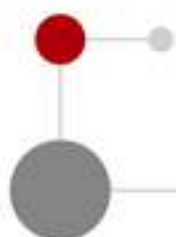




ACNAP

Association of Cardiovascular
Nursing & Allied Professions

The ESC Textbook of Cardiovascular Nursing



Edited by
Catriona Jennings
Felicity Astin
Donna Fitzsimons
Ekaterini Lambrinou
Lis Neubeck
David R Thompson



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European Society
of Cardiology

The ESC Textbook of Cardiovascular Nursing

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The ESC Textbook of Cardiovascular Nursing

EDITED BY

Catriona Jennings

Honorary Professor and Director of Nursing and Interdisciplinary Relations,
National Institute for Prevention and Cardiovascular Health,
National University of Ireland, Galway, Republic of Ireland

Felicity Astin

Professor of Nursing, School of Human and Health Sciences, University of Huddersfield and
Calderdale and Huddersfield NHS Foundation Trust, Huddersfield, UK

Donna Fitzsimons

Professor of Nursing, Head of School of Nursing & Midwifery
Queen's University Belfast, Belfast, UK

Ekaterini Lambrinou

Professor in Medical Nursing and Specialties and Gerontology Department of Nursing, School
of Health Sciences, Cyprus University of Technology, Limassol, Cyprus

Lis Neubeck

Professor of Cardiovascular Nursing, School of Health and Social Care,
Edinburgh Napier University, Edinburgh, UK

David R. Thompson

Professor of Nursing, School of Nursing and Midwifery,
Queen's University Belfast, Belfast, UK

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Foreword

The ESC Textbook of Cardiovascular Nursing is an important resource for cardiovascular nurses at all stages of their career. It is the work of leading experts in cardiovascular care and is divided into three sections. The first section, 'The centrality of nursing within cardiovascular care', comprises three chapters: 'The epidemiology of cardiovascular disease', 'Delivering high-quality cardiovascular care', and 'Key considerations for continuing professional development and specialization'. This section describes the public health needs of the population with cardiovascular problems and how best to prepare nurses to meet the challenges of delivering evidence-based cardiovascular care.

The second section, 'Holistic nursing care: assessment, intervention, and evaluation', comprises nine chapters. The first chapter is called 'Anatomy and physiology of the healthy heart' and provides an overview of how the healthy heart functions. This is followed by 'Nursing assessment and care planning in the context of cardiovascular care'. Together, these two chapters provide an important foundation on which to develop the condition-specific content that follows about the management and care of patients presenting with common cardiovascular conditions. These chapters are entitled 'Care of the patient with coronary heart disease', 'Care of the patient with cardiac arrhythmias', 'Care of the patient with valvular heart disease', 'Care of the patient with inherited cardiac conditions and congenital heart diseases', and 'Care of the patient with heart failure'. Many cardiovascular conditions are long term and so the patient plays an important role in managing their heart health. The next chapter, 'Cardiovascular prevention and rehabilitation', provides a comprehensive overview which offers both online and hard copy resources and references, which could well serve as a standalone guide to cardiovascular risk reduction and health promotion. 'Pharmacology for cardiovascular nurses' is an exceptionally well-organized and well-written chapter and provides readers with a logical, easy-to-follow approach to understand cardiac medications.

The textbook concludes with a section entitled 'Professional considerations for nurses working in cardiovascular care' which includes three chapters. An important

part of the nurse's role is as an educator, but few have had the opportunity to access training in this field. The chapter entitled 'Patient education and communication' addresses this gap. The chapters that follow consider some of the challenges that nurses face as well as a snapshot of what the future may hold for the professions: 'Addressing the current challenges for the delivery of holistic care' and 'Looking forward: the future of cardiovascular care'.

The authors' commitment to evidence-informed practice makes this textbook of great value to all nurses who care for cardiac patients. Most of the authors are themselves researchers and they cite the latest evidence as well as current clinical practice guidelines and advocate for a 'patient-centred care approach' for all cardiac patients and their families.

The ESC Textbook of Cardiovascular Nursing is practical for both graduate and postgraduate nursing programmes that provide courses on cardiovascular care. It should be essential reading for nurses who work in inpatient and/or outpatient cardiovascular settings. Its value extends to hospital wards and nursing units, including intensive care units as well as the community setting.

Catriona Jennings, editor-in-chief, is Honorary Professor at the National University of Ireland, Galway, and an internationally recognized clinician, educator, and scientist with many years of experience in the prevention of cardiovascular disease. Among her accomplishments are the EUROACTION trials and the EUROASPIRE surveys that promote interdisciplinary models of preventive care. She is also one of the founders of the Masters of Science, Postgraduate Diploma in Preventive Cardiology and the clinical Preventive Cardiology programme, both developed at Imperial College London. Professor Jennings's extensive background in nursing practice and research is amply evident throughout this excellent textbook.

Felicity Astin, co-editor, is a clinical academic nurse and Professor of Nursing at the University of Huddersfield and holds a joint appointment with Calderdale and Huddersfield NHS Foundation Trust. She led the development and publication of the original Core Curriculum for the Continuing Professional Development of Nurses in Europe, supported by the expertise of the Association of

Cardiovascular Nursing and Allied Professions (ACNAP) Education Committee. The Core Curriculum has been translated into several languages and provided the impetus for this textbook. Professor Astin's applied research focuses upon person-centred care in cardiology practice to examine patients' experiences of the care they receive and use the findings to drive improvement in healthcare provision.

Donna Fitzsimons, co-editor, is Professor of Nursing and is currently Head of the School of Nursing and Midwifery and a member of the Senate at Queen's University Belfast. She holds several significant leadership roles at the European Society of Cardiology (ESC), was the first nurse elected to the ESC Board (2014–2020), and contributed to the Clinical Practice Guidelines in the same period. She pioneered the launch of the ESC Patient Forum between 2018 and 2020 and is committed to the involvement of patients, carers, and the wider interdisciplinary team as a means to enhance patient experience and outcomes. Professor Fitzsimons's research is widely cited and has guided patient care and professional development for several decades.

Ekaterini Lambrinou, co-editor, is Associate Professor and first elected academic staff in the Department of Nursing at the Cyprus University of Technology, Limassol, Cyprus. Her research and cardiovascular nursing mainly focus on the care of patients with heart failure. She has actively contributed to ESC Guidelines and position statements. She is a regular contributor to the activities of ACNAP and the Heart Failure Association of the ESC.

Lis Neubeck, co-editor, is Professor of Cardiovascular Health in the School of Health and Social Care at Edinburgh Napier University. She is Honorary Professor of Sydney Nursing School, Charles Perkins Centre, University of Sydney in Australia where she lived before her appointment in Edinburgh. Her research focuses on innovative solutions to secondary prevention of cardiovascular disease,

identification and management of atrial fibrillation, and technologies to improve access to healthcare. Professor Neubeck has been awarded several grants for her research, for which she has been widely acknowledged and honoured. She is the current President of the ESC ACNAP.

David R. Thompson, co-editor, is Professor of Nursing at Queen's University Belfast. He is Honorary Professor in the Department of Psychiatry, University of Melbourne, Australia; Adjunct Professor in the School of Public Health, Monash University, Melbourne, Australia; Honorary Professor in the School of Nursing and Midwifery, University of Queensland, Brisbane, Australia; and Distinguished Professor in the School of Nursing at Anhui Medical University, Hefei, China. In addition, he is a founding editor of the *European Journal of Cardiovascular Nursing*. Professor Thompson's research focuses on understanding the experiences, concerns, and needs of patients, their partners, and family. His prolific publications on cardiac care, specifically cardiac rehabilitation and psychosocial responses to illness, have guided the care of cardiac patients for several decades.

This distinguished group of scientists, educators, and clinicians have produced a fresh, state-of-the-art textbook. As a fellow of the ESC and the American Heart Association, I have worked with these esteemed colleagues for more than three decades. Their textbook is a boon to all those in the nursing profession who care for patients with heart disease. I recommend it without reservation.

Erika Sivarajan Froelicher, MA, MPH, PhD, FAAN
Emeritus Professor
Department of Physiological Nursing,
School of Nursing, and
Department of Epidemiology and Statistics,
School of Medicine
University of California San Francisco
San Francisco, CA, USA

Letter to nurses from the ESC Patient Forum

'It is more important to know what sort of person has a disease than to know what sort of disease a person has.'

William Osler

Dear Nurses,

While the aphorism by William Osler may still have some resonance, this textbook demonstrates that in the twenty-first century it is possible to know both the person and the disease, and through positive therapeutic relationships that respect the patient perspective to better achieve the outcomes that matter to patients.

This textbook combines the objective clinical details with the recognition of the importance of patient participation in care and understanding the emotional impact of cardiovascular disease on patients. Knowledge and understanding save lives and make a real difference to the quality of life of those whom you care for.

Recognizing that we, your patients, are persons and what defines us is so much more than our illness, is fundamental for our care. We wish to be listened to, treated as individuals with feelings, and given the opportunity to have a voice in the decisions about our treatment and care.

Being a patient is also being weak and vulnerable. You go with us through some of the darkest hours and most intimate moments in our lives. In this situation, a positive

personal encounter can turn a potentially frightening experience into a compassionate interaction.

We are thankful for the much-needed human touch, the reassurance, and the humanity nurses provide while we are surrounded by beeping and flashing monitors or anxiously awaiting a medical procedure.

We hope that you will inquire about our hopes and expectations and explain what we should expect in the following days and weeks and how our lives will change.

We count on you, with care and understanding, to help us to believe we can confidently take on the challenges ahead, that everything is going to be all right, that we will be all right.

We need our nurses to always be alert and develop special little antennas that help you notice even our smallest handicaps, our pain, our fears because in respect of your unenviable workload and the stressful environment we might not dare to say something.

Nurses, we count on your scientific knowledge incorporated in this book, and we rely on you to help us—with kindness, compassion, and empathy.

You are our hand-holders and comforters, reassurance providers, listeners, and translators and our appreciation and thanks for your dedication, support, and efforts is endless.

Your ESC Patient Forum

Preface

We are proud to present this textbook on cardiovascular care to you on behalf of the European Society of Cardiology (ESC) Association of Cardiovascular Nursing and Allied Professionals (ACNAP). The team of editors and authors of this textbook are experienced practitioners who wish to dedicate this textbook to all those individual patients and families who we have cared for throughout our own careers and who have helped to teach us what we know today. We realize that the care of patients with cardiovascular disease is becoming increasingly specialized and that there is a need for resources to better educate and support staff new to the area. This textbook is just one of those resources developed by ACNAP. We hope it inspires you to ask questions, search for answers, and become the best cardiovascular nurse you can be. There is now a strong body of evidence confirming that educating the nursing workforce internationally increases patient safety and saves lives. As a cardiovascular nurse, we understand that you will be committed to that objective, and we further hope that the learning within this textbook will help you to work more closely with us to help fulfil the ESC mission, which is to reduce the burden of cardiovascular disease across the world.

This textbook builds on our Core Curriculum for the Continuing Professional Development of Nurses Working in Cardiovascular Care and provides in-depth learning for nurses specializing in caring for patients with coronary heart disease, cardiac arrhythmias, valvular heart disease, inherited cardiac conditions and congenital heart diseases, and heart failure. The pathology of these conditions is described as well as the normal anatomy and physiology of the heart. While tailoring nursing assessment and interventions to the care of patients with heart disease, it emphasizes high-quality holistic care taking account of the needs of patients with complex comorbidities, as well as their families. The imperative of prevention and rehabilitation in terms of both primary and secondary prevention is confirmed as well as educational, behavioural, and therapeutic interventions. The epidemiology of cardiovascular disease is covered including disease burden and inequalities across European regions. Chapters devoted to patient education and communication and to

pharmacology are also included. The textbook concludes with a chapter which looks into the future challenges and opportunities for nurses and the evolution of nursing in cardiovascular care.

This textbook is designed for registered nurses working in a cardiology setting, to be used alongside a variety of teaching and learning approaches, including problem and team-based learning using clinical cases to facilitate how to apply theory in practice, and guided reflective practice to encourage learners to develop new knowledge and ways to practise that arise from thinking about their own or other observed practice. Cross-referencing is used to encourage learners to make links and to explore all parts of the textbook that are relevant to their learning. The textbook is not aimed at advanced nurse practitioners who would expect more advanced educational content; nevertheless, they may find it to be a useful educational tool. It is just one innovative element within the suite of ACNAP resources developed over recent years that are available at <https://www.escardio.org/Sub-specialty-communities/Association-of-Cardiovascular-Nursing-&-Allied-Professions>. We encourage you to join the ACNAP international community of nurses, where you can be part of a vibrant community of nurses of all kinds who are dedicated to driving up the quality of cardiovascular care, and you can benefit from connecting with them and becoming an active part of this community.

Since the creation of coronary care units in the 1960s, the evolution of cardiac surgery, and the development of interventional cardiology, which includes close monitoring and management of patients by nurses supported by modern technology, our profession has had an increasingly important role in cardiovascular care requiring extended skills, specialization, and autonomy. These clinical nurse specialist roles have contributed to the delivery of holistic and person-centred cardiovascular care. Importantly, nurses, whose fundamental premise is the delivery of holistic care, are in a prime position to contribute to reducing health inequalities, improving health literacy, and playing an important role in preventing disease. However, the expectation of what nurses can and should do in the context of cardiovascular care varies

significantly across Europe and indeed globally. This variation is a function of several factors including the culture of healthcare and the standing of nurses within it; the education and preparation of nurses for both general and specialist care; the healthcare system of each country; and the availability of physicians and specially trained nurses and the nature of interdisciplinary working.

In 1980, Professor Paul Hugenholtz, first Fellow, Founder, and early President of the ESC, acknowledged the importance of building on the potential of nurses and actively encouraged this professional group to get involved in the ESC. Attie Immink, a nurse from the Netherlands, took the initiative by bringing nursing sessions into the ESC Congress and finally establishing the ESC Working Group on Cardiovascular Nursing in 1991. This small group of specialist nurses, mainly from Northern Europe, had ambitious goals to put nursing research on the European map. The group held their first scientific conference in the spring of 2000 in Glasgow, UK, and established the *European Journal of Cardiovascular Nursing* in 2002, which has subsequently grown to become a leading nursing journal globally. In 2006, the Working Group was transformed into the ESC Council on Cardiovascular Nursing and Allied Professions, and in 2018, the Council became the seventh Association of the ESC—the ACNAP.

ACNAP has conducted two surveys of nursing education principally among its membership and attendees at EuroHeartCare conferences, the first between 2009 and 2011 and the second in 2018. Both have identified a huge variation in the availability and content of specialist cardiovascular education and training for nurses across Europe. In the most recent survey¹ of 876 European nurses, while most reported being educated to bachelor level, a significant minority of 46% had reached masters or doctorate level, possibly reflecting the study population of conference attendees and those holding membership with a professional association. Despite this, many reported feeling unable to fulfil their clinical roles to optimal levels. These perceptions were particularly evident in relation to acute care and cardiovascular risk factor management with respondents expressing a need for education and training opportunities either as face-to-face courses or via blended or e-learning modes. This textbook is just one part of that armoury that we hope will help you join with us in the fight against heart disease.

An important priority for improving the quality of care for patients with cardiovascular disease, which is the largest cause of premature mortality worldwide, is to build on the potential of the nursing workforce. In order for nurses to fulfil this potential, there is a need for standardization in

the education and preparation of nurses for specialization. The ACNAP strategic plan builds on its commitment to further nursing science in Europe, but also looks beyond this goal to address both education and clinical practice issues. Education is supported through the annual scientific EuroHeartCare Congress which reaches out to nurses and allied professionals across Europe and other countries worldwide, and also with the ACNAP Core Curriculum which was launched in 2015. Curricula for nursing education vary enormously across European countries, but these curricula define the essential content for cardiovascular nursing. In addition, issues around health policy, regulation, and assessment of competencies mean that nurses are prevented from practising to the full extent of their education and training. In some countries, nursing lacks the formal and recognized medical specialty training that physicians undergo where roles are clearly defined. If nurses are to meaningfully contribute to meeting the ESC mission of reducing the burden of cardiovascular diseases in Europe and, further, to reducing premature mortality from non-communicable diseases to levels recommended by the World Health Organization, these training issues must be addressed.

The ACNAP Core Curriculum, which exists alongside the ESC Core Curriculum for the Cardiologist, serves as a template for structure, content, and educational philosophy in national academic institutions, especially in those countries where this is missing. Like the cardiology core curriculum, it also requires the development of specialist curricula within the field of cardiovascular medicine. ACNAP, in collaboration with the Heart Failure Association and the European Association of Percutaneous Cardiovascular Interventions, has already published nursing curricula. In addition, ACNAP has worked with the Preventive Cardiovascular Nurses Association to develop a Certificate Programme in Cardiovascular Preventive Care.

Given the large global burden of cardiovascular diseases, and ageing populations with comorbidities and complex care needs, nurses, who represent the largest healthcare workforce worldwide, are well placed to advocate for and deliver evidence-based care and to make an important contribution to the delivery of high-quality cardiovascular care across the different healthcare economies in Europe and beyond. In order to fulfil the real potential of our international workforce, we need to ensure that nurses entering into specialization, following their basic nursing education, receive appropriate training for specialization which is of an equal standard across Europe. Despite all the considerable progress in cardiovascular care over recent decades, there is still much to be done and we hope

that this textbook supplies you with the knowledge and inspiration to help you play your part in beating the world's biggest killer.

A word of sincere thanks and acknowledgement is due to the authors—expert clinicians, researchers, and educationalists from all over the world and, in some cases, who represent nursing leadership groups which are partners of ACNAP internationally. In working with these bodies, ACNAP has been able to contribute to international leadership initiatives to promote cardiovascular nursing education and research and improve clinical practice. Our hope is that all these partners will find our ACNAP textbook useful in supporting the education and preparation of nurse specialists internationally.

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Catriona Jennings
Felicity Astin
Donna Fitzsimons
Ekaterini Lambrinou
Lis Neubeck
David R. Thompson

Contents

Symbols and abbreviations	xv
Contributors	xvii

Section 1 The centrality of nursing within cardiovascular care

Chapter 1 The epidemiology of cardiovascular disease	3
Guy De Backer, Ian Graham, María Teresa Lira, Laura L. Hayman, and Izabella Uchmanowicz	
Chapter 2 Delivering high-quality cardiovascular care	29
Lis Neubeck, María Teresa Lira, Ercole Vellone, Donna Fitzsimons, Lisa Dullaghan, and Julie Sanders	
Chapter 3 Key considerations for continuing professional development and specialization	55
Lis Neubeck, Jennifer Jones, Izabella Uchmanowicz, Sue Koob, Catriona Jennings, María Teresa Lira, Shirley Ingram, and Donna Fitzsimons	

Section 2 Holistic nursing care: assessment, intervention, and evaluation

Chapter 4 Anatomy and physiology of the healthy heart	81
Geraldine Lee, Gabrielle McKee, Andreas Protopapas, and Ian D. Jones	
Chapter 5 Nursing assessment and care planning in the context of cardiovascular care	111
Ekaterini Lambrinou, Diane L. Carroll, Howard T. Blanchard, Eleni Kletsiou, Felicity Astin, Alison Woolley, Jo Tillman, Ricardo Leal, and Rosie Cervera-Jackson	
Chapter 6 Care of the patient with coronary artery disease	145
Valentino Oriolo, Margaret Cupples, Neil Angus, Susan Connolly, and Felicity Astin	
Chapter 7 Care of the patient with cardiac arrhythmias	179
Geraldine Lee, Nina Fållun, Neil Angus, Jeroen Hendriks, Tone M. Norekvål, Selina Kikkenborg Berg, and Donna Fitzsimons	
Chapter 8 Care of the patient with valvular heart disease	215
Tone M. Norekvål, Britt Borregaard, Tina B. Hansen, Trine B. Rasmussen, and Sandra B. Lauck	
Chapter 9 Care of the patient with inherited cardiac conditions and congenital heart diseases	241
Jodie Ingles, Tootie Bueser, Pascal McKeown, Philip Moons, and Donna Fitzsimons	

Chapter 10	Care of the patient with heart failure	283
	Tiny Jaarsma, Anna Stromberg, Ekaterini Lambrinou, Andreas Protopapas, Loreena Hill, Ana Ljubas, and David R. Thompson	
Chapter 11	Cardiovascular prevention and rehabilitation	303
	Patricia Jennings, Kathy Berra, Laura L. Hayman, Irene Gibson, Jennifer Jones, Alison Atrey, David R. Thompson, Chantal F. Ski, Mary Kerins, Tara Conboy, Lis Neubeck, Robyn Gallagher, and Sue Koob	
Chapter 12	Pharmacology for cardiovascular nurses	369
	Jan Keenan, Rani Khatib, Gabrielle McKee, Todd Ruppert, and Franki Wilson	

Section 3 Professional considerations for nurses working in cardiovascular care

Chapter 13	Patient education and communication	399
	Felicity Astin, Emma Harris, Lis Neubeck, Robyn Gallagher, and Jennifer Jones	
Chapter 14	Addressing the current challenges for the delivery of holistic care	419
	David R. Thompson, Martha Kyriakou, Izabella Uchmanowicz, Jan Keenan, Rani Khatib, Loreena Hill, Lis Neubeck, Ekaterini Lambrinou, and Abigail Barrowcliff	
Chapter 15	Looking forward: the future of cardiovascular care	443
	David R. Thompson, Lis Neubeck, and Robyn Gallagher	
	Index	453

Symbols and abbreviations

AAS	acute aortic syndrome	ECG	electrocardiography/electrocardiogram
ABG	arterial blood gas	ECMO	extracorporeal membrane oxygenation
ABPM	ambulatory blood pressure monitoring	EDS	Ehlers–Danlos syndrome
ACE	angiotensin-converting enzyme	EDV	end-diastolic volume
ACNAP	Association of Cardiovascular Nursing and Allied Professions	ESC	European Society of Cardiology
ACS	acute coronary syndrome(s)	EU	European Union
ADP	adenosine diphosphate	FS	frailty syndrome
ADR	adverse drug reaction	FTAAD	familial thoracic aortic aneurysm and dissection
AF	atrial fibrillation	GBD	Global Burden of Disease
AHA	American Heart Association	GCNLF	Global Cardiovascular Nursing Leadership Forum
AI	artificial intelligence	GTN	glyceryl trinitrate
AMI	acute myocardial infarction	HbA_{1c}	glycated haemoglobin
ANP	advanced nurse practitioner	HBPM	home blood pressure monitoring
APN	advanced practice nurse	HCM	hypertrophic cardiomyopathy
ARB	angiotensin II receptor blocker	HDL-C	high-density lipoprotein cholesterol
AV	atrioventricular	HDL-C	high-density lipoprotein
AVSD	atrioventricular septal defect	HFmrEF	heart failure with a mid-range ejection fraction
BACPR	British Association for Cardiovascular Prevention and Rehabilitation	HFpEF	heart failure with a preserved ejection fraction
BMI	body mass index	HFrfEF	heart failure with a reduced ejection fraction
BNP	B-type natriuretic peptide	HSBC	Health Behaviour in School-age Children
bpm	beats per minute	hs-TnT	high-sensitivity troponin T
CABG	coronary artery bypass graft	ICC	inherited cardiac condition
CAD	coronary artery disease	ICCU	intensive cardiac care unit
CCS	chronic coronary syndrome(s)	ICD	implantable cardioverter defibrillator
CCTGA	congenitally corrected transposition of the great arteries	ICN	International Council of Nurses
CHD	congenital heart disease	ICVH	ideal cardiovascular health
CI	confidence interval	IHI	Institute for Healthcare Improvement
CNS	clinical nurse specialist	INR	international normalized ratio
COVID-19	coronavirus disease 2019	IVR	idioventricular rhythm
CPVT	catecholaminergic polymorphic ventricular tachycardia	LDL	low-density lipoprotein
CRT	cardiac resynchronization therapy	LDL-C	low-density lipoprotein cholesterol
CRT-D	cardiac resynchronization therapy device	LMWH	low-molecular-weight heparin
CS	cardiogenic shock	LQTS	long QT syndrome
cTn	cardiac troponin	LV	left ventricle/ventricular
CVD	cardiovascular disease	LVEF	left ventricular ejection fraction
CVH	cardiovascular health	LVNC	left ventricular non-compaction
CVPR	cardiovascular prevention and rehabilitation	LVOTO	left ventricular outflow tract obstruction
DALY	disability-adjusted life year	MAP	mean arterial pressure
DBP	diastolic blood pressure	MCS	mechanical circulatory support
DCM	dilated cardiomyopathy	MEA	mean electrical axis
DOAC	direct oral anticoagulant	MFRR	multifactor risk reduction
		MI	myocardial infarction
		MINOCA	myocardial infarction with non-obstructive coronary arteries

MONICA	Multinational MONItoring of Trends and Determinants of CARdiovascular Disease	S3	third heart sound
NACP	National Cardiac Audit Programme	S4	fourth heart sound
NICE	National Institute for Health and Care Excellence	SA	sinoatrial
NOAC	non-vitamin K antagonist oral anticoagulant	SBP	systolic blood pressure
NRT	nicotine replacement therapy	SCAI	Society for Cardiovascular Angiography and Interventions
NSTE	non-ST-segment elevation	SCD	sudden cardiac death
NSTEMI	non-ST-segment elevation myocardial infarction	SCORE	Systematic Coronary Risk Evaluation
NYHA	New York Heart Association	SMART	Specific, Measurable, Achievable, Realistic, Timely
OARS	Open-ended questions, Affirmation, Reflective listening, Summarizing	STEMI	ST-segment elevation myocardial infarction
OGTT	oral glucose tolerance test	SVT	supraventricular tachycardia
PCI	percutaneous coronary intervention	TAVI	transcatheter aortic valve implantation
PCSK9	proprotein convertase subtilisin/kexin type 9	TCS	temporary circulatory support
PDA	patent ductus arteriosus	TGA	transposition of the great arteries
PDSA	Plan–Do–Study–Act	TOF	tetralogy of Fallot
PPCI	primary percutaneous coronary intervention	TWI	T-wave inversion
PPCM	peripartum cardiomyopathy	UFH	unfractionated heparin
PREM	patient-reported experience measure	UK	United Kingdom
PRO	patient-related outcome	URL	upper reference limit
PROM	patient-reported outcome measure	US	United States
QI	quality improvement	VAD	ventricular assist device
RAAS	renin–angiotensin–aldosterone system	VA-ECMO	venoarterial extracorporeal membrane oxygenation
RCM	restrictive cardiomyopathy	VKA	vitamin K antagonist
RCT	randomized controlled trial	VSD	ventricular septal defect
RV	right ventricle/ventricular	VT	ventricular tachycardia
S1	first heart sound	WHO	World Health Organization
S2	second heart sound		

Contributors

Neil Angus, RN, MN BN (Hons),
PG Cert (Professional & Higher Education) FHEA
Senior Lecturer
University of the Highlands and Islands, Inverness, UK

Felicity Astin, RN, BSc (Hons), PG Cert (Education),
MSc, PhD, FHEA
Professor of Nursing
University of Huddersfield and Calderdale and
Huddersfield NHS Foundation Trust
Huddersfield, UK

Alison Atrey, BSc, PG Dip, Ad PG Dip, SRD, PhD
Honorary Clinical Fellow
National University of Ireland
Ireland, Galway

Abigail Barrowcliff MPharm IPP PG(Dip) Pharm
Advanced Clinical Pharmacist - Cardiovascular Services
Leeds Teaching Hospitals NHS Trust
Leeds, UK

Kathy Berra, MSN, NP, BC, MSN, NP-BC, FAANP, FPCNA,
FAHA, FAAN
Co-Director, The LifeCare Company
Stanford Prevention Research Center (Ret)
Stanford University School of Medicine (Ret)
Stanford, CA, US

Howard T. Blanchard, DNP, MEd, RN, ACNS-BC, CEN
Clinical Nurse Specialist
Massachusetts General Hospital, Boston, MA, US

Britt Borregaard, RN, MPQM, PhD
Associate Professor
Odense University Hospital, Odense, Denmark

Tootie Bueser, RN, MSc, PhD
Director for Nursing & Midwifery, South East Genomic
Medicine Alliance
Guy's & St Thomas' Hospital NHS Foundation Trust
London, UK

Diane L. Carroll, PhD, RN, FAAN, FAHA, FESC
Nurse Researcher, Munn Center
Nursing Research
Massachusetts General Hospital, Boston, MA, USA

Rosie Cervera-Jackson, RN, MA (Oxon), MSt, DipHe
Practice Educator Royal Brompton Hospital
London, UK

Tara Conboy, RGN, BSc, MScN, MScPC, FIPC
Occupational Health Advisor
Medmark Occupational Health, Dublin, Ireland

Susan Connolly, MB BCH BAO, PhD, FRCP Edin
Consultant Cardiologist
Western Health and Social Care Trust, Enniskillen, UK

Margaret Cupples, MD, FRCGP
Emeritus Professor
Queen's University Belfast, Belfast, UK

Guy De Backer, MD, PhD
Emeritus Professor
Ghent University, Ghent, Belgium

Lisa Dullaghan, MSc, RN
Interim Assistant Director Nursing—Safe &
Effective Care
South Eastern Health & Social Care Trust, Belfast, UK

Nina Fålun, RN, ICN, MSc
Clinical Nurse Specialist
Haukeland University Hospital
Bergen, Norway
Senior lecturer
Western Norway University of Applied Sciences
Bergen, Norway

Donna Fitzsimons, BSc, PhD
Professor and Head of School of Nursing & Midwifery,
Queen's University Belfast, Northern Ireland

Robyn Gallagher, RN, BA, MN, PhD
Professor of Nursing
The University of Sydney, Sydney, Australia

Irene Gibson, RGN, MA, PG Dip, FNIPC
Director of Programmes and Innovation at the National
Institute for Cardiovascular Health (NIPC)
Galway, Ireland

Ian Graham, MB, BCH, BA, BAO, FRCPI, FESC, FTCD
Professor of Cardiovascular Medicine
Trinity College Dublin, Dublin, Ireland

Tina B. Hansen, PhD
Associate Professor
Zealand University Hospital, Denmark

Emma Harris, BSc, PhD
Research Fellow in Patient Education and
Communication
University of Huddersfield, Huddersfield, UK

Laura L. Hayman, PhD, MSN, FAAN, FAHA, FPCNA
Professor of Nursing
UMass Boston and UMass Medical School,
Boston, MA, US

Jeroen Hendriks, RN, MSc, PhD
Professor of Cardiovascular Nursing
Flinders University and Royal Adelaide Hospital,
Adelaide, Australia

Loreena Hill, BSc, MSc, PhD
Lecturer (Teaching & Research)
Queen's University Belfast, Belfast, UK

Jodie Ingles, GradDipGenCouns, PhD, MPH
Head, Clinical Genomics Laboratory and Cardiac Genetic
Counsellor
Centre for Population Genomics, Garvan Institute
of Medical Research, and UNSW Sydney, Sydney,
Australia
Centenary Institute, The University of Sydney, Sydney,
Australia
Department of Cardiology, Royal Prince Alfred Hospital,
Sydney, Australia

Shirley Ingram, RGN, MSc
Advanced Nurse Practitioner
Registered Nurse Prescriber
Department of Cardiology
Tallaght University Hospital
Dublin, Ireland

Tiny Jaarsma, RN, PhD
Professor
Linköping University, Linköping, Sweden

Catriona Jennings, BA (Hons), PhD, PG Cert ULT, FESC,
FPCNA, FIPC
Honorary Professor of Nursing and Interdisciplinary
Relations
National University of Ireland—Galway, Galway, Ireland

Ian D. Jones, RN, PhD, PGCLT
Professor of Cardiovascular Nursing
Liverpool John Moores University, Liverpool, UK

Jennifer Jones, PhD, MSc, PGCertEd, MCSP, HPC, FIPC
Associate Professor
National University of Ireland, Galway and Director of
Training and Education
National Institute for Prevention and Cardiovascular
Health
Galway, Ireland

Jan Keenan, RN, DipN (London), PGDip Ed, MSc
Non-Medical Prescribing Lead, Oxford university
Hospitals, and Visiting Fellow, Oxford Brookes University

Mary Kerins, RGN, SCM, Cert CCU, Dip Cardiac
Rehabilitation, MSc
Manager of Cardiac Rehabilitation Services
St James's Hospital, Dublin, Ireland

Rani Khatib, DPharm (PhD), FRPharmS
Consultant Cardiology Pharmacist and Honorary Senior
Lecturer
Leeds Teaching Hospitals NHS Trust and University of
Leeds, Leeds, UK

Selina Kikkenborg Berg, RN, Ph.d. FESC. FAHA
Professor of Cardiology
The Heart Center
Copenhagen University Hospital Rigshospitalet,
Denmark

Eleni Kletsiou, RN, MSc, PhD
University General Hospital Attikon, Athens, Greece

Sue Koob, MPA
CEO
Preventive Cardiovascular Nurses Association,
Madison, WI, US

Martha Kyriakou, RN, BSc, MSc, PhD
Nurse
Nicosia General Hospital, Nicosia; and Cyprus University
of Technology, Limassol, Cyprus

Ekaterini Lambrinou, RN, BSc, MSc, PhD, FESC, FHFA
Professor in Medical Nursing & Specialties and
Gerontology Nursing
Director, MSc in Advanced Acute and Intensive
Cardiology Care
Department of Nursing, School of Health Sciences,
Cyprus University of Technology

Sandra B. Lauck, PhD
Clinical Associate Professor and Clinician Scientist
University of British Columbia, Vancouver, BC, CA

Ricardo Leal, BSc, MSc

Charge Nurse,
Royal Brompton Hospital – Adult Intensive Care,
London, UK

Geraldine Lee, BSc, PhD

Reader in Advanced Clinical Practice
Kings College London, London, UK

María Teresa Lira, MScN, CV Specialist, FPCNA

Executive Coordinator of Research Unit
Hospital Clínico Fuerza Aérea de Chile Santiago, Chile

Ana Ljubas, Msc, FESC

Assistant Director for Nursing, Head Nurse
University Hospital Centre Zagreb, Zagreb, Croatia

Gabrielle McKee, BA (Mod), PhD

Associate Professor
Trinity College Dublin, Dublin, Ireland

Pascal McKeown, MD, FRCP, FESC

Head of School and Dean of Education
School of Medicine, Dentistry & Biomedical Sciences
Queen's University Belfast, Whitla Medical Building
Lisburn Road, Belfast

Philip Moons, PhD, RN, FESC, FAHA, FAAN

Professor of Healthcare and Nursing Science
KU Leuven, Leuven, Belgium; University of Gothenburg,
Gothenburg, Sweden; and University of Cape Town,
Cape Town, South Africa

Lis Neubeck, BA (Hons), PhD, FESC

Professor of Cardiovascular Nursing
Edinburgh Napier University, Edinburgh, UK

Tone M. Norekvål, RN, MSc, PhD, FESC, FAHA

Professor of Nursing
Haukeland University Hospital, Bergen; and University
of Bergen; and Western Norway University of Applied
Sciences, Bergen, Norway

Valentino Oriolo, MSc, FESC

Cardiac ACP
Department of Emergency UHBW Associate Senior
Lecturer CVS Pharmacology
UWE Education Chair, EAPCI
Education Committee, ACNAP
Supervision and Assessment Lead, AIM, HEE

Andreas Protopapas, RN, BSc, MMedSc, PhD

Lecturer in Nursing
European University Cyprus, Nicosia, Cyprus

Trine B. Rasmussen, PhD

Associate Professor/Senior Researcher
University of Copenhagen/Herlev and Gentofte University
Hospital, Copenhagen, Denmark

Todd Rupp, RN, PhD, FAHA, FAAN

John L. and Helen Kellogg Professor of Nursing
Rush University, Chicago, IL, US

Julie Sanders, RN, BSc (Hon), MSc, PhD, FESC

Director Clinical Research
St Bartholomew's Hospital
Barts Health NHS Trust and Honorary Clinical Professor
of Cardiovascular Nursing, The William Harvey Research
Institute, Queen Mary University of London
London, UK

Chantal F. Ski, PhD

Professor and Director of the Integrated Care Academy
University of Suffolk, Ipswich, UK

Anna Stromberg, PhD

Professor
Linköping University; and Linköping University Hospital,
Linköping, SE

David R. Thompson, RN, BSc, MA, PhD, MBA, FRCN, FAAN, FESC, MAE

Professor of Nursing
Queen's University Belfast, Belfast, UK

Jo Tillman, RGN, BSc, MSc

Senior Nurse/Matron
Royal Brompton Hospital, Guys and St Thomas' NHS
Foundation Trust, London, UK

Izabella Uchmanowicz, RN, PhD, FESC, FHFA

Professor
Wroclaw Medical University, Wroclaw, Poland

Ercle Vellone, PhD, RN, FESC, FAAN

Associate Professor of Nursing
University of Rome Tor Vergata, Rome, Italy

Franki Wilson, MPharm, PGDip

Advanced Clinical Pharmacist
Leeds Teaching Hospitals, Leeds, UK

Alison Woolley, RN, ANP, MSc

Lead Nurse for Pre-Operative Cardiac Surgery
St George's University Hospital NHS Foundation Trust,
London, UK

Section 1: The centrality of nursing within cardiovascular care

1 The epidemiology of cardiovascular disease

GUY DE BACKER, IAN GRAHAM, MARÍA TERESA LIRA, LAURA L. HAYMAN,
AND IZABELLA UCHMANOWICZ

CHAPTER CONTENTS

Introduction 4

The burden of cardiovascular disease across Europe 4

- Historical background 4
- Cardiovascular disease mortality 5
- Premature cardiovascular disease mortality 7
- Morbidity 8
- Economic burden of cardiovascular disease 10
- Summary 11

Cardiovascular risk across the lifespan 11

Introduction 11

Cardiovascular disease risk estimation: overview
and use in clinical practice 12

Cardiovascular risk estimation in special
populations 16

The future in cardiovascular disease estimation 20
The role of the nurse 20

Explanation of the cardiovascular disease epidemic and consequences for the future 20

KEY MESSAGES

- Cardiovascular disease (CVD) remains a major cause of total mortality in Europe, accounting for 45% of all deaths in Europe as a whole and 37% of total mortality in the European Union.
- Results from the European Society of Cardiology Atlas of Cardiology demonstrate important inequalities, with CVD deaths accounting for more than 50% of all deaths in some countries compared with less than 30% in others.
- Disability-adjusted life years may be among the most appropriate quantitative indicators of how effective preventive and therapeutic strategies are in reducing the CVD burden.
- Another indicator of the burden of CVD morbidity is the hospitalization rate for cardiovascular conditions which is 30% higher in men than in women, in particular for acute myocardial infarction admissions.
- Global risk calculation has been considered the best tool for comprehensive cardiovascular primary prevention, to deal with the risk of developing atherosclerotic CVD.
- To prevent death and morbidity from CVD, the guidelines highlight the importance of identifying asymptomatic patients who would be candidates for more intensive, evidence-based medical interventions that reduce CVD risk.
- In recent years, challenges in cardiovascular risk estimation efforts have included how to estimate it in different vulnerable groups more accurately, such as children and adolescents, young adults, older adults, and immigrants, and how other factors, such as social status or literacy, may influence expected outcomes.

