a vegan diet coupled with a 30-minute walk daily. Approximately one-fourth of the participants discontinued use of oral hypoglycemic agents, and 50 percent reduced their insulin doses by approximately one-half. The study was conducted in a residential setting over a five-week period.

These findings support the novel approach of using a plant-based, low-fat diet to treat diabetes. Further studies are ongoing.
Milk substitutes do not contain unhealthy estrogens. Non-genetically modified, organic soy is best, but other milk substitutes are healthy as well.

A variety of colorful fruits should be consumed daily. Berries are especially healthy. Keep in mind that non-organic berries and grapes are heavily treated with pesticides. If patients cannot afford to buy all organic produce, encourage them to attempt to purchase organic berries and grapes. Instruct them to wash the fruit carefully before eating it.

Freshly ground flaxseed should be eaten daily for multiple health benefits. Compounds in flax prevent breast cancer.

Green tea offers benefits to the entire body. It protects against cancer.

Encourage liberal use of culinary herbs. Some of the best herbs for women include basil, garlic, turmeric, citrus peels, rosemary, ginger and mustard.

Fats should be used sparingly. Patients should purchase excellent quality cold-pressed oils. Use flax oil for cold dishes. Canola, hemp, pumpkin, walnut, macadamia, sesame and olive are healthy choices. Many large supermarkets now stock a full range of oils.

Seeds, nuts, and nut butters consumed in small amounts provide protein, complex carbohydrates, healthy fats, fiber, and many phytochemicals. Sesame seeds, almonds, walnuts and Brazil nuts are among the most nutritious.

Advise women to limit fish to twice weekly. Cold-water, oily fish, such as mackerel, tuna, herring and salmon, are good choices. Sardines are excellent because they are good sources of calcium in addition to protein and healthy oils.

Women should avoid or limit dairy products because of added growth hormones that can contribute to imbalances of hormones in the human body. Use organic dairy products if available. Limit consumption of them as well.

Limiting sweets, salt, and fried foods promotes a healthy weight and avoids consumption of empty calories.

Limit caffeinated beverages, especially soda and coffee. Caffeine is contraindicated for women with fibrocystic breast disease.

NUTRITION FOR MEN

At its most basic, the purpose of the male reproductive system is to produce sperm and transport it to a women’s body for reproductive purposes. Sexual pleasure biologically enhances that process.

Healthy food for men

Bananas are rich in fiber and micronutrients that men need. Pumpkin seeds and chocolate relieve symptoms of an enlarged prostate, improve hormone formation, and promote glandular balance. Vitamin E aids sperm formation and promotes general wellness.

Lycopene-rich tomatoes and watermelons offer many health benefits, including cancer prevention. Lycopene is especially effective in the prevention of prostate, lung and stomach cancers.

Meat intake should be minimized, and any that is eaten should be low in fat. Many men eat large amounts of meat. However, there is a direct link between consumption of red meats and an increased risk of colon cancer. A 20-year study found that increasing the intake of processed meats by 1 ounce daily increased the risk of stomach cancer by 15 to 38 percent. Heavy meat eaters double their risk of contracting prostate cancer, according to Edward Giovannucci of Harvard Medical School. He says that men who eat red meat five or more times weekly quadruple their risk of colon cancer.

Pumpkin seeds

Pumpkin seeds contain protein, fiber, and healthy fatty acids. They are an outstanding source of zinc, which is needed for proper functioning of the male sexual organs.

Research shows that ingesting pumpkin seeds effectively prevents and reduces symptoms of mild to moderate benign prostate hyperplasia. Men find they sleep better, too, because they do not have to arise at night to urinate frequently.

Researchers have determined that consuming 2 grams of pumpkin seeds daily improves prostate and urinary health.

Nutritional interventions for gout

Ninety-five percent of patients treated for gout are men. Gout is an extremely painful type of arthritis that most commonly affects the big toe. Uric acid crystals build up in the joint, causing swelling, redness and pain. Gout frequently runs in families.

Gout was historically considered to be a “rich man’s disease” because it was most commonly diagnosed in wealthy, overweight men. Only wealthy people could afford expensive, fat-laden diets that included organ meats and prime cuts of meats marbled with fat that were popular in years past.

Gout flare-ups can be reduced by decreasing the intake of rich foods and maintaining a healthy weight. Some fruits are especially beneficial in the treatment and prevention of gout and are excellent choices because they promote health of the entire body in addition to relieving the distress of gout.

Studies indicate that cherries offer multiple healing benefits for patients who suffer from gout. Cherries are very alkaline; uric acid is neutralized, and crystal formation is inhibited. Cherries possess a rich supply of phytochemicals and are rich in iron. They benefit the health of the hepatic and endocrine systems.

Cherries aid bowel elimination and improve the health of the entire body. They are the most important food that gout sufferers can consume. Fresh berries are best, but frozen ones also are available. Concentrated unsweetened cherry juice may be purchased as well.

Blueberries contain antioxidants and phytochemicals that reduce inflammation. They are low in calories and high in vitamin A. Blueberries benefit the health of the pancreas and the eyes.

Strawberries may help to reduce the pain of gout by two methods. They contain salicylates, similar to those found in aspirin. In addition, strawberries are an excellent source of vitamin C, a potent anti-
inflammatory agent. Strawberries are alkaline, so they may help to prevent uric acid crystals from forming. They promote mild diuretic actions, and uric acid crystals are dissolved and excreted via the urinary tract. Strawberries may lower blood pressure and provide healthy potassium.

Bromelain is an enzyme in pineapple that is used to decrease arthritic pain.

Foods low in calories and high in fiber are an important part of a program that promotes a healthy weight. Consuming a wide variety of fruits and vegetables is essential. Weight management is essential for patients suffering from gout.

Eating for longevity

There is a vast difference among patients who age well and those who get old before their time. A lifestyle that promotes longevity ideally begins early in life. However, it is never too late to make healthy choices that optimize the quality of their lives and living longer.

Challenges of nutrition and aging

Metabolism of nutrients may be impaired as people age. Stomach acid may be less abundant. Absorption of nutrients may be lessened. Appetites may diminish. Constipation may occur. Food preparation may be limited by medical, cognitive, financial, or functional issues.

Dental, swallowing, and sensory issues may present challenges. The ability to smell and taste food may be diminished. Adaptive equipment may be needed. Vitamin and mineral deficiencies sometimes occur. Vitamin supplements may be useful.

Multiple medications may create digestive disturbances. Elders may have multiple co-morbidities that benefit from nutritional support. Depression and fatigue may reduce the desire to eat or prepare food. Elders may need assistance preparing meals and eating.

Nurses must implement strategies and offer nutritional tips that promote optimal health, no matter how old a patient is.

Nutritional tips that promote longevity

- Add one teaspoon of cinnamon to whole-grain breakfast cereal to regulate blood sugar levels and promote bowel health.
- Include ample amounts of fruits, vegetables, and herbs in the diet. They are rich sources of antioxidants, which are among the most important deterrents to aging. Plant-based foods should comprise most of the diet. Whole grain, complex carbohydrates offer benefits for the entire body.
- Yellow and orange vegetables contain beta-carotene, a precursor of vitamin A. Vitamin A helps prevent night blindness.
- Dark green leafy vegetables, such as collard greens, are rich sources of lutein, which helps to reduce the incidence of age-related macular degeneration, a major cause of blindness. Researchers at Harvard Medical School found that people who consumed collard greens a minimum of twice weekly experienced macular degeneration at a rate of 50 percent less than those who only consumed them occasionally.
- Consume small amounts of heart-healthy fats.
- Keep bones strong by obtaining calcium from dark green leafy vegetables. Calcium supplements should be in a bio-chelated form with manganese, magnesium, zinc and vitamin D. Calcium citrate is a bio-available form of calcium.
- Eat blueberries.
  - Blueberries and other fruits and vegetables with dark skins aid the health of the eyes.
  - Blueberries contain plant pigments called anthocyanidins, which aid visual and cardiovascular health. They strengthen veins and can help prevent varicocities, including hemorrhoids, from occurring.
  - Blueberries are packed with vitamins and antioxidants. A rich source of fiber, blueberries may prevent constipation.
  - They help maintain the circulation of the tiny capillaries in the eyes, including the retina.
- Drink black/green Camellia sinensis tea.
  - Black and green teas differ in their biochemical makeup, but both offer health benefits for the entire body. Tea helps to prevent osteoporosis. Studies indicate that black and green teas reduce LDL cholesterol and blood pressure levels. Tea has diverse benefits for the cardiovascular system and may prevent myocardial infarctions from occurring. Multiple studies demonstrate that tea helps prevent cancer; green tea is especially protective against cancer formation. Tea is a mild diuretic, and tannins in tea help to relieve diarrhea.
  - Tea contains approximately one-half of the caffeine content of a similar amount of coffee.
  - Research suggests that green tea may improve tolerance of hormonal agents administered to prevent recurrence of breast cancer.
  - However, excessive tea consumption may interact with blood thinners and asthma medications.

Summary

Nutritional education and interventions need to be individualized to patients’ needs. Interventions must be sensitive to the patient’s physical abilities and social resources. Pay special attention to cultural traditions when discussing food with patients because eating is not just the ingestion of nutrients but a powerful social activity as well.

Much misinformation exists about nutrition. Nurses can creatively empower patients by increasing their knowledge base. Good food can be simple, inexpensive food. Healthy eating does not have to be hard.

Encourage patients to invest in the best-quality foods they can find. It will pay them benefits for the rest of their lives. If they have children, it is even more important that they make healthy choices.

School lunches are becoming healthier. Some hospitals now are even implementing programs that include organic, local foods, fresh vegetables, and healthy, tasty choices for patients.

Nurses are among the health care professionals who spend the most “face time” with patients. And patients repeatedly say that nurses are the health care professionals they trust the most. Let patients know they can trust nurses to be the force behind building healthier current and future generations.
NUTRITIONAL UPDATES FOR NURSES

Final Examination Questions

Choose True or False for questions 26 through 35 and mark them on the answer sheet found on page 133 or complete your test online at Nursing-EliteCME.com.

26. More than two-thirds of the deaths in the United States are due to illnesses that are influenced directly by dietary choices.
   - True
   - False

27. Together, fruits and vegetables comprise one-third of the MyPlate icon.
   - True
   - False

28. Examples of whole foods include canned peaches, white flour, walnuts, and eggs.
   - True
   - False

29. Quinoa, soy, and deep water cold fish are all sources of protein.
   - True
   - False

30. Phytochemicals help to protect the body from cancer.
   - True
   - False

31. The World Health Organization does not make any recommendations on the intake of caffeine for pregnant women.
   - True
   - False

32. One of the most common serious allergies in children is an allergy to milk proteins.
   - True
   - False

33. Researchers have found that long-term adherence to a vegetarian diet reduced the risk of developing diabetes by almost 75 percent.
   - True
   - False

34. Consuming meat frequently is a risk factor for development of prostate cancer.
   - True
   - False

35. Dark green leafy vegetables such as collard greens may help to prevent age related macular degeneration.
   - True
   - False
Chapter 6: Panic Disorder:
A Comprehensive Nursing Update

3 Contact Hours

Release Date: 04/30/2013
Expiration Date: 04/29/2015

Audience
This course was designed and developed for nurses, advanced practice nurses, nurse practitioners, and other licensed professionals who provide patient care in multiple settings along the healthcare continuum.

Purpose statement
Panic disorder is an anxiety disorder that will affect approximately 20 percent of the United States population over the course of their lives; prevalence clarifies the need for nurses in every care setting to understand the management of panic disorders. The purpose of the course is to provide nurses with current evidence-based information regarding prevalence, clinical presentation, diagnosis, prognosis and various treatment modalities.

Learning objectives
Upon completion of this course the learner should be able to:

● Describe clinical presentation, etiology, differentiation for diagnosis, and potential complications.

● Identify and describe the multiple treatment modalities and complementary therapies.

● Understand supportive care during a panic attack and collateral impact on families.

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Author disclosure
Patricia Bratianu has disclosed no pertinent financial relationships or other conflicts of interest relevant to the content of this course.

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The Curriculum Planner has disclosed no pertinent financial relationships or other conflicts of interest relevant to the content of this course.

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Panic disorder: what is it?

According to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR) panic disorder is defined as occurrence of panic attacks associated with more than one month of subsequent persistent worry about having another attack, consequences of the attack, or significant behavioral changes related to the attack.

Panic disorder may be with or without agoraphobia. Agoraphobia, which literally means fear of open spaces, is fear and avoidance of places and situations where escape or help in the event of panic is not readily available.

So what is a panic attack? The DSM-IV-TR states that a panic attack has four of the following potential symptom manifestations:

- Palpitations, pounding heart, or increased pulse.
- Sweating.
- Trembling or shaking.
- Sense of smothering or shortness of breath.
- Chest pain or discomfort.
- Feeling of choking.
- Nausea, abdominal distress.
- Feeling dizzy, lightheaded, unsteady, faint.
- Derealization or depersonalization.

In panic disorder, the panic is spontaneous and unexpected. Panic attacks can occur with other anxiety disorders, but for the diagnosis of panic disorder to be made, the panic must occur without a specific, predictable precipitant. For example, a person who has a fear of heights goes in a tall building and has a panic attack while looking out the window. That is not panic disorder.

For a diagnosis of panic disorder to be made, let's look at another example: A person is washing dishes. She has a panic attack. That attack occurred without a clearly precipitating event. The attack is spontaneous and unexpected as in the case of panic disorder.

When people are having a panic attack, they feel like they “have to get out of here” and may feel like they are suffocating or dying. Additional symptoms may include diarrhea, headache, cold extremities, fatigue, insomnia or persistent thoughts that “won’t go away.” Panic attacks may occur sporadically or many times daily. Most peak within 10 minutes and resolve within 30 minutes.