- The nurse or nurse specialist is uniquely well placed to play a pivotal role in risk estimation and management through her or his knowledge of the science of risk estimation, its practical application, and her or his role as counsellor and advisor through the nurse's unique relationship with patients, families, and communities for holistic assessment and shared decision-making.
- Regardless of the strategy, prevention of CVD should be coordinated and implemented at many levels, from international roadmaps and guidelines to national and regional policies and standard operating procedures of individual healthcare centres and other business entities.
- Prevention of CVD should take a multidisciplinary, multifactorial, and societal approach including strategies to improve health literacy, empowerment, self-care management, and environmental adaptations.

Introduction

In this chapter, we will cover the available epidemiological data for cardiovascular disease (CVD). The chapter starts with a description of the health burden caused by CVD in Europe using different data sources. A brief historical background is given of CVD followed by a description of the burden of CVD mortality and morbidity. The prevalence of CVD, which refers to the number of people who are currently living with CVD in the population, and economic burden of CVD are also discussed. Next, risk factors for CVD are described focusing on atherosclerosis and certain genetic conditions (e.g. familial hypercholesterolaemia). CVD risk estimation is highlighted along with an overview of clinical practices. The preventive role of nurses is intimately linked to estimating the patient's risk for CVD and working with the health team and the patient in their shared decision-making. Additionally, there is a detailed description of several risk estimation equations and the important role of risk modifiers and biomarkers. Challenges in cardiovascular risk estimation efforts have included not only how to address it in different regions or countries, but also how to estimate it in different vulnerable groups more accurately, such as children and adolescents, young adults, older adults, and immigrants, and how other factors, such as social status or literacy, may influence expected outcomes. Finally, there is a section on an explanation of the CVD epidemic and consequences for the future. Prevention of CVD should take a multidisciplinary, multifactorial, and societal approach including strategies to improve health literacy, empowerment, self-care management, and environmental adaptations.

The burden of cardiovascular disease across Europe

The purpose of this section is to describe the health burden caused by CVD to society in Europe using different data sources. Reports from authorities dealing with the burden of CVD are available particularly from the European Society of Cardiology (ESC),¹ the European Heart Network,² the World Health Organization (WHO),³ and the Global Burden of Disease (GBD) study group.⁴

Comparisons of these results are not always possible because the data are not harmonized from the outset; results are also presented for sets of different countries, for example, all or some of the 53 member states of the WHO's European Region, of the 28 European Union (EU) member states, and of the 56 ESC member countries. Mortality statistics are mainly based on official data with limitations regarding the quality of the data, including cause of death certification. Results on morbidity from the GBD study have been estimated by modelling surveillance data and results from surveys and from hospital records, all of which also have limitations in terms of validity and precision. Clearly, standardization across Europe of definitions, data collection methods, and validation procedures is required, with an emphasis on real data to reduce the need for estimates and modelling.

Historical background

The epidemic of CVD is a dramatic story in its own right. It started with alarming rises in CVD mortality rates in Western countries after the Second World War, resulting in a warning by the Executive Board of the WHO in 1969: 'Mankind's greatest epidemic: coronary heart disease has reached enormous proportions striking more and more at younger subjects. It will result in coming years in the greatest epidemic mankind has faced unless we are able to reverse the trend by concentrated research into its cause and prevention.' In the absence of precise and valid statistics it was difficult to understand the epidemic. This was the background of the world's largest epidemiological study ever conducted of heart disease, stroke, risk factors, and population trends: the Multinational MONitoring of Trends and Determinants of CARdiovascular Disease (MONICA) Project⁵. During the 1980s and 1990s, the attack rates of acute myocardial infarction (AMI) were registered in communities across four continents during a 10-year period using a standardized protocol. In people aged 35–64 years, large differences in attack rates of AMI were observed as well as large differences in changes

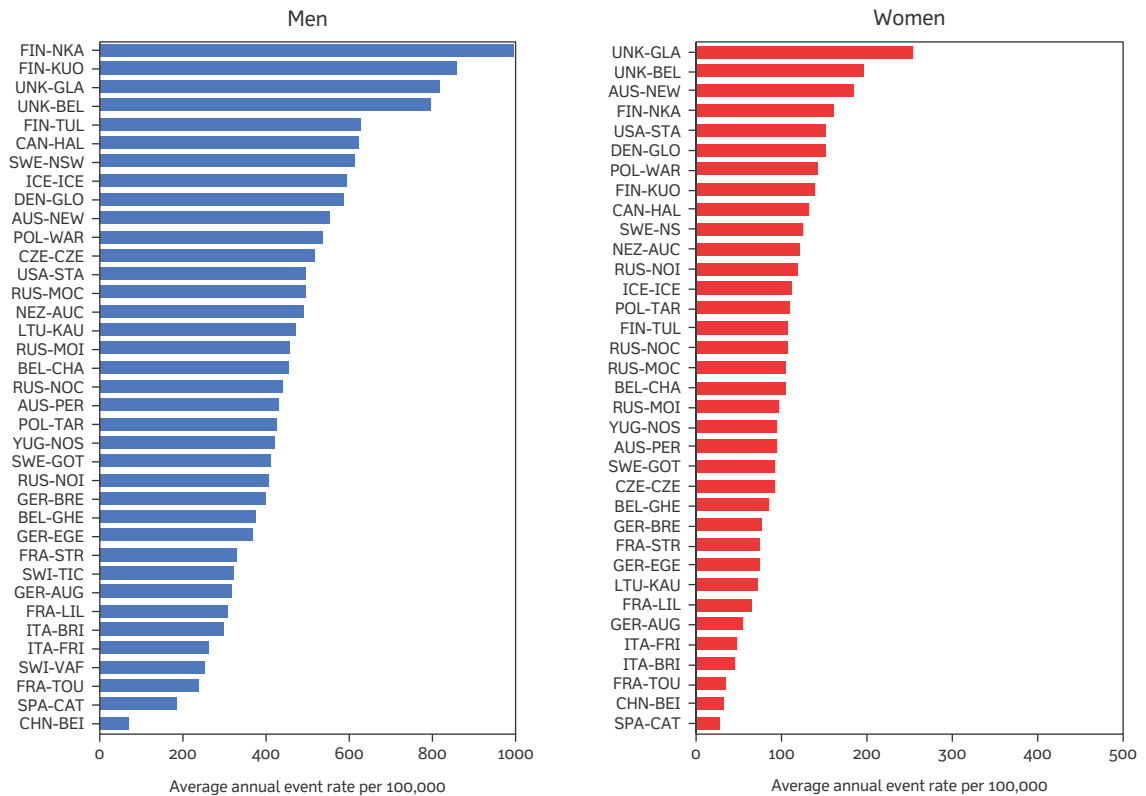


Fig. 1.1 Average annual age-standardized event rates of AMI per 100,000, for men and women aged 35–64 years, based on observations during the first 3 years of registration in the mid-1980s (see reference⁵ for the precise years and the identification of the communities).

Source data from Tunstall-Pedoe H. MONICA. Monograph and multimedia sourcebook: world's largest study of heart disease, stroke, risk factors, and population trends 1979–2002. Geneva: World Health Organization; 2003.

of these attack rates over time; this is illustrated in ► **Fig. 1.1** and ► **Fig. 1.2**.

These results and others clearly illustrate the dynamics of the epidemic of CVD in the last decades of the twentieth century, confirming the trends seen in official mortality statistics and illustrating large differences between communities and over time. The results also showed that temporal changes in attack rates of AMI varied by region within countries, for instance, in Belgium, where a significant difference in attack rate of AMI and in temporal change was observed between the populations of Ghent and Charleroi, two cities 100 km apart in which the same healthcare system is operational (see ► **Fig. 1.1** and ► **Fig. 1.2** comparing BEL-GHE with BEL-CHA). The overall conclusion of the MONICA Project was that changes in cardiovascular risk factors explain partly the variation in population trends in coronary heart disease⁶ and that

changes in coronary care and secondary prevention were strongly linked with declining coronary endpoints.⁷

Cardiovascular disease mortality

CVD is still a major cause of total mortality in Europe, accounting for 45% of all deaths in Europe as a whole (40% in men and 49% in women) and 37% of total mortality in the EU (34% in men and 40% in women).² Results from the ESC Atlas of Cardiology demonstrate important inequalities, with CVD deaths accounting for more than 50% of all deaths in some countries compared with less than 30% in others.¹ Although the annual number of deaths from CVD has declined in some high-income Western European countries between 1990 and 2013, globally in Europe more and more people are dying from CVD. This is mainly due to the demographic growth and the ageing of

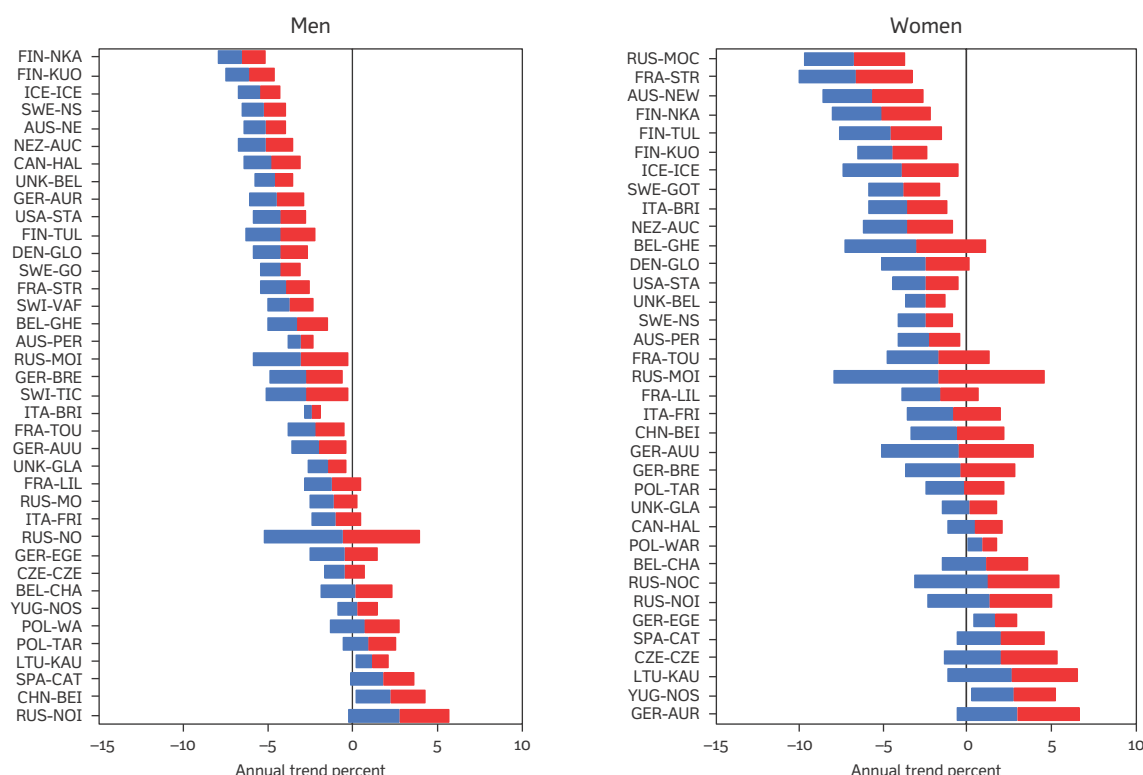


Fig. 1.2 Average annual change from the mid-1980s to the mid-1990s in age-standardized attack rates of AMI in per cent, for men and women aged 35–64 years at baseline. The horizontal bars represent the annual trend in per cent and the 95% confidence intervals. Declining trends are shown to the left of the zero line, increasing trends to the right (see reference (5) for the precise years and the identification of the communities).

Source data from Tunstall-Pedoe H. MONICA. Monograph and multimedia sourcebook: world's largest study of heart disease, stroke, risk factors, and population trends 1979–2002. Geneva: World Health Organization; 2003.

populations—more women than men ultimately die from CVD, particularly from stroke, and this also has to do with their longer life expectancy. These results should warn us that the burden of CVD will remain a major challenge as the European population grows and ages.

The rise in the absolute number of people dying from CVD is in sharp contrast with the significant decline that has been observed in age-adjusted CVD mortality rates in many European countries. This steep decline in age-adjusted CVD mortality rates had already started from the early 1970s onwards in some high-income countries in Europe; a similar but delayed pattern is now observed from the beginning of this century in other mainly Central and Eastern European countries. However, recent statistics suggest that the decline in CVD mortality among adults in some countries in past decades is now plateauing, especially in young adults.^{8–11}

In 2014, age-standardized mortality rates from coronary heart disease across ESC member countries were 214 and 384 per 100,000 in women and men, respectively. The variation between countries is huge with rates greater than 500 and greater than 800 per 100,000 in women and men, respectively, in Belarus, Kyrgyzstan, Republic of Moldova, the Russian Federation, and Ukraine compared with less than 60 and less than 120 per 100,000 in women and men, respectively, in France, Luxembourg, the Netherlands, Portugal, and Spain.¹ Age-standardized mortality rates for stroke are less different between the sexes but large differences are also present between countries.

Temporal changes between 1985 and 2014 in 38 ESC member countries reveal a decline in the age-standardized mortality rate for CVD from 374 to 209 deaths per 100,000 in women and from 586 to 339 per 100,000 in men. This decline was observed in both high-income and

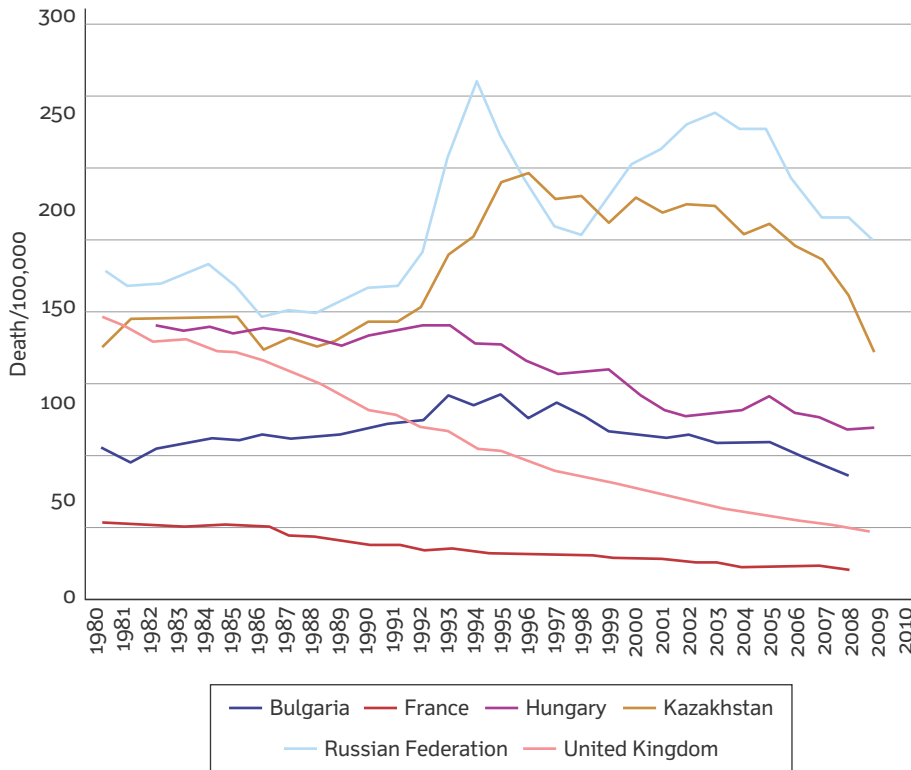


Fig. 1.3 Time trends in coronary heart disease mortality, men under 65 years.

middle-income countries but large differences existed at the national level.¹

In summary, CVD and coronary heart disease mortality peaked in Western Europe in the 1960s. From then on, the gradient changed from South–North to West–East, with Eastern Europe peaking in the 1980s and 1990s. In ► **Fig. 1.3** and ► **Fig. 1.4**, time trends in coronary heart disease mortality are presented for men and women, respectively, aged less than 65 years from 1980 to 2010 in a few selected countries. It should be appreciated that showing coronary heart disease mortality in people younger than 65 years may be misleading because an apparent decline may reflect a transfer of events to older ages, and the total burden of CVD may still increase. Furthermore, as outlined later, a reducing CVD case fatality rate may conceal the true disease burden, as more people live with CVD as a chronic disease.

The causes of declines in coronary heart disease mortality have been explored by Simon Capewell through a technique known as IMPACT modelling.¹² In general, over half of the observed declines relate to changes in major risk factors, notably smoking, elevated blood pressure

and cholesterol (mainly reflecting diet), and under half to treatments; in ► **Fig. 1.5**, the percentages of the decrease in deaths from coronary heart disease attributed to treatments and to risk factor changes are presented based on studies using the IMPACT model and others.¹³

Premature cardiovascular disease mortality

Although around two-thirds of all CVD deaths in Europe occur in people aged over 75, approximately 1.3 million people die annually of CVD before that age, which can be considered as premature mortality. This is a serious burden to society not only at the level of the individual patient but also from a socioeconomic perspective. It is also assumed that a large proportion of these premature CVD deaths can be prevented by lifestyle adaptations and an optimal control of CVD risk factors.

In Europe, these premature CVD deaths are responsible for 35% of all deaths before the age of 75 years; in some high-income countries, cancer has now taken over the lead as a cause of premature mortality. In contrast to CVD

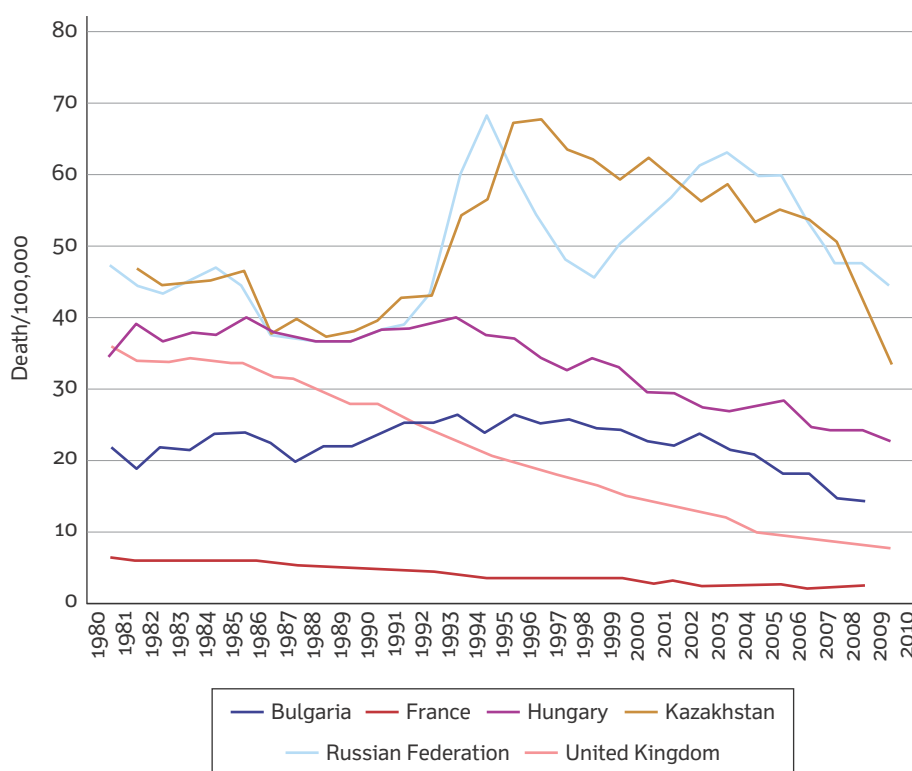


Fig. 1.4 Time trends in coronary heart disease mortality, women under 65 years.

mortality at all ages, less women than men died prematurely from CVD in the ESC member countries.¹

Morbidity

Given the significant decline of the case fatality due to CVD, the most recent CVD mortality statistics no longer reflect the real burden of disease in absolute number. Statistics on the morbidity of CVD are, however, less available or less comparable between countries because of differences in defining and ascertaining morbidity. Some results are presented here on the incidence and the prevalence of CVD, on disability-adjusted life years (DALYs) lost due to CVD, and on hospitalizations for CVD.

Incidence

The incidence of CVD gives the number of new cases that occur within a given time period, such as 1 year. Estimates from the GBD database show that in 2015 the annual incidence of CVD was more than 11 million new cases in Europe as a whole,² 5.4 million in men and

5.8 million in women. One-half of all new cases was due to ischaemic heart disease, slightly more in men than in women; stroke accounted for 14% of all new cases, somewhat more in women than in men. In the EU, the annual incidence of CVD in 2015 was estimated at 6 million new cases.

Results from the ESC Atlas of Cardiology² reveal that CVD in ESC member countries increased from 1990 to 2015 in high- and middle-income countries, respectively, by 11% and 22% in women and by 17% and 26% in men.

Prevalence

The prevalence of CVD refers to the number of people who are currently living with CVD in the population. Based on GBD data, it was estimated that, in 2015, 85 million people out of the 831 million inhabitants in the 53 countries of the WHO's European region lived with CVD; of these 85 million, almost 49 million lived in the EU.¹⁴ According to GBD data, there were approximately 83.5 million people living with CVD in the ESC member countries in 2015.¹

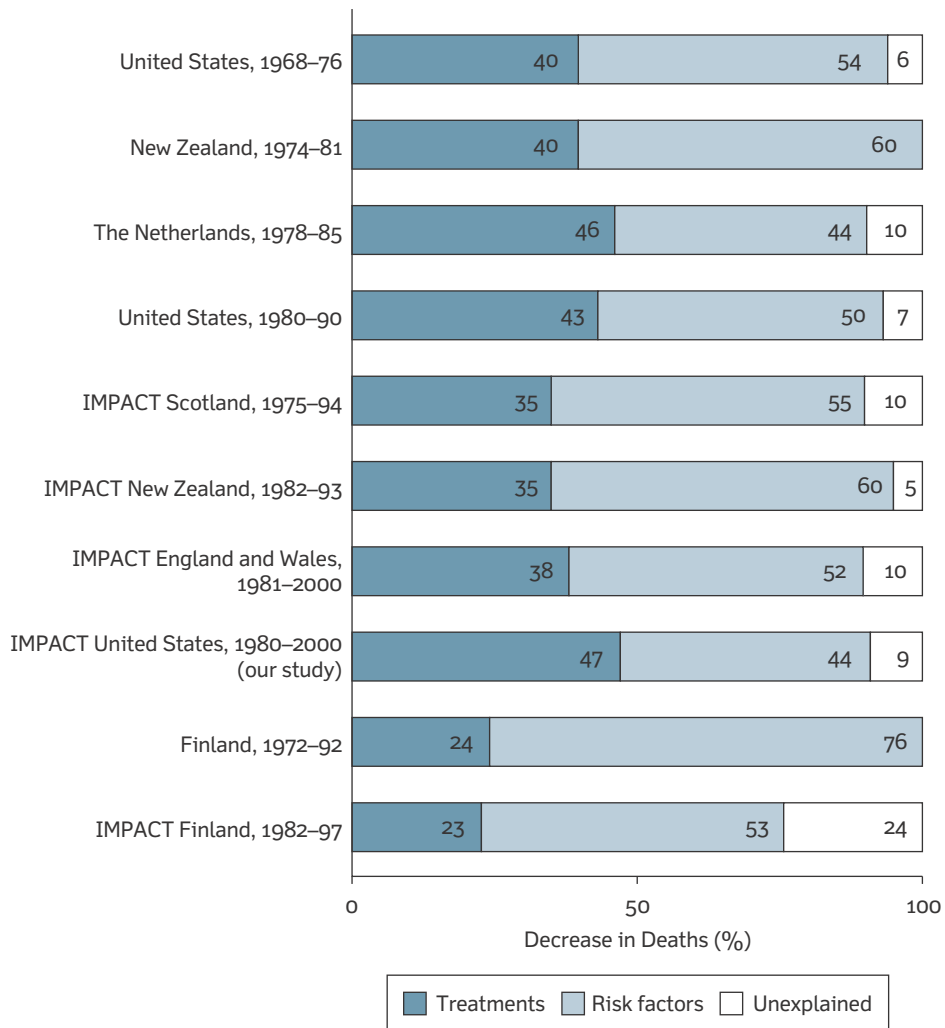


Fig. 1.5 Illustration of IMPACT modelling estimates of the proportionate causes of declines in coronary heart disease mortality. Percentages of the decrease in deaths from coronary heart disease attributed to treatments and risk factor changes. See original study for references.¹²

Age-standardized prevalence rates of CVD were higher in men compared to women and were higher in Central and Eastern Europe compared with Northern, Western, and Southern Europe.

Over the past 25 years, the absolute number of patients with CVD increased in Europe by 34% in men and by 29% in women; in the EU, the respective rise was 32% in men and 26% in women.

The age-standardized prevalence rates decreased slightly over the same time period in Europe: with a relative reduction of 9% in men and 5% in women with, however,

large differences between countries such as –16.6% in men in Germany compared to +4% in men in Belarus.²

Disability-adjusted life years lost due to CVD

DALYs may be among the most appropriate quantitative indicators of how effective preventive and therapeutic strategies are in reducing the CVD burden. A DALY can be thought of as one lost year of 'healthy' life. DALYs lost due to CVD encompass both premature CVD deaths and physical and psychosocial disabilities caused by living with

CVD. The sum of DALYs lost due to CVD can be thought of as an indicator of the gap between the actual health status of a population and the optimal health situation where all people live to an advanced age in good health, free of CVD.

According to GBD data,⁴ in 2015, DALYs lost due to CVD in women and men across ESC member states accounted for a total of 8 million and 36 million years lost, respectively, which corresponded to 22% and 24% of all DALYs lost. In Europe as a whole, it was estimated that 64 million DALYs were lost due to CVD, representing 23% of all DALYs; in the EU, that figure was 26 million, representing 19% of all DALYs.²

The rates of DALYs from CVD are generally higher in Central and Eastern Europe than in Northern, Southern, and Western Europe.² To illustrate the variation between countries, results of crude rates of WHO estimates for the number of DALYs lost due to CVD per 1000 population in a few European countries are presented in ► **Table 1.1**.¹⁵ In both sexes, the numbers differ between countries by a factor of four to five.

Between 1990 and 2015, a reduction in mean age-standardized rates of DALYs from CVD per 100,000 lost to CVD was observed across ESC member states in both women (from 5759 to 3451) and men (from 9764 to 6326). There was also in 2015 a clear difference in age-standardized rates of DALYs from ischaemic heart disease per 100,000 lost to ischaemic heart disease between high-income ESC member countries (1004 and 2407 in women and men, respectively) compared with middle-income ESC member countries (2715 and 5977 in women and men, respectively). Broadly speaking, there is a West–East gradient, as with CVD mortality.

Hospitalizations

Another indicator of the burden of CVD morbidity is the hospitalization rate for cardiovascular conditions. The WHO European Hospital Mortality database for 31 European countries provides admission rates for CVD per 1000 population.¹⁶

The admission rate was 30% higher in men than in women, in particular for AMI admissions. Between countries, significant differences in admission rates existed but no geographical pattern appeared; these differences may reflect both differences in the severity of CVD burden and in the access to healthcare systems. As an illustration, results of hospitalization admission rates are given in ► **Table 1.2** for CVD, AMI, and heart failure for the years 2011 or 2012 in some European countries.

Table 1.1 Estimated DALYs lost due to CVD per 1000 population in some European countries, 2012

Country	All, n/1000	Men, n/1000	Women, n/1000
France	40	44	36
Switzerland	41	44	37
UK	46	53	39
Sweden	55	60	50
Belgium	51	56	46
Italy	54	57	51
Finland	63	76	51
Germany	67	72	62
Czech Republic	85	94	76
Poland	90	106	74
Croatia	95	102	87
Romania	125	139	111
Latvia	153	177	134
Bulgaria	167	187	149
Russian Federation	181	217	150
Ukraine	194	214	177

Source data from World Health Organization. Health Statistics and Information Systems. http://www.who.int/healthinfo/global_burden_disease.

Economic burden of cardiovascular disease

The burden of CVD can also be expressed in economic terms. The estimated cost to the EU economy is €210 billion per year; around 53% (€111 billion) is due to healthcare costs, 26% (€54 billion) to productivity losses, and 21% (€45 billion) to the informal care of people with CVD² (<http://www.ehnheart.org/cvd-statistics/cvd-statistics-2017.html>). Approximately 28% of the overall costs of CVD is related to coronary heart disease and 20% to stroke. The costs of CVD are responsible for 8% of the total healthcare expenditure in Europe, varying

Table 1.2 Hospital inpatient admission rates per 1000 population for CVD, AMI, and heart failure, 2011–2012, by country

Country	CVD, n/1000	AMI, n/1000	Heart failure, n/1000
Ireland	14.0	1.9	1.4
Spain	14.5	1.6	2.2
UK	14.7	1.8	1.3
The Netherlands	19.5	2.4	1.8
Switzerland	21.5	3.2	2.0
France	23.9	1.6	3.3
Czech Republic	30.7	2.6	3.9
Hungary	35.5	2.4	3.7
Austria	40.0	2.5	2.9
Germany	40.3	3.8	4.6
Lithuania	45.4	4.1	4.6

Source data from World Health Organization. Health Statistics and Information Systems. http://www.who.int/healthinfo/global_burden_disease.

from 3% to 19% between countries. In 2015, the costs per capita were €218,000 in Europe as a whole varying from €48,000 to €365,000 between countries.²

Summary

- Statistics from different databases show that CVD remains a major cause of death, accounting for 45% of all deaths in Europe and 37% of total mortality in the EU.
- There still exist important inequalities in CVD mortality with deaths from AMI and stroke being on average higher in Central and Eastern Europe compared to Northern, Southern, and Western European countries.
- Age-adjusted CVD mortality rates started to decline in the 1970s in some high-income countries in Europe and have also been falling since the beginning of this century in middle-income European countries. This decline is, however, plateauing in young adults in some countries of the world.

- The CVD burden remains a major challenge when absolute numbers are considered: the annual incidence is estimated at 11 million new cases of CVD in Europe and 6 million new cases in the EU. In 2015, more than 85 million people were living with CVD in Europe.
- Although mean age-standardized rates of DALYs from CVD have been reduced across ESC member states, CVD was responsible for 8 and 36 million years lost in women and men, respectively, in 2015, accounting for 22% and 24% of all DALYs lost.
- Regarding costs to the EU economy, it is estimated that CVD costs approximately €210 billion per year.

Cardiovascular risk across the lifespan

Introduction

From an early era, mankind has been searching for ways of predicting the future. In the health arena, the focus has been on identifying risk factors for the development of future avoidable health-threatening events. A risk factor is something that is likely to increase the chances that a particular event will occur,¹⁷ thus increasing the likelihood of developing a disease. This term was coined in 1961 by Dr Thomas R. Dawber of the Framingham Heart Study which led to the identification of the major CVD risk factors, most of which are modifiable, suggesting the possibility of intervention for prevention.¹⁸

The atherosclerosis associated with CVD starts in early childhood and develops slowly, but at a variable rate, over many years. While age is sometimes considered as a risk factor, it is really just a measure of exposure time. Starting with a variable genetic predisposition, the rate of progression is then modified by the intensity of lifestyle, environmental, and biochemical risk factors. This forms the basis of preventive strategies.

While certain genetic conditions such as familial hypercholesterolaemia may be associated with aggressive CVD, in most people, the rate of increase in low-density lipoprotein cholesterol and blood pressure may be determined by multiple mutations or polymorphisms which, individually, have a small effect. These may have a very modest effect on 5-year risk but, because they operate from birth, their effect on true lifetime risk may have been underappreciated. This has been supported by Mendelian randomization studies¹⁹ which provide evidence that

low-density lipoprotein cholesterol and raised blood pressure are (1) truly causal and (2) that their rate of rise is genetically determined, although of course modified by conventional risk factors over the years. As will be noted in the later section on the future of risk estimation, this raises the possibility of identifying young people and families in whom lifestyle measures to reduce risk are particularly important.