Panic disorder with agoraphobia

Having a panic attack is terrifying. The memory of it is etched deeply by a process that is primitive and without rational thought. Avoidance behaviors may begin after just one panic attack. Early treatment is critical because with each panic, the likelihood of avoidance increases. Intensity may increase as well because the victim fears reoccurrence more and more.

Signs of agoraphobia include:

- Traveling shorter and shorter distances; this can increase to where people may only feel safe in a small portion of one room of their home.
- Needing a “safe” person with them.
- Inability to be employed.
- No longer driving.
- Avoiding situations where “escape” is difficult, such as shopping malls, social events, narrow hallways, and public transportation.
- Avoiding exercise because of fear that shortness of breath or increased heart rate will trigger a panic attack.
- Avoiding foods that might trigger symptoms, such as coffee.

Statistics

Sixty million Americans, approximately 20 percent of the population of the United States, will suffer a panic attack at some time during their lives. Of those, 1.7-5 percent of American adults have panic disorder. The National Comorbidity Survey Replication (NCS-R) records that the lifetime prevalence rate of panic disorder is 4.7 percent.

According to the National Institute of Mental Health, panic disorder affects about 6 million Americans. Australian and British rates are slightly lower. Approximately 0.7 percent of children are believed to suffer from panic disorder or generalized anxiety disorder. Numbers, especially for children, may be higher because panic disorder is under diagnosed and undertreated in children.

Peak onset of panic is generally considered to be ages 15-19. While it can develop at any age, panic disorder usually develops before age 40. Panic disorder is diagnosed twice as often in women as in men, and is more common in women who have never been pregnant. Panic attacks
may be less frequent during pregnancy but more common in the postpartum period.

There is not a clear mechanism that provokes development of panic disorder. There is an increased occurrence if another family member has panic disorder, yet most people who suffer from it do not have another relative with it. Some studies indicate that if an identical twin has panic disorder, the other twin is likely to have it as well. Panic attacks often begin during periods of transition or high stress.

**Physiology/etiology**

While environment has a role in the occurrence of stress and stress management, most theorists focus on a physiological origin of panic disorder. Many researchers conclude that both physiology and stress are a factor to varying degrees.

When there is a threat to a mammal, humans included, a minimum of two neurological pathways are activated within the brain. The frontal lobe of the cerebral cortex becomes activated to facilitate decision-making. Prior to that, the more primitive, unconscious brain activates the fight-or-flight response. Much of that response involves the amygdala, responsible for regulating blood pressure, increasing heart rate, and alertness.

The amygdala is a critical part of the emotional, limbic system. It consists of two small portions of tissue deep within each side of the brain. The amygdala rapidly freezes memories using a different mechanism than that which is used by the frontal cortex when learning and creating memories result from a non-threatened state. The amygdala stimulates impulses that send the person into a fight-or-flight response before conscious, rational thinking occurs. Several studies refer to processes within the amygdala, hypothalamus, and brainstem centers.

Studies indicate that panic disorder is related to various biochemical imbalances. Chemicals involved include GABA, serotonin, cortisol, dopamine, noradrenaline, cholecystokinin, and interleukin. Others indicate carbon dioxide receptor hypersensitivity and lactate-producing symptoms. The HPPA (hypothalamic-pituitary-adrenal axis) has been implicated. Catecholemines may be involved.

**Differential diagnosis**

Panic is a medical disorder. While no specific lab or imaging tests confirm the diagnosis of panic disorder, a medical exam is indicated to rule out other health conditions. Often people who are experiencing a panic attack present in an emergency department thinking they are having a heart attack. Most patients first seek help for panic disorder from their primary caregiver.

Whether the person appears first in an emergency department, psychiatrist’s office or general practitioner’s office, an EKG, blood chemistry panel, thyroid level, and a CBC should be obtained.

Panic symptoms may mimic mitral valve prolapse, hyperthyroidism, hyperparathyroidism, or hypoglycemia. Pheochromocytoma, cardiac arrhythmias, temporal lobe epilepsy, and audiovestibular system dysfunctions may resemble panic.

A medication review is needed. Legal and illegal substances may produce panic-like symptoms. The use of stimulants, including caffeine and hallucinogens, may provoke or mimic panic. Withdrawal from medications may precipitate panic as well. People who are discontinuing SSRI (selective serotonin reuptake inhibitors) may present with the SSRI discontinuation syndrome, which has symptoms similar to panic.

Panic disorder is one of six major types of anxiety disorders. Anxiety disorders are among the most common disorders of our time. The six major types of anxiety disorders are:

- Generalized anxiety disorder.
- Obsessive-compulsive disorder.
- Phobias.
- Post-traumatic stress disorder (PTSD).

Hyperventilation is involved in panic attacks. Some theorists believe people with panic disorders may chronically hyperventilate, precipitating panic attacks. Many studies allude to hypersensitivity within the nervous system.

Children 2 to 3 years old who tend to be very shy and withdrawn in new social environments appear to be more at risk of developing anxiety disorders. However, the vast majority do not develop any disorders. Studies do not specify what anxiety disorders the children are at risk of developing, but panic disorder does seem to be a possible outcome.

The amygdala of older children with anxiety disorders reacts similarly to children at risk for developing anxiety and depression. This response is different from children who do not have an anxiety disorder.

There is no clear-cut genetic pattern identified yet in the development of panic disorder.

Panic may be exacerbated during changes of hormonal balance, such as onset of menses or menopause.

Some theorists believe that people with panic attacks are more cognizant of internal clues to “danger,” such as increased awareness of muscles tightening or increased heart rate. They may unknowingly overreact to normal variances within the body, producing thoughts of danger where none exists.

Positron emission tomography (PET) scanning indicates increased flow around the right hippocampal area and decreased serotonin binding. MRI (magnetic resonance imaging) shows normal volume of the hippocampus, with reduced temporal lobe volume in patients with panic disorder.

- Social anxiety disorder.
- Panic disorder.
- Post-traumatic stress disorder (PTSD).

While each of the anxiety disorders has specific symptoms, they often overlap. People with panic often suffer from one or more of the other anxiety disorders as well.

As noted above, panic disorder may occur with or without agoraphobia. Approximately one-third of people with panic disorder become agoraphobic, unable to leave their homes or to do normal activities of daily living, such as grocery shopping, without being accompanied by a trusted, “safe” person.

A diagnosis of panic disorder may be made by obtaining a detailed history and physical exam. Screening tools may be useful to provide more detailed information and to rule out other anxiety disorders.

Psychological screening assessment tools that may be useful in the diagnosis and subsequent evaluation of treatment include:

- Composite International Diagnostic Interview.
- Anxiety Sensitivity Index – ASI.
- Fear Questionnaire.
- The Mobility Inventory for Agoraphobia – MI.
- Agoraphobic Cognitions Questionnaire – ACQ.
- Body Sensations Questionnaire – BSQ.
- Sheehan Disability Scale – SDS.
- Panic Disorder Severity Scale – PDSS.
- Hospital Anxiety and Depression Scale – HADS.
- Becks Anxiety Inventory – BAL.
- Hamilton Anxiety Rating Scale –HAM-A.
Co-morbidities

Panic disorder affects one in 10 patients in primary care settings. Patients with panic disorder often suffer from one or more of the other anxiety disorders. Some researchers consider the boundaries defining panic and other forms of anxiety to be gray areas. The presence of co-morbidities significantly impacts the effects of treatment and degree of recovery from panic disorder.