Cardiovascular disease risk estimation: overview and use in clinical practice

The role of risk estimation

The integrated approach to estimating the cardiovascular risk of an individual is based on the concept that classic risk factors (age, sex, abnormal lipids, smoking, hypertension, diabetes) have a combined effect on cardiovascular risk which may be stronger than the isolated effect of each one of them. The INTERHEART study²⁰ found that in different regions of the world these factors (including also abdominal obesity, psychosocial factors, consumption of fruits, vegetables, alcohol, and regular physical activity) accounted for 90.4% of the population-attributable risk for myocardial infarction, and the risk increased exponentially when they clustered. However, the incidence of coronary heart disease, atherosclerotic CVD, and the burden of risk of each risk factor (attributable risk) differ significantly among populations.^{21,22} The preventive role of nurses is intimately linked to knowing the attributable risk of these factors, estimating the patient's risk of developing CVD or dying from it (using an appropriate tool), and working with the health team and the patient in their shared decision-making on how to adopt measures to mitigate the effect of modifiable cardiovascular risk factors.^{23–25}

Absolute, total, or global cardiovascular risk is defined as the probability of developing coronary disease or other CVD in a determined period of time, generally 5–10 years. Based on the weight of each risk factor in a given population, the sum of all these in an arithmetic equation aims to estimate an individual's risk of suffering a cardiovascular event as low, intermediate, or high.²⁶ Correct risk stratification is crucial for adequate risk management to improve outcomes. It supports guideline recommendations about treatment priorities, initiation or adjustment of medication, lifestyle modification, and resource allocation and aims to avoid

over- or undertreatment in individuals with low or high risk respectively.^{26–29}

Relative risk compares the possibility of suffering a cardiovascular event in a person with risk factors compared to one without.³⁰ At individual level, risk models help to educate and motivate people to introduce lifestyle changes and to improve their treatment adherence to achieve risk reduction,^{23,28,31} including those whose short-term risk is low or moderate, mainly due to their young age.^{32,33} Nurses can help people understand the effect of a particular risk behaviour by reviewing the relative risk of that factor; that is, how its modification can impact the future risk of suffering a cardiovascular event. For example, a woman aged 65 years with normal total cholesterol and systolic blood pressure but who smokes, can reduce her chance of a fatal cardiovascular event by 40–50% in the next 10 years if she stops smoking. There are several examples of nurse-delivered cardiovascular risk management, tailored to risk estimation and raising awareness strategies, as nurses are increasingly undertaking this task worldwide.^{30,31,34,35}

Risk estimation equations

One of the first risk estimation tools was the Framingham equation³⁶ that includes risk factors, previously identified as objectively, strongly, and independently related to coronary heart disease, using logistic and parametric regression models. These risk factors were measured at a baseline examination of a healthy cohort who were followed up for 10 years or more, with ascertainment of cardiovascular events. From these data, a baseline risk was derived and then beta-coefficients (in effect multipliers) calculated using Cox or Weibull methods to estimate the effects of rising levels of individual risk factors. This model is the baseline for the majority of the risk stratification instruments developed worldwide, such as the European risk charts³⁷, the Systematic COronary Risk Evaluation (SCORE) project (38) the revised WHO CVD risk charts³⁹, the American College of Cardiology/American Heart Association 2013 pooled cohort risk equations⁴⁰ and, more recently, the SCORE2 and SCORE2-OP risk charts.^{41,42}

It is nowadays usual to model stroke and coronary heart disease risks separately because the proportions may vary (proportionately more strokes in low-risk countries) and regional differences in risk are also shown between the sexes. The effect of age should be allowed to vary; absolute

risk increases with age but relative risk reduces and the use of a constant beta-coefficient may overestimate risk in older people.

Over the past three decades, many risk algorithms have been developed or adapted, after realizing that the initial instruments may under- or overestimate risk when applied to a different population.^{43–45} In 2008, Beswick et al. identified more than a hundred prognostic models for cardiovascular primary prevention.⁴⁶ Therefore, in order to use risk equations, they need to be properly adapted, according to specific epidemiological data, and their predictive value must be validated accordingly. External validation is an essential step in the development of risk prediction models. This process evaluates and demonstrates the applicability and transportability of this model from the original cohort from whom it was constructed (derivation cohort) so they could be reliably used in a different cohort.⁴⁷ Validation requires a cohort with enough statistical power and evaluates two main attributes of the equation: *calibration*, the ability to predict the risk of suffering an event by comparing the observed versus predicted events, and *discrimination*, the ability to identify individuals according to their risk (high–intermediate–low) of developing an event in a certain period of time. According to findings, recalibration methods are defined and reclassification of individuals may be performed.^{48–50}

► **Table 1.3** summarizes the key points of the validation process. In internal validation, the model is tested against a random subsample of the cohort from which the model

was derived but this may be more a test of the mathematics than of the actual performance. An external validation is clearly preferable, in which the model is tested against a well-defined different cohort.

Although the importance of validation of risk instruments is strongly advised, it is frequently not performed. Collins et al. conducted a systematic review of articles, which describes the evaluation of 120 prediction models.⁵¹ They evidenced poorly reported key details such as calibration, inappropriate designs, and lack of acknowledgement of missing data—all crucial performance measures of prediction models. Explicit guidelines for the validation of these instruments have not yet been developed, and it is apparent that no tool is perfect. Nevertheless, understanding the multivariate properties of these stratification models and appreciating their inherent limitations could improve a more accurate recognition of patients, especially on both sides of the spectrum: high and low risk.^{52–54}

Even though CVD risk estimation is recommended due to the conviction that it can play an important role in therapeutic decisions of individuals and populations when used properly, recent studies have found that in Europe risk assessment is not always performed to guide clinical practice.⁵⁵ Risk equations have little value if they are not used by clinicians on a daily basis.⁵⁶ Lack of time, disdain of prediction rules, and multiplicity of risk models with unclear knowledge of the best choice are some of the reasons to not routinely apply risk prediction tools.²⁶

Table 1.3 Definitions of CVD risk score terminology

Discrimination	The ability to identify who will and who will not develop CVD <i>Components of discrimination</i> 1. Sensitivity: percentage of individuals who developed CVD and were identified correctly 2. Specificity: percentage who did <i>not</i> develop CVD and were identified correctly 3. Area under the curve (AUC): a way of expressing the maximum achievable sensitivity and specificity 4. Positive predictive value: percentage above a certain score (cut-point) who actually develop CVD 5. Negative predictive value: percentage below a certain score (cut-point) who remain disease free
Calibration	Goodness of fit; the extent to which predicted and actual cases coincide
Net Reclassification Index	The percentage of individuals who move to a higher or lower risk category when a new risk factor is added to the equation

The 2021 European guidelines on CVD prevention in clinical practice address some of these points.²⁸ The guidelines review the advantages and limitations of risk charts, compare usefulness of lifetime versus 10-year cardiovascular risk estimation tools, and thoroughly analyse the role of other factors not included in the standard tools (modifiers and biomarkers).

Certain people are at high or very high risk and do not require a risk scoring system but rather immediate attention to all risk factors. These include people with known CVD, most diabetics, and patients with moderate to severe chronic kidney disease. Risk scoring systems such as SCORE2 and SCORE2-OP are for use specifically in people who are apparently healthy, that is, in a primary prevention setting. ► **Table 1.4** summarizes the current European recommendations on risk assessment.²⁸

A recent report (2019) from the European Association of Preventive Cardiology in collaboration with the Acute Cardiovascular Care Association and the Association of Cardiovascular Nursing and Allied Professions about risk prediction tools in CVD prevention has been released.²⁶ It presents a summary of available tools, aiming to aid

the clinicians ‘to choose the right tool for the right patient’, highlighting aspects to consider for different populations (i.e. younger or older adults, ethnic minorities, immigrants, and geographic regions), taking into account several considerations for selecting prediction tools. It also recommends the use of prediction algorithms for different patient categories, at the U-Prevent website (<https://u-prevent.com/>). It should be noted that some of the algorithms on this website require further validation studies.

The role of risk modifiers and biomarkers in CVD risk estimation

Despite the broad spectrum of available instruments and the recommendation for more specific use, it is widely acknowledged that risk algorithms have their own limitations.^{26,29} Most of the score models are based on observations from many years ago, and epidemiological data have been shown to be very dynamic with rising or falling incidences of CVD compared with baseline data.²⁹ Moreover, cardiovascular risk factor profiles also vary, leading to changes in their attributable

Table 1.4 Recommendations for CVD risk assessment

Recommendations	Class ^a	Level ^b
Systematic global CVD risk assessment is recommended in individuals with any major vascular risk factor (i.e. family history of premature CVD, FH, CVD risk factors such as smoking, arterial hypertension, DM, raised lipid level, obesity, or comorbidities increasing CVD risk).	I	C
Systematic or opportunistic CV risk assessment in the general population in men >40 years of age and in women >50 years of age or postmenopausal with no known ASCVD risk factors may be considered.	IIb	C
In those individuals who have undergone CVD risk assessment in the context of opportunistic screening, a repetition of screening after 5 years (or sooner if risk was close to treatment thresholds) may be considered.	IIb	C
Opportunistic screening of BP in adults at risk for the development of hypertension, such as those who are overweight or with a known family history of hypertension, should be considered	Ila	B
Systematic CVD risk assessment in men <40 years of age and women <50 years of age with no known CV risk factors is not recommended.	III	C

ASCVD = atherosclerotic cardiovascular disease; BP = blood pressure; CV = cardiovascular; CVD = cardiovascular disease; DM = diabetes mellitus; FH = familial hypercholesterolaemia.

^a Class of recommendation.

^b Level of evidence.

risk, affecting their weight in risk equations.^{57,58} Such secular changes can be dealt with by recalibration using updated mortality and risk factor information. Recalibration is also possible for non-fatal events but is methodologically much more challenging. HeartScore, the electronic version of SCORE, contains recalibrated charts for many European countries ([https:// www.heartscore.org/](https://www.heartscore.org/)).

In the continuous search to refine the predictive ability of risk stratification instruments, several studies have been conducted⁵⁹ to include in these tools other factors that have demonstrated a strong and independent association with the chance of developing CVD, such as elevated high-sensitivity C-reactive protein (hsCRP), low ankle–brachial index, elevated apolipoprotein B, and family history of premature atherosclerotic CVD.⁶⁰ However, their addition to the models have not resulted in improvement in their discrimination, probably because they have been measured with methods that are useful but not sufficient (area under the ROC curve, c-statistic) or the lack of understanding, for example, of the complex genetic basis of CVD.^{56,59–62}

Several investigators have been testing new methods that may reclassify risk when adding other risk markers to a prediction model, such as the net reclassification index developed by Pencina et al.,⁶³ but their utility is still to be demonstrated.^{58,59,62} In practice, adding more factors to a risk equation may only make it more complex (limiting also its use in countries with limited resources). Instead, they propose to take them into account as complementary information to assist clinical judgement, especially in those individuals at intermediate risk or near a threshold of risk stratification between two categories.^{29,56,60,62}

Cardiovascular risk modifiers, including biomarkers, are comorbid conditions or markers not routinely screened but with the potential of providing additional prognostic guidance.^{29,60} The most recommended additional factors that improve or modify risk estimation, and whose assessment is feasible in daily practice, are physical activity, socioeconomic status, social isolation or lack of social support, family history of premature CVD, body mass index and central obesity, coronary artery calcium score, other lipids as triglycerides or apolipoprotein B, ankle–brachial blood pressure index, and carotid ultrasonography.^{28,29,60} In comparative studies of markers of subclinical atherosclerosis, the coronary artery calcium score has shown the best reclassification ability in

intermediate risk, even at extreme ages (≤ 45 years, ≥ 75 years).^{28,29,60}

Regardless of the risk group classification, and the use of modifiers to refine risk stratification, nurses must be aware of the importance of taking a detailed personal and family history.⁶⁴ Moreover, medical history is the first factor to determine the most suitable risk assessment tool.²⁶ Monitoring and appropriately treating severe isolated risk factors as dyslipidaemia, diabetes, or hypertension and encouraging lifestyle changes in the presence of inactivity, smoking, obesity, or unhealthy eating habits such as salt and saturated fat intake, must be the core of nurse-led management. Also, routine reassessment of cardiovascular risk factors, and cardiovascular risk stratification, will ensure optimal risk factor management across the lifespan.⁶⁵

In summary, global risk calculation has been considered, for almost two decades, the best tool for comprehensive cardiovascular primary prevention, aiding in the establishment of health priorities, to deal with the risk of developing atherosclerotic CVD.^{27,37,43} Recent reports and guidelines from several interdisciplinary task forces, including nursing,^{26,27} continue to identify as a crucial component of effective action the identification of individuals at high risk of suffering a cardiovascular event. To prevent death and morbidity from CVD, the guidelines highlight the importance of identifying asymptomatic patients who would be candidates for more intensive, evidence-based medical interventions that reduce CVD risk. This remains a major public health challenge as a significant number of events occur in the apparently healthy population, and young individuals with severe isolated risk factors are usually classified as being at intermediate risk using standard risk equations.²⁹

Nurses must be aware of epidemiological considerations, including the burden of risk factors and the particular incidence of CVD in their target population, as well as select the appropriate risk estimation tool, reviewing their validation process to judge and estimate how useful a certain model is for their own clinical practice and considering additional valuable data enabling individual tailored risk management.

Finally, it is important to highlight that not only primary prevention of CVD requires risk estimation to guide evidence-based management. Patients with other cardiovascular-specific pathologies or risk factors, not always included in the estimation equations, may benefit

from the use of specific risk tools. For example, for patients with diabetes, there is the ADVANCE risk engine⁶⁶ or the DIAL model⁶⁷; for patients with a vascular disease history, the SMART (which is in the process of recalibration)⁶⁸ and SMART-REACH models⁶⁹ are available; for patients with coronary artery disease the EUROASPIRE risk model estimates 2-year risk of recurrent CVD⁷⁰ and for patients with heart failure, the MAGGIC risk calculator⁷¹ or the Seattle heart failure model⁷² are proposed. The U-Prevent website, recommended by current guidelines,²⁶ includes these and other algorithms for different patient categories.

Cardiovascular risk estimation in special populations

Introduction

In recent years, challenges in cardiovascular risk estimation efforts have included not only how to address it in different regions or countries, but also how to estimate it in different vulnerable groups more accurately, such as children and adolescents, young adults, older adults, and immigrants, and how other factors, such as social status or literacy, may influence expected outcomes.

Also, some comorbidities are relevant for CVD management, either because they share risk factors or because some processes or treatments inherent to the pathology increase the cardiovascular risk. Some examples are chronic kidney disease,⁷³ inflammatory arthritis,³⁵ cancer treatments,^{28,74} especially breast cancer patients who receive highly cardiotoxic treatments leading to heart failure incidence rates of up to 30%⁷⁵ and an increased CVD mortality risk exceeding their breast cancer mortality risk,⁷⁶ and HIV patients with increased survival, due to more effective and widespread treatment,⁷⁷ in whom a recent meta-analysis found a twofold higher AMI risk association with chronic HIV infection.⁷⁸

Cardiovascular risk in children and adolescents

Valid and reliable instruments for prediction of adult-onset CVD based on estimation of risk in childhood and adolescence do not exist. During the past 40 years, however, substantial research attention has focused on factors that contribute to the development and progression of atherosclerotic and hypertensive processes in early life. Results of this research have informed guidelines for assessment

and management of established risk factors for CVD with emphasis on promoting cardiovascular health in childhood and adolescence and reducing risk for incident CVD in adulthood.⁷⁹

Evidence supporting the importance of prevention and management of established risk factors for CVD beginning early in life emanates from basic, clinical, and population-based studies. Autopsy studies have demonstrated that atherosclerotic processes begin in childhood and are associated with the presence of potentially modifiable and non-modifiable risk factors including smoking, obesity, dyslipidaemia, and elevated blood pressure.^{80,81} Tracking of these risk factors from childhood to adulthood has been observed in studies conducted in the US and globally.⁸²⁻⁸⁴ Data from several studies including the Cardiovascular Risk in Young Finns Study link the presence of cardiovascular risk factors in adolescence with indicators of subclinical atherosclerosis in adulthood (e.g. carotid artery intima-media thickness).⁸⁵ In contrast, longitudinal studies have demonstrated that preservation of low levels of cardiovascular risk is associated with less subclinical atherosclerosis in adulthood.⁸⁶⁻⁸⁷ Finally, the prevalence of potentially modifiable risk factors in childhood and adolescence, as documented in population-based studies conducted globally, underscore the importance of prevention beginning early in the life course.^{88,89} Risk factors of particular concern are the prevalence and trends of overweight and obesity, a recognized risk factor for type 2 diabetes mellitus and CVD.

The WHO collaborative, cross-sectional Health Behaviour in School-age Children (HBSC) survey has provided data (estimates) of health behaviours and well-being as well as socioenvironmental factors in children and adolescents in Europe since 1983.⁹⁰ Based on self-reported height and weight, recent HBSC data, consistent with reports from the GBD study, indicate that the prevalence of overweight and obesity among 11-, 13-, and 15-year-olds is high but varies between countries and the sexes.^{91,92} In all three age groups, the reported prevalence was higher in Southern Europe than in Northern Europe. In the GBD study, 24% and 23% of boys and girls, respectively, were either overweight or obese in developed/high-income countries.⁹² The prevalence of overweight and obesity in children and adolescents in developing/low- and middle-income countries also increased substantially from approximately 8% in 1980 to 13% in 2013 for boys and girls.⁹² Since obesity clusters with other established risk factors for CVD in childhood and adolescence, healthcare providers are advised to assess and monitor blood pressure, lipid profile, and insulin

resistance in children and adolescents who present with obesity.⁷⁹

Central to preventing overweight and obesity and promoting cardiovascular health across the life course are lifestyle behaviours, particularly patterns of physical activity and dietary intake. Methodological limitations notwithstanding, data from the WHO and findings from epidemiological studies conducted in Europe provide insight and have been used to guide and inform recommendations for clinical and public health practice, multilevel policies, as well as future research.^{93,94} A recent report from the 2013/2014 HBSC study focused on 29 European countries emphasizes the importance of factors that operate beyond the individual level in acquisition and maintenance of physically active lifestyles.⁹⁵ While WHO and other evidence-based guidelines recommend at least 60 minutes/day of moderate- to vigorous-intensity physical activity for children and adolescents aged 5–17 years, global data support the findings of Weinberg and colleagues and point to the importance of social and environmental determinants of health behaviours and health.⁹⁵ In this recent report from HBSC, substantial variation in activity was observed within countries including within Europe. For example, 40% of 11-year-olds in Finland met WHO guidelines while only 13% of their counterparts in Italy met the recommendations for 60 minutes/day of moderate- to vigorous-intensity physical activity. Relatedly, 76% of Danish 15-year-olds but only 30% of their Albanian counterparts participated in vigorous physical activity outside the school environment for two or more hours per week.⁹⁵ Taken together and consistent with studies conducted in the US,⁹⁶ the findings from this study point to the importance of macro-level factors that operate beyond the level of the individual as key determinants of health behaviours and health. While additional research is needed to explicate the pathways and mechanisms through which these macro-level factors interact with individual characteristics to influence health behaviours and health in children and adolescents, healthcare providers, child health advocates, and other stakeholders are advised to consider these factors in assessing and managing health behaviours and in developing and implementing preventive interventions for children and adolescents.

Establishing and maintaining healthy patterns of dietary intake across the life course are also influenced by macro-level factors, referred to as contexts (e.g. families, schools, communities) in socioecological models of health and development.⁹⁷ In the 2016 HBSC comprehensive report, inequalities in eating behaviours were

documented and attributed to differences in contextual characteristics: children and adolescents from less affluent families were generally more likely to self-report a 'poorer' diet as well as other health behaviours than their more affluent counterparts.⁹¹ Specifically, breakfast and fruit consumption as well as daily evening meals were more common in children and adolescents from higher-affluence families. Daily soft drink consumption, primarily sugar-sweetened beverages, was associated with lower affluence in most countries and regions but was more common among higher-affluence groups in Albania, Armenia, Estonia, the Republic of Moldova, and Romania. A well-established major contributor to overweight and obesity, the reported average daily consumption across all HBSC countries and regions for 13-year-old boys and girls was 21% and 16%, respectively. Consistent with global data, healthy eating behaviours became less common during the school-age/adolescent transition (11–15 years of age). Of note, and well documented globally, time spent being physically active declined during the school-age/adolescent transition particularly among girls. While 30% of 11-year-old boys met the requirement of 60 minutes/day of moderate- to vigorous-intensity physical activity, this decreased to 21% at age 15. A similar trend was observed for girls: 21% of 11-year-old girls met this daily requirement for physical activity while only 11% of 15-year-olds met the requirement.⁹¹

Adding to the importance of adolescence as a critical time for cardiovascular health promotion and preventive interventions are data on tobacco use, the leading cause of preventable death globally. While estimates for early initiation and weekly smoking have declined since the 2009/2010 HBSC survey, both remain high in some countries and regions.⁹¹ The 'average' reported estimates across countries of 15-year-olds who smoke at least once per week was 12% and 11% for boys and girls, respectively. In contrast, in Croatia, 25% and 21% of 15-year-old boys and girls, respectively, reported smoking at least once a week. Of note, and consistent with US data, the prevalence of weekly smoking increased significantly with age (from 11 to 15 years of age) in most of the WHO European Region and was also associated with other adverse health behaviours including high levels of alcohol consumption and unhealthy eating habits.⁹¹

While the HBSC survey provides self-report estimates of health behaviours, patterns and trends over time as well as between and within-country differences in social determinants of health are important considerations. *Investing in Children: The European Child and*

Adolescent Health Strategy 2015–2020 reminds us of these important sociodemographic differences in determinants of health and encourages monitoring and surveillance of health behaviours and indicators of health over time and with efforts focused on obtaining high-quality data.⁹⁸

The guiding principles of this document for European countries that are developing and/or revising child and adolescent health strategies are particularly noteworthy and include adopting a life-course and evidence-informed approach, promoting strong partnerships and intersectoral collaboration, and adopting a rights-based approach.⁹⁸

Since CVD is the major cause of morbidity and premature mortality in most of the European countries, a life-course approach to individual/clinical and population-based primary prevention is particularly noteworthy. This guiding principle is based on the recognition that adult health and disease are rooted in health and experiences in previous stages of the life course and it systematically reflects economic, social, environmental, biomedical, behavioural, and other relevant factors that influence health. Targeted efforts to disrupt negative intergenerational cycles that are created by or contribute to health inequities are also emphasized.⁹⁸ *Investing in Children* outlines efforts designed to enhance the lifestyle behaviours central to cardiovascular health across the life course with particular emphasis on policies that support primordial prevention, preventing the development of established risk factors by developing and maintaining healthy lifestyle behaviours.⁹⁹ Successful adoption and implementation of such policies requires continuing emphasis on evidence-based multisectoral approaches. For example, the WHO European physical activity strategy for 2016–2025 contains priority policies including (but not limited to) adopting national guidelines tailored to the promotion of physical activity among adolescents, improving urban planning and transport infrastructure to promote active transport, creating environments to support physical activity for children and adolescents (free outdoor sport, safe walking and cycling routes), ensuring school curricula include a strong physical education component, and ensuring adolescents with lower affluence or disabilities have easy access to physical activity opportunities.¹⁰⁰

Taken together, the prevalence and trends in CVD-related lifestyle behaviours in children and adolescents in Europe demonstrate some progress towards achieving established goals (e.g. reducing tobacco use). A major

challenge to the health of current and future generations of Europeans is the prevalence and projected trends of overweight/obesity. A major risk factor for CVD in adults, obesity tracks from adolescence to adulthood with approximately 80% of obese adolescents retaining this chronic condition into adulthood. Patterns of physical activity and dietary intake are key components of maintaining energy balance and preventing overweight early in life and across the life course. Clearly, available data support the urgent need for implementation of evidence-based, multidisciplinary, multisectoral preventive interventions, as suggested in *Investing in Children*.⁹⁸ This document emphasizes investing in both individual as well as population-based approaches to prevent and manage overweight/obesity. Investing focused on individuals as well as population-based/public health approaches to prevent and manage overweight/obesity. Nurses and nurse practitioners working within multidisciplinary teams are well prepared and positioned in healthcare and community settings to assess and manage overweight/obesity as part of an integrated profile approach to cardiovascular health promotion and risk reduction for children and adolescents.⁷⁹ As the largest healthcare discipline globally and advocates for the health of the public, nurses and organized nursing societies must participate in targeted country- and region-specific activities designed to allocate resources and increase capacity for life-course ideal cardiovascular health for all peoples of the world.

Risk estimation in young adults (<50 years)

Absolute risk may not be accurate for younger populations as age is a relevant predictor of 10-year risk. Individuals under the age of 50 years will always tend to be classified with low absolute risk even in the presence of a very unfavourable risk factor profile or severely intense isolated factors, with a higher risk of early CVD onset and high risk across their remaining lifespan.^{26,28,56,101} Some suggested strategies to address this are the use of relative risk charts or 'risk age', lifetime risk calculators, or CVD-free life years.^{26,28,56,102}

For example, a 40-year-old man who smokes, has a total cholesterol level of 300 mg/dL (8 mmol/L), and a systolic blood pressure of 160 mmHg has a 3% absolute risk of presenting with a fatal cardiovascular event in the next 10 years. Compared with a 40-year-old man who does not smoke, has a normal total cholesterol level, and normal

systolic blood pressure (whose estimate risk is 0%), his relative risk is three times higher than this second individual, of the same sex and age.

Also, the 40-year-old man with a 3% risk has the same risk as a 60-year-old man who does not smoke, has a normal total cholesterol level, and normal systolic blood pressure (3%). This comparison has been referred to as 'vascular age'.¹⁰¹ In this example, the 40-year-old man with the described burden of risk has the same probability of dying of a cardiovascular event as the healthy 60-year-old man. Communicating lifestyle changes and the importance of adherence to treatment can reduce his relative risk; if he fails to modify his burden of risk factors, he may lose 20 years of CVD-free life.

Lifetime risk calculators aim to estimate the risk of an individual developing CVD at some point in their lifetime.^{54,103} These estimations provide a more comprehensive assessment of the overall burden, because they also take into account competing risks (i.e. death from cancer).¹⁰² Increases in life expectancy have also been taken into account for the need of longer-term risk prediction tools (i.e. 30-year risk).¹⁰⁴ However, these models also have some limitations. The main concerns are that their analyses have been restricted to risk factors measured at a single age (not considering dynamic changes of risk factor levels or treatment) and mainly in predominant populations.¹⁰² In addition, the lack of cut-off points to define risk levels and guidelines for management using these scales have been pointed out.¹⁰¹

There are some modifiers of cardiovascular risk that are more prevalent in younger populations that need to be taken into account, such as substance abuse. Reports from the US national health survey two decades ago evidenced that regular cocaine use was associated with an increased likelihood of non-fatal myocardial infarction in people aged 18–45 years; 25% of these events were attributable to frequent use.¹⁰⁵ Cocaine produces acute effects such as electrocardiographic abnormalities, acute hypertension, arrhythmia, stroke, and AMI, due to coronary artery spasm resulting from adrenergic system stimulation, and long-term use induces cardiomyopathy, endothelial injury, and vascular fibrosis.^{106,107}

In summary, risk estimation in younger adults needs more research⁵⁶ and nursing plays an important role in gathering evidence. Medical and family history (i.e. familial hypercholesterolaemia), lifestyle, behaviours, and modifiers must be thoroughly analysed. Estimation of the impact of risk factors, through relative risk, lifetime

risk, or other similar approaches, is recommended. The information obtained regarding a predicted risk must translate into meaningful actions and sharing it with the patient raises awareness, increases self-motivation, and enables shared decision-making when setting realistic goals.²⁶

Risk estimation in older people

Age is a measure of exposure time rather than being a risk factor as such, and older people with even modest risk factor levels may be at high risk with the possibility of overmedication. Several specific considerations apply to CVD risk estimation in older people. These have been addressed in the 2021 ESC Guidelines on CVD prevention in clinical practice²⁸ and the SCORE2-OP algorithm was specifically developed to estimate 10-year fatal and non-fatal CVD events adjusted for competing risk in apparently healthy people aged ≥ 70 yrs.⁴²

Risk estimation in ethnic minorities and immigrants

Migration between countries is increasingly growing, especially in Europe, Asia, and North America.¹⁰⁸ According to the European Commission, 22.3 million non-EU citizens were living in the EU on 1 January 2018, representing 4.4% of the EU population; the main regions of origin are India, China, North Africa, and Pakistan.¹⁰⁹

Ethnic differences in the prevalence of cardiovascular risk factors are well documented in the literature: genetic background, lifestyle, environmental factors, cultural and religious habits, awareness, and the way people perceive and cope with illness and disease influence cardiovascular health.^{26,108,110} Therefore, the profile of burden of risk differs among immigrant populations.¹¹¹ For example, South Asians have a higher prevalence of diabetes and hypertension whereas white populations have a higher prevalence of smoking and obesity. On the other hand, Chinese and South Americans have a lower overall CVD risk.^{28,108,112}

However, evidence suggests that CVD risk profiles change after a residence time, with ethnic-specific temporal trends: declination in cardiovascular health over time, or with significative differences when compared with second-generation (born in host country) individuals.^{28,108,110,112} This has been explained by the phenomenon of acculturation, that is, a process of 'adaptation and exchange of behavior patterns to the principal culture in

the new country'. Nevertheless, its true effect remains uncertain and may be confounded by secular trends in the health of immigrants.¹¹⁰

Despite the high rates of immigration in recent times, data regarding risk factor burden, how nativity and length of residence influence changes in cardiovascular health, and cardiovascular event incidence among immigrants are scarce and vary in quality.^{28,112} What has been demonstrated is that current risk estimation tools do not provide adequate estimations of CVD risk in ethnic minorities²⁸; validated instruments underestimate¹¹³ or overestimate¹¹⁴ risk in patients from certain ethnic minority groups. For example, the multi-ethnic HEalthy LIfe in an Urban Setting (HELIUS) study from Amsterdam using SCORE found that ethnic minorities had a greater estimated risk of fatal CVD: however, further research is needed to assess if this translates into ethnic differences in CVD incidence.¹¹¹ Current guidelines recommend that ethnicity-specific CVD risk equations should be developed.

The future in cardiovascular disease estimation

As reviewed in the present chapter, all risk estimation systems have limitations and ongoing research is needed. In 2020, the Board of the ESC approved the establishment of a Cardiovascular Risk Collaboration based in the European Heart Health Institute in Brussels. This has a very ambitious work programme. The most immediate task was the development of the updated SCORE2 and SCORE2-OP risk models. These new charts and calculators estimate the risk of total (fatal plus non-fatal) CVD in low-, medium-, high-, and very high-risk regions of Europe and have been published recently.^{41,42}

Recent publications⁴⁹ raise the possibility of a new approach to risk estimation starting in childhood. Mendelian randomization studies are analogous to randomized control trials in that the polymorphisms that determine cardiovascular risk are randomly distributed, making comparison with those who do not have the polymorphisms unlikely to be biased.

The polymorphisms that determine the rate of rise in blood cholesterol and blood pressure have a small effect on 5-year risk but a large and generally unappreciated effect on true lifetime risk, because they operate from birth throughout life. This may imply that the rate of rise in blood pressure or blood cholesterol in the early years of life estimates true lifetime risk, whereas the estimated 'lifetime' risk in current risk systems is based on cohorts that start

at about age 40 years. In future, rather than considering 10-year risk, we may consider risk in terms of mmol/years of exposure to cholesterol or mmHg/years of exposure to blood pressure. This approach has the possibility of approaching the 'holy grail' of risk estimation—individualized risk estimates in early life. Even without genetic testing, an increase in low-density lipoprotein cholesterol and blood pressure (even within conventional 'normal' levels) may signify a young person in whom vigorous lifestyle advice may be wise, with periodic risk checks.

The role of the nurse

The nurse or nurse specialist is uniquely well placed to play a pivotal role in risk estimation and management through her or his knowledge of the science of risk estimation, its practical application, and her or his role as counsellor and advisor through the nurse's unique relationship with patients, families, and communities for holistic assessment and shared decision-making. Nurses may also have, or develop, unique skills in simple and accessible communications. Their role as facilitator/coordinator of the actions of the multidisciplinary prevention care team, mentors and role modelling of future nurses, and evidence-based practice protocols and standard operating procedures play a crucial part in the goal of achieving better cardiovascular health.¹¹⁵

Finally, experience has shown that nurses are particularly effective in participating in clinical audits of risk factor management such as the SURvey of Risk Factors (SURF).¹¹⁶ Indeed, SURF may be an example of the use of international research data to improve patient outcomes through promoting better risk factor control. In a similar way, international endeavours such as the Global Cardiovascular Nursing Leadership Forum (GCNLF)¹¹⁷ may help nurses to engage with and support cardiovascular prevention worldwide through research, education, policy advice, and advocacy.

Explanation of the cardiovascular disease epidemic and consequences for the future

As described previously, CVD constitutes a serious health and economic burden, which is likely to increase further due to population ageing. As demonstrated earlier, the incidence of CVD seems, to a large degree, to be determined by environmental modifiable factors, especially those

related to lifestyle, and, hence, it might be controllable. This puts particular emphasis on the prevention of CVD.¹¹⁸

Prevention of chronic conditions, such as CVD, can be discussed in at least two contexts. First, one can distinguish between primordial, primary, secondary, and tertiary prevention. These terms refer to preventing the penetration of risk factors into the population (primordial prevention); intervening before the illness occurred, thorough control of its existing risk factors (primary prevention); screening to identify the condition at its earliest stages, before the onset of signs and symptoms (secondary prevention); and managing the disease after it had been diagnosed, to slow down or stop its progression and to identify potential complications as early as possible (tertiary prevention).¹¹⁹ Second, as outlined by Rose in 1985,¹²⁰ the risk of each chronic disease can be monitored and controlled at either individual or population level. Hence, this author proposed two approaches, the ‘high-risk’ strategy and the ‘population’ strategy. The former is aimed at identifying high-risk susceptible individuals and providing them with an individualized intervention, whereas the idea behind the latter is to control the determinants of the disease’s incidence in the whole population.¹²⁰ While those two approaches have their pros and cons (► Table 1.5)¹²⁰ and were criticized by some authors in the context of CVD prevention,¹²¹ they are complementary to one another and, as shown later in this section, can be easily implemented as the components of both primordial/primary and secondary prevention; although they are applicable to tertiary prevention too, this issue is out of the scope of the present chapter and as such, is not discussed.

Regardless of the strategy, prevention of CVD should be coordinated and implemented at many levels, from international roadmaps and guidelines to national and regional policies and standard operating procedures of individual healthcare centres and other business entities. This continuum should start from existing white papers on CVD prevention, such as the World Heart Federation roadmaps¹²² and the 2021 European guidelines on CVD prevention.²⁸ These documents should be incorporated into national health policies to guide and facilitate the two above-mentioned strategies of the primary and secondary prevention of CVD. Examples of primordial/primary and secondary preventive measures of CVD within the framework of the ‘population’ and ‘high-risk’ strategy are shown in ► Table 1.6. As denoted in the table, all these activities should involve nurses, utilizing their knowledge and experience as initiators, advisors, or direct providers.