People with depression or personality disorders who present with panic have poorer outcomes than people without those co-morbidities. Studies indicate that patients who have generalized anxiety disorder, social phobia, or PTSD in combination with panic disorder do not recover as well as those without those concurrent diagnoses.

Prevalence of major depression accompanied by panic disorder may be as high as 50 to 60 percent. This is not surprising because of the effects each disease has upon individuals. In addition, many of the same chemicals within the brain are associated with depression and panic disorder.

Panic disorder is found among 7 to 28 percent of drug and alcohol abusers. Most indicators show that people with panic disorder self-medicate to control their anxiety. The flip side is that the substances can trigger panic attacks. Eight to 15 percent of individuals in alcohol treatment programs have panic disorder.

In addition to being frequently diagnosed in the presence of emotional disorders, panic disorder is concurrent with diagnoses of several body systems. Upon examination, it appears that the anxiety may exacerbate the other conditions and vice versa.

Patients diagnosed with COPD, migraine headaches, fatigue, and irritable bowel syndrome demonstrate increased occurrences of panic disorder.

Cardiovascular disorders may occur in the presence of panic disorder. People with panic disorder have almost twice as frequent diagnoses of coronary artery disease compared to those without panic disorder. The risk of sudden death related to a cardiac event is higher in people previously diagnosed with panic disorder.

Pregnant women are more likely to have early labor or low birth-weight infants if panic disorder is present.

People with panic disorder have an elevated rate of suicide.

Prognosis

Panic disorder is not considered curable, yet it is often a highly treatable condition, with 65 percent of patients obtaining remission within six months or less. The use of medication and Cognitive-behavioral therapies are beneficial in 85 percent of patients. They may be used individually or in conjunction with each other. However, the outlook is less promising if co-morbidities are present. People who develop panic later in life tend to do better than those who develop it while very young.

Studies relating to race are inconsistent. Some studies indicate that Caucasians have better remission rates than nonwhites; others do not support that. Some researchers find that people with a higher socioeconomic status have better outcomes. These studies are sometimes linked to the improved outcomes for Caucasians. Socioeconomic studies are also linked to whether the person is employed and to what degree as well. In addition:

- Panic disorder with the presence of agoraphobia has a poorer prognosis than panic disorder without agoraphobia.

- Early treatment is key to improved outcomes in many cases.
- People living with elevated stress do not fare as well as those who do not have added stress.

One of the most reliable predictors of treatment response is the overall severity of the panic disorder. This is measured by frequency and intensity of panic attacks as well as the presence or absence of agoraphobia and avoidance behaviors. The degree of avoidance behaviors is considered by some to be the key indicator of success or failure of treatment.

In studies addressing anxiety disorders as a whole and not specifically panic disorder, smokers, separated or divorced individuals, people living alone, and those with social problems were at higher risk of developing anxiety, with poorer outcomes resulting. Survivors of abuse and single parents were also at risk. Of note, 35 percent of elderly depressed patients had at least one anxiety disorder.

Treatment options

Treatment of panic disorder frequently consists of two primary modalities: medication and cognitive-behavioral therapies. Exposure therapies, breath work, nutrition, herbs, and additional complementary modalities are useful as well. People with panic disorder frequently employ several treatment modalities.

Because panic is a multifaceted disorder, improving quality of life and stress reduction techniques are important to include in an effective treatment plan for panic disorder. Family therapy may be beneficial as well to reduce stress and to provide education and support for family members.

Pharmaceuticals

Medications are very helpful in managing panic disorder. They can help to prevent panic attacks, relieve common comorbidities such as depression, and reduce the intensity of panic attacks. There are three main types of medications commonly used: antidepressants, benzodiazepines, and beta blockers.

Sometimes medications are prescribed for short-term use until other types of therapies are deemed effective. Success rates improve when medications are used in combination with cognitive-behavioral therapies. Medications and therapy do not cure panic disorder but have major impacts on a patient’s quality of life.

Some people recommend trying cognitive-behavioral therapies before prescribing medication. The degree that the patient’s life is being affected by panic disorder must be considered. The advantage of using medications early in treatment is that it prevents the occurrence of panic attacks and reduces the severity of those that occur. With approximately one-third of people developing agoraphobia in the presence of panic disorder, early treatment with medication may outweigh the risks of the medications.

When treating with pharmaceuticals is considered, it must be kept in mind that people with panic have an increased frequency of
self-medicating with alcohol and other legal and illegal substances. Potentially dangerous or life-threatening interactions may occur.

Several different medications may need to be utilized before the right medication or combination of medications is effective. Each patient is different.

Doses sometimes need to be adjusted periodically during periods of reduced or increased stress. Sometimes adjustments are needed when patients are “stretching their wings” and attempting to reduce avoidance behaviors.

Patients sometimes try to reduce or stop taking medications without notifying health care professionals. There is still a stigma in society about needing psychotropic medications. Keep this in mind if you have a client who is not doing as well as previously. He or she may be trying to taper medications without your knowledge.

**Antidepressants**

Antidepressants can be very useful in the treatment of panic disorder. However, they have been associated with a higher risk of suicide.

Selective serotonin reuptake inhibitors (SSRIs) are the most frequently prescribed medications. Examples include fluoxetine (Prozac), sertraline (Zoloft), paroxetine (Paxil), citalopram (Celexa) and Lexapro (citalopram). SSRIs relieve anxiety and the depression that is often present in the face of panic disorder. These medications take about two to six weeks to reach their maximum effectiveness. They work by regulating serotonin levels. SSRIs must be taken consistently. They are not effective for treating acute panic attacks.

Common side effects include gastrointestinal distress, sexual dysfunction, weight gain, and changes in sleep patterns. Other side effects are nervousness and drowsiness. If discontinued, SSRIs need to be tapered off gradually. If reduced too quickly, marked depression, irritability, and increased anxiety may occur.

Older tricyclic antidepressants are still employed to treat panic disorder. Imipramine, (Tofranil), clomipramine (Anafranil), desipramine (Norpramin), nortriptyline (Pamelor), and amitriptyline (Elavil) have all been used to treat panic disorder. The medications are useful, but they can be sedating and may cause dry mouth, dizziness, and weight gain.

Tricyclic antidepressants take three to six weeks to become effective. They are not physically addictive and they are inexpensive. Particularly while titration initially occurs, patients may report feeling dull and have difficulty with concentration and memory. A benefit of the tricyclics is that they can help to relieve insomnia and panic attacks that occur during sleep.

Monoamine oxidase inhibitors (MAOIs) are less frequently used except when there are co-morbidities that indicate their use is needed or if other treatments for panic disorder have failed. Phenelzine (Nardil) is the most widely used MAO inhibitor used to relieve panic disorder.

MAOIs have several serious side effects. A low tyramine diet must be followed. MAOIs may interact with SSRIs, causing serotonin syndrome, a dangerous condition that can be life-threatening. Symptoms include confusion, hallucinations, muscle stiffness, seizures, blood pressure changes and arrhythmias. Development of serotonin syndrome is a medical emergency, and immediate help must be sought.

**Benzodiazepines and anti-anxiety medications**

Benzodiazepines are tranquilizers. They provide rapid reduction of anxiety and are useful when a panic attack occurs or during periods of high stress. Taken orally, they act within 30 minutes or less and are sometimes administered intravenously if patients are hospitalized. Common benzodiazepines used include alprazolam (Xanax), lorazepam (Ativan), diazepam (Valium), and clonazepam (Klonopin).

These medications may be habit-forming and are sedating. Tolerance may develop, requiring larger doses to be effective. Panic can be worse when these medications are discontinued. These drugs have the potential for abuse and can be hazardous when alcohol is consumed. Care must be taken when driving or operating machinery until the effect on the individual is known.

Patients may feel dull, lethargic, or have difficulty concentrating with these medications, especially during initial treatment. Some patients report feeling “hung over” the next day after using benzodiazepines. Side effects increase with higher doses, but some people report that when they are having very intense panic attacks, they can tolerate higher doses – yet the same doses when they are less panicked give them side effects.

Lack of coordination, clumsiness, slow reflexes, depression, dizziness, and light-headedness can result from benzodiazepine administration. Thinking and judgment may be impaired, and memory may be impacted. Visual changes have been reported. Benzodiazepines can decrease panic, but also numb other emotions. They may cause or increase depression. Some people, usually the very young or elderly, experience a paradoxical effect when benzodiazepines are administered; hypermania, rage, hallucination, and aggression may occur.

Buspirone, trade name Buspar, is an azpirone that can be helpful in the treatment of panic disorder. Side effects may include dizziness, headaches and nausea. Buspirone requires administration for about two weeks to reach its peak therapeutic effect. It is calming, but not fast-acting like the benzodiazepines for acute panic situations.

**Beta blockers**

Propranolol, trade name Inderal, is believed to block the effect of epinephrine and stress hormones. Studies reveal threat receptor sites in the brain are blocked when Inderal is administered. It appears to decrease the extent that a terrifying experience, such as a panic attack, is etched into the brain’s memory.

Propranolol also modulates the pulse rate, so the victim does not experience and associate a racing heart rate with panic, which heightens anxiety. Beta blockers may be administered before a patient enters a high-stress situation to reduce the physical symptoms of anxiety. This can be useful when people are attempting to “push their limits” or if they are in new situations. The beta blockers reduce the sense of panic without the sedation and cognitive impairment that may accompany benzodiazepines.

The use of beta blockers for the relief of panic disorder is controversial among some therapists. They believe beta blockers are not effective for panic disorder and that panic that responds to treatment with beta blockers is actually mitral valve prolapse misdiagnosed as panic disorder.
Cognitive-behavioral therapy (CBT)

Cognitive-behavioral therapy is an effective treatment of panic disorder with or without agoraphobia. It may be used in conjunction with medication or independently. Cognitive-behavioral therapy empowers the patient with techniques to manage stress, decrease anxiety and correct thinking patterns that potentiate panic. It is the most widely used psychological therapy for treatment of panic disorder.

Cognitive-behavioral therapies focus on thinking and making conscious changes in thoughts that are not helpful as well as making behavioral changes. These therapies focus on the here-and-now; they do not attempt to resolve underlying psychological conflict or trauma. Often programs are short-term, ranging from one to three months. There are self-help and distance support programs available via the Internet. Group and individual sessions are available.

CBT programs require a high degree of patient motivation and commitment, and the work can be rewarding and exhausting simultaneously. But benefits can reach beyond reducing the panic disorder; therapy can change a patient’s way of relating to him- or herself and others. It may prompt significant lifestyle changes.

CBT addresses thought and belief patterns that cause anxiety and disempower the patient, who learns ways to challenge negative thoughts and replace them with constructive ones.

People who suffer from panic may engage in catastrophic thinking, which means believing that the worst possible outcome for an event may happen, even if the likelihood is minute. Participants in CBT programs learn to recognize and refute catastrophic thoughts. They then learn to replace them with more realistic thoughts.

CBT programs use a systematic approach. The participants receive homework to practice skills. Workbooks are often used. Initially, it is very hard work that feels unnatural. In time, confidence grows. Automatic negative thinking is replaced with more realistic, manageable thoughts that reduce baseline anxiety levels.

Cognitive-behavioral therapies can be helpful for people newly diagnosed with panic as well as for people who have had panic disorder for decades. It works with mild panic and even with patients who suffer from agoraphobia.

The tools are helpful for agoraphobics when trying to decrease avoidance behaviors. They learn to break down barriers into smaller components, which increase the likelihood of success.

Panic disorders may be persistent or they may vanish for years then suddenly reappear. People who have successfully learned CBT strategies in the past may reach back to use the techniques if panic reappears or if new situations are causing anxiety.

Cognitive-behavioral therapies help patients to reduce anxiety by teaching healthier thinking patterns. Participants learn behavioral strategies to change their responses to stressful situations, including panic attacks. They learn that a panic attack can be interrupted at any stage of panic, but that it is most effective to recognize early stages of panic and stop the panic before it becomes intense.

Here are ways development of healthier thinking patterns may be facilitated:

- Participants in a cognitive-behavioral therapy session are provided education that explains panic attacks are not fatal, nor does having a panic attack indicate insanity.
- People in the midst of a panic attack often think that they are dying of a heart attack or “going crazy.” With education about the nature of panic attacks, anxiety that would normally exacerbate fear and heighten the terror of the panic attack is reduced. Baseline anxiety is lessened.
- The participant learns to self-assure him- or herself, and realizes “I know what this is. It is a panic attack. I feel horrible, but I know what it happening. Panic attacks are self-limiting. I am not losing my mind. I am not having a heart attack. I am not going to die from this. It will pass.”

Basic instructions like these offer enormous relief for patients. Knowing that they are essentially OK and not going insane or facing death reduces panic levels monumentally.

Cognitive-behavioral therapy may also be beneficial because having a panic attack feels like being completely out of control. This terrifying thought compounds the panicly feelings. Reframing, recognizing self-defeating thoughts, and feeling “more in control,” can reduce panic. Perceiving a higher level of control instead of feeling at the mercy of panic attacks that arise uninvited from anywhere at anyplace or time helps patients feel empowered and less anxious.

The less underlying anxiety present, the less frequent and less intense panic attacks may become. As frequency and intensity are reduced, patients can think clearer, sleep better, and be more realistic. They become optimistic about gaining some power over preventing panic attacks.