To summarize, the aim of CVD prevention is to avoid penetration of its risk factors (e.g. overweight, inappropriate diet, inadequate physical activity, and smoking) into the population, to control the risk factors that already exist within the population, and to identify patients with early, asymptomatic stages of the disease. While the activities from the scope of primordial prevention should be undertaken at a population level, primary and secondary prevention are of utmost importance in the case of high-risk groups, for example, in obese people, smokers, and individuals with a family history of CVD. Prevention of CVD should take a multidisciplinary, multifactorial, and societal approach including strategies to improve health literacy, empowerment, self-care management, and environmental adaptations at the workplace and in the milieu.

Table 1.5 Pros and cons of the ‘population’ and ‘high-risk’ strategy

	‘Population’ strategy	‘High-risk’ strategy
Pros	Radical Large potential for population Behaviourally appropriate	Intervention appropriate to an individual Subject motivation Physician motivation Cost-effective use of resources Favourable benefit-to-risk ratio
Cons	Small benefit to an individual Poor motivation of a subject Poor motivation of a physician Worrisome benefit-to-risk ratio	Difficulties and cost of screening Palliative and temporary—not radical Limited potential for individual and population Behaviourally inappropriate

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Table 1.6 Examples of primordial/primary and secondary preventive measures of CVD that could be implemented within the framework of the ‘population’ and ‘high-risk’ strategy. Role of nurses defined as an initiator (I), advisor (A), and provider (P)

	Primordial/primary prevention	Secondary prevention
‘Population’ strategy	(I, A) Legal initiatives aimed at elimination/attenuation of established risk factors of CVD (e.g. higher taxes for tobacco products, ban for vending machines with sweets and sodas in schools, etc.) (I, A) Legal initiatives aimed at the promotion of a healthy lifestyle (e.g. an act increasing the number of compulsory physical education classes in school curricula) (I, A, P) Administrative initiatives promoting a healthy lifestyle (e.g. national and regional programmes promoting physical activity and balanced diet) (I, P) Health education programmes (risk factors of CVD, healthy lifestyle) (I, A, P) Social media campaigns promoting a healthy lifestyle	(I, A) National and local screening programmes (I, A) Legal initiatives enforcing participation in mass screening programmes (e.g. a law increasing compulsory health insurance rate for those who permanently ignore personalized invitations for screening) (I, A, P) Health education programmes (early symptoms of CVD, available screening tests, and programmes) (I, A, P) Social media campaigns promoting participation in mass screening
‘High-risk’ strategy	(P) Identification of people at risk (within the scope of the activities mentioned above and/or during everyday practice) (P) Individual education and counselling (P) Tailored interventions	(P) Identification of people at risk (within the scope of the activities mentioned above and/or primary prevention and/or during everyday practice) (P) Individual education and counselling (P) Tailored follow-up programme

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2 Delivering high-quality cardiovascular care

LIS NEUBECK, MARÍA TERESA LIRA, ERCOLE VELLONE,
DONNA FITZSIMONS, LISA DULLAGHAN, AND JULIE SANDERS

CHAPTER CONTENTS

Definition and elements of high quality of care 29

Fundamentals of high-quality professional practice 30

Nursing workforce 30

Core elements of high-quality care in professional practice 30

Care must be safe 30

Care must be effective and evidence based 31

Care must be timely 34

Care must be equitable 35

Care must be efficient 36

Care must be people-centred 44

Barriers to implementing quality care 49

Conclusion 51

KEY MESSAGES

- High-quality care should be safe, effective, timely, equitable, efficient, and people-centred.
- Nurses need to understand the fundamentals of high-quality professional practice.
- The use of patient-reported outcome measures and patient-reported experience measures helps to bring the patient voice into high-quality care.
- Measurement and audit are important tools to determine the quality of care.
- It is imperative that nurses develop cultural competence.
- Understanding the barriers to high-quality care can help to overcome them to ensure that patient well-being is preserved.

Definition and elements of high quality of care

The World Health Organization (WHO) considers the delivery of high-quality care to be a global imperative in the drive to achieve universal health coverage.¹ Several elements have been defined as core elements or domains of high-quality care. One of the first definitions was proposed by the Institute of Medicine in 2001,² including six domains: safe, effective, timely, efficient, equitable, and people-centred (► **Table 2.1**). The WHO recommends that healthcare workers embrace a teamwork philosophy, participate in quality measurement of patients' desired outcomes using data to demonstrate effectiveness and safety, and consider patients and/or communities as partners in the effective care process.¹

Table 2.1 Core elements of high quality of care

Safe	Minimizes harm due to errors and preventable injuries
Effective	Based on the best evidenced scientific knowledge available
Timely	Coordinates a comprehensive flowchart of care to avoid delays
Equitable	Provides care independently of personal characteristics (i.e. ethnicity)
Efficient	Avoids waste of time, resources, or duplication of tests (lack registers)
People-centred	Works in partnership taking into account values, needs, and preferences

Source data from Institute of Medicine. 2001. Crossing the Quality Chasm: A New Health System for the 21st Century. Washington, DC: The National Academies Press. <https://doi.org/10.17226/10027>.

These components are widely shared by multiple organizations and have become the framework for the description and regulation of high-quality professional practice of nursing,³ as well as for the definition of quality care metrics or instruments to measure clinical care and outcomes worldwide.⁴

Fundamentals of high-quality professional practice

Within every profession, the ultimate goal is to deliver a high-quality professional service, measured by metrics agreed by consensus, and frequently monitored by a professional body that has responsibility for ensuring practice meets standards. In the nursing profession, practice excellence has been defined as a ‘dynamic process that integrates the best theoretical and practice knowledge (praxis) in each [patient/] client encounter’.⁵ This incorporates elements of professionalism, best practice, and humanistic holistic care throughout the life-course continuum by developing meaningful relationships with patients and the health team.⁶ These characteristics, in combination with values and attitudes such as honesty, empathy, initiative, curiosity, and innovation, are crucial to achieve a high quality of care,^{7,8} especially in non-communicable diseases such as cardiovascular disease.⁹

Nursing workforce

Nurses constitute the largest group of health workforce members worldwide. Consequently, they have a central role in delivering high-quality care across the continuum, improving individual, family, and community health.¹⁰ It

was noted by the Joint Commission on Accreditation of Healthcare Organizations, that nearly every person’s life-time healthcare experience involves the contribution of nurses,¹¹ and this is particularly true in cardiovascular healthcare, which ranges from primordial prevention in infancy through to debilitating and life-limiting conditions, such as heart failure, and to palliative care. Nursing has been identified as a critical factor in determining the quality of care patients receive.¹² Nurses play a role in hospital with cardiovascular patients, monitoring to detect clinical changes or possible errors, avoiding failure to rescue, and performing multiple tasks which have positioned nurses at the front lines of quality improvement (QI).⁴ Nurses are important providers of out-patient services such as cardiovascular prevention and rehabilitation, heart failure, and arrhythmia specialist services, and act as a safety net to support patients living independently.

Core elements of high-quality care in professional practice

Care must be safe

Safety is a critical issue for contemporary healthcare, and many consider that safety is an inextricable component for delivery of quality care.¹³ It is a key component of the fundamentals of care.¹³ Failures or gaps in basic or fundamental aspects of care not only cause distress and dissatisfaction but have been identified as threats with significant risks for patients. It is imperative to consider both unsafe practice, which in itself harms the patients,¹³ but also the failure to act. The harm attached to *care left undone* has been highlighted as a significant problem

in contemporary nursing.¹⁴ The delivery of care that is safe, patient-centred, compassionate, effective, and efficient is the responsibility of all healthcare professionals.¹⁵ However, of all members of the healthcare team, nurses have been identified as critically important in ensuring patient safety, making a key contribution through their ability to coordinate and integrate the multiple aspects of quality care.¹⁵

Safety is influenced by other factors that are also components of quality care such as leadership, evidence-based practice, evidence-based nurse-sensitive outcomes measures, teamwork composition, and collaborative work. There are other challenges that directly affect patient safety such as nurse staffing ratios, high staff turnover, and poor working conditions. An inadequate nursing staff ratio also compromises the safety of nurses as well, with a two- to threefold increased risk of needlestick injuries occurring when staff levels are reduced.¹⁶ When there is an adequate skill mix of staff with a higher number of registered nurses, there are fewer adverse events including complications after abdominal aortic surgery and lower infection rates in paediatric cardiac intensive care.¹⁶ A systematic review of nurse staffing found better patient–nurse ratios were associated with a decrease in the risk of in-hospital mortality (odds ratio 0.86, 95% confidence interval 0.79–0.94) and nurse-sensitive outcomes.¹⁷ Individual nurses' satisfaction with their role and competencies (i.e. knowledge, skills, and attitudes) can also affect patient safety.¹⁶ Patients also have higher levels of satisfaction with their care when it is perceived to be safe.¹⁸ Some aspects of safe cardiovascular care are related to those common to non-communicable diseases, for example, minimizing risk of complications or re-hospitalization, dealing with low adherence or errors in medication, close monitoring in acute phases, and educating patients with special devices.¹⁹

Care must be effective and evidence based

Evidence-based practice is essential to provide the highest quality care, while controlling healthcare costs.²⁰ Evidence-based protocols enable standard high-quality care across different health systems globally.¹ Evidence-based nursing for patients with cardiovascular disease has been developing for more than a decade,²¹ integrating robust evidence in clinical guidelines for the prevention and treatment of cardiovascular disease and leading the implementation of cardiovascular nursing interventions to enable collection of outcomes data in a standardized way.²¹ Critical decision-making for clinical practice is

inherent in the role of the professional nurse, and it relies on both clinical expertise, and the best possible evidence, usually collated in guidelines or recommendations.¹⁶

Implementation of evidence-based practice is linked to a higher education preparedness of nurses (e.g. degree-prepared) and the expansion of scope of practice to the full range of nursing competencies.²² It has been demonstrated that higher advanced and/or specialist nursing qualifications as well as master's degrees in research and doctoral and postdoctoral programmes have a crucial role in developing nursing skills, such as research leadership.¹⁰

In an evidence-based healthcare environment, nurses need to be able to utilize and generate robust evidence.²³ To assess nurse effectiveness, nursing-sensitive indicators are mandatory in creating the evidence around what clinical interventions are most effective.¹⁰ The main challenges to develop evidence-based nursing practice are a lack of agreement on the elements of care and the type and quality of nursing research. Systematic reviews have highlighted that nursing research literature remains descriptive, with a low impact on practising nurses, making them difficult to interpret and follow clear evidence-based clinical practice.¹⁴ Also, there is a lack of evidence of patient-related outcomes (PROs) collected directly from patients themselves, and sparse poor-quality evidence for fundamental nursing care interventions, with studies that did not define primary outcomes, used inappropriate metrics, or conducted analysis with significant risk of bias.¹⁴

The absence of standardized definitions among the healthcare system leaders (managers, policymakers) and professionals (researchers, clinicians, educators, etc.) lead to differences in parameters and variables that affect measurement and aggregation of data to develop robust evidence.²⁴ However, several efforts have been made to generate standardized quality metrics to build an evidence base and knowledge, including in cardiovascular care. Nursing research aims to address a paradigm between medical science and clinical need, and social sciences.²⁵ Consequently, nursing evidence tends to take a more holistic vision of human health.

Providing high-quality care that is informed by the latest evidence

Recent decades have witnessed a complete transformation in terms of how cardiovascular care is delivered, with new advances in technology, drug treatments, and interventional techniques revolutionizing patient care and improving treatment outcomes. During that time, those practising within the speciality have been kept updated

by a process of continuous professional development that is now recognized as necessary for all professionals. The fundamental premise underpinning this innovation is that high-quality patient care requires practitioners who are up to date with the latest evidence and are skilled in acquiring, evaluating, and applying this within a patient- and family-centred context.²⁶ For nurses and allied professionals, this has meant developing new skills in evidence-informed practice that are now a cornerstone of our professional knowledge base.

What are evidence-based care and evidence-informed care?

There are currently ever-increasing amounts of data and evidence available within the healthcare arena. The challenge for those working within cardiovascular care is to determine the validity of these data and evaluate their relevance to our practice setting. Traditionally, as healthcare practitioners, evidence is available from a variety of different sources and each has its own utility. When assessing a patient who is presenting with chest pain, for example, it is important to communicate effectively to reassure the patient and explain the process of making a differential diagnosis. The nurse will ask a series of questions regarding the nature, severity, and implications of the patient's pain to help elucidate whether it is cardiac in origin; while at the same time checking the patient's vital signs, electrocardiogram, and high-sensitivity troponin. Data from each of these qualitative and quantitative sources will be assimilated and each play their part in arriving at a more definitive conclusion. It is to be expected then that nursing science embraces data from both qualitative and quantitative perspectives, triangulating them to provide a more holistic understanding of the patient experience (see also Chapter 5).

In 2019, the WHO distinguished between evidence-based practice and evidence-informed practice on the basis that the latter includes clinical judgement, which is somewhat open to interpretation.²⁷ The JBI (formerly Joanna Briggs Institute) Model of Evidence-Based Healthcare offers a more comprehensive and globally applicable theory of how knowledge is generated and translated into practice and policy change (► Fig. 2.1).

Within the European Society of Cardiology (ESC), it is recognized that there is a need to arrive at an expert consensus on the available evidence and provide clear guidance for practitioners. In order to achieve this, the ESC has produced Clinical Practice Guidelines across many specific cardiovascular conditions and also provides regular updates on these to ensure the latest contemporary guidance is available.

How do we source the latest evidence?

Despite engaging in regular educational activities and professional development, it is difficult to keep on top of the very latest evidence within cardiovascular care. There are a wide variety of strategies that can be used to help in this endeavour, which can be accessed through membership of the Association of Cardiovascular Nursing and Allied Professions (ACNAP) (<https://www.escardio.org/Sub-specialty-communities/Association-of-Cardiovascular-Nursing-&-Allied-Professions>), including the *European Journal of Cardiovascular Nursing*, the clinical case gallery, ACNAP essentials4U, the annual congress, and a range of other research and evidence-based resources. There are also many useful research databases such as PubMed, MEDLINE, the Cochrane Library, and CINAHL that can be searched using keywords to identify the latest evidence in cardiovascular care.

What is the role of the ESC Guidelines?

The field of cardiovascular care has evolved at an unprecedented rate over recent decades with huge advances in diagnostics, interventional techniques, pharmacotherapy, and the evidence underpinning lifestyle change. It is never easy to weigh up the risks and benefits of particular treatment strategies and apply these to the specific preferences of an individual patient and/or their family members. In order to keep abreast of the most recent data, practitioners frequently turn to Clinical Practice Guidelines produced by the ESC. These Guidelines have been produced by the ESC since the mid-1990s and they represent one of the premier educational products of the Society. In order to develop consensus on the latest trials and research that is undertaken on an international basis, the ESC charges a group of recognized experts on specific topics to constitute a Task Force. Great care is taken to ensure the diversity and independence of this team that is usually led by two chairpersons. Every year these Task Forces of the ESC produce four or five Guidelines and a range of Position Papers and Consensus Documents. Each one takes a minimum of 2 years to develop and represents the ESC perspective on the best available evidence on which to inform the clinical practice of doctors, nurses, and allied professionals.

All of this work is governed by the Clinical Practice Guidelines Committee of the ESC which meets regularly to discuss priorities and implement strategies that maintain the highest levels of integrity and quality assurance within the ESC Guidelines. In the past decade, there has always been an ACNAP representative on this Committee

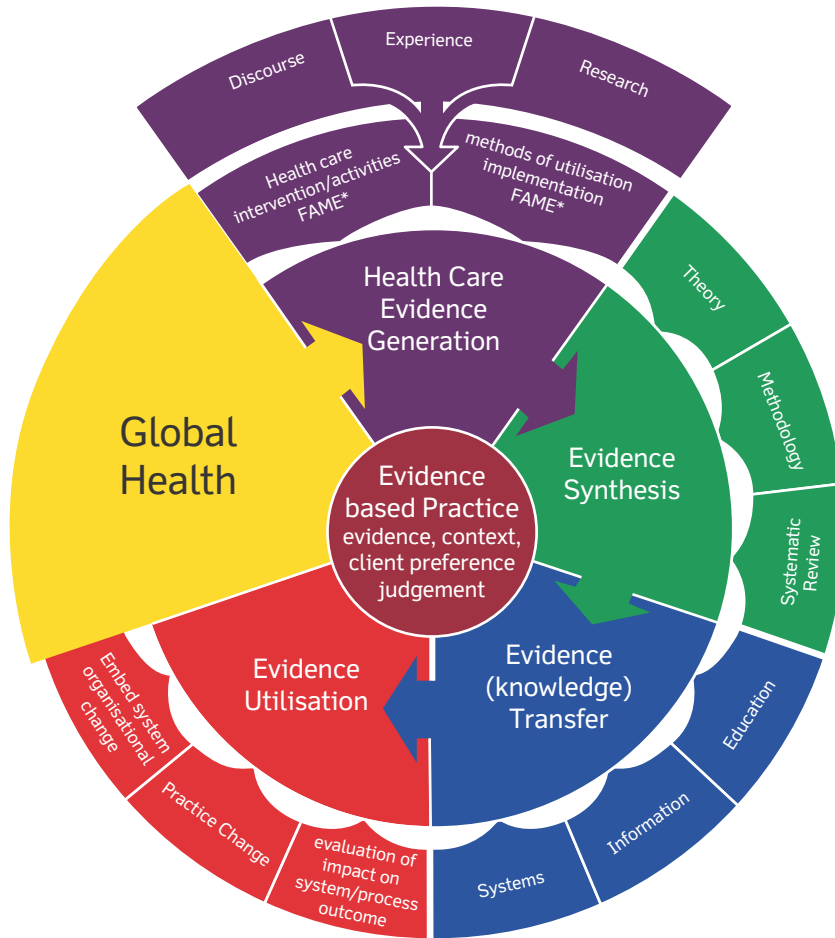


Fig. 2.1 The JBI Model of Evidence-Based Healthcare.

Reproduced from Jordan Z, Lockwood C, Munn Z, Aromataris E. The updated Joanna Briggs Institute Model of Evidence-Based Healthcare. *Int J Evid Based Healthc*. 2019 Mar;17(1):58–71. doi: 10.1097/XEB.000000000000155 with permission from Wolters Kluwer.

to ensure the transfer of this important source of evidence into the professional domain of those practitioners who enjoy the majority of patient contact. As a result, it becomes the responsibility of nurses and allied professionals to familiarize themselves with this scientific content and develop strategies by which they can optimize its translation into practice. Given the diversity of educational preparation, roles, responsibilities, and autonomy that nurses and allied professions receive throughout Europe, it is a challenging objective and ACNAP is there to support members to navigate this.

The first stage in this journey is to develop an inquiring mind, that is clearly focused on one question:

Is this the best care, intervention, therapy, or procedure that we can offer this person (patient) to optimize his or her treatment experience and outcome?

What a simple question—but one that frequently has a very complicated answer! The ‘PICOTS’ model is frequently used to help refine the question you are asking (► Table 2.2).

To begin with, it is naïve to assume that within all the various healthcare infrastructures that exist throughout Europe nurses and allied professionals have the insight, courage, or autonomy to question traditional practice in this way, to challenge the status quo, and to advocate on behalf of the patient. This has been well recognized

Table 2.2 The PICO model for clinical questions

P I C O T S	Patient, Population, or Problem	How would I describe a group of patients similar to mine?
	Intervention, Prognostic Factor, or Exposure	Which main intervention, prognostic factor, or exposure am I considering?
	Comparison or Intervention (if appropriate)	What is the main alternative to compare with the intervention?
	Outcome you would like to measure or achieve	What can I hope to accomplish, measure, improve, or affect?
	What Type of question are you asking?	Diagnosis, Aetiology/Harm, Therapy, Prognosis, Prevention
	What type of Study do you want to find	What would be the best study design/methodology?

within the Be Guideline Smart Initiative. Over recent years, ACNAP has developed a range of resources to help support nurses and allied professionals to become more effective in implementing evidence-informed care. These are available on the ESC ACNAP webpage (<https://www.escardio.org/Sub-specialty-communities/Association-of-Cardiovascular-Nursing-&-Allied-Professions>) and are updated regularly. They have been developed and supported by the National Societies of the ESC in conjunction with our industry partners. We would advise you to browse the various sources of information and support that exist online in order to update yourself with contemporary practice and work with your local colleagues and team members to enable their more widespread dissemination into practice.

How do we evaluate evidence?

There is a plethora of unreliable data available within the cardiovascular arena, some of which reach the status of ‘fake news’, but it is sometimes challenging to recognize it as such for professionals and patients alike. There are a wide range of critical appraisal tools available to help practitioners evaluate evidence and make informed decisions. The next critical element is having the skills to evaluate the quality of evidence before making changes

to clinical practice. There are many methods of evaluating quality available to practitioners such as CASP, the Critical Appraisal Skills Programme (<http://casp-uk.net/>). These usually offer a checklist or series, but beyond this, it is important to understand if the research design was appropriate to the research question, if the data were collected appropriately, and if there are any potential issues of bias. Quantitative data should be robust, reproducible, and generalizable. Qualitative data should be trustworthy and authentic. Nurses need to understand that not all research is of the same calibre. To address this, the ESC uses classes of recommendations and levels of evidence to identify the strength of the evidence (► Fig. 2.2).

Care must be timely

Access to care at the right time is critical to ensure that cardiovascular conditions are well managed. In the acute setting, access to primary percutaneous intervention, or where that is not available, thrombolysis, can reduce the likelihood of myocardial damage, and therefore of subsequent heart failure or death (see Chapter 5 and Chapter 6 for tools to deliver timely care in emergency situations). Timely care is also important in ensuring patients have access to medications. Heart failure nurses

Classes of recommendations		
Classes of recommendations	Definition	Suggested wording to use
Class I	Evidence and/or general agreement that a given treatment or procedure is beneficial, useful, effective	Is recommended/is indicated
Class II	Conflicting evidence and/or a divergence of opinion about the usefulness/efficacy of the procedure	
Class IIa	Weight of evidence/opinion is in favour of usefulness/efficacy	Should be considered
Class IIb	Usefulness/efficacy is less well-established by evidence/opinion	May be considered
Class III	Evidence or general agreement that the given treatment or procedures not useful/effective, and in some cases may be harmful	Is not recommended

Level of evidence	
Level of evidence A	Data derived from multiple randomised clinical trials or meta-analysis
Level of evidence B	Data derived from single randomised clinical trials or large non-randomised trials
Level of evidence C	Consensus of opinion of the experts and/or small studies, retrospective studies, registries



Fig. 2.2 Definitions of the ESC levels of evidence and classes of recommendation.

play a critical role in identifying early signs of worsening heart failure, and this has been demonstrated to prevent hospitalizations and death. Delays in treatment are also likely to raise anxiety, which has a strong relationship with adverse outcomes in cardiovascular patients. Cardiovascular prevention and rehabilitation attendance is known to decrease with any delays of recruitment to the service.²⁸

Care must be equitable

Globalization and migration have generated a significant increase in ethnic, cultural, and linguistic diversity in many countries, challenging health services and providers to be able to respond accordingly. Understanding and addressing health needs requires cultural competence and is recognized as a major strategy to address health inequities and identified as a core requirement for effective patient-centred care. Therefore, nurses must recognize their crucial role in reducing inequalities.

Cultural competence is multifaceted and includes the ability to work and communicate effectively and appropriately with people from culturally diverse backgrounds. Furthermore, culturally competent systems are able to meet diverse social, cultural, and linguistic needs. Cultural competence components have not yet been fully defined. Cultural awareness, cultural knowledge, and cultural skills/behaviour have been recognized as key aspects as they have the greatest impact in health context. These components are relevant in the ability to communicate, perform physical assessments, and collect health data from culturally/ethnically diverse patients.

According to the US National Center for Cultural Competence, racial and ethnic minorities are disproportionately burdened by chronic illness and cardiovascular health disparities have been well documented, and continue to be a main concern. The goal of cultural competence education for health professionals is to achieve equitable, effective healthcare including diverse populations and has been highlighted as a core competency

for leadership in cardiovascular nursing. Several groups have discussed and proposed universal standards of cultural competences for nurses, not only to guide clinical practice but also research, education, and administration, including the definition of culturally competent outcomes. Patient satisfaction, trust, health status, and adherence to treatment have been tested in proposed models but still further development is needed, becoming an important challenge for nursing, considering also that social expectations of nursing vary significantly from country to country.

Care must be efficient

Determining if healthcare is efficient is often viewed in terms of financial costs to the healthcare provider. Of course, the economic cost is important. However, to truly determine if healthcare is efficient, a range of measures need to be taken into account. Much of the literature focuses on how to evaluate efficiency, and there are a range of tools that can be used to do this. However, efficient care links closely to quality indicators.

Measuring quality

Unless the quality and safety of care is audited, improvements cannot be determined.²⁵ The WHO states that 'a core set of quality indicators is critically important for judging whether activities are producing higher quality of care leading to significant change in health outcomes'.¹ There are several definitions of an indicator, most of them agree that they should be measurable, valid, reliable, specific, related to performance or outcomes, enable comparisons (across populations, healthcare sectors, geographic locations), and should be established by consensus.²⁵ Standardized data sets promote transparency, provide feedback, and support clinical, administrative, and health policy decision-making. Therefore, definitions are crucial to operationalize concepts, set variables and parameters, and define or develop measurement tools.³⁰ Nursing metrics have been defined as process performance quality indicators that provide a framework to measure fundamental nursing care. However, nursing outcome measures have proven to be complex and non-specific, being responsible for a lack of basic information for healthcare providers in the past. The development of standardized metrics for nursing is essential, and caring is a fundamental nursing value and key indicator of nursing quality.²⁹ A user-friendly framework of indicators with systematic performance measurements of key patient-sensitive metrics and staff-sensitive metrics are an example of efforts to

generate standardized data sets, to increase visibility of nursing's contribution.

To achieve the aims of increasing nurses' visibility, nurses are mandated to champion the development of better metrics, generating a routinely collected data set of relevant measures.²⁵ This will require the ability to articulate care with the often time-consuming process of collecting the necessary data.¹⁴ The use of time-saving metrics technology, such as real-time indicators (i.e. patient falls, medication errors, infection rates, patient self-reported outcomes, workload measures, and employee injuries), aids in the process, but will need nurses to improve their capacity to understand, influence, and use new technologies and informatics, including remote care.

Developing nursing quality care metrics using evidence-based standards and agreed through consensus provides a plausible framework to generate evidence about the quality of nursing care, highlighting areas of good practice, those that require improvement, as well as enabling the sharing of process lessons. Results of these models' implementation have shown higher staff awareness of metrics and standards, improved patient care and documentation, generated better evidence, and achieved more accurate measurement across services.

However, there are still ongoing challenges related to quality measurement or outcome indicators that must be addressed by robust research, especially in complex care processes, such as those performed in interprofessional collaboration models. Most studied outcomes have been on observational or physiological measures, with very few collecting PROs. Shifts in the model of care implies also a shift in quality outcome measures. Patient-centred care, is focused on enhancing patients' satisfaction/experience and this should be measured accordingly. Despite its increasing importance, there is still lack of consensus regarding appropriate measurement of these data.³⁰

Measuring quality in cardiology

Quality management in cardiology care has undergone a rapid evolution over the past three decades. Isolated efforts at simple quality measures have developed into national programmes dedicated towards the public reporting of healthcare performance on a range of cardiology quality metrics. There is clear evidence that healthcare is not always safe and can lead to poorer patient outcomes. To enhance safety and quality in cardiology care, clinical guidelines have been developed by international societies such as the ESC and the American Heart Association to guide healthcare professionals in specific treatments for cardiac conditions using current evidence. The use of

guidelines should help with daily clinical decisions for treatment; however, there are still variations between different hospitals and regions.³¹ Guidelines, although essential, are insufficient alone to determine if quality care is being delivered. Processes that assure, monitor, and continually improve quality must be built into the foundations of healthcare systems.¹

At its core, quality management in cardiology care is designed to improve the quality of care delivered to cardiac patients and, in doing so, improve patient safety and outcomes such as patient experience, hospital readmission, and mortality.³² Quality management is normally sought through a set of activities that are intended to ensure that services are safe and meet patient needs and requirements in a systematic and reliable manner. These methods lead to a level of quality control that should allow patients and service providers to have confidence in their healthcare services.³³ Cardiology nurses play a vital role in the quality management of cardiology services as they understand the needs of cardiac patients and are the healthcare professionals who most directly impact the cardiac patient's experience of care. Therefore, cardiology nurses need to develop quality management understanding and capability so they can contribute to and lead

on quality initiatives that positively impact outcomes for cardiac patients.

The primary goal of quality management in healthcare is optimizing performance to improve patient outcomes. It is therefore important to consider the Institute for Healthcare Improvement (IHI) Triple Aim initiative which provides a framework for improving healthcare delivery outcomes. It is IHI's belief that QIs must be developed to simultaneously pursue the three dimensions of the IHI Triple Aim³⁴:

- Improving the patient experience of care.
- Improving the health of populations.
- Reducing the per capita cost of healthcare.

Quality management—the Juran Trilogy (1986)

The Juran Trilogy, also known as the Quality Trilogy (► Fig. 2.3),³⁵ was developed by Dr Joseph Juran in 1986 as an approach to manage quality. It has become the basis for most quality management best practices worldwide and consists of three quality-related functions: planning, control, and improvement. Together these functions provide an active interrelated approach

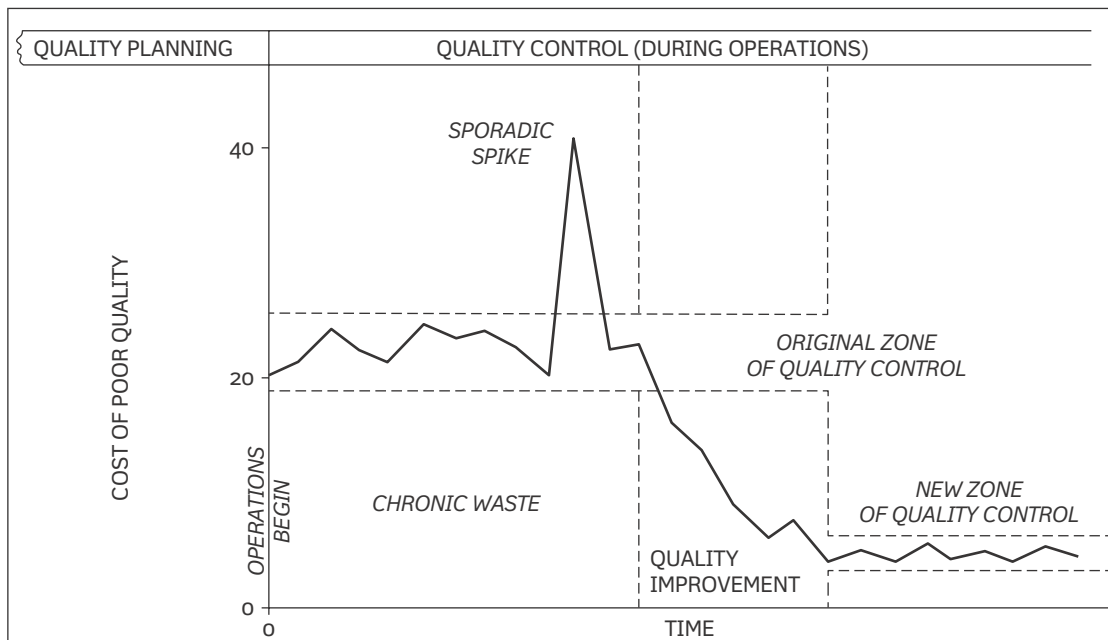


Fig. 2.3 The Quality Trilogy.

Reproduced from Defeo JA and Juran JM. Juran's Quality Handbook: The Complete Guide to Performance Excellence 6/e: McGraw Hill Professional; 2010 with permission from McGraw Hill.

for high-performance management and improved patient outcomes.

Quality planning

Quality planning begins with a comprehensive understanding of the patient's needs. In the planning stage, it is critical to define who the patient group are and find out their needs.³⁵ Areas of poor control of practice and gaps in care need to be identified and built in during the quality planning stage. Planning activities should be done with a multidisciplinary team, with all key stakeholders represented. It is important to take into account different stakeholder views and in particular engage with patients about what they feel matters. By working in partnership with patients, they can help to identify what the priority areas of focus should be and how to address them. Patient engagement in developing effective service delivery can benefit patients, both in their experience of care and the quality of the service they receive.³⁶ Once patients' needs are identified, the requirements for the change can be defined and designed.

During the planning phase, it is important to determine what data are needed to know the changed process is achieving the predicted improvement. For example, if a QI project is attempting to reduce the 30-day readmission rate for heart failure patients, then the number of patients discharged with a primary diagnosis of heart failure and the number of these patients readmitted within 30 days of discharge need to be captured. Control metrics which demonstrate improvement need to be considered at the quality planning stage and an infrastructure for the data requirements included in the design.

Quality control

Quality control is a key method for improving quality in healthcare through the measurement of performance and detection of emerging problems. Quality control is the continuous measurement of performance; ensuring that a process remains stable over time (in control) and that its performance remains within the upper and lower control limits. Quality control involves the measurement of key input, process, and outcome data and focuses on monitoring the system, detecting emerging problems (special causes), and taking steps to address them.³⁵

Quality control consists of internal and external quality control; internal quality control involves metrics and indicators that assess individual practices and determine how teams are performing against local standards. These control metrics will include key nursing performance indicators for safety (early warning scores, omitted medication, falls risk, malnutrition screening), incidents, complaints, patient experience, and internal audit programmes. It

is a registrant's responsibility to be knowledgeable of the internal quality control levels expected within their organization.

External quality control measures are designed to provide hospitals with performance data and highlight areas for improvement. External quality control within cardiology care has undergone significant change with the development of European and worldwide best practice guidance, global research studies, and national audit programmes that report on a number of quality measures. National registries, such as the SWEDHEART Registry, were implemented to track patient outcomes and improve quality in cardiovascular care. The chosen measures are based on evidence-based guidelines for prevention and treatment of multiple conditions, including acute myocardial infarction, heart failure, and stroke.

One such national registry is the UK's National Cardiac Audit Programme (NACAP); this programme highlights aspects of safety, clinical effectiveness, and outcomes for cardiac patients. The NACAP has six subspecialty audits—Adult Cardiac Surgery, Adult Percutaneous Coronary Interventions, Cardiac Rhythm Management, Heart Failure, Congenital Heart Disease in Children and Adults, and Myocardial Ischaemia National Audit Project. The audit findings recognize areas of clinical excellence that can be adopted across the National Health Service, but also identify areas where care falls below expected standards. These standards are used to determine local and national QI aims for healthcare professionals, service managers, and commissioners.

The Myocardial Ischaemia National Audit Project (MINAP) is a domain within the NACAP that contains information about the care provided to patients who are admitted to hospital with acute coronary syndromes. Data are collected and analysed to illustrate the 'patient journey' from a call to the emergency services or their self-presentation at an emergency department, through diagnosis and treatment at hospital, to the prescription of preventive medications on discharge. Provision of care by staff practising in participating hospitals is expressed through clinically important quality control indicators.

Quality improvement

If you want better performance, you need a better design.

QI is the use of systematic tools and methods to continuously improve the quality of care and outcomes for patients.³⁷ While quality control focuses on identifying problems in patient care, it cannot move a system to a higher level of performance beyond the constraints of an existing system design. QI focuses on finding opportunities to improve quality by changing and redesigning systems.