Skills practiced during cognitive-behavioral therapy sessions include recognizing overestimation of the power that panic possesses as well as ways to manage anxiety and panic. Resources are discussed. Realizing that others will provide assistance if panic attacks occur reduces feelings of isolation that dominate during panic attacks.

While these strategies may seem obvious to a person who does not suffer from panic disorder, to a person with it, these acts sometimes seem about as likely for them to achieve as is flying to the moon.

A study done in Australia measured the effectiveness of an Internet-based cognitive-behavioral therapy program led by a therapist. It had promising results. While the Internet is not a substitute for direct face-to-face contact, this offers an affordable, accessible option for people who are far from services, too embarrassed to obtain services, or agoraphobic. For some, it may be sufficient help; for others, it may be a much-needed lifeline when other options are not available.

Some cognitive-behavioral therapy programs include instruction about progressive muscle relaxation techniques. To do progressive muscle relaxation, clients sit or lie in a comfortable position with their eyes closed. Starting at the toes, the person contracts then release the muscles in the toes, then feet, followed by the ankles and so forth until his or her entire body is relaxed. The exercise provides immediate relaxation and body awareness skills.

Numbness and not being able to feel grounded is terrifying during panic. Being able to feel, concentrating on an activity that can be
performed anywhere, and having to think about something other than the panicked feelings can be useful during a panic attack. Participants are encouraged to use this strategy on a regular basis as a healthy exercise as well.

Many of the frightening symptoms of panic are caused by hyperventilation. Often, people with panic disorder hyperventilate under stress so frequently that they are not even aware of it until it becomes extreme. Learning breath awareness and practicing breathing techniques for 10 minutes twice daily can be beneficial. It is relaxing and helps people realize they can control their breathing.

During a panic attack, people commonly say that they feel like they are suffocating and can’t breathe. By practicing breathing techniques, the likelihood of hyperventilation precipitating a panic is reduced. If a panic does occur, the person has another tool to calm him- or herself. Of all the behavioral skills, breath awareness is probably the most powerful.

Another component of cognitive-behavioral therapy is education about the disorder. As participants learn the physiology, it may help to reduce feelings of shame that are common. People with panic disorder often feel embarrassed by their limitations and “odd” behaviors. To know that panic is a physical disorder and not a weakness goes a long way in stress reduction. By learning about the condition, participants feel more in control. This is critical with people who suffer from panic disorder because they feel extremely vulnerable and out of control when panic attacks occur. In addition, the more information that sufferers have, the more choices they can make to minimize panic.

Participants in cognitive-behavioral therapy programs learn to identify what makes them feel anxious. Learning to avoid caffeine and nicotine, being aware that panic may increase at certain times of a menstrual cycle, or finding that exercise may help prevent panic are just some of the topics that may be addressed. Participants learn to make lifestyle choices that reduce stress and panic and frequency of panic attacks.

A great deal of time in cognitive-behavioral therapy is spent examining thought patterns. Automatic thoughts can trigger and intensify panic attacks. Participants learn to recognize their negative thoughts and refute them. They learn to distinguish between thoughts and feelings.

There are several common, automatic thought patterns that panic sufferers have that increase their distress. These include:

- Viewing situations as black and white; perfectionism; feeling “I am weak.”
- Catastrophic thinking: “If I have a panic attack, I might die from a heart attack.”
- Exaggerating risk: “If I have a panic attack, no one will want to go out with me ever again.”
- Giving up: “I will have a panic attack and get fired, so I am not even going to apply for a job.”
- Thinking that they are weak: “There is something wrong with me, I am too sensitive; it’s just the way I am, and that won’t change.”
- Thinking too many “shoulds”: “I should be able to drive on the interstate, everyone else does.”
- Confusing body feelings with facts that imply danger: “When I run, my heart beats fast” or “That will give me a panic attack.”

Recognizing, examining, refuting, and replacing unhelpful thinking patterns is very hard work. People who have panic disorder may have thousands of these kinds of thoughts each day. Fortunately, most people have a few patterns that tend to repeat themselves over and over, so a process does not have to be developed for every one. Participants are instructed to write down their thought patterns and substitute new, realistic ones instead.

Here is an example of how to challenge an automatic negative thought pattern:

Jane suffers from panic disorder. Her biggest fear is that she will not be able to breathe during a panic. She believes that she will die a horrible, suffocating death and no one will care for her children. The children will end up in foster care and lead terrible lives because she is unable to “get a grip.”

In this example, it is clear that Jane is not being kind to herself and sees herself as defective. She is using catastrophic thinking, assuming she will be dead and her children’s lives will be ruined. She is exaggerating the risk associated with panic. People do not die from panic attacks. People do not stop breathing with panic, even if it feels that they are not getting air. She is associating the feeling of suffocation with death, when in reality, it is the panic that makes her feel unable to breathe. She is actually hyperventilating and causing the feeling.

So how can Jane help herself?

She needs to learn the physiology of panic so she can separate feelings from thoughts. Jane would initially be asked to write down the following procedure, shown below in bold type. Several workbooks are available to guide clients through this process, but a simple notebook may be used as well.

First, Jane needs to (1) identify the feelings that make her feel like she is going to die. She believes that when she feels short of breath, it means she is dying. Thus, in this case, the feelings of shortness of breath are the trigger for the panic.

Jane then must (2) identify the automatic thought she gets in this situation: “I am suffocating to death.”

She then must learn to (3) challenge that thought. She should ask herself what the likelihood of her dying during a panic attack realistically is. Because she has received information about the physiology of panic, even though Jane feels like it’s 100 percent likely when in the throes of panic, her rational thought might tell her that it is a 40 percent probability (which is still an exaggeration, but also is markedly less than 100 percent.) She then must (4) write down the change in her feelings, in this case the percentage she now estimates is her likelihood of dying from suffocation during a panic attack.

Then Jane needs to (5) write down her revised rationale for believing the new estimate that there is a 40 percent chance of dying.

She might write something like this: “It gets so hard to breathe when I am having a panic attack. I try really hard to take a deep breath, but I just can’t. My throat feels so tight. It will just block off my airway completely one day.” Then she needs to write down why that is not what is really happening and (6) state what actually is occurring: “I know that I am breathing. Throats do not just close up during panic. I feel short of breath because I am hyperventilating.”

Jane then should be asked to (7) consider other ways of thinking about the feeling of suffocating and (8) rate the probability that the new thoughts are true:

“People do not just suffocate to death. Most people who have trouble breathing suffer from emphysema or have bad hearts or something like that. I had a physical. I have a healthy heart and lungs. The likelihood of this being a fact is 75 percent,” Jane might write.

She also should consider another explanation for her symptom:

“My throat feels terrible because my neck muscles are tense because of the anxiety. The likelihood of this being true is 50 percent.”

Finally, Jane should (9) write down what she now thinks is the likelihood of that original automatic thought, that she is going to suffocate to death during a panic. When she faces facts, Jan
Some therapies have been researched extensively, while other are ideas that alternative therapies, instruct patients to notify their health care provider. Therapies as adjuncts to conventional health care. Prior to adding any complementary therapies facing him or her, and they discuss what memory will be addressed. To conduct this therapy, the therapist sits closely in front of the patient, and easy for most people to learn. It is currently being used in the treatment of post-traumatic stress disorder as well as panic disorder. EMDR practitioners believe that traumatic memories are etched into the brain differently than other memories. They find that tracking back and forth with the eyes while reliving a traumatic memory removes the emotion associated with the memory. It is highly effective, quick to do, and easy for most people to learn. It is currently being used in the treatment of post-traumatic stress disorder as well as panic disorder.

Here is an example:

Henry does not drive because he is afraid that he will crash the car during a panic and die. He has learned the facts about his fear and how to challenge his automatic thoughts and look realistically at his symptoms of panic. He wants to drive to his daughter’s house, which is about three miles away.

During therapy, Henry and the therapist will determine the steps required to meet Henry’s goal of driving to his daughter’s house.

EMDR – Eye movement desensitization and reprocessing

EMDR can help to release deep-rooted fears that resulted from trauma or from earlier panic attacks. It can be provided by a therapist who teaches patients to do the technique themselves. EMDR practitioners believe that traumatic memories are etched into the brain differently than other memories. They find that tracking back and forth with the eyes while reliving a traumatic memory removes the emotion associated with the memory. It is highly effective, quick to do, and easy for most people to learn. It is currently being used in the treatment of post-traumatic stress disorder as well as panic disorder.

To conduct this therapy, the therapist sits closely in front of the patient, facing him or her, and they discuss what memory will be addressed. The therapist encourages the patient to recall the event as if she or he is watching it on a movie screen or as if watching a train passing by.

As the patient recalls the event, the therapist asks for clear details of what the person experienced. While the patient is recounting the event, the therapist asks the patient to follow her or his finger as he or she waves it horizontally in front of the patient’s face. The patient is told to keep his or her eyes focused on the moving finger and to move only the eyes, not the head.

Emotions may be intense, but the therapist reminds the patient that it is just a memory, like a movie on a screen or a passing train. EMDR can be highly effective treatment despite its somewhat strange approach. Patients can learn to do the technique at home simply by looking at an object, for example, the molding between the ceiling and walls of a room. The person then should follow the line of the molding back and forth with his or her eyes while recalling the trauma.

Complementary therapies

Many people who suffer from panic and other disorders turn to alternative therapies as adjuncts to conventional health care. Prior to adding any alternative therapies, instruct patients to notify their health care provider. Some therapies have been researched extensively, while other are ideas that people who suffer from panic disorder have reported using. Use caution as herbal preparations and other complementary therapies, such as herbs or homeopathic preparations. Sometimes they may interact with conventional treatments or cause undesirable side effects. Occasionally, medication doses may need to be adjusted. Herbs may compete with SSRIs, rendering the SSRIs less effective.

- Nutrition
  Healthy nutritional choices support brain health and reduce
anxiety. Stimulants, such as products that contain caffeine, may increase panic and promote a sensation of heart palpitations. Chocolate, green and black teas, coffee, and colas all contain caffeine. Caffeine is also found in over-the-counter headache, diet, and cold remedies. The herbs guarana and yerba mate contain caffeine as well. Caffeine should be avoided.

Alcohol is a depressant. It may temporarily reduce anxiety, but in the long run, it can make it worse. Alcohol may interact with medications commonly prescribed for anxiety.

Carbohydrates should be consumed as fresh fruits and vegetables and whole grains. Simple sugars may cause spikes in blood sugar levels, which can make a person feel “wired” or jittery. Fruits and vegetables are rich in vitamin C, which is depleted during stress, and whole grains provide B complex vitamins that are needed for nerve function. They can help to reduce stress. Oats produce calming substances and contain calcium and B vitamins that nourish and calm the nervous system. Figs and avocados contain nerve-soothing components as well.

Foods rich in calcium, magnesium, and potassium should be eaten because these nutrients may be depleted with anxiety. Cold, deep-water fish, green leafy vegetables, nuts and legumes are good sources. These also provide essential fatty acids that are critical for neurotransmitters and general wellness. They can be calming for some individuals.

Keeping a diet diary may be beneficial for some patients with panic disorder to help them learn to identify foods that make them “feel good” and those that increase feelings of anxiety.

- **Herbal medicine**
  Herbal medicine can help relieve panic disorder via a multitude of mechanisms. There are herbs that reduce panic as well as relieve symptoms that people with panic frequently suffer from.

Herbs may be used in several ways. Some herbs need to be used consistently for maximum effectiveness. Other herbal remedies work quickly to relieve symptoms.

- Lemon balm is often thought of as an antidepressant herb. Antidepressant herbs have relaxant effects, which is why they are beneficial for the relief of anxiety. Lemon balm has been employed for centuries for good mental health. It calms “nervous stomachs” and helps to relieve migraines that are triggered by stress.

- St. John’s Wort is an herb that has been shown to relieve mild to moderated depression. It needs to be administered consistently for several weeks to reach maximum effectiveness. It is calming. St. John’s wort should not be taken at the same time as pharmaceutical antidepressants because the herb and the drug will compete for receptor sites in the brain.

- Passionflower relieves tension and has sedative, antispasmodic effects. It can relieve tension headaches, including migraines that are triggered by stress. Passionflower contains indoles, which are components of serotonin and tryptophan.

- Kava is a well-researched herb that is useful as a substitute for benzodiazepines. It is sedating, and caution must be exercised when initially implemented. Alcohol potentiates its sedating effects.

- Chamomile is calming and can relieve stomach upsets. Sometimes it is used to relieve tension headaches.

- Evening primrose oil, black current seed oil and borage seed oil are also useful in the treatment of anxiety. They contain substances that nourish and soothe the nervous system. They are rich sources of essential fatty acids.

Herbs are generally well tolerated. People utilizing herbs experience fewer side effects than those using pharmaceuticals. The herbs are gentle but effective when used consistently.

- **Aromatherapy**
  The sense of smell is closely tied into the limbic system. Aromatherapy uses concentrated essential oils of plants for healing. Some people believe that essential oil treatment can be very useful and grounding to patients with panic disorder.

There are a multitude of oils that provide multiple benefits. Some are uplifting, others grounding. Rosemary and peppermint essential oils can aid concentration. Many tree oils, such as sandalwood and cypress, promote a feeling of grounding. Floral oils are uplifting and reduce anxiety. Rose and jasmine are very effective. Some oils, such as marjoram, aid sleep.

Lavender is oil that has been used for centuries and is the most researched essential oil. Lavender can be added to a soothing bath to promote relaxation. Add it to a massage for double benefits – relaxation from the massage and from the essential oil. People might carry a few drops of oil on a tissue when facing anxiety-provoking situations. Inhaling the odor will work because of the relaxant principles of the lavender as well as by encouraging a deep breath. Essential oils are very concentrated. They are used externally and are diluted in most cases. They need to be kept out of the reach of children because they are poisonous.