QI provides the opportunity for system or process redesign that can lead to higher levels of performance. System redesign, testing of new ideas, and measurement are required to determine if the new ideas are leading to improvement.

There are many QI methodologies available, such as Lean, Six Sigma, Total Quality Management, and Model for Improvement. There is no one 'right' QI approach for all change; the characteristics of the current system must be considered when deciding which approach to QI will have the greatest application and impact.³⁸

The IHI model for improvement is a QI methodology that provides a framework for designing, testing, and implementing changes.³⁴ The framework allows changes to be tested in a low-risk environment to determine efficacy before large-scale adoption. The model is designed to be flexible and comprehensive, rather than a rigid step-by-step approach that can inhibit innovation.

The model is based on three fundamental questions that define the endpoint (► Fig. 2.4):

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What changes can we make that will result in an improvement?

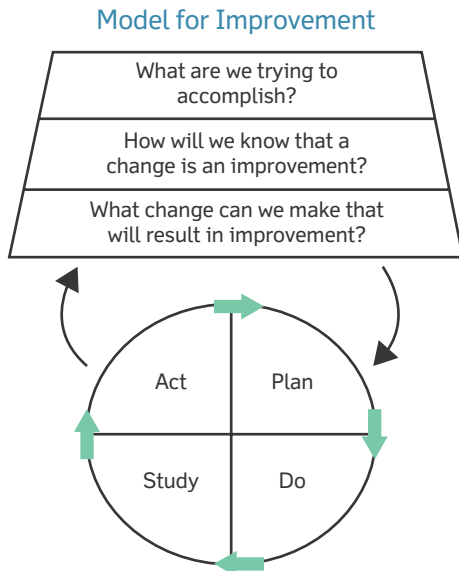


Fig. 2.4 IHI model for quality improvement.

Reproduced from Langley GL, Moen R, Nolan KM, Nolan TW, Norman CL, Provost LP. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance* (2nd edition). San Francisco: Jossey-Bass Publishers; 2009 with permission from John Wiley and Sons.

The Model for Improvement is an approach to continuous improvement where changes are tested in small rapid cycles that involve Plan–Do–Study–Act (PDSA) cycles. The PDSA cycle creates the structure for testing and implementing the change. Testing the change under a variety of conditions can demonstrate that the improvement can be sustained in the future. Implementation of the change should be managed as a series of PDSA cycles as these small-scale tests of change are central to iterative improvement.³⁹

PDSA cycles form the foundation for implementation of a successful intervention and increase the chances of long-term success. The scale and spread approach in QI is where smaller incremental steps within services can grow and lead to larger, sustainable organizational change.⁴⁰

Data over time—run charts and control (Shewhart) charts

QI requires change to occur; however, not all changes result in improvement. One of the fundamental tools of QI is to understand the variation in the process over time. This can be done using run charts and control (Shewhart) charts. A run chart is the simplest of charts and consists of a single line plotting data over time with a central median line (► Fig. 2.5).

Run charts provide a valuable tool at the beginning of a project, as they can reveal important information about a process before enough data have been collected to create a control chart. Run charts can be used for:

- Displaying data to monitor performance of one or more process/es.
- Determining if a change has resulted in improvement.
- Demonstrating whether the improved performance has been sustained.⁴¹

Control charts also plot a single line of data over time with a central median line but include upper and lower control limits. These limits are calculated based on the data being plotted and can demonstrate if the system is stable (within the control limits) or unstable (outside the control limits) (► Fig. 2.6).

Control charts are used to monitor the redesigned process to ensure it sustains the improved performance (with new upper and lower control limits), reduced variation, and improved results.

Data challenges

The importance of having access to robust, real-time data for quality management is recognized.⁴² However, there can often be a lag in data being available and good

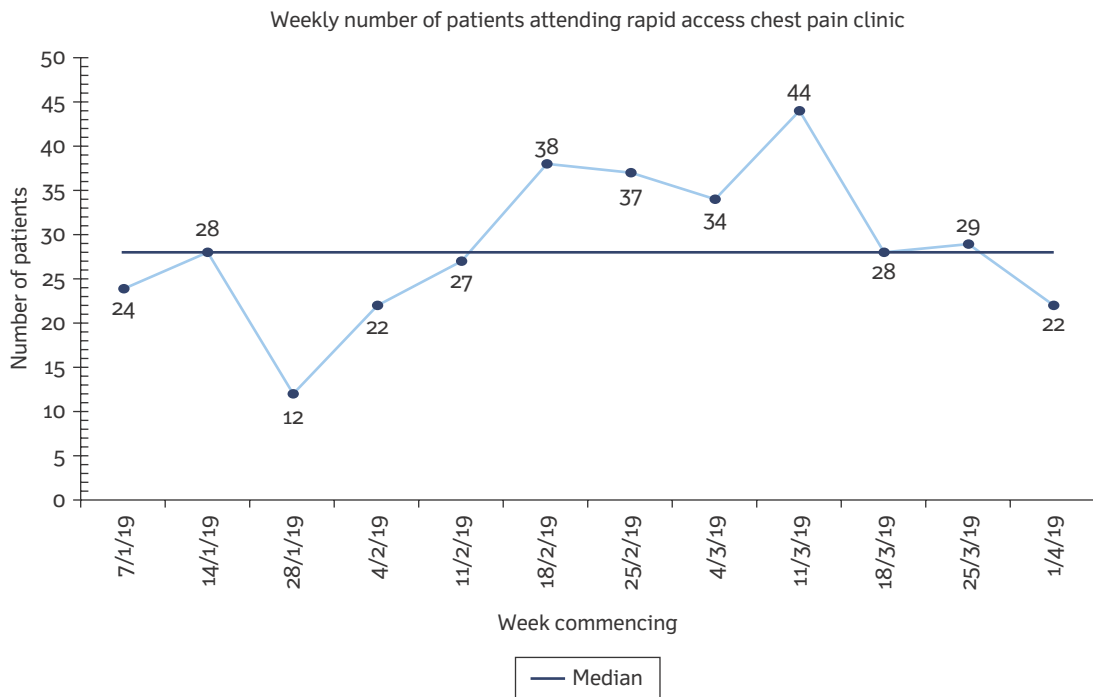


Fig. 2.5 Example of a run chart.

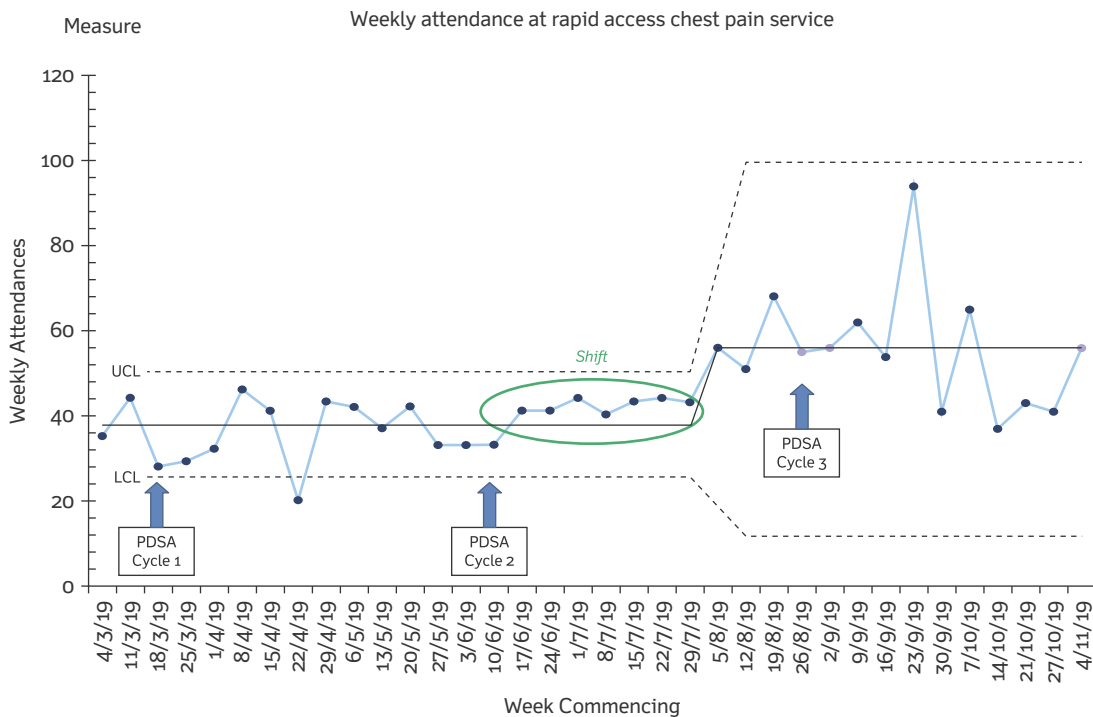


Fig. 2.6 Example of a control chart.

evidence being delivered; this is problematic for clinical leaders and policymakers who require this data to effectively drive improvements in cardiovascular care. Healthcare organizations need a modern approach to data management that supports a complete understanding of the patient's journey, with real-time access to healthcare metrics and data.

Additionally, healthcare data can be challenging to access; data can be hidden in information systems and the collections of data available often don't link together. The result is a delay in the adoption of new systems, inadequate responses to healthcare programmes, and poor engagement and experience. Cardiology nurses need to be aware of data available locally and be able to develop simple measures and data that provide reliable datasets to demonstrate improvement.

Embedding a culture for quality management

Quality management in healthcare requires long-term commitment and a shared determination to make a difference; it involves empowering staff to understand quality problems, develop effective solutions, and put them into practice.⁴² Sustainable changes are more likely to result from an approach that involves team members in developing and implementing the change.⁴³ Healthcare will not reach its full potential until quality management becomes an intrinsic part of everyone's job, in all parts of the system.⁴⁴ This involves building will and capability and engaging healthcare professionals in participating, innovating, and leading QI at the frontline.

There are many successful examples where QI has been embedded in practice; one being the South Eastern Health and Social Care Trust in Belfast, Northern Ireland. In 2011, the Trust set out on a journey to create a culture of QI where all health and social care professionals felt supported to take part in transforming patient safety, care quality, and the patients experience. The Trust developed the 'Safety, Quality & Experience' (SQE) training programme that enables staff to deliver improvements in areas that matter to them and to patients. During the programme, participants learn QI methodology and put their new knowledge into practice with coaching and support from mentors, to deliver an improvement that will benefit patients. This has led to a range of SQE projects across all specialties, including cardiology projects to improve patient flow at the Rapid Access Chest Pain clinic and to increase patient awareness of novel anticoagulants prior to coronary angiography. The Trust has embedded a QI culture across a large-scale organization by engaging frontline practitioners in SQE. The success of the SQE training has quickly spread further

afield, with other trusts now sending healthcare professionals to complete the programme and bring the learning back into their own organization.

Section Summary

Complex healthcare issues are best addressed by quality management approaches that engage frontline staff and embed collaborative interprofessional team working. Quality management requires the attention of all the stakeholders: patients, healthcare professionals, healthcare policymakers, patient advocates, and commissioners of care. Quality management in cardiology nursing remains an active area for innovation and improvement. More than ever before, the impact of QI efforts on patient outcomes will be crucial to improve cardiovascular health in the coming years. Cardiology nurses are the healthcare professionals who most directly impact the cardiac patient's experience of care and therefore need to be at the forefront of quality management initiatives that positively impact outcomes for patients.

Role of technology and informatics in quality of care

Technology plays an important part in assuring quality of care. Currently, the role of technology for care provision is now thought as essential to nursing care. The Topol review, conducted to provide independent advice on how technology will change the role of healthcare providers, emphasized three key points for incorporating digital healthcare⁴⁵:

1. Patients need to be included as partners and informed about health technologies, with a particular focus on vulnerable/marginalized groups to ensure equitable access.
2. The healthcare workforce needs expertise and guidance to evaluate new technologies, using processes grounded in real-world evidence.
3. The gift of time: wherever possible, the adoption of new technologies should enable staff to gain more time to care, promoting deeper interaction with patients.

The integration of health information technology in clinical practice workflows has been developing quickly in the last decade and digital technologies have profoundly impacted every aspect of nursing care, from training (i.e. simulated skills) to patients' remote self-care. High-quality care requires the best use of innovative technological advances.

Electronic medical records and automated medication records reduce nurses' paperwork, improving direct patient care and safety.¹⁶ Studies have reported 2.75 fewer hours per shift on medication administration (reallocated to patient care and training) with a 79% reduction in medication errors.¹⁶ A recent systematic review explored the usefulness of electronic data for long-term monitoring of patients with cardiovascular chronic diseases, such as hypertension and heart failure.⁴⁶

Nursing, as with other health professions, is constantly challenged with emerging advances and it is imperative to understand and influence the development and use of new technologies. Nursing training is often focused on issues relevant to clinical practice, with less interest from nurses in adopting technological interventions or being major players involved in the design of new technology tools.¹³ Also, nurses are seldom involved in technological purchase decisions with poor results in the organization's investment.¹⁶ To succeed in the implementation of new technology in the clinical setting, direct caregivers must be involved in the overall process. Therefore, nursing needs to move from a reactive approach to technological advances to an anticipating and influencing approach.²⁹

Including technology and informatics in their initial education, being aware and exploring current developments, foreseeing their impacts, and working with information technology experts will help nurses to develop health informatics and digital tools and learn how technology can improve efficiency, promote safer practice, and increase engagement. Furthermore, all technology requires early and ongoing assessment over healthcare effects. High-quality research is essential to understand the nursing position, patients' perceptions, and outcomes when technology is utilized.

PROMs and PREMs in delivering high-quality and values-based healthcare

Given the global burden of cardiovascular disease and the need to increase the likelihood of desired health outcomes, values-based healthcare (which aims to increase the value that is derived from the resources available for a population) is important from both the patient and societal perspective.⁴⁷ This links specifically with the 'effective' and 'person-centred' quality care domains. Emphasis has previously been given to mortality outcome and, to a lesser extent, morbidity outcome. However, to optimize health outcomes, those important to patients must be prioritized and globally health ministers have stated the need to invest in measures that 'matter most to people'. Primarily,

the focus has been on PROs but patient-reported experience measures (PREMs) have been gaining international recognition in relation to both quality of care and values-based healthcare.⁴⁸

PROs are health outcomes directly reported by the patient without interpretation by others, measuring the patient's perception of the impact of their condition or treatment on their health. In contrast, PREMs measure quality of care in relation to the patient's experience while they were receiving care. This is often considered a quality indicator rather than a direct quality measure.⁴⁹ However, a consistent positive association between patient experience, safety, and clinical effectiveness has been found across a range of clinical specialities,⁵⁰ demonstrating patients are able to distinguish between safety, clinical effectiveness, and experience.⁵¹ Thus, patient experience should be considered a core measurement in assessing healthcare outcomes in the delivery of high-quality care.⁵²

Use of PROMs and PREMs in advancing high-quality care

PROs are predominately measured using patient-reported outcome measures (PROMs), usually in the form of a standardized questionnaire. PROMs can be used 'actively' at the patient level for shared decision-making or 'passively' at the aggregated level to inform clinical guidelines and commissioning, for performance assessment and benchmarking, and for research and QI.

While many clinical guidelines, including those from the ESC, do now refer to the need for PROM assessment, there is little evidence of extensive use at the individual patient level, despite its value in shared decision-making, personalized care, and values-based care. However, greater PRO use occurs at the aggregate level. For example, in England and the US, PROMs are used extensively for certain conditions, while in Sweden, PROs are included within their national quality registers with approximately 40% also including PREMs.⁵³ Likewise, in Denmark a national system for PROs reporting is currently being established. Patient experience is also a key objective in Pay For Performance (P4P) programmes in Australia, the US, and some European countries, aimed at reducing variation in quality of care and to develop strategic commissioning.¹

To advance the consistent use of PROMs and PREMs in outcomes measurement, the International Consortium for Health Outcomes Measurement (ICHOM: <https://www.ichom.org>) has developed standardized measurement outcomes by clinical condition as agreed by a consortium of experts and patient representatives to focus on what matters most to patients. Of the available cardiovascular

standard sets (atrial fibrillation, hypertension in low- and middle-income countries, heart failure, and coronary artery disease), all include PROs, while the hypertension in low- and middle-income countries standard set also includes patient experience. Likewise for research, the Core Outcome Measures in Effectiveness Trials (COMET: <http://www.comet-initiative.org>) initiative includes papers where core outcomes for research in specific clinical areas have been defined. For example, the core outcome datasets for coronary artery disease⁵⁴ and cardiac surgery⁵⁵ both include PROs.

PROM and PREM tools in cardiovascular care

PROM tools are generally either generic (applied to any patient or general population) or disease specific (applied to a particular condition or treatment) and both should be used in healthcare assessment as they provide complementary information. However, while there are a plethora of PROM instruments, not all are developed and validated adhering to robust psychometric principles, and surprisingly, only a small proportion include patient involvement to decide what outcomes to measure.⁵⁶ Selecting the right instrument can be challenging although databases such as COSMIN (COnsensus-based Standards for the selection of health Measurement Instruments: <https://www.cosmin.nl>) and PROMIS (Patient-Reported Outcomes Measurement Information System: <http://www.healthmeasures.net/explore-measurement-systems/promis>) can be useful.

In Europe and the UK, the EQ-5D has been the most widely used simple generic preference-based measure of health and is well received by patients,⁵⁷ although the SF-36 is also often the generic tool of choice both in and outside the US. ➤ **Table 2.3** includes some examples of commonly used, well-validated cardiovascular disease-specific PROMs.

While ➤ **Table 2.3** includes commonly used PROMs, other tools do exist. For example, the McNew questionnaire (myocardial infarction, coronary disease, and heart failure), symptoms of illness score (cardiac surgery), and more recently the ESC European Association of Preventive Cardiology-developed HeartQoL (core cardiac tool). Likewise, there are disease-specific PROMs for other cardiovascular conditions, for example, the Atrial Fibrillation Symptom Scale (AFSS), the Cardiff Cardiac Ablation patient-reported outcome measure (C-CAP), the Cambridge Pulmonary Hypertension Outcome Review (CAMPHOR), and the PROM-CR1, which is in development for cardiac rehabilitation. However, further development and validation work in these areas is needed.

Table 2.3 Examples of validated disease-specific questionnaires

Angina and coronary artery disease	Seattle Angina Questionnaire (SAQ)
Cardiomyopathy	Kansas City Cardiomyopathy Questionnaire (KCCQ)
Coronary revascularization (percutaneous coronary intervention and coronary artery bypass grafting)	Coronary Revascularisation Outcome Questionnaire (CROQ)
Heart failure	Minnesota Heart Failure Questionnaire (MHFQ) and KCCQ

PREMs can be either relational (patient experience of their relationships during treatment) or functional (experience of practical issues, such as facilities available) and both generic and disease-specific PREM tools exist. Like PROMs, there are a vast number of PREM tools with generic instruments accounting for just over two-thirds. Again, validity and reliability across all PREM tools has been shown to be highly variable but the Hospital Consumer Assessment of Healthcare Providers and System (HCAHPS), the Norwegian Patient Experience Questionnaire (NORPEQ), the Picker Patient Experience Questionnaire (PPE-15), and the Patient Experiences with In-patient Care (I-PAHC) instruments have been found to demonstrate the most evidence of validity and reliability for in-hospital PREMs.

The future: PROMs and PREMs core to delivering high-quality cardiovascular care

To deliver high-quality and values-based care, PROMs and PREMs need to be fully integrated into everyday clinical practice. A significant amount of work is needed for this to become commonplace, but there are four key areas worthy of focus. Firstly, appropriate and robustly developed and validated disease-specific tools, including involvement and/or co-production with patients, are needed in cardiovascular care areas where none exist, or where do they exist, fall short of the scientific required standard. To address this, the ESC led by ACNAP has recently created both a Patient Engagement Forum and a PROMs

committee to focus on these areas. Secondly, and aligned to point one, greater robust evidence is needed on PROMs and PREMs. Thus, methodologically rigorous research is needed that aligns, where possible, to standardized core dataset recommendations and reports using CONSORT-PRO guidelines (reporting of PROs in randomized trials). Thirdly, there needs to be adoption of appropriate electronic technologies to support the routine introduction of PROMs and PREMs into clinical practice.⁵⁸ Finally, and most importantly, a widespread general culture shift in shared decision-making, and the value and inclusion of PROMs in this, is needed.

Care must be people-centred

A central element of ensuring that people remain at the core of our healthcare is ensuring a focus on patient-centred care. Although the terms patient-centred care and people-centred care are often used interchangeably, there are differences. Patient-centred care is often viewed as a central component of management of a non-communicable disease. Patient-centred care has been defined as ‘Providing care that is respectful of and responsive to individual patient preferences, needs, and values and ensuring that patient values guide all clinical decisions’.⁵⁹ It is associated with improved effectiveness, health outcomes, and patient experiences especially in vulnerable cardiovascular populations such as older patients with a high burden of comorbidities.

Patient-centred care principles are intimately related to actual nursing challenges such as sharing decision-making, health literacy, language access, and cultural competence. Considering patient/family preferences, understanding that each person experiences a condition in a unique way with their own expectations, are directly related to nursing empathic competences and communication skills that will also enable patients to actively participate in their care (shared decision-making).

Empowering and enabling patients to participate in their own care and being involved in health strategy decisions is crucial in patients with long-term conditions such as cardiovascular disease. Self-care and self-management are particularly important in achieving desired outcomes. However, learning to share decisions with patients as partners in their own care requires a fully prepared, informed, and engaged patient and implies significant changes in the traditional paternalistic model of care. For example, in patients with anticoagulant treatment, it is important to develop culturally adapted, high-quality, comprehensive, up-to-date evidence education tools in a way that can

make intellectual, emotional, and practical sense to the patient.

Patient- and family-centred care are two of the several multidimensional terms referring to innovative approaches to care. These models recommend that care is delivered and planned around the convenience of both the individual and their family members. The concepts of patient-centred care and family-centred care have gained increasing public prominence in recent years as an attempt to improve the quality of care and meet the needs of patients. In Australia, for example, patient-centred care has been practised for more than a decade, with the adoption of self-determination and autonomy as the pillars of this movement. As part of patient-centred care and family-centred care, patients are also situated in the front row, as they are increasingly asking the healthcare systems to participate in their care process.⁶⁰

Patient-centred care and family-centred care are therefore identified as contemporary concepts, as opposed to the less acceptable old ways of healthcare delivery, when physicians chose to adopt a paternalistic approach, thus limiting the interventions and the inputs from patients and families. Patient-centred care and family-centred care identify similar approaches and philosophies of caring, but according to some sources, each of them can be conceived according to the context of care and the patients involved. For instance, in paediatrics, the concept of family-centred care can prevail, to emphasize the right and the responsibilities of the parents towards their children’s well-being. However, in adulthood, the concept of family-centred care is more merged to that of patient-centred care, to emphasize also the role of patients in individual care decisions. Thus, it is common to find the terms patient- and family-centred care used interchangeably across the literature.⁵⁹

Key concepts and benefits of patient- and family-centred care

Patient- and family-centred care principles are built upon the relationships and collaborations of its most important members, namely patients, families, physicians, nurses, and other professionals. The Institute for Patient- and Family-Centred Care (<https://www.ipfcc.org/>) and other groups reached agreement on the following principles of patient-centred care:

- Information sharing: the exchange of honest, objective, and unbiased information between families and providers.
- Respect and honouring differences: cultural diversity and family traditions, including knowledge, values,

beliefs, and cultural backgrounds are respected and honoured.

- Partnership and collaboration: patients and families collaborate with providers at all levels of healthcare, participating in decision-making at the level they choose.
- Negotiation: medical care plans are flexible and agreed upon by families and patients. Choices and decisions about their health are favoured and shared between team members.
- Care in the context of family and community: policies and systems are developed so that they are tailored to patients' and families' needs in all settings, including community-based services.

The aforementioned principles suggest the presence of two common ingredients that are essential to achieve patient- and family-centred care outcomes: being receptive and responsive to the needs of the individuals and their families, and supporting their participation in the care process.

Patient- and family-centred care: impact on outcomes

Considerable research has been conducted to explore the benefits of patient- and family-centred care models. Evidence indicates that they can improve several outcomes, related to patients, healthcare providers, and health systems. In patients, studies have found a positive relationship between patient- and family-centred care and satisfaction. In 2008, Wolf conducted a randomized controlled trial to examine the effect of patient-centred care during discharge from an acute surgical care setting, and found that participants in the patient-centred care group rated their satisfaction and quality of services more highly.⁶¹ Similarly, in 2000, Counsell found increased satisfaction with care when patient-centred care was adopted from hospital admission to discharge.⁶² Other studies have reported a decrease in hospital readmissions and use of healthcare services. Heart failure patients who were managed using a patient-centred approach during their hospital stay, were less likely to be readmitted with a recurrence within 30 days of discharge. Data from a randomized study showed that patient-centred care was associated with less annual visits for specialty care, less frequent hospitalizations, and reduced laboratory tests. A patient-centred care approach can also improve patient self-care. Furthermore, a systematic review found that the use of educational strategies for adult patients with heart

failure improved self-care, quality of life, and knowledge, particularly when it was delivered by a multidisciplinary team.⁶³

The benefits of patient- and family-centred care can also extend beyond patient outcomes, and may also encompass healthcare providers and health systems. For example, when staff incorporated patient-centred care practices, these were associated with lower turnover intentions, and higher quality of care. In addition, patient-centred care was negatively correlated with medical errors and near misses. These important benefits of patient- and family-centred care can have a number of implications for healthcare providers and health systems. For example, nurses can use patient- and family-centred care as an instrument to improve both the quality of care, and also the context in which they work and their well-being. Policymakers demonstrating interest in particular patient- and family-centred care models can promote, disseminate, and implement these initiatives in light of their evidence-based effectiveness.⁶⁴ Given the evidence for benefit of patient-centred care, it would seem logical that its adoption should be incorporated into clinical guidelines. However, a review and expert consensus from the ACNAP Science Committee evaluated a selection of ESC Guidelines and found that the inclusion of patient-centred care as a recommendation is low.⁶⁵

Strategies for successful patient- and family-centred care

Patient- and family-centred care is now considered a central aspiration of most high-quality healthcare systems. Major effort has been made to enhance partnership and collaboration with patients and families. However, successful patient- and family-centred care goes beyond the improvement of these relationships. In 2009, a team from the Group Health Research Institute (Seattle, WA, US) oriented their research on people-centred care and developed a framework to help understand the areas for action, implementation, and improvement.⁶⁶ To promote the adoption of people-centred care, healthcare systems should orient their strategies through these three macro levels: (1) interpersonal, (2) clinical, and (3) structural levels of care (► Table 2.4).

Interpersonal level of care

Strategies to implement patient- and family-centred care begin with improving the interpersonal level of care. This context encompasses the relationship between healthcare providers and patients/families. It is essential to develop effective communication techniques to involve patients

Table 2.4 Strategy levels of patient- and family-centred care

Interpersonal level	Clinical level	Structural level
Adopt communication techniques	Ensure shared clinical decisions	Improve access to care
Promote patient narratives	Promote self-care	Improve healthcare physical environment
Build strong partnerships	Improve care transitions	Promote virtual care
Ensure shared decision-making	Support with clinical follow-ups	Promote information technology
Encourage involvement in care		

Source data from Greene SM, Tuzzio L, Cherkin D. A framework for making patient-centered care front and center. *Perm J*. 2012 Summer;16(3):49–53.

and families in the process of care and earn their trust. In order to ‘centralize’ care, it is important to understand patient and family preferences, needs, and values. Three routine steps are suggested in order to safeguard patient- and family-centred care in daily practice: (1) building a partnership with the patient, through patient narrative (starting point of the process); (2) strengthening the partnership through shared decision-making; and (3) documenting patient preferences, beliefs, values, and involvement in care and decision-making. Also, regular investigations into patients’ and families’ experience of care could help find areas of improvement, with the last objective to monitor the quality of care offered.

Clinical level of care

The clinical level of care refers essentially to the care delivered by the professional teams. In order to ensure higher standards of care, providers should adopt clinical decisions according to the best available evidence and, at the same time, ensure active patient and family involvement.^{66,67} However, the needs of patients surpass clinical needs and, therefore, they should be empowered to achieve more autonomy. A further element of patient- and family-centred care is the promotion of self-care for individuals with chronic illnesses and their families. In this context, the engagement of patients is viewed as a more active role in the care process. This is an important objective of all healthcare systems, especially in previous recent decades, where the ageing population and the increase in life expectancy have paved the way for the increase in non-communicable diseases. Another aspect of clinical care is to improve care transitions, or the movement of patients across healthcare providers and settings.

Pre-discharge interventions should include facilitation of patient engagement, and patient and family education oriented to self-care. Post-discharge interventions should be proactive and encompass facilitation of communication with healthcare providers, additional support (including follow-up phone calls and home visits), and clinical follow-up.

Structural level of care

The structural level of care represents, essentially, the environment where care is delivered. A growing body of literature has been published on the field of the ‘healing environments’, defined as the healthcare environments that are designed to positively influence the patient’s healing process, recovery, and well-being. Recognition of these healing environments represents key progress, as now many structures are still tailored to facilitate clinical activities. For example, doctors’ and nurses’ stations in hospitals are often distant from patients’ beds, and healthcare services are designed such that patients and families are forced to move to services rather than having them wherever they are, with the result of increasing psychological and physical stress. The creation of a healing environment that removes barriers between patients, families, and providers is one of the objectives of the Planet Tree Model. Specifically, the aims of this model, which is being implemented in many institutions around the world, are to (1) demedicalize the individual and family experience, and (2) create more accessible services in the context of care.

Some strategies to improve the healthcare physical environment include, for example, redesigning the waiting areas and the spaces of outpatient services, to ensure

that they better meet patient and family needs. Or interventions to improve access to care, including more outreach services in underserved rural and urban areas, minimization of clinic waiting times, and facilitation of appointment-making processes. A structural context should also dedicate proper strategies to information technology, in order to facilitate (1) organization and exchange of patient-related information, which is typically fragmented across and isolated within services and (2) virtual care, a broader term that refers to interactions that do not require patient, family, and providers to be in the same room at the same time. Virtual visits can be one means to ensure continuity of care, and make healthcare systems more patient- and family-centred, as they provide easier access to care and improve effective communication with healthcare providers.⁶⁸

Optimal delivery of patient- and family-centred care cannot prescind from strategies and interventions that are evidence based and multidimensional in nature. Healthcare providers, which are facing increasing pressure to implement patient- and family-centred care into their practice, have to engage in multidisciplinary aspects of care, from building relationships with patients and families, to engaging in organizational leadership strategies. But they are also constantly challenged by the provision of care under conditions of constrained resources, especially in this modern era where the epidemiological transition has determined a tremendous expansion of individuals with chronic illnesses and an increase in costs.

Patient- and family-centred care in cardiovascular conditions

Cardiovascular diseases are recognized as a major health problem worldwide. According to the literature, they represent the leading cause of death (see Chapter 1). For example, in the US, they account for 17% of all health expenditure.⁶⁹ However, the burden of cardiovascular diseases comes not only from mortality but also from the consequences of living with the disease. As an example, coronary artery disease (the most common disease of the heart), is a major cause of disability in developed countries, and also a primary contributor to the development of heart failure, which in turn is the principal cause of hospitalizations in older adults.

A patient- and family-centred care approach is increasingly being recognized as an important component of the treatment and management of cardiovascular diseases. Recent developments have heightened the need

for further implementation of patient- and family-centred care interventions in cardiovascular nursing and medicine, particularly during the initial periods following an acute cardiac event (e.g. acute coronary syndrome, heart failure, and ventricular arrhythmias). A systematic review found that the highest effectiveness of patient- and family-centred care interventions was reached when delivered to acute patients, for example, those being affected by myocardial infarction. However, there is substantial evidence of positive effects also when patient- and family-centred care is implemented for chronic patients with exacerbations. With regard to this, the experience of Ekman and colleagues (2012) is noteworthy.⁷⁰ They implemented a randomized controlled trial by recruiting patients with chronic heart failure hospitalized for worsening of symptoms. The study intervention was based on three patient- and family-centred care goals (initiating, working, and safeguarding the partnership) and provided evidence of a significant reduction in hospital readmissions and maintenance of functional performance.⁷⁰

In addition, a retrospective study suggested that patient- and family-centred care was able to reduce mortality in veteran patients hospitalized for acute myocardial infarction, although the estimation of the 'technical' quality of care was not proven directly, rather by means of measures of adherence to international guidelines. A more recent study by Fors and colleagues (2015) implemented a detailed patient-centred care intervention for patients affected by acute coronary syndrome, to facilitate discharge from hospital and return to everyday life. The intervention comprised a care planning and decision-making process performed collaboratively by patients and healthcare professionals. It included a first step (inpatient stay) concerning listening to patient narratives and reaching a joint agreement on the care plan. A second step was then performed during outpatient care visits, to discuss the health status, and a third final step (the most important one) was instead dedicated to primary care. The benefits of this approach were a reduced length of stay, a minor uncertainty about the disease and treatment, and a significant improvement in quality of life and self-efficacy. One of the fundamental aspects to improve the health of patients affected by cardiovascular diseases is the implementation of practice guidelines. In 2015, the ESC produced five guidelines; one of them was to support the management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. This initiative, to which a team of nurses also participated, was important because it emphasized the patient- and family-centred care approach in the emergency context. Two strategies were particularly

recommended: the involvement of an interdisciplinary team and the involvement of the families.

But what exactly are the opinions and views of cardiac patients concerning patient- and family-centred care? In a recent qualitative study, 18 cardiac patients hospitalized in coronary care units were interviewed. The study found that the most important perceived themes regarding patient- and family-centred care included the management of their uncertainty, more flexibility of care, more effective and emphatic communication, and the importance of making independent decisions in the care process. The results of this study are important because, to date, little attention has been given to cardiac patients' perceptions towards patient- and family-centred care and, more importantly, they confirm once more that such perceptions match the key principles of a patient- and family-centred care approach.⁷¹

Patient- and family-centred care as a support to self-care in cardiovascular conditions

Unfortunately, individuals who develop a cardiovascular illness have a higher risk of subsequent cardiovascular events (e.g. stroke and myocardial infarction), so it is important they engage in preventive lifestyle behaviours (physical activity and exercise, diet, smoking cessation, etc.) and perform an adequate level of self-care.⁷² Self-care, defined as the decision-making process performed by patients to promote their health and manage their illness, represents a fundamental aspect of patient- and family-centred care because it requires the individuals to become the main actors who are responsible for their care. In the cardiovascular field, self-care has been extensively studied in patients affected by heart failure. Initially, Riegel and colleagues developed the 'situation-specific theory of heart failure self-care', which was then followed by the 'middle range theory of self-care of chronic illness', in order to describe how self-care works in individuals with heart failure and chronic illnesses, respectively. These theories, which are quite similar, identify three components of self-care: (1) self-care maintenance, that is, the actions performed by patients to promote health and keep the chronic illness stable (e.g. physical exercise, diet, medication adherence); (2) self-care monitoring and symptom perception, that is, the process of monitoring signs and symptom of an illness (e.g. keeping a record of body weight); and (3) self-care management, namely the process of decision-making after detecting signs and/or symptoms

(e.g. consulting the healthcare providers because of a symptom).

In heart failure studies, researchers have found that self-care can improve a variety of outcomes including quality of life, mortality, healthcare utilization, and symptoms. But there is also evidence of self-care benefits in other populations, such as hypertension, coronary heart disease, and atrial fibrillation, where in general there is a significant improvement in lifestyle modifications, self-monitoring, and medication adherence. Patients also rely on their families, relatives, or friends for the management of their care. These individuals are called informal caregivers and contribute to a variety of self-care tasks including accompanying patients to medical appointments, monitoring health conditions, and communicating with healthcare providers. Similar to self-care, caregiver contributions have also shown a positive impact on patients' outcomes, particularly on medication adherence, health behaviours, psychological health, quality of life and healthcare utilization, and patient clinical events (hospitalizations, access to emergency services, and mortality).

Caregiver contributions to self-care have been defined, in the context of heart failure, as:

[T]he process of recommending to (or substituting for) the patient to perform those behaviors that help to (1) maintain stability of heart failure conditions (caregiver contribution to self-care maintenance), (2) facilitate heart failure symptom monitoring and perception (caregiver contribution to symptom monitoring and perception), and (3) respond to the signs and symptoms of an HF exacerbation when they occur.⁷³

Self-care should be considered an important target of patient- and family-centred cardiovascular care, due to the fact that such diseases are complex in nature and often manifest with symptoms that can limit physical, social, and mental abilities, as well as impair quality of life. With advanced cardiovascular conditions, patients may not be able to overcome the difficulties in self-managing their illness, so it is necessary to involve caregivers from the very beginning of the care planning. Therefore, assessing both self-care abilities of patients and the levels of contributions of caregivers to self-care may allow an understanding of the extent of their active participation in the management of the disease. Other indispensable patient- and family-centred care strategies should encompass the implementation of personalized educational interventions focused on (1) closing knowledge gaps, (2) sustaining motivation and

self-efficacy, and (3) strengthening specific self-care skills and abilities.

Barriers to implementing quality care

Failures to provide adequate care or 'care left undone' are frequently reported as safety and quality gaps, and have been under intense scrutiny. High-profile incidents of poor care led to increased development of policies, strategies, and research groups focused on fundamental aspects of nursing care.¹⁴ Failures in fundamental or basic care constitute significant risks for patients, often leading to wider patient safety failures as hospital-acquired infections or issues in nutrition and hydration in older people.¹⁴ There has been some debate around whose role it is to deliver this care as it is increasingly delegated to other care staff.¹⁰ It has been suggested that nurses tend to see fundamental care as minor physical tasks often devalued and invisible in a technological era, for which they do not have time, whereas it is highly valued by patients whose experience of healthcare is sensitive to nursing quality.¹⁰ Suboptimal nursing care can lead to patient distress and dissatisfaction as they expect nurses to be well educated and competent but also compassionate and caring.¹⁰

Another source of quality care failure is a healthcare context that tends not to value these attributes, placing more importance on cost-effectiveness outcomes rewarding 'task and time' nursing rather than personalized care. Missing or incomplete nursing care has been clearly associated with nurse staffing levels and the replacement of registered nurses with less skilled workers.¹⁰ This kind of restructuring initiatives lead to less time spent on direct caregiving, less mentoring of staff nurses, and undermine nurses' clinical leadership; all resulting in higher levels of dissatisfaction and lower meaningful nurse–patient relationships.¹⁶ Excessive administrative tasks, paperwork, and data collection are taking away nurses' time to spend on direct care; for an hour of patient care, 30–60 minutes are needed for subsequent paperwork.¹⁶ This is endorsed by international debate relating failures in nursing care with nurses' inability to provide compassionate care, such as comforting and talking to patients, when workloads intensify.¹⁴

Nurses report that the most enjoyable feature of nursing is helping patients and their families, but complain that 40% or less of their time is spent on direct patient care. Surveys describing nurses' last shift report high percentages of care left undone; 20–30% of the patients did not

receive adequate skin or oral care, 28% of nurses were not able to provide patients with necessary education or family instructions, and up to 40% were not able to comfort or talk with their patients.⁷⁴ Studies about burnout, and the reasons nurses want to leave the profession, reveal that nurses are profoundly dissatisfied when they have not been able to provide the personalized care they want to.

Technology has also been blamed for interfering with 'care' in the broad sense of the term, moving away from high-touch care. There is a growing use of robotics for fundamental care provision (i.e. to provide feeding assistance or robot bathtubs in elder care). The challenge to nursing is to humanize the use of technology exerting influence on how it can and should provide fundamental care and not forgetting the importance of personal caring and touch.

Poor conceptual definition and lack of agreement surrounding components of fundamental aspects of nursing care prevents the development of robust evidence, and underlines problems with the delivery of such care. Limited data on the effectiveness of the intervention undermines a refocus on fundamental nursing care: developing a consensus definition of fundamental nursing care will facilitate the development of adequate metrics. Different interpretations have contributed to the lack of clarity of the concept referring, for example, to fundamental needs (i.e. hygiene), aspects of nursing care (i.e. honesty), and outcomes or factors required to address these needs. The lack of consensus of general or common descriptors and the dissimilar inclusion of elements (i.e. low reference to comfort, pain management, privacy, and dignity) have also contributed to misunderstanding.¹⁰ This confusion is also influenced by the diversity of terms used to describe fundamental care, such as essence of care, essentials of care, and basic nursing, as a synonym of compassionate care and the frequent use of 'fundamental care' and 'fundamentals of care' as interchangeable terms. Nurses therefore have a critical role to play in collecting data to demonstrate efficacy of our interventions. Despite progress in nursing practice and research, there is still not enough knowledge of what elements of the fundamentals of nursing care matter to patients and how this agrees or differs with caregivers.¹⁰

Qualitative studies have examined patients' subjective experience/perception underlying fundamental care.¹⁰ Reports from stroke survivors describe the psychosocial and emotional impact tailored to physical needs (i.e. eating) and how their integration in care, involving them in setting achievable targets, helped them to regain independence and self-esteem. Studies in these patients

also highlight that distressing experiences were more evident than positive ones; independently of the clinical outcome, patients retained vivid memories after their acute stroke phase. Biographical disruption, poor narratives of patient–carer relationship, long-stay patients’ intensive care unit experiences (including lack of families being present/involved), and other patients’ and families’ perspectives of inadequacies in nursing care are some challenges nurses must be aware of and constitute areas where more analysis of patients’ experience data is needed to provide insight into current practice and how it addresses aspects of care most valued by patients and families.

A third dimension creating barriers to high-quality care exists within the health system or the context. Failures of care are not solely the responsibility of nurses as several conditions can enable or hinder care at different levels.¹⁰ Resources (equipment and human), policy, culture, leadership, feedback, and standardized evaluation have been identified as system enablers.¹⁰ Some authors emphasize that unless changes of core values and attitudes within healthcare systems occur, fundamentals of care will not be improved. Environment and culture are relevant challenges to the provision of patient- and family care, especially in intensive care units such as coronary care units. Literature about the fundamentals of nursing care appears confusing, with authors providing lists of nursing activities, using different definitions of fundamentals and fundamental or compassionate care.¹⁰ Greater visibility of fundamental nursing care is needed to understand how it can contribute to patient experience and outcomes. Nurses have been called to action internationally to produce evidence for clinical practice in the fundamentals of care in a reliable, replicable, and robust manner.

A major identified barrier is uncertainty or ignorance about the qualifications and competence of nursing leaders by other professionals, managers, and even patients. Gaps in role clarification and collaborative leadership, lack of operationalization of team functioning, or conflict resolution adds to this difficulty. Varying levels of authority; misunderstanding of current roles and responsibilities; and different interests, goals, expectations, styles, and experience can interfere with communication and generate conflict. Some critical factors such as systemic determinants, organizational structures, context, and workplace culture may be beyond the control of the team. Tools, procedures, management influences, professional practice regulation, institutional policies, and the physical environment are relevant for the full scope of practice within an interdisciplinary approach.

Health organizations and managers must establish workplace cultures that embed innovation and excellence where staff are respected and valued, with positive practice environments providing development and support to the health team. Local empowerment will create local solutions and a better understanding of workflow in members of the interdisciplinary team. This requires radical shifts in service delivery and philosophy (i.e. flexibility of roles), values, and norms of the system with explicit commitment to innovation and learning (both formal and informal education).⁷⁵

Nurses have been identified as pivotal in team building and in creating a culture of collaboration for safe, high-quality care, especially for cardiovascular patients. Nurse-coordinated care in the interdisciplinary team has proven to be effective, especially in preventive cardiovascular care, but it depends on several factors such as training, knowledge, professional confidence, and evidence-based practice. Newly graduated nurses frequently lack intradisciplinary expertise while postgraduate training of nurses largely determines their role on a cardiovascular team.²⁰ Programmes led by specialist nurses that include general practice nurses, dietitians, and physical activity specialists have achieved significant results in cardiovascular risk management related to diet, physical activity, and blood pressure.²⁰ This translates into benefits such as increased follow-up, fewer angina symptoms and hospital admissions, lower mortality, as well as better general health.

Moreover, physicians recognized their lack of knowledge about diet and physical activity regimens in specific medical conditions as well as lack of the competencies for effective lifestyle counselling for cardiovascular patients, whereas experienced clinicians have reported that working within a nurse-led professional collaborative practice model has increased their knowledge, leading to changes in behaviour and practice.²⁰ Systematic socioeconomic reviews have provided robust evidence of nurse-led inpatient units compared with doctor-led units with better outcomes such as functional status, well-being, readmissions, and mortality. In nurse-led primary care, patient satisfaction also tends to be higher. Key organizations recognize the importance of interdisciplinary working and the role of nursing as an essential component and provider of highly skilled cardiovascular care in the team. This will improve as more nurses are encouraged globally to embrace leading roles in evidence-based practice, advocacy, and collaboration between disciplines.

Conclusion

In this chapter, we have explored the delivery of high-quality cardiovascular care through the adoption of the WHO framework for quality care. High-quality care needs to be safe, effective and evidence based, timely, equitable, efficient, and, most importantly, people-centred. Nurses make up the largest group of healthcare workers, and therefore have a central role in ensuring that care is of high quality across the life course. Nurses need to advocate for safe practice, and to do so we must be able to access and apply the latest evidence. It is essential that nurses are able to critique research and understand the quality of the research on which we base our decisions to provide care. Using the ESC Guidelines and derivative products is one way to ensure that our decisions are based on the best evidence available.

Nurses need to develop cultural competence to address the disproportionate burden of disease among culturally and linguistically diverse groups to ensure that care is equitable. In doing this, we explored the links between efficient care and quality of care indicators. We also discussed PROMs and PREMs as important measures of quality care. These measures help us to remember how important it is to keep the patient and the family at the centre of everything we do.

Finally, this chapter reviewed the barriers to high-quality care, and the way nurses can overcome these by working with health systems to implement practice that enables provision of high-quality care, by investing in educational opportunities for nurses and embedding innovation and excellence in all we do.

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3 Key considerations for continuing professional development and specialization

LIS NEUBECK, JENNIFER JONES, IZABELLA UCHMANOWICZ, SUE KOOB, CATRIONA JENNINGS, MARÍA TERESA LIRA, SHIRLEY INGRAM, AND DONNA FITZSIMONS

CHAPTER CONTENTS

Introduction 56

Nursing education across the career trajectory 56

What is specialization and advanced nursing practice? 58

Cardiovascular advanced nursing practice in Europe 59

Role expansion—a prerequisite for specialization and advanced practice 59

Education to achieve specialization and advanced practice status

Regulation, barriers, and enablers 61

Clinical experience and core competencies 61

Competence 62

Core competencies of the clinical nurse specialist—based on the Irish model (Office of the Nursing and Midwifery Service Director) 62

Core competencies of the advanced nurse practitioner 62

Prescribing/referral of medications and/or ionizing radiation 63

Timely and efficient integrated care: the role of teamwork and collaboration 63

Reflective practice 65

Reflective clinical practice: what is it and why does it matter? 65

Methods of reflection 68

Practice application 69

Effective nursing leadership 70

Introduction 70

All nurses are leaders 71

What is leadership in nursing and why is it important? 71

What kinds of leadership work best in nursing? 72

Compassionate leadership in healthcare 72

Clinical leadership in nursing 73

Getting involved with professional societies, associations, and heart foundations 73

What professional development opportunities do societies, associations, and foundations provide for nurses working in cardiovascular care? 73

Summary 74

Conclusion 74

KEY MESSAGES

- Nurses are on a lifelong learning journey.
- Using the core curriculum enables a framework for learning.
- There is some disparity in description of specialist and advanced practice roles, but all require additional education beyond initial qualification.
- Reflection is an important part of learning.
- Leadership in nursing is critical to ensure high-quality patient care.
- Professional societies and associations provide important support for lifelong learning and development of core skills.

Introduction

In this chapter, we will look at continuing professional development in nursing. Continuing professional development is described internationally by a variety of terms. These include continuing nursing education, life-long learning, and professional skills development (among others). While there is no universally agreed term for continuing professional development, there is a generally accepted understanding of its purpose—to help nurses maintain an updated skill set so that they are able to care for patients safely and competently. Given the current climate of an ageing population and the increasing incidence of non-communicable disease, and in particular cardiovascular disease (CVD), nurses, who are the largest healthcare workforce worldwide, are called upon to continue their efforts in the development of high-quality healthcare services, as discussed in Chapter 2. Nurses do not exist in isolation from other health professionals, in fact they are required to work in an integrated and interdisciplinary way with physicians, allied health professionals, and indeed other disciplines outside the healthcare domain such as social care services. One way that nurses contribute to service development and improvement is to enter into specialization in cardiovascular care and develop advanced practice skills. In order to develop as specialists, nurses need to access appropriate educational programmes to prepare them for these roles. In addition, these programmes provide stepping stones towards advanced practice. Service improvements and innovations are more likely to happen when professionals are able to reflect on their clinical practice and use their experience to make positive improvements. This influences what happens on both an

individual and bigger picture level. Nurses can find opportunities for getting involved in research and service development by linking into organizations that support funding for their research and provide mentorship and opportunities for leadership. Implementing research findings in practice is essential to improving care for our patients. Mentorship and leadership provided by nurses for nurses is also an imperative to create a culture for quality in care (see Chapter 2).

Nursing education across the career trajectory

Across the globe, nurse education is moving towards university-based models. The evolution of nursing from hospital-based training to bachelor of nursing and graduate programmes is as a result of increasing knowledge of the effectiveness of nursing care and the ability of nurses to manage complex cardiovascular conditions. Educational programmes for cardiovascular nurses need to ensure that cardiovascular nurses are ‘fit to practise’, with the necessary knowledge and skills to ensure optimal care.¹ It is well known that skilled nurses reduce morbidity and mortality. In a study reporting discharge data of more than 400,000 patients, a 10% increase in the ratio of bachelor degree-prepared nurses resulted in a 7% decrease in morbidity.² Similarly, an Australian review highlighted the association between workforce, qualifications, and quality of care, and found critical thinking and clinical skills increase incrementally, with increased nursing qualifications.³

Despite the strong evidence for degree-based education programmes for nurses, there is still disparity in the delivery of education across Europe. Consequently, the Education Committee of the European Society of Cardiology (ESC) Association of Cardiovascular Nursing and Allied Professions (ACNAP) (formerly the Council of Cardiovascular Nursing and Allied Professions) developed the core curriculum for education of cardiovascular nurses.⁴ The Education Committee reviewed existing curricula, international publications, and policy documents and developed a core curriculum underpinned by educational theory with eight major themes (► **Box 3.1**).

The core curriculum was designed as a document to inform discussions about the harmonization of the continuing professional development of cardiovascular nurses across health services and educational institutions in Europe. Across each of these themes, nurses move from novice to expert following Benner’s model

Box 3.1 Core curriculum major themes



Fundamentals of cardiovascular pathophysiology

- ☒ Anatomy, pathophysiology, and clinical manifestations
- ☒ Recognizing clinical deterioration
- ☒ Atherosclerotic heart disease
- ☒ Heart rhythm and conduction
- ☒ Structural abnormalities
- ☒ Heart muscle disorders



Optimizing cardiovascular health for people and populations

- ☒ Global CVD burden
- ☒ Coronary risk factors
- ☒ Risk assessment
- ☒ Behaviour change
- ☒ Interventions to aid prevention



Assessment, planning, and managing care

- ☒ Cardiovascular assessment
- ☒ Diagnostic tests
- ☒ Eelectrocardiogram skills
- ☒ Life support skills
- ☒ Pharmacology
- ☒ Nursing care plans



Principles and practices of person- and family centred care

- ☒ Person-centred care
- ☒ Shared decision-making
- ☒ Reflective practice
- ☒ Tools and approaches



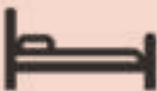
Education and communication

- ☒ Education and adult learning
- ☒ Communication skills
- ☒ Health literacy



Emotional and spiritual well-being

- ☒ Emotional resources and self-care
- ☒ Prevalence of maladaptation
- ☒ Screening tools
- ☒ Nursing interventions



Physical well-being and comfort

- ☒ Patient safety
- ☒ Symptom management
- ☒ Exercise and rehabilitation
- ☒ End of life care



Evaluation of the quality of care

- ☒ Systems and organizational theory
- ☒ Quality care and quality indicators
- ☒ Care coordination
- ☒ Risk assessment, patient safety, audit, and evaluation
- ☒ Role of technology in patient safety

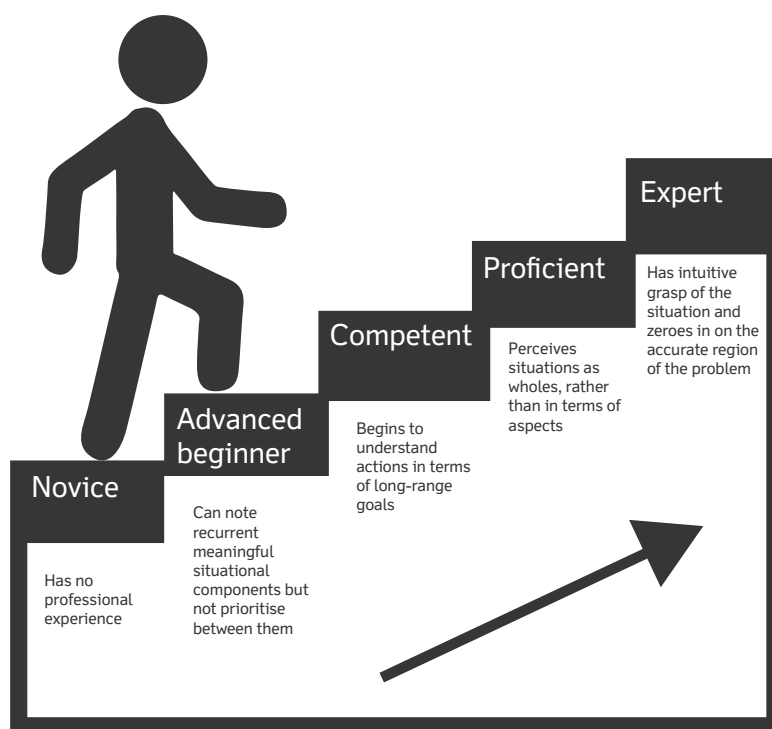


Fig. 3.1 The continuum of nursing experience.

Source data from Benner P, *From Novice to Expert: Excellence and Power in Clinical Nursing Practice*, Commemorative Edition, 2001.

(2001),⁵ recognizing that the process of becoming a skilled cardiovascular nurse occurs on a continuum over time. Accordingly, nurses move through the five levels of proficiency: novice, advanced beginner, competent, proficient, and expert (► Fig. 3.1).⁵ This provides a vision for the future of how nurses can advance from novices to becoming experts and leaders in cardiovascular care.

Global standards in cardiovascular nursing competence are important, as nurses are highly mobile, and are frequently incentivized to move country to meet nursing shortages.⁶ Within England alone, over 13.8% of National Health Service staff report a non-British nationality.⁷ Some 67,559 staff are nationals of European Union countries and a further 63,818 staff come from Asia. Therefore, mechanisms need to be in place to ensure that internationally trained nurses have acceptable standards of practice underpinned by core curricula and competency-based education, such as the ACNAP core curriculum to ensure standardized levels of practice.⁶ Nurses comprise the largest portion of the healthcare workforce, with around 28 million nurses working globally.⁸

With a highly mobile population, it is imperative to understand the significant contribution that nurses make in reducing the global burden of CVD across healthcare services. However, this contribution can be recognized only if cardiovascular nurses are appropriately educated and trained, equipped with the required knowledge and skills, and supported by relevant certifications. Therefore, it is an immediate priority for ACNAP to support the dissemination of the core curriculum to ensure that the comprehensive, explicit standards/guidelines encompassing educational preparation, roles, and competencies for cardiovascular nurses globally are accessible. Lifelong learning is required to ensure the maintenance of competencies, which then helps to assure quality cardiovascular care.

What is specialization and advanced nursing practice?

One of the key challenges is the variety of definitions which surround the concepts of specialization and advanced nursing practice, which are underpinned by research,

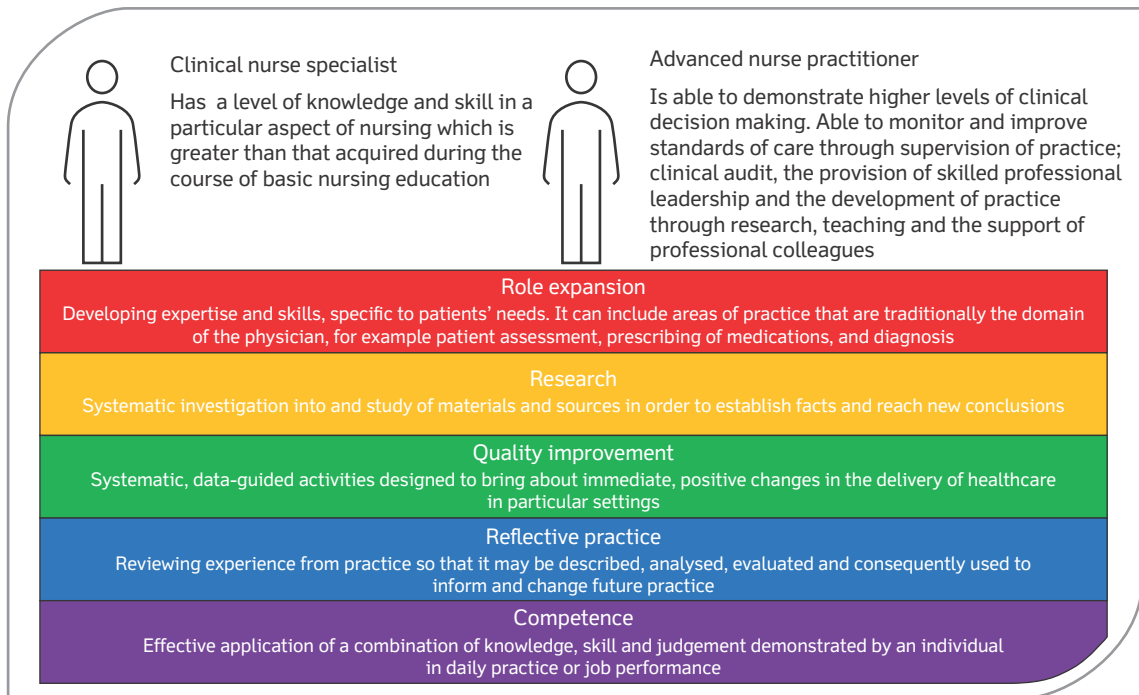


Fig. 3.2 The foundations of specialization and advanced nursing practice.

continuing professional development, quality improvement, role expansion, and reflective practice (► Fig. 3.2).

In the absence of an international definition or title for nurses in expanded roles, the definition of 'advanced nursing/nurse practice' is used by the International Council of Nurses (ICN) to describe 'a registered nurse who has acquired expert knowledge, complex decision-making skills and clinical competencies for expanded practice, which is shaped by the country in which s/he is credentialed to practice'.⁹ Ryley and Middleton (2016) suggest that advanced practice is a level of practice rather than a specific role.¹⁰ However, a clear and legal title for the advanced practice nurse protects both the public and the practitioner and provides role clarity for all. Internationally, titles are many and varied; however, the terms clinical nurse specialist (CNS) and advanced nurse practitioner (ANP) are used frequently.^{9,11} In Ireland, for example, these titles have now shaped the model of graduate to advanced practice,¹² providing a clear framework from graduate nurse to ANP (► Fig. 3.3).

Cardiovascular advanced nursing practice in Europe

The evidence shows that care provided by ANPs improves patient outcomes, is safe, acceptable, and cost neutral

and ANPs now make up a growing percentage of the nursing workforce.¹³ The US leads the way with a level of 5.6%, Canada 1.4%, the Netherlands 1.5%, and Ireland has projected growth from 0.2% to 2% of ANPs by 2021.¹⁴ Advanced practice cardiovascular nursing in Europe is already in evidence, especially in the area of heart failure, with the ESC suggesting every hospital that manages patients with heart failure should employ a heart failure specialist nurse.¹⁵ Cardiac rehabilitation recommends the inclusion of a cardiovascular nurse specialist as a team member in Portugal¹⁶ and individual nurses have provided evidence of ANP benefits in cardiology services.¹⁷

Role expansion—a prerequisite for specialization and advanced practice

Role expansion of the general nurse is common in modern nursing and there is potential for the role expansion of nurses in line with health service needs.¹⁸ Cardiovascular medicine has evolved into many specialities as evidenced by the affiliated groups of the ESC (seven Associations, seven Councils, and 15 Working Groups). With increasing specialization and evolving evidence-based care, patients' needs have become more complex and cardiovascular nursing has had to expand and specialize to provide expert

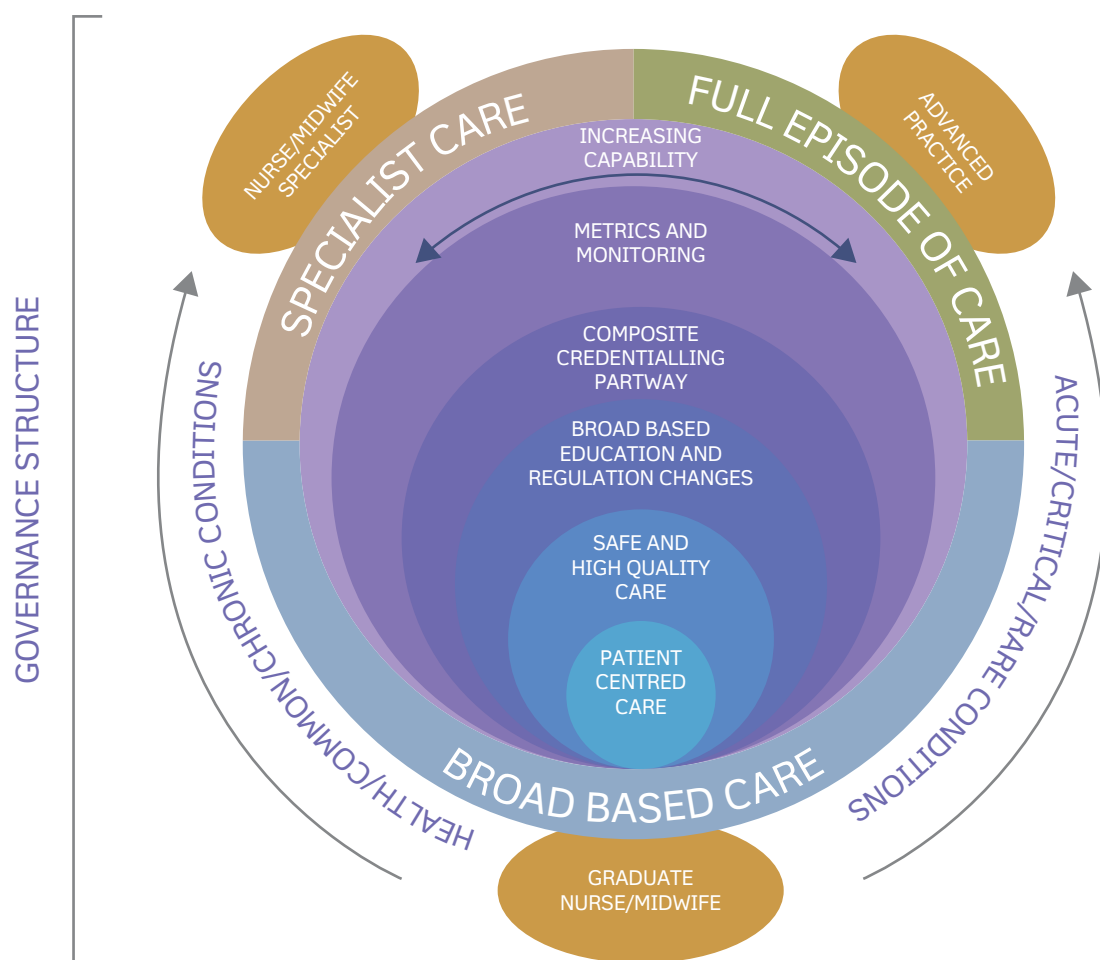


Fig. 3.3 Model of Advanced Practice.

Reproduced by kind permission of The Department of Health, Ireland. A Policy on the Development of Graduate to Advanced Nursing and Midwifery Practice.

care. In response to this, ANP roles have developed in many countries with cardiovascular medicine at the forefront. The American Heart Association suggests that advanced nursing roles within cardiology add to the quality of patient care and are cost-effective.¹⁹ Cardiovascular medicine provides the nurse who wishes to expand their role with a variety of specialist areas in which to practise, as a generalist, specialist, or ANP. Historically, role expansion to 'specialist' nurse has been driven by the individual nurse in collaboration with the cardiologist²⁰ and while some countries in Europe have developed strategies for role development,¹⁴ individual vision, drive, and determination remain the key drivers of specialist and advanced practice.

The goal of role expansion is to improve the quality of care provided by nurses, through enhanced competencies which expand the nurse's skills, capacity, and ability to deliver expert care.¹⁸ Role expansion in cardiology nursing includes developing expertise and skills specific to patients' needs and can include areas of practice that are traditionally the domain of the physician, for example, patient assessment, prescribing of medications, and diagnosis. Role expansion brings an increase in autonomy¹⁸ and consequently increased professional accountability within each individual professional's scope of practice. For example, Scope of Practice in Ireland is described as 'the range of roles, functions, responsibilities and activities which a registered nurse or registered midwife is educated,

competent and has authority to perform'.²¹ Internationally, it may define practice limitations within which the nurse may practise legally.⁹ An Organisation for Economic Co-operation and Development (OECD) report reviewed the development of ANPs in 12 countries, ten of which were European, and found that ANPs improve access, reduce waiting times, and provide equal quality care to that of physicians with a high level of patient satisfaction.¹³

Education to achieve specialization and advanced practice status

Although a cardiovascular nurse's education may begin in the coronary care unit, cardiac surgical unit, and/or cardiac catheterization laboratory, there are many routes into cardiovascular nurse specialization. Working in acute environments exposes the nurse to a variety of cardiac conditions, interdisciplinary teamwork, and emergency nursing actions, and facilitates the beginning of electrocardiogram interpretation, a specialist skill vital in all aspects of specialist cardiovascular care. However, primary care is an excellent environment to develop holistic skills in cardiovascular risk factors and prevention. There is no right way or wrong way to become a cardiovascular nurse specialist, but continuing professional development is the hallmark of specialization. The ICN suggests the ANP is educated to master's degree level, but this varies by country.²² In Ireland, for example, the CNS is educated to postgraduate diploma level in the specialist area of practice, while the ANP is educated to a master's level qualification.

As cardiovascular care covers many different conditions, treatments, and interventions, in addition to the core curriculum⁴ described earlier, specialist curricula are also required to inform the continuing professional development of cardiovascular nurses and complement the core curriculum. Heart failure, for example, is a global and complex condition in which ANP roles have evolved and grown.²³ The Heart Failure Association of the ESC, in collaboration with ACNAP, has developed a heart failure-specific educational curriculum for nurses.²⁴ The American College of Cardiology is developing competencies for ANPs that are similar to those for physician training and specific to the care of cardiovascular patients.¹⁹ Similarly, the European Association of Percutaneous Coronary Intervention has developed a certification to assure optimal quality in interventional cardiology by assessing the knowledge and attitudes of nurses and allied professionals. Although national standards for cardiovascular care have not been comprehensively developed, the ESC generates a variety of guidelines that provide nurses with a clinical framework

to benchmark clinical practice and be safe in the knowledge that they are providing evidence-based care.

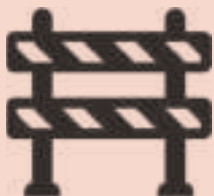
Regulation, barriers, and enablers

Regulation of advanced nursing practice is vital to protect both the patient and the practitioner and ensures safe and competent nursing care from skilled providers. In Europe, the extensive nursing workforce is not all at graduate level,⁴ with some countries requiring state licensing instead of professional registration. In a survey of European countries to determine international ANP regulation, it was found that CNS posts existed in nine countries with formal regulation provided in four countries.^{11,22} In addition, these surveys revealed that ANP posts existed in nine countries, with formal regulation in Ireland, Norway, the Netherlands, and Spain.

In response to an ageing population, chronic disease, delayed access to care, and extended waiting lists, policies on the development of graduate to advanced nursing (and midwifery) have been developed.¹⁴ The goal of policies are to support nurses to progress from graduate to ANP within 1–2 years, moving from competent to capable, novice to expert. Policy documents will now enable nurses to develop in a structured way. Other enablers to ANP include role clarity, working within a team of ANP, belonging to ANP associations locally and internationally, national policy, graduate education, support of clinical mentors, and being part of a clinical indemnity scheme for legal protection and representation.^{14,19} Specific barriers to becoming an ANP have been described by nurses, including lack of role clarity and lack of national policies (► Box 3.2).

Clinical experience and core competencies

Clinical experience in a specific area of cardiovascular care often shapes the ANP speciality. The difference between a general registered nurse and an ANP within a speciality is the depth of knowledge and critical thinking skills the ANP brings to the area.⁹ The ICN has devised competencies for the general nurse and a framework for the nurse specialist.²⁵ A CNS will hone their focus of knowledge and experience into a specific speciality such as heart failure. However, an ANP will extend into the 'medical' domain, diagnosing and managing the patient, within a particular speciality. As such, they expand their level of knowledge and competence from that of a specialist nurse.⁹

Box 3.2 Barriers to advanced nursing practice frequently cited by nurses

- Lack of role clarity
- Lack of national policies
- Limited financial support
- Large caseloads
- Working alone
- No mentorship
- Lack of regulation
- Undervalued roles
- Limited access to diagnostics
- Opposition of other healthcare providers
- Unwillingness of physicians to delegate or provide clinical supervision
- Lack of insurance support
- Varied role titles leading to lack of identification with roles of others
- Limitations to nurse prescribing

National standards of the duration of clinical experience required to practise as an ANP vary; the US requirement is 4–6 years' experience, and Ireland is now reduced to 2 years from 5 years to achieve ANP level. Specific supervised experiential learning requirements for ANP also vary by country, with the US requiring 750 hours and Ireland 500 hours.¹⁴ European countries also have specific frameworks for advanced practice such as in Wales¹⁰ and in Germany.⁹

The ANP leads a service, thereby taking responsibility and clinical accountability for a specified caseload, which includes diagnosis and management planning. Many ANPs practise autonomously, including completing an episode of care and discharging or referring the patient to another service or clinician. While some practice aspects overlap, including advanced physical assessment and diagnosis, nursing knowledge and experience inform the ANP's autonomous decision-making.²⁰

Competence

The ICN suggests that 'competence' is 'the effective application of a combination of knowledge, skill and judgement demonstrated by an individual in daily practice or job performance'.²⁵ In Ireland, competence is 'the effective and creative demonstration and deployment of advanced knowledge and skill in human situations, based on professional attitudes, emotions, values, and sense of self-efficacy of each ANP, as well as advanced knowledge of procedures'.¹⁴

Core competencies of the clinical nurse specialist—based on the Irish model (Office of the Nursing and Midwifery Service Director)

The CNS will often work within the multidisciplinary team and closely with medical colleagues to provide

specialized assessment, planning, delivery, and evaluation of care utilizing protocol-driven guidelines.¹⁴ In Ireland, the CNS must have at least 1 year of experience in the specialist area of care and provide evidence of experience and education relevant to the area of practice. The CNS role in Ireland centres on five core competencies (► Fig. 3.4).