- **Flower essences**
  Flower remedies reportedly work on a vibrational level. They are harmless and very dilute, yet they work. They are similar to homeopathic remedies in that there is no measurable amount of the actual plant substance in the remedy. A few drops are taken under the tongue or diluted in a small amount of water. They do contain alcohol. Specific remedies are chosen based upon the quality of the fear and anxiety that the person has.

Several essences can be blended together to create a custom blend. There is a product that contains five remedies that has many devoted users. Remedies may be used consistently or on an as-needed basis and can be effective options during panic attacks. No known side effects are recognized.

- **Exercise**
  Fresh air and exercise have been used to relieve anxiety for a very long time. Exercise has multiple benefits, including reducing stress, and it aids with neurotransmitter function. Some people with panic are fearful of exercise, thinking it will provoke panic. Usually, these fears are tied into awareness of the increased respiratory and heart rate that occurs with vigorous exercise. If this is a concern, gentle exercises should be initiated until the person becomes more confident. Yoga and Tai Chi provide excellent workout options that focus on integration of the body, mind and spirit. This is especially beneficial for people with panic disorder.

Several studies have been done that link wellness to exposure in the natural world. Blood pressure and pulse rates as well as self-assessments of participants exposed to nature indicate a clear reduction in stress levels when people are exposed to a natural environment.

Taking a walk outside provides exercise, and gives the added benefits that nature provides. For people with panic disorder, the change in scenery helps to reduce ruminating unhealthy thoughts. Breathing deeply is more likely when walking in fresh air as well.

Some people with panic are afraid to go outside or walk. Even sitting...
in a sunny window or walking around the outside of a house may be small steps that they can take. Noticing the rhythms of the seasons or activities that happen in the natural world every day may boost moods and energize people suffering from panic disorder.

Living with panic disorder

Living with panic disorder can be challenging. If panic attacks are new, there is the fear of not knowing what is happening. If panic has persisted, it can be discouraging. Panic attacks sometimes disappear and then resurface, sometimes even years later. That is frustrating. It is not a curable illness but may become chronic.

If agoraphobia exists, stress intensifies. Some people are unable to work. Financial challenges may arise. If employed, a person with panic may require support if she or he faces increased stress in the workplace.

Family members may become frustrated with the person suffering from panic disorder. They may feel helpless. Let’s look at some strategies for living with panic disorder.

Emotional support during panic attacks

People having panic attacks feel terrified and vulnerable during the attacks. They feel totally out of control, embarrassed, and certain that something horrible is happening. They feel they cannot survive the attack.

How to support a person during a panic depends on the person’s needs. If it is a new diagnosis or undiagnosed panic, the fear is likely of death or of going insane. People who have more knowledge about panic may realize what is happening but fear that this time is different or that they just can’t keep suffering through the attacks.

Provide privacy. Ask patients what they need, and offer to stay with them. Remind them that panic is like a wave – it builds up then reaches a peak, then dissipates and goes away.

During a panic attack, people’s sense of time may be altered; three seconds may feel like five minutes. Tell patients they will get through it, and encourage them to use their “tools” – slow deep breaths, keeping eyes open, taking a walk outside – whatever works best. Be kind. Treat them with dignity. Talk them through it. After the panic attack, people may feel tired or still feel jittery. Let patients be your guide.

The patient’s perspective

Patients suffering from panic disorder often feel isolated. They may not want others to know about the panic disorder. If agoraphobic, they may feel like a burden to their families. They just want to be able to do what everyone else does without it having to be so hard.

Learning that close friends and family want to help is a relief, but may increase anxiety. People who have not experienced a panic attack may not understand how terrifying it is. The person with the panic is given lots of advice about how to get over it. While the concern is appreciated, the person suffering from panic may feel pressured to please others or may resent that loved ones do not understand.

People who have panic may have setbacks from time to time. It is frustrating and scary to experience panic again and repeat the steps that they previously did just to be able to do ordinary activities. Long-term sufferers may reach what they consider to be a reasonable level of comfort and quality of life. They may not want to attempt to broaden their horizons.

People who have been agoraphobic may live in constant dread of signs that their world is shrinking. They may feel that they can’t climb out of the fear again and again. On the other hand, the joy that they feel from simple things such as being able to go in a grocery store may be limitless.

With each success, more successes become possible. Growth spurts may occur. Panic disorder is like any other condition. It is different for each person, depending upon support and where they are at various stages of life.

When a loved one suffers from panic

Watching a loved one experience a panic attack can be frightening. Family members will benefit from learning about the disorder. They may feel angry until they realize that panic disorder is a physical disorder. It is overwhelming to watch a loved one who was fully employed, independent, and articulate one week become afraid to drive, clingy and scared the following week. Resentment may occur if the family member who has panic disorder doesn’t “push” her- or himself enough in the eyes of the rest of the family.

Other family members may need to take on additional responsibilities. Children may be frightened or resentful if the parent is agoraphobic and cannot take them to activities like other parents do.

It is important to teach family members about boundaries and how to prevent enabling behaviors. Family members have an important role in stress management and need to find a balance between being supportive, letting go, and living their own lives. Family members may need counseling to deal with the stress of panic disorder.

Summary

Panic disorder is a very common condition. The degree of disruption that it causes in a person’s life is highly variable. Several theories exist that try to explain the origin of panic disorder. It seems to be primarily biological but heavily impacted by stress in the environment.

Anyone, any age, can be diagnosed with panic disorder. The most serious form of panic disorder is panic disorder with agoraphobia. Agoraphobia may develop quickly. It may occur after just one panic attack.

Panic disorder needs to be diagnosed early for treatment to be most effective. With each subsequent panic attack, the fear of recurrence and likelihood of avoidance behaviors developing increases.

Children may suffer from panic disorder. It is likely that panic is underdiagnosed and undertreated in children.

Several treatment options are available. The most effective programs utilize medication and cognitive-behavioral therapy. Complementary medicine offers support for panic disorder as well.
People with panic often suffer from depression. They may self-medicate to relieve their symptoms.

Living with panic disorder as the sufferer or as a family member can be challenging. All family members must learn strategies for self care.

References


PANIC DISORDER: A COMPREHENSIVE NURSING UPDATE

Final Examination Questions

Choose True or False for questions 36 through 40 and mark them on the answer sheet found on page 133 or complete your test online at Nursing.EliteCME.com.

36. Symptoms of panic attack include nausea, feelings of depersonalization, and fear of losing control.
   ○ True  ○ False

37. Behaviors that indicate the presence of agoraphobia include traveling shorter and shorter distances, needing a “safe person,” and avoiding situations where escape is difficult.
   ○ True  ○ False

38. People who have depression or PTSD as comorbidities with panic disorder have better outcomes than those who do not have those co-morbidities.
   ○ True  ○ False

39. Selective serotonin reuptake inhibitors and benzodiazepines are used to treat panic disorder.
   ○ True  ○ False

40. Panic disorder affects only the person with the disease.
   ○ True  ○ False
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