Internationally, it is recognized that heart failure specialist nurses play an essential role within a multidisciplinary heart failure management programme with roles including the provision of education to patients and their families, optimization of disease-modifying medications, and monitoring and early detection of indicators of clinical decompensation.²⁴

Core competencies of the advanced nurse practitioner

Registered ANPs work in partnership with other healthcare colleagues and provide holistic assessment, diagnosis, autonomous decision-making regarding treatment, interventions, and discharge from an episode of care as per the core concepts (► Fig. 3.5 and ► Box 3.3). Despite the described competencies, some role crossover is evident in Europe due to differing role titles.

In the current climate of medical practitioner shortages, it is tempting to perceive the ANP as a replacement for the physician. As the nursing role expands, there is a crossover with roles and skills traditionally undertaken by other healthcare professionals, such as physicians,⁹ and this is most apparent in the ANP role where comparison is often made. This can either enhance professional collaboration or divide. Nursing is more than just a set of tasks and a competency-led model of care can ensure that the ANP is bringing the 'core values' of nursing care to her or his advanced practice.¹²

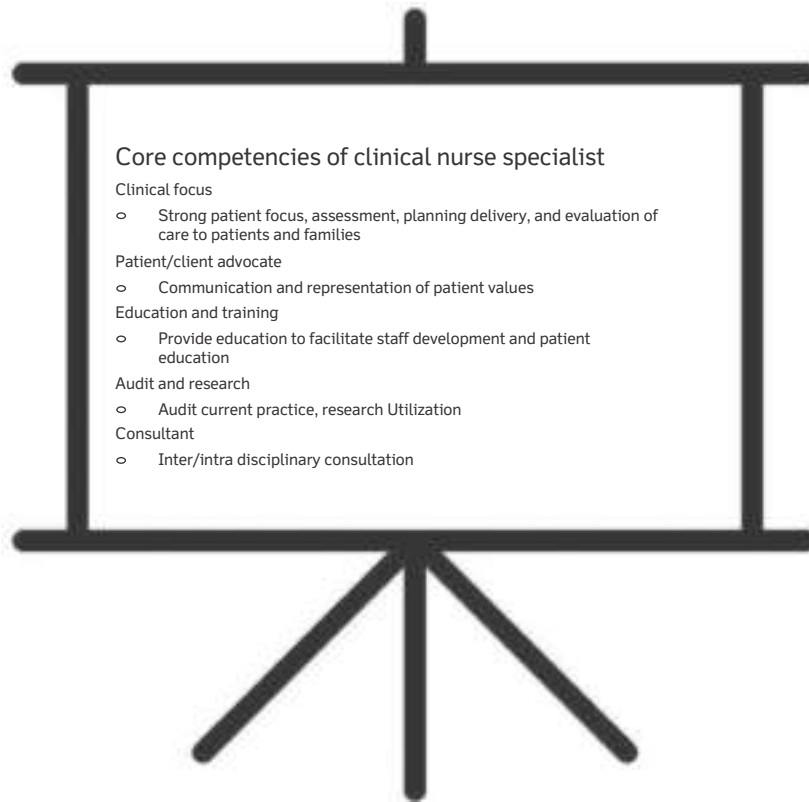


Fig. 3.4 The five core concepts of the CNS role in Ireland.

Prescribing/referral of medications and/or ionizing radiation

Prescribing medications and referring for X-ray are advanced skills traditionally in the physician's remit. With the success of nurse prescribing of medications²⁶ and radiation,²⁷ other healthcare professionals are becoming prescribers.²⁸ Nurse prescribing is beyond the scope of this chapter (see Chapter 12) but is considered an integral component of ANP in several European countries (Ireland, the UK, the Netherlands, and Sweden) with varying restrictions, education, and regulation.

Advanced nursing practice varies greatly throughout Europe. In Ireland, there is now a clearly defined pathway from general, specialist, to ANP. Although direction and regulation may be lacking in many countries, advanced nursing practice roles have traditionally been developed by pioneering, innovative, and driven cardiovascular

nurses.^{23,29} Using advanced nursing practice networks internationally and nationally can provide nurses with direction and support (► **Box 3.4**) and ESC Guidelines provide evidence-based care pathways for the varied specialities. Schober's (2016) ICN publication provides a wealth of information on advanced nursing practice with excellent sections on role development.⁹ ANPs provide safe, patient-focused care and are entrepreneurs and leaders.³⁰ Cardiology nursing provides many opportunities to achieve this.

Timely and efficient integrated care: the role of teamwork and collaboration

Healthcare models have evolved in response to more complex patient needs and services facing major challenges to operate more efficiently to cope with population changes.³¹ An ageing population due to higher life expectancy, exponential increase in chronic and lifestyle-related

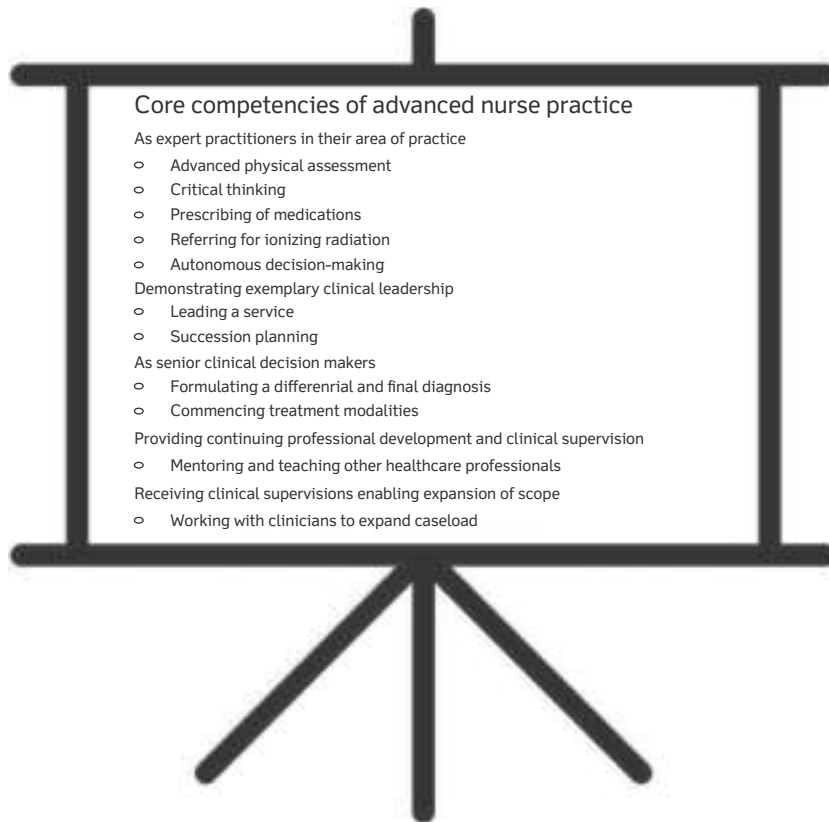


Fig. 3.5 Core competencies of advanced nurse practice.

illnesses such as cardiovascular conditions, and chronic mental or physical illnesses/disabilities will continue to present significant challenges that will require skilled care.³² Due to the complexity of CVD, no single profession is able to provide safe and effective care, or have the knowledge, skills, or resources to meet all of these requirements.³¹ Several examples of integrated, collaborative, and comprehensive care models have been proposed which promote teamwork rather than single disciplines working in silos.^{34,33}

The term 'collaboration' is widely used, but may be misunderstood because its meaning is dependent on particular settings.³⁴ We can consider three modes of cross-disciplinary, team-based care as defined in ► **Table 3.1**. These are all proven effective across the spectrum of management of CVD with reduced hospitalizations, length of stay, and mortality.³⁵

Several elements (principles, competencies, determinants, drivers, and barriers) of collaborative practice have been described in the literature (► **Fig. 3.6**).³⁶

Morley and colleagues highlight key determinants of team collaboration related to structural, psychological, and educational factors³⁴:

- Structural determinants (opportunity).
- Psychological determinants (willingness).
- Educational determinants (ability).

They also classify elements in three axes: content, processes, and behaviours of the team, where processes are related to organizational structures.³⁴ The articulation of these elements helps us to understand, develop, and contextualize a framework for effective interprofessional teamwork. This is also useful for teaching and assessing interprofessional teamwork competencies and identifying strengths, as well as areas needing improvement.³⁷ Team training has been identified as a critical curricular need, both at undergraduate and postgraduate levels, advocating more shared interprofessional learning to create common teamwork competencies.³⁷

Box 3.3 An example of the advanced nurse practitioner role in chest pain assessment in the emergency department

Chest pain is a principal presenting complaint to this tertiary care hospital. Presentations had increased from 5% of all presentations in 2009, to 11% in 2018. In 2009, 48% of all patients presenting with chest pain were admitted to hospital, often remaining on a trolley in the emergency department for several days, while awaiting an inpatient bed/further investigation. This presented a real problem for the hospital with reduced access to emergency bed capacity, growing numbers of patients cared for on trolleys, and increased use of available in-hospital beds. The primary goal of the evaluation of the patient who presents with chest pain is to accurately risk stratify and either identify, or exclude, a diagnosis of acute coronary syndrome.

The ANP assesses the patient with chest pain in the emergency department autonomously. The ANP performs a comprehensive assessment of health history, advanced physical assessment (including auscultation of heart sounds), electrocardiogram interpretation, blood testing and interpretation, chest X-ray referral, and risk stratification. Utilizing ESC Guidelines and clinical acumen, the ANP rules in/out acute coronary syndrome and other serious causes (i.e. pulmonary embolism as a priority) and then assesses for possible stable heart disease and/or a non-cardiac cause for the chest pain. Health promotion is a core component of the care that is provided.



Once acute coronary syndrome/cardiac chest pain is ruled out and the patient categorized as being at low–intermediate risk of a major adverse cardiac event in 30 days, the ANP discharges them to primary care. If there is a potential differential diagnosis of stable angina, the ANP discharges the patient to the joint ANP/CNS-led chest pain clinic for exercise stress testing within 72 hours. The ANP reports on the exercise stress test, refers for invasive testing, prescribes medications if required, and/or discharges the patient who receives a diagnosis while avoiding hospital admission. Although the ANP practises autonomously, and the majority of their patients do not see a physician, they work as part of the interdisciplinary cardiology team as, inevitably, there will be cases outside the ANP’s scope of practice.

The cardiology ANP-led chest pain service has delivered remarkable patient benefits in the last 8 years with limited resource investment including the avoidance of almost 600 inpatient admissions per year. Within the first year, acute hospital admissions were reduced by 36%, and waiting on emergency department trolleys by 60%, contributing to significant savings for the hospital.

Reflective practice

An important part of continuing professional development and improvement of the quality of services is reflective practice. The reflective practitioner will find opportunities for improvements in service development because they will always consider how better to conduct care, especially in the event of care practice going particularly well or going wrong. Developing skills for critical evaluation of the application of research and evidence-based guidelines to everyday clinical practice is essential. However, this should be in the context of a critical awareness of the limitations that clinicians and service providers face in their ability to develop and deliver services that adhere to these guidelines.

Critical reflection on the quality of care centres on a number of factors which include the philosophy of care, moral dilemmas in decision-making, clinical decision-making, and audit, research, and evaluation (► Fig. 3.7).³⁸

Reflective practice is an important learning process involving capturing an experience and analysing and

evaluating it in order to improve practice. Knowledge does not ensure good practice. Likewise, experience alone does not lead to learning. For example, breaking bad news is a skill that can be taught and theoretically applied but it is the deliberative reflection on this experience that forms the essential integration of knowledge to practise, enabling self-development and better patient care going forward. Reflective practice is also integral to development of the nursing profession and is a central feature in the revalidation process.³⁹ Consequently, acquisition and implementation of this important skill is essential to nursing practice. The following aims to provide nurses with an understanding of reflective clinical practice and why it matters, together with practical guidance on how to effectively apply reflection into clinical practice.

Reflective clinical practice: what is it and why does it matter?

The concept of reflective practice originated in 1984 from Donald Schon.³⁹ It is recognized as an essential skill that

Box 3.4 Examples of advanced nursing practice networks in Europe



Table 3.1 Definitions of cross-disciplinary team-based care

Type of cross-disciplinary team	Definition
Multidisciplinary—‘multi-’ means ‘more than one’	Mixed-discipline practitioners who tend to work in relative isolation with particular unshared goals
Interdisciplinary	Implies not only collaboration but also interaction of professionals from different backgrounds bringing together expertise to achieve common goals through cohesive shared plans, in a more profound level considering the patient and family ‘as a key member of the care team’
Transdisciplinary	Also includes non-healthcare partners, and encourages team members to move beyond their discipline integrating expertise to solve problems and generate new knowledge Reported examples of this model include family-initiated escalation of care and palliative cardiovascular care



Fig. 3.6 Key elements required for effective interdisciplinary teamwork.

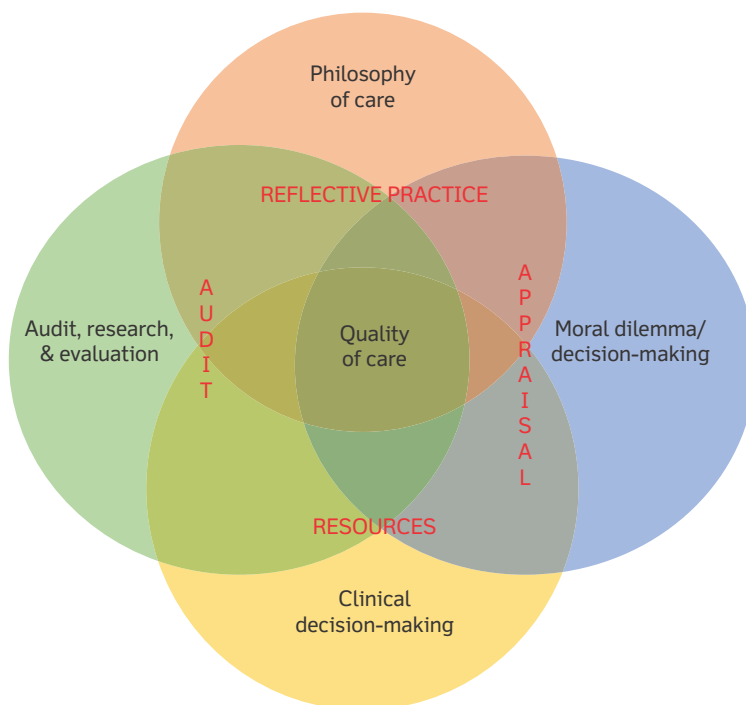


Fig. 3.7 Critical reflection on daily reality.

Reproduced from Esterhuizen P, Freshwater D, Freshwater C, et al. Clinical supervision and reflective practice, Int Textb Reflective Pract Nursing, Chichester Wiley-Blackwell 2008; 119–136 with permission from John Wiley and Sons.

should be applied at every level of nursing practice. In essence, it allows for learning from experiences by 'making sense' of them through a process of *describing, analysing, and evaluating*.⁴⁰ Gibbs clearly captures this, stating: 'It is not sufficient simply to have an experience in order to learn. Without reflecting upon this experience, it may quickly be forgotten, or its learning potential lost. It is from the feelings and thoughts emerging from this reflection that generalisations or concepts can be generated. And it is generalisations that allow new situations to be tackled effectively.'⁴¹

The ability to reflect on experiences is strongly linked to deep learning, development of self-regulated learning, and professional identity. While it is argued that reflection is a difficult concept to define, Bulman describes it as 'reviewing experience from practice so that it may be described, analysed, evaluated and consequently used to inform and change future practice'.⁴² Every clinical encounter has the scope to become a potential learning situation. Clinical reflection allows for individuals to not only learn from mistakes and poor choices but also to acknowledge when things have gone well.

There are many reasons why reflection in clinical practice is important, including:

- *Development of practice:* reflective clinical practice assists nurses to sort through information, negotiate the confusing or complex situations within their practice, and to examine the context of practice from a variety of perspectives. This enables practitioners to gain a deeper understanding of the issues and to identify the best course of action to optimize outcomes in practice. Nurses who take the time to reflect on their daily experiences have been shown to provide enhanced nursing care, have a better understanding of their actions, which in return develops their professional skills.⁴³ Ultimately this learning both enhances development of nursing practice as well as providing better care to the patients.
- *Continual professional development and revalidation:* reflective clinical practice is also a requirement for many regulated health professions, including nursing. Demonstrating evidence of critical reflection and the ability to identify one's own strengths and weaknesses, together with the development of a needs-driven learning plan that aims to continually enhance competence, is key to demonstrating continual professional development, maintaining registration, and is also a core requirement in nursing revalidation.²
- *Coping with emotions:* nurses suffer emotional trauma and reflective practice facilitates coping. The process of

reflection has been shown to help nurses to recognize the experience that caused them distress or uneasiness in order to gain a better understanding of their personal response, disperse the emotional load, and think deeply about what they learned about themselves and their nursing practice.⁴⁴ The day-to-day emotional impact of nursing can take a toll on nurses. Reflective practice allows nurses to have a safe outlet to discuss and better understand their feelings and practice.

- *Overcoming barriers to achieve success and positive outcomes:* reflection does take time but importantly allows individuals to take a step back and objectively examine situations, and identify ways to overcome barriers in order to improve quality.

Methods of reflection

Often reflection occurs after the event (reflection-on-action) and allows for practitioners to gain new knowledge from experiences through a process of thinking about what happened, analysing the actions that were performed, and identifying what would change the outcome next time. Reflection can also occur prior to and during an event or experience. Reflection-in-action is more advanced and involves practitioners reflecting on practice while it is happening, where gains in understanding enable a situation and outcome to change in real time.

Commonly, reflection is informal with no formalized recording. For example, individuals may think about a particular incident that day or a group or team of individuals may look at a particular situation together and learn from each other. It is useful to structure these informal reflections using three key questions⁴⁰:

1. What went well?
2. What did not go so well?
3. What would you do differently next time?

More formalized reflection, such as producing a written account, provides for a more meaningful reflection and enables deeper learning. There are many different examples of frameworks that can be helpful to structuring reflections.⁴⁵ For example, Boud and colleagues highlight that reflection is returning to that whole experience and analysing the situation.⁴⁶ Re-evaluating the experience gives a new perspective on that experience, resulting in a possible change of behaviour. This framework also acknowledges that change in practice is dependent on an individual's readiness for application and commitment to action (► Fig. 3.8).

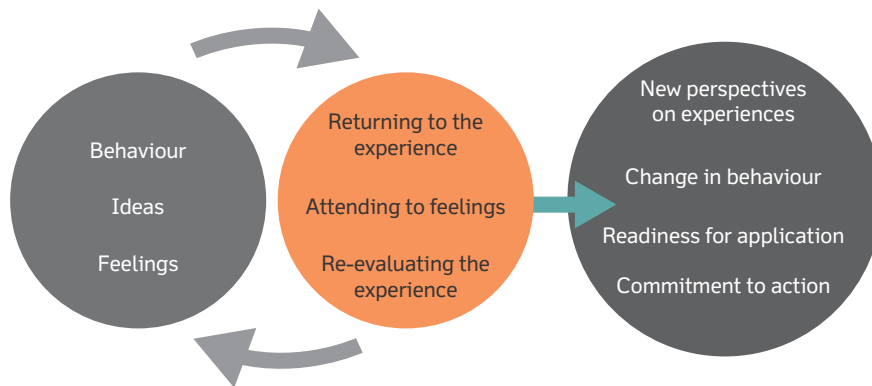


Fig. 3.8 Boud's framework for reflection.

Source data from Boud D, Keogh R, Walker D. Reflection: Turning experience into learning. Routledge, 2013.

Gibbs' reflective cycle (► Fig. 3.9) builds on Boud's model and acknowledges that personal feelings influence the situation. This framework breaks down reflection into further stages of evaluation and analysis and recognizes there is a clear link between the learning that has happened from the experience and future practice.

Practice application

As highlighted previously, reflective practice is an important process. From students to practising nurses, reflection encourages growth and helps nurses continue to provide the best care to patients. A greater emphasis

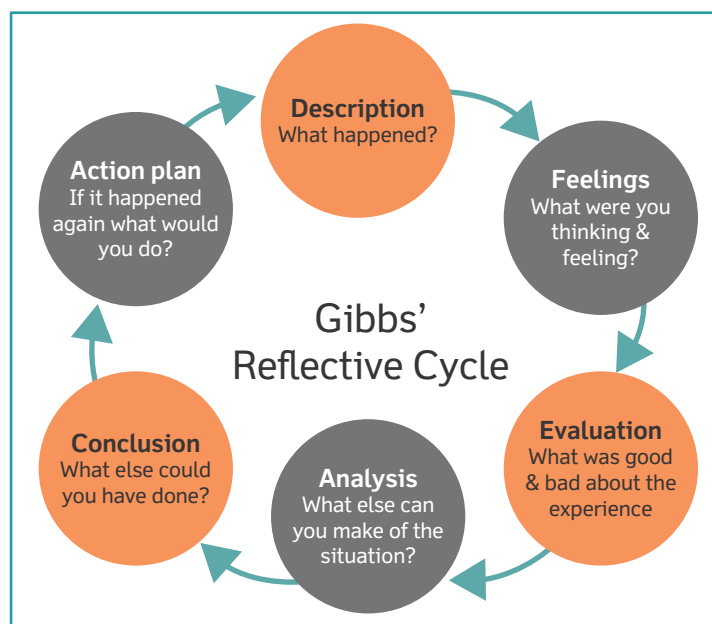


Fig. 3.9 Gibbs' reflective cycle.

Source data from Gibbs G. Learning by doing: A guide to teaching and learning methods. Further Education Unit, Oxford Polytechnic, 1998.

is now being placed on continuous professional practice with many professional bodies requiring the submission of written reflections to be provided as evidence of learning. Gibbs' framework (► **Table. 3.2**) provides a useful template to support nurses in this important process.

In summary, clinical reflection is a vital tool in nursing practice. It enables individuals to learn from their experiences and actions, resulting in better understanding, knowledge, and, ultimately, better patient care. Reflective ability is a learned skill of critical thinking and situation analysis that can be developed. Nurses at every level of their career are encouraged to draw on existing frameworks to support this important learning process. Developing a portfolio of reflections and journal keeping are particularly encouraged together with ensuring to seek feedback and to reflect on that feedback. Professional practice requires competency and the ability to think reflectively, with many

regulatory bodies now requiring evidence of critical reflection. Consequently, acquisition and implementation of this important skill is essential to nursing practice.

Effective nursing leadership

Introduction

Leadership is an essential feature of any healthcare organization, enabling the delivery of high-quality patient care by balancing issues such as welfare of personnel, general resource management, and cost-efficiency alongside the organizational vision. The mission, attitude, and behaviours of a healthcare organization begin with its leadership, which creates the vision and purpose of the organization.

Table 3.2 Example template for written reflections using Gibbs' cycle.

Description	<i>What learning did I apply to real-world clinical practice?</i>
	<i>What exactly did I do and how would I describe it precisely?</i>
Feelings	<i>How exactly did I feel during this application of my learning?</i>
Evaluation	<i>What was I trying to achieve?</i>
	<i>Why did I choose that particular action?</i>
	<i>What went well?</i>
	<i>What did not go so well?</i>
Analysis	<i>What criteria am I using to judge success?</i>
	<i>What sense can I make of this in light of my past experience?</i>
	<i>What factors were influencing me?</i>
	<i>Could I have handled this better in a similar situation?</i>
	<i>How do I now feel about this experience?</i>
	<i>Can I support myself or others better as a consequence?</i>
Conclusion	<i>Faced with that experience again, what would I do?</i>
	<i>What can be concluded, in a general sense, from these experiences and the analyses I have undertaken?</i>
	<i>What can be concluded about my own specific ways of working?</i>
Action plan	<i>What am I going to do differently in this type of situation next time?</i>
	<i>What steps am I going to take on the basis of what I have learnt?</i>

All nurses are leaders

The notion that leadership is the domain of the more experienced, senior, or powerful nurse is outdated, and recent literature confidently asserts that every nurse is a leader, responsible for the quality of care that they personally provide and that delivered by their team.⁴⁷ A devolved, rather than hierarchical, leadership structure encourages opportunities for healthcare improvement and fosters innovation at team and organizational levels. A key component of your role as a cardiovascular nurse is to recognize and respond to opportunities for healthcare improvement, offering every patient the highest standards of care. The ACNAP Be Guideline Smart Initiative (<https://www.escardio.org/Sub-specialty-communities/Association-of-Cardiovascular-Nursing-&-Allied-Professions/Education/be-guidelines-smart>) has produced a range of resources that educate and empower nurses like you to advocate for the patient and challenge suboptimal care. These types of educational resources enable cardiovascular nurses at all levels to demonstrate their leadership potential and strategies for change. You are encouraged to join ACNAP and learn more on how to unleash your own leadership potential.

What is leadership in nursing and why is it important?

Definitions of leadership are illusive and conflicting. Leadership has been variously defined as the ability to

bring individuals to success with the minimum conflict and the maximum cooperation, allowing leaders to be able to make decisions using authority,⁴⁸ or 'the process of getting people to do their best to achieve a desired result. It involves developing and communicating a vision for the future, motivating people and gaining their engagement'.⁴⁹ These definitions show how the concept varies within the literature and across different settings, so this section aims to provide a more holistic understanding of the leadership concept, with key leadership theories outlined in ► Table 3.3.⁵⁰

The debate around whether leaders are born or made largely concludes that because leadership is a social construct, it can be fostered, developed, and modulated for different circumstances.⁴⁷ There are also different perspectives on the factors that may influence effective leadership and how these can lead to transformation in service delivery. A key facet is that leadership is relational—and that effective leaders have an impact, by effecting a change in the behaviour of others. The concept of emotional intelligence has been proffered as a key mechanism by which such change is achieved.⁴⁷ The Cumulative Index to Nursing and Allied Health Literature (CINAHL) defines emotional intelligence as the intentional and intelligent use of emotions to help guide behaviour and thinking. Nurses are consistently regarded across many different cultures as compassionate and trustworthy, and those emotions have now been recognized as central components of effective healthcare leadership. Research

Table 3.3 Summary of traditional leadership theories

Great man theories	Based on the belief that leaders are born with innate qualities and are destined to become leaders
Trait theories	Leaders possess certain traits that are positive in nature. Fits in well with 'great man theories'
Behaviourist theories	Focuses on what leaders do rather than on their qualities
Situational leadership	Leadership is specific to the situation; leaders will adapt their style according to the specific situation they are in
Contingency theory	This is a refinement of situational leadership. Focuses on identifying situational variables and matching this with a specific leadership style to suit
Transactional theory	Emphasizes the relationship between leaders and followers, focusing on mutual benefits
Transformational theory	Change is the central concept and leadership is about empowering followers to excel in their performance

Source data from Bolden R, Gosling J, Marturano A, et al. A Review of Leadership Theory and Competency Frameworks. Exeter, 2003.

conducted regarding nursing leadership has revealed that a culture of effective leadership within the field of healthcare is associated with improved patient outcomes, higher job satisfaction, and reduced nursing staff turnover rates.⁵¹

What kinds of leadership work best in nursing?

There are many different styles of leadership available (► Table 3.3), but to be successful, nurse leaders require high levels of cognitive ability in order to consistently coordinate all elements of the clinical setting and effectively quality assure patient-centred clinical nursing care practices. Within this context, transformational leadership has been regarded favourably in hospital, primary care, and community settings.⁵² Transformation refers to a process of interaction between the leader and the other staff, that moves them towards workplace goal achievement. Pullen claims that transformational leadership generates positive change in people and social systems with the ultimate goal of changing followers into leaders.⁵³ The concept focuses on inspiring the team to carry out their responsibilities to the best of their abilities, whereby the leader creates a ‘shared vision’ of the future that others buy into.⁵⁴ The leader will earn respect from followers by role modelling exemplary behaviour that inspires others to emulate similar traits, transforming the quality of healthcare provision among nursing staff. Innovation based on problem-solving initiatives and transmission of values along with ethical principles are significant in this transformational form of leadership.

While many of these behaviours are irrefutable, more recently the concept of transformational leadership has been challenged because of its hierarchical approach, conflicting evidence that it produces superior outcomes,^{55,56} and concern that it is an idealistic concept⁵⁷ that puts unrealistic pressure on individuals. Providing the highest standards of patient care is extremely challenging for nurses in the post-coronavirus 2019 (COVID-19) era, with its continually changing and demanding healthcare environment. One of the biggest problems experienced within the sector is enabling staff to influence change and motivate teams towards patient-centred care in such adverse circumstances. With considerable cost-efficiencies required in healthcare to deliver affordable services, the sector is under pressure—staff shortages exist right across the international healthcare workforce, stress levels are high, and burnout is common.⁵⁸ All too often, nurses seem pulled between increasing their productivity

and delivering safe and effective care and there is clear evidence that such job strain in nurses impacts their own health outcomes.⁵⁹ The COVID-19 pandemic has emphasized the interconnectedness of global healthcare and the imperative of collaboration in solving current healthcare challenges. It is in this context that compassionate leadership has emerged as potentially of greater value to nursing and the healthcare professions than process-orientated styles of leadership, given the nature of our work and the goals we aspire to.⁶⁰

Compassionate leadership in healthcare

Compassionate leadership encourages a move away from heroic models of leading, to a more collaborative approach in which all members of the healthcare team are seen and heard. Advocating for patients is a priority and because values and goals are shared within teams, there can be more devolved decision-making at all levels in the organization.⁶¹ ► Table 3.4 outlines the strategies needed to create a compassionate culture within the workplace.⁶² It is evident that this is a devolved approach to leadership, but the important point is that it starts at the level

Table 3.4 The essence of effective healthcare leadership

1	Support, trust, and compassion
2	Valuing diversity and fairness
3	Building effective teams
4	Building relationships across boundaries
5	Promoting learning and innovation
6	Promoting others’ development and leadership
7	Ensuring effective performance
8	Ensuring necessary resources are available and used well
9	Ensuring direction and alignment
10	Developing positivity, pride, and identity

Source data from West MA, Chowla R. Compassionate leadership for compassionate health care. In: Gilbert P (ed) Compassion: Concepts, research and applications. London: Routledge, pp. 237–257.

of the individual. Each one of us as nurses can make the move to a compassionate culture, starting with ourselves. Edmondson⁶³ underlines the importance of being authentic—open to change and honest enough to stand over our mistakes. He advocates a ‘humble curiosity’, where appreciation and gratitude breed a culture of optimism that makes commitment and motivation palpable within yourself and your team.

Identifying new leaders is critical to the future success of nursing. It is important for nursing staff to build effective nursing leadership structures for better clinical care, contributing to patient safety outcomes in everyday nursing practice.

Clinical leadership in nursing

In the nursing literature, the concept of nursing clinical leadership is frequently linked to management and official roles.⁶⁴ A clinical leader is described as a nurse directly involved in offering clinical care that continuously improves the quality of patient experience and outcomes by influencing other people.⁶⁴ Nursing leadership necessitates instilling in the workplace a culture of professional and modern patient-centred nursing personnel. Kreindler⁶⁵ explores the politics of patient-centred care, explaining that leaders should emulate the positive aspects of each group's focus while guiding them towards putting patients first. Effective nursing leadership is important in all forms of work settings within clinical nursing practice, and especially in acute settings where swift decision-making is crucial to save lives. This is the case with clinical leadership in cardiovascular nursing, in which engagement as a nurse in a healthcare environment indisputably fits into that context. The major *raison d'être* for leadership in nursing is to determine the most suitable goals and objectives for the organization in relation to quality patient care.⁴⁸ Therefore, effective leadership is key to establishing successful nursing teams within the clinical environment.

In summary, leadership is an important aspect of any healthcare organization that enables the delivery of high-quality patient care by balancing issues such as welfare of personnel, general resource management, and the organizational vision as a whole. Definitions of leadership have evolved over recent years and it is now regarded as a collaborative and devolved process in which all nurses are recognized as leaders. This section has discussed the concept of leadership, explored key perspectives, and emphasized the importance of nursing leadership in enhancing patient outcomes as well as nurturing teamwork in

organizations. It has considered clinical leadership in cardiovascular nursing and underlined the principles of emotional intelligence and compassionate leadership approaches in delivering effective nursing care in today's challenging clinical context. Cardiovascular nurses should be equipped with requisite knowledge, expertise, and support to become leaders in cardiovascular care. Self-reflection is a key component of effective leadership and the ACNAP website has a range of resources for you to learn more and to really grow your leadership potential within cardiovascular nursing.

Getting involved with professional societies, associations, and heart foundations

What professional development opportunities do societies, associations, and foundations provide for nurses working in cardiovascular care?

Developing a profile as a nurse is an important part of continuing professional development. An important route to achieving such a profile includes joining and linking in with professional associations, societies, and heart foundations. These groups can provide several opportunities such as furthering education, funding and mentoring for doctoral, postdoctoral studies, and other research, networking with colleagues beyond the confines of one's institution, and leadership. They can also provide support to patients and caregivers, influence policy, and advocate for both professionals and patients. Many of these groups produce educational materials and programmes, publish and disseminate research in journals, and offer patient and carer support groups.

Most associations serve as a primary source for lifelong learning. They offer a wide range of professional development opportunities including tools and resources to increase knowledge and build professional skills. They offer networking opportunities to access and connect with healthcare professionals facing similar work and patient-related challenges. They are a valuable resource for sharing best practices in cardiovascular care.

As the science around CVD evolves and demands on health professionals' time and attention continue to increase, lifelong learning is critical for providers and

patients so that healthcare can be delivered at its highest level. Associations and societies are the cornerstone for the timely dissemination of new and important healthcare information.

It is especially important for nurses to become involved in professional groups. Nurses represent the largest segment of the healthcare workforce, are considered the most trustworthy of all professions (<http://www.gallup.com/poll/1654/honesty-ethics-professions.aspx>), and they play a critical role in our schools, hospitals, community health centres, long-term care facilities, and home care. These groups also work to ensure that nurses contribute to CVD guideline development committees, health-related boards, panels, and commissions.

The Institute of Medicine (IOM) report,⁶⁶ *The Future of Nursing: Leading Change, Advancing Health*, recommended increasing the number of nurse leaders in pivotal decision-making roles on boards and commissions that work to improve the health of everyone in the US. National and international nursing organizations continue to raise awareness that all healthcare-related boards and commissions benefit from having the unique perspective of nurses.

The Preventive Cardiovascular Nurses Association is a leading nursing organization dedicated to the prevention of CVD and stroke. The Preventive Cardiovascular Nurses Association's mission supports the important role of nursing in CVD and stroke prevention internationally by establishing and supporting the Global Cardiovascular Nursing Leadership Forum (GCNLF). The GCNLF explores ways in which nursing and global nursing organizations can support the established cardiovascular risk reduction and stroke reduction goal set by the World Health Organization to reduce deaths from non-communicable diseases by 25% by 2025. Recognizing that nurses and nursing organizations are on the frontlines of patient education, the GCNLF works to engage and mobilize an international community of nursing leaders to promote prevention through research, education, policy, and advocacy. In addition, the GCNLF aims to develop a mechanism for outreach to low- and middle-income countries where organized nursing practice and leadership is not well established or supported for the prevention of and rehabilitation from CVD and stroke.

ACNAP is one of seven associations of the ESC. The mission of ACNAP is to support nurses and allied professionals throughout Europe and more globally to deliver the best possible care to patients with CVD and their families. ACNAP provides a diverse portfolio of activities, including education, research, and mentorship.

ACNAP has developed a core curriculum with key themes to support the continuing professional education of nurses working in cardiovascular settings; a portfolio of e-learning, which offers webinars and a clinical case gallery to help nurses and allied professionals learn from real-life, practice-based scenarios; a comprehensive Guidelines Implementation Toolkit, 'Be Guidelines Smart'; and one of the most highly ranked journals in the field, the *European Journal of Cardiovascular Nursing*.

Summary

Globally, nurses and nursing organizations are a central and essential component of research, practice, policy, and advocacy initiatives designed to promote CVD and stroke prevention. Nurses are an important part of the healthcare team in addressing the needs of patients and are uniquely positioned to play a major role in reducing the burden of CVD and stroke. Providing nurses with improved training, networking opportunities, and access to professional and patient education materials will save lives, improve quality of life, and reduce healthcare costs for those at risk for, or already living with, CVD or stroke.

Conclusion

In this chapter, we have examined the role of continuing professional development through the lens of the ESC core curriculum for cardiovascular nursing. Although there are challenges in defining what a CNS and ANP are, advanced nursing practice must be 'grounded in direct care or clinical work'.⁶⁷ It is essential that these roles are clearly defined and protected to ensure the safety of the public, and so that all team members have a clear understanding of what the CNS or ANP are able to do. Continuing professional development is essential to increase skills, and is widely endorsed as an essential part of every nurse's role. It is therefore critical that we work together as a team to best deliver patient- and family-centred care. Nurses exist as part of a skilled transdisciplinary team which is fostered by mutual trust, positive working relationships, and clear roles and responsibilities.

To enable high-quality care, continuing professional development requires nurses to become skilled at reflective practice, firstly to be able to critically reflect on our daily reality. Using a model, such as Gibbs' reflective cycle, nurses can form a detailed assessment of their reaction and form an action plan for what we should do if the same situation were to arise again. Skilled reflection is

important for nurse leaders, who need to be able to reflect on how a team works together to improve patient- and family-centred care.

Developing new nursing leaders is critical to the future success of nursing. It is important for nursing staff to build effective nursing leadership roles such as team leadership and transformational leadership, among others, for better clinical care and patient safety outcomes every day in nursing practice. Leaders and aspiring leaders are encouraged to engage with professional societies, associations, and heart foundations, as these are important sources of support and continuing professional development.

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Section 2: Holistic nursing care: assessment, intervention, and evaluation

4 Anatomy and physiology of the healthy heart

GERALDINE LEE, GABRIELLE MCKEE, ANDREAS PROTOPAPAS,
AND IAN D. JONES

CHAPTER CONTENTS

Introduction 82

Blood vessels and the control of blood flow 82

- Overview of the circulatory system 82
- The overall structure of blood vessels 83
- The structure and function of arteries 83
- The structure and function of the arterioles 84
- Control of blood flow 84
- The structure and function of capillaries 85
- The structure and function of veins 86

Overview of cardiac anatomy 87

- Key features 87
- Coronary circulation 89

Mechanics of the heart 90

- Contractility 90
- Cardiac cycle 91
- Auscultation of the heart 93
- Blood pressure 93
- Pulse pressure 94
- Mean arterial pressure 94
- Arterial pulse 94
- Ejection fraction 94

Electrical properties of the heart 94

- Myocytes and the cardiac syncytium 94
- Ventricular cardiomyocyte 94

Atrial cardiomyocyte 95

Sarcomeres 95

Autorhythmic cells 96

Control/regulation of the heart rate and intrinsic heart rate 96

Cardiac conduction 96

Control of the heart rate—neurohormonal/homeostatic systems 97

The autonomic nervous system 97

The action potential 97

Fast- and slow-response action potentials 97

Action potential and electrocardiogram 98

Recording an electrocardiograph 98

Limb lead positions 99

Precordial lead positions 101

Axis determination 101

How do you calculate the mean axis of the QRS? 103

Quick look at the mean axis—an easy approach 103

ECG analysis and individual parameters of an ECG 104

ECG components in relation to the action potential 104

Using a systematic approach to analysis 105

Reference ranges for the ECG parameters 105

Conclusion 109

This chapter provides a basic introduction to cardiac anatomy and physiology of the heart and the conduction system along with a description of the electrical

and mechanical characteristics of the cardiac cells. The chapter concludes with an overview of the normal parameters of the electrocardiograph that can be used as a

framework to structure a process of systematic analysis. This approach can be applied to abnormal electrocardiographs and rhythm strips presented in the chapters outlining the care of patients with cardiac conditions.

KEY MESSAGES

- A normally functioning heart is essential to create a pressure gradient in the blood vessels that will enable blood flow to the organs.
- The coronary circulation is adapted to meet the high metabolic needs of the heart because it has a greater blood flow, an extensive capillary network, and greater oxygen extraction than other organs.
- The heart contains myocardial cells and autorhythmic cells that enable it to conduct electricity and contract, respectively.
- While the heart possesses its own internal automaticity, its activity is influenced by a combination of factors, the most important of which are neural and hormonal.
- Heart rate is ordinarily determined by the pacemaker activity of the sinoatrial node, which has the highest intrinsic firing rate of the automaticity cells.
- The cardiac cycle describes all of the activities of the heart through a single complete heartbeat.
- The 12-lead electrocardiogram is composed of specific components that reflect the action potential—P wave, QRS complex, and T wave.
- A 12-lead electrocardiogram should be reviewed in a logical, comprehensive manner examining each of the leads so that rate, rhythm, axis, and any abnormalities can be detected.

Introduction

To understand how the human heart and circulation works, it is helpful to have an overview of the key anatomical and physiological features. The study of human anatomy and physiology has been described as the study of life. This branch of science asks questions about the structure and internal workings of human beings and how they interact with the world around them. The circulatory system describes the heart, blood vessels, and properties of the blood and how the circulation functions. It is important to understand how the heart and circulation functions in health so that pathological changes, along with clinical sequelae, can be recognized. The Greek physician

Galen is credited with being one of the first scientists to hypothesize how the heart and circulation worked. Legend has it that he discovered the pulmonary circulation in 129 AD. Some 30 years later, in his role as chief physician to the gladiators in Pergamum, he was able to observe the beating hearts of wounded gladiators. This marked a major step forward in understanding how the heart and circulation worked.¹

Despite this, for several centuries scientists thought that blood was circulated through the body by the lungs. In the 1600s, Harvey, an English scientist, was said to be the first to describe how the systemic circulation functioned with the heart propelling the blood through the brain and body. The heart is indeed an amazing organ with unique physiological properties not shared by any other organ in the human body.

Blood vessels and the control of blood flow

Overview of the circulatory system

The circulatory system consists of two major components: the blood vessels and the heart. The heart is the pump that maintains blood flow within the system and the blood vessels function as the transport system. The circulatory system is referred to as a single closed system and the volume within it stays relatively constant. Within this system there are two circulations, utilizing the two synchronous pumps of the right side and the left side of the heart (► Fig. 4.1). The circulatory system has multiple functions. These include the transport of gases, nutrients, and wastes, the regulation of blood pressure, acid–base balance, fluid balance, and body temperature. The right side of the heart receives blood from the venous circulation of the body and brain and pumps it to the lungs for oxygenation and carbon dioxide release, while the left side of the heart receives oxygenated blood from the lungs and pumps it to the body and brain.

The system is made up of five types of blood vessels which when combined would cover 100,000 km. The blood vessels can be grouped into three main categories: arteries, capillaries, and veins (► Fig. 4.2). Arteries, and their smaller counterparts arterioles, generally carry oxygenated blood away from the heart to the tissues. Veins, and their smaller counterparts venules, generally carry deoxygenated blood from the tissues to the heart. In

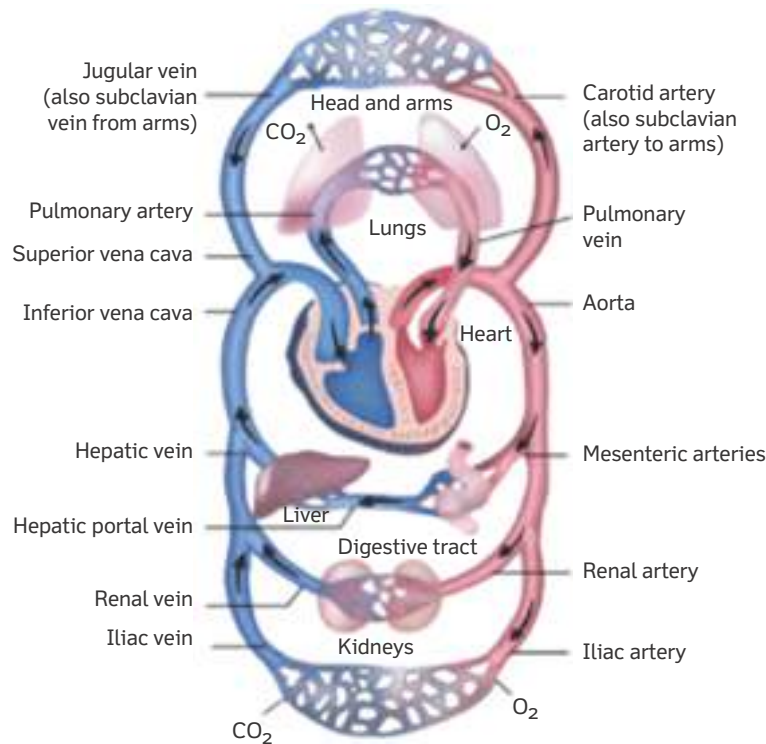


Fig. 4.1 The circulation of blood in the body.

In this section, we will describe the structure of blood vessels and then review the functional aspects describing fluid exchange, blood pressures, vasodilatation, and vasoconstriction.

The overall structure of blood vessels

The different types of blood vessels in the human body consist of between one and three layers, reflecting their function (► Fig. 4.2). The innermost layer is called the tunica intima and is better known as the endothelium. This layer is common to all blood vessels and is in direct contact with the blood that flows through the hollow opening inside the blood vessel called the lumen. It has the same basic structure across all blood vessels—a single layer of squamous epithelium, a basement membrane that acts as a structural support, and an elastic layer on the outside. The next major layer is the muscular layer, or the tunica media, which is made up of both smooth muscle and elastic fibres. The proportion of these layers differs across arteries, arterioles, veins, and venules and this layer is completely absent from capillaries. The outmost layer is

the tunica externa, which is made up of elastic and collagen fibres and is absent in capillaries.

The structure and function of arteries

Arteries are blood vessels that usually transport blood away from the heart. They contain all three layers: the tunica intima, tunica media, and tunica externa (► Fig. 4.2). They differ in diameter at rest from 1 cm to 0.1 mm and differ in the amount of muscle and elastic that is present, particularly in the tunica media. Arteries have the largest tunica media layer of all blood vessels and, depending on the artery, the amount of elastic fibres present differs substantially. The largest arteries of the body, those of the pulmonary trunk and the aorta, tend to have greater proportions of elastic fibres and a wider lumen than other arteries. These characteristics allow these large arteries to act as temporary reservoirs for blood leaving the heart. This helps to regulate the intermittent pumping of blood from the heart to create a more consistent flow and pressure. These large elastic arteries empty into smaller, more muscular arteries which have the capacity to constrict and

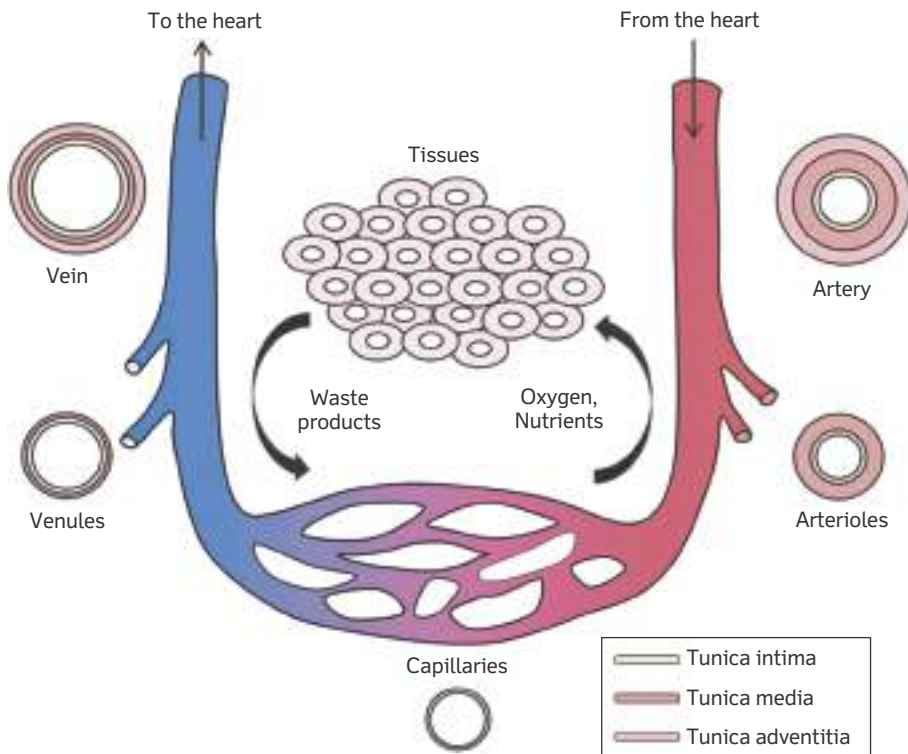


Fig. 4.2 The main blood vessels of the body.

dilate, enabling them to play an important role in regulating the distribution of the blood throughout the body. When blood leaves the heart, it is at its highest pressure; the strong muscular structure of the arteries (the dominant tunica media muscular layer and elastic layer) minimizes the loss of pressure as blood flows through these vessels, compared to other blood vessels (► Fig. 4.3). This facilitates the maintenance of blood flow in the circulatory system.

From birth, exposure of the endothelium to shear stress and multiple cardiovascular risk factors lead to the accumulation of fatty streaks, seen from the age of 1 year, and eventually plaques beneath the endothelium surface. This accumulation changes the characteristics of the endothelium and tunica media, eventually developing into atherosclerosis² (see Chapter 6 for more detail).

The structure and function of the arterioles

Arterioles have a similar structure to arteries and have three layers. However, they are smaller in diameter and

their thick walls take up a greater proportion of the overall vessel, leaving a small vessel lumen for blood to flow through (► Fig. 4.2). The tunica media is predominantly muscle and as the blood vessel gets closer to the capillaries, this layer gets thinner. At the junction with the capillary, there is a sphincter that controls flow into the capillary. These precapillary sphincters are important in the regulation of blood flow to tissues. The endothelium, which lines arteries and arterioles, is surrounded by a thin layer of connective tissue. The cells of the endothelium secrete many substances that are important in blood clotting, vascular permeability, and vasoconstriction and vasodilatation which control blood flow to the tissues.

Control of blood flow

The proportion of blood in the capillary beds is increased by the relaxation of the precapillary sphincters and the smooth muscle of the tunica media. This relaxation causes the vessel lumen to enlarge and consequently decreases the blood pressure in the small arteries and arterioles (► Fig. 4.3). This relaxation is

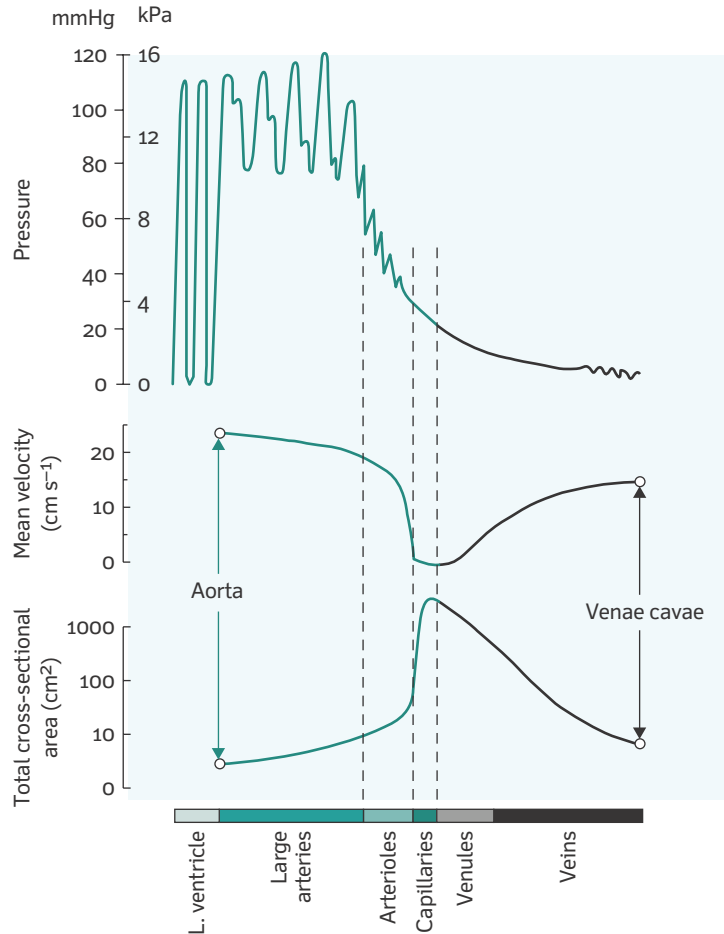


Fig. 4.3 Pressure, blood flow/velocity, and cross-sectional lumen size of blood vessels.

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termed vasodilatation and can result from sympathetic nervous system activation of blood vessels in some organs, release of local vasodilators, and metabolic vasodilators (► **Table 4.1**). Vasoconstriction is the opposite, with an increase in vessel muscle contraction, resulting in decreased lumen size and increased blood pressure in the vessel. It is caused by hormones, local hormones, and the sympathetic nervous system in some vessels. The coronary circulation of the heart is strongly influenced by the metabolic vasodilators, particularly adenosine, during exercise. In an average individual with healthy arteries, these mechanisms facilitate increased blood supply to the myocardium of the heart to meet the increased aerobic needs of the heart as it moves from normal cardiac muscle contraction and beating at 70

beats per minute (bpm) to increased force of contraction and heart rate required, for example, during exercise.

The structure and function of capillaries

Capillaries differ from all other blood vessels in that they have only one main layer, the endothelium, which is surrounded by a basement membrane (► **Fig. 4.2**). These are very small vessels, ranging from 4 to 10 μm in diameter and up to 1 mm long. Although the smallest of the blood vessels, they make up 80% of the 100,000 km of blood vessels within the body. The capillaries fulfil the main function of the circulatory system by exchanging gases and nutrients between the blood and the tissues. They form capillary beds that are in close contact with almost every

Table 4.1 Vasoconstriction and vasodilatation

Main vasoconstrictors	Main vasodilators
Noradrenaline (adrenaline) via α receptors, i.e. in skin	Adrenaline (noradrenaline) via β_2 receptors, i.e. in coronary vessels and skeletal muscle
Angiotensin II	Local vasoactive chemicals from the endothelium: nitric oxide, histamine, bradykinin, serotonin, prostacyclin
Antidiuretic hormone	Metabolic vasodilators: increased carbon dioxide, hydrogen, and adenosine (a by-product of adenosine triphosphate metabolism) or decreased oxygen
Endothelin (from the endothelium), thromboxane	Atrial natriuretic peptide

cell in the body, which enables them to fulfil this important function. The extensiveness of the capillary bed and the structure of the capillary vary depending on metabolic requirements of the tissues. Tissues that have high oxygen demands, such as muscle, tend to have large capillary networks. While some tissues, such as cartilage, are avascular with no capillary beds, necessitating the exchange of nutrients and gases to move through surrounding tissues.

The structure of the capillary is designed for its function of exchange. The capillary uses two different types of gradient to facilitate exchange: pressure gradients for the movement of fluid and concentration gradients for the diffusion of gases and nutrients. Exchange will occur between the blood in the capillaries and the surrounding interstitium and then with the cells, if a gradient is present. Oxygen will therefore move from the blood, where levels of oxygen are high, to the tissue where the levels are low due to the usage of oxygen during metabolism. The reverse is true of carbon dioxide, which moves from the tissues, where metabolism created high levels, to the blood which has low levels. Fluid exchange due to pressure gradients is rather more complex as two pressures are involved. At the arterial end of the capillary, hydrostatic pressure, due to the blood pressure in the capillary, is high and pushes fluid into the interstitium which has a

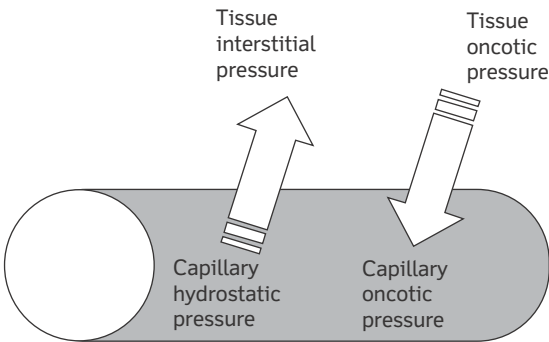


Fig. 4.4 Capillary pressures and capillary fluid exchange. The left portion of the diagram reflects the pressures in the arterial end of the capillary, where the outward force of the capillary hydrostatic pressures is dominant and results in fluid moving from the capillary into the interstitium. The right side reflects the venous end of the capillary where the capillary osmotic/oncotic pressure is dominant and results in fluid being drawn back into the capillary.

low hydrostatic pressure. In opposition to this, osmotic/ oncotic pressure is at work. This pressure is mainly due to the presence of proteins. In the arterial capillary, the large amount of protein in the blood osmotically attracts fluid and attempts to pull fluid from the tissues. However, at the arterial end of the capillary, the dominant force is the hydrostatic pressure and there is net movement of fluid into the surrounding tissue, approximately 24 L of fluid every day (► Fig. 4.4). The opposite is true at the venous end of the capillary. Here, the hydrostatic pressure in the capillary is low and the osmotic pressure remains the same, and is higher than the hydrostatic pressure, so fluid is pulled into the venous capillary, about 21 L per day. The excess is returned to the circulatory system by the lymphatic system. However, there are some reasons that will cause fluid to remain in the tissues and surrounding interstitial fluid. The most common of these are increased capillary pressure or capillary permeability, a reduction in lymphatic drainage, or a decrease in plasma proteins.

The structure and function of veins

Blood flows from the capillaries into the venules and then the veins. Veins carry blood back from the tissues to the heart. Veins have a three-layered structure similar to arteries but differ in that the tunica media—the muscle layer—is much thinner (► Fig. 4.2). This means that the vessel walls are very compliant and act as a reservoir, containing approximately 60% of the system's blood. Veins

have a large lumen and the pressure within them is relatively low (► Fig. 4.3). Because of the structural weakness of the veins and the low pressure of this system, venous return to the heart is slow and is augmented by valves in the larger veins, which prevent backflow, and pumping due to surrounding skeletal muscle contraction. Contraction of the skeletal muscle exerts pressure on the veins and squeezes blood back to the heart. Venous return is also facilitated by vasoconstriction which can be stimulated by sympathetic nerves. The slowness of flow through the veins can lead to the stasis of blood, particularly behind the valves, which can increase the risk of venous thrombosis development.

Overview of cardiac anatomy

Key features

The heart is the core of the cardiovascular system, a hard-working muscular organ that contracts rhythmically and automatically. It plays a major role as a pump that ensures the continuous flow of blood in the body, pumping blood through the circulation by developing a pressure gradient. To do this it functions as two pumps acting synchronously—the right side pumps blood to the pulmonary circulation, and the left side to the systemic circulation. The heart has its own circulation system called the coronary circulation. The sinoatrial node generates electrical impulses that stimulate the cardiac muscle. This causes the contraction of the chambers of the heart which powers blood into the circulation. The combinations of mechanical and electrical events that occur with each beat of the heart is collectively known as the cardiac cycle (see 'Mechanics of the heart'). The human heart is about the size of an adult closed fist and weighs about 250 g and 300 g in the average adult female and male, respectively. The heart is one of the few muscular organs in the body that works every second, every minute, of every day of your lifetime. At an average 70 bpm in the average lifetime, this amounts to approximately 2.5 billion beats.

The heart is normally located in the mediastinum between the lungs. Two-thirds of it lie to the left side of the midline of the chest, and one-third to the right (► Box 4.1 and ► Fig. 4.5). It has a slightly tilted appearance with the apex, the tip of the left ventricle, resting on the diaphragm. The apex beat is generally auscultated on the midline of the left clavicle in the fifth intercostal space between the fifth and the sixth ribs. The base or top of the heart is much wider and is the location of the entry and exit of the main

Box 4.1 Did you know?

In rare cases (1:12,000 adults), a congenital condition means that the heart points to the right side of the heart rather than the left. This condition is called dextrocardia.

vessels. It lies mainly under the sternum just below the second rib. The location of the heart may deviate slightly depending on stature. Short individuals tend to have a slightly more horizontal heart orientation and tall individuals a more vertical orientation.

The heart is enclosed within a double-walled pericardial sac, also called the pericardium (► Fig. 4.5). The outer layer of the pericardium has a fibrous layer that supports and anchors the heart to the diaphragm and surrounding structures and a parietal layer of serous pericardium. The inner layer, the epicardium (mesothelial cells, fat, and connective tissue), covers the outer surface of the heart and is known as the visceral layer of the serous pericardium. The serous layers secrete pericardial fluid. The pericardial fluid accumulates between the pericardium and the epicardium and allows movements of the heart to occur uninhibited and without friction against the surrounding organs.

The heart itself is made up of several more layers. Below the epicardium is the myocardium. It is the thickest layer of the heart which is muscular in structure (cardiomyocytes). The innermost layer of the heart that lines the chambers and valves is called the endocardium (endothelial cells and subendocardial connective tissue).

The heart is made up of four chambers: two atria and two ventricles (► Fig. 4.6). The upper chambers of the heart, called atria, have a thin myocardial layer and their main function is the collection of blood that enters the heart from the venous system. The right atrium receives deoxygenated blood from the lower part of the body, via the inferior vena cava, and from the upper part of the body via the superior vena cava. The left atrium receives oxygenated blood from the pulmonary veins.

Two atrioventricular (AV) valves separate the atria from the ventricles; the tricuspid valve on the right side of the heart and the bicuspid, or mitral valve, on the left side of the heart (► Fig. 4.6). When the valves in the heart are working effectively, they create a one-way system of blood flow. During most of the cardiac cycle (except when the ventricles contract), the valves are open and their cusps project into the ventricles. The valves are thin, non-muscular, fibrous structures with cusps that are attached by chordae tendineae to papillary muscles in the

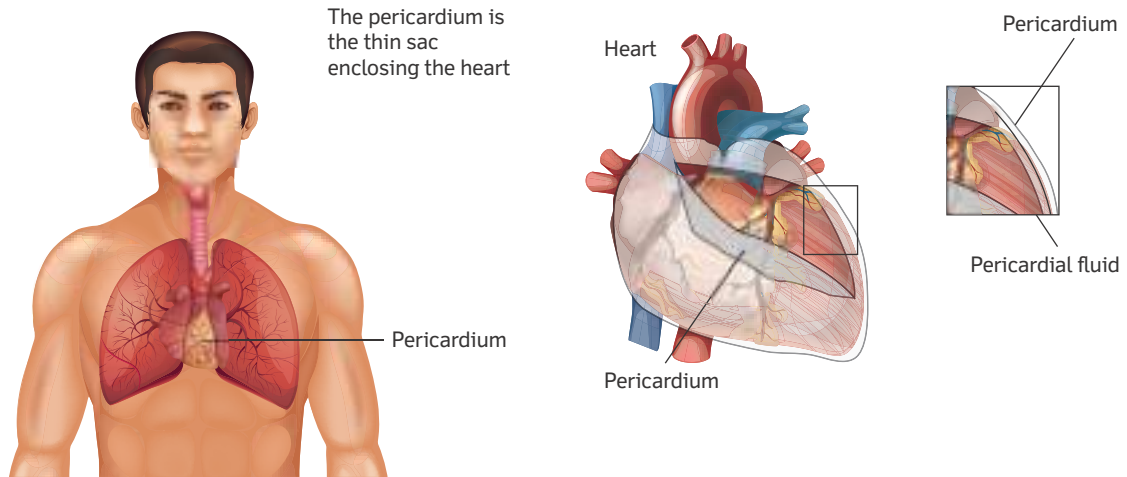


Fig. 4.5 The heart and the pericardium.

walls of the ventricles. When the ventricular muscles of a healthy heart contract, blood attempts to flow from the high-pressure ventricles back to the low-pressure atria. The valves are pushed upwards and overlap on each other to close the valve opening and prevent backward flow. In addition, the papillary muscle contracts which tightens

the chordae tendineae. This prevents the cusp moving further backwards into the atria. The mechanism is like opening an umbrella, in that it can only open to a certain degree beyond which it will turn inside out. Valvular thickening and stiffening tend to occur with age (see Chapter 8).

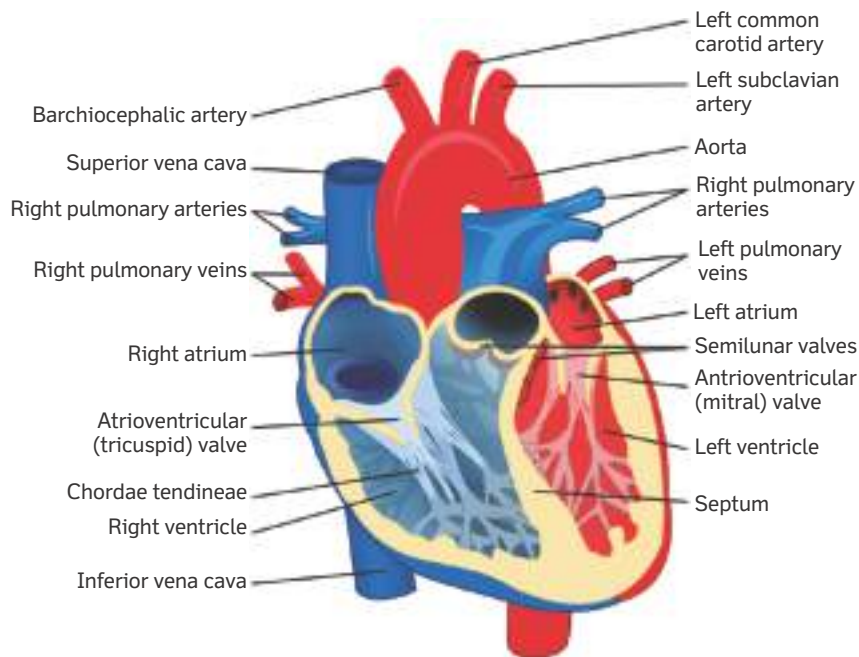


Fig. 4.6 Cross-section of the heart showing the chambers, valves, and major blood vessels.

Box 4.2 Did you know?

Some ultra-endurance athletes have been reported to have left ventricular wall thicknesses that can be up to 19 mm due to the high level of aerobic activity linked to their sport.

The ventricles are the ‘pumping chambers’ of the heart and have thicker muscle layers compared to the atria which are ‘receiving chambers’. The mean thickness of the myocardium in the left ventricle is around 7 mm in women and 9 mm in men (► **Box 4.2**). Hypertrophy is the term that describes the excessive enlargement of an organ. This can occur in the heart as a result of pathophysiological changes that occur when the heart has to work harder than normal to maintain its normal output in conditions such as hypertension and heart failure (see Chapter 10). Overwork of the left ventricle can also cause hypertrophy as the heart musculature increases as part of a physiological response to large amounts of aerobic exercise.

The exit vessels from the right and left ventricles are the pulmonary artery and the aorta, respectively (► **Fig. 4.6**). They have valves called semilunar valves, which as the name implies, are shaped like a half-moon. They work in the same way as the AV valves and close when blood attempts to flow back into the ventricles. This occurs at the end of ventricular contraction (systole) when the pressure in the ventricles decreases and drops lower than the pressure in the aorta and pulmonary artery.

Coronary circulation

For the heart to fulfil its essential function, it needs an adequate blood supply. This is provided by the coronary circulation (► **Fig. 4.7**). The heart tissues receive oxygenated blood from two small blood vessels, the right and left coronary arteries. These are the first vessels to emerge from the root of the aorta. They emerge unseen from behind the right and left cusps of the aortic valve. The coronary arteries progress horizontally thereby encircling the myocardium along the groove between the atria and the ventricles, called the coronary sulcus. The branches of the right and left coronary arteries then radiate down in a crown (corona)-like appearance. The right coronary artery has two main branches. The marginal branch, visible in a frontal view of the heart, moves along the coronary sulcus and supplies blood to the right ventricle and atrium. The descending branch, the posterior interventricular artery, visible in a posterior view of the heart, supplies the right and left ventricle. The left coronary artery has two main branches. The circumflex branch in the coronary sulcus supplies the left atrium and the left ventricle, and the anterior interventricular artery supplies both ventricles. As seen from these descriptions, there is some overlap in the supply from both main arteries, particularly to the ventricles. There is individual variation but, in most people, the right coronary artery is dominant and supplies most of the oxygenated blood to the myocardium.

The coronary arteries supply 250 mL of oxygenated blood per minute to the average-sized heart at rest, a supply

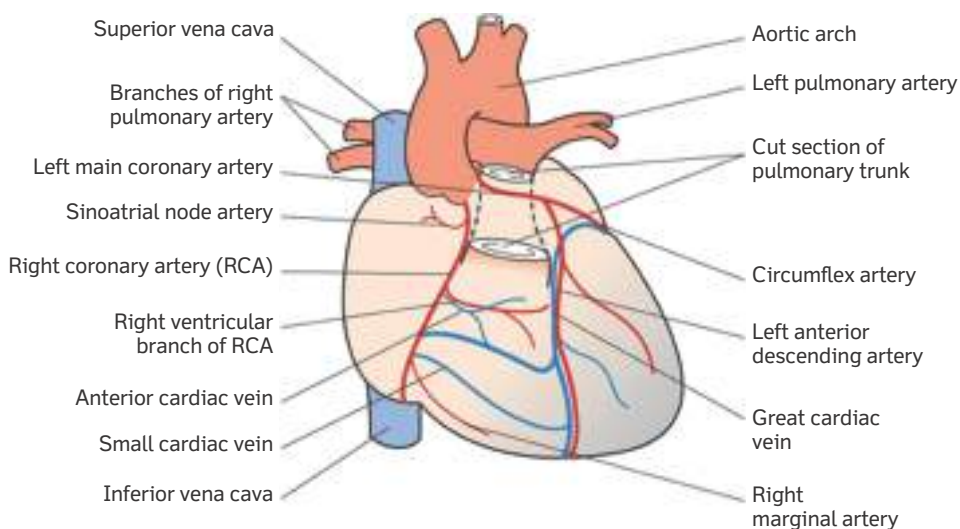


Fig. 4.7 Diagram of the heart showing the coronary circulation.

Box 4.3 Did you know?

A heart rate of over 100 bpm means that the blood flow to the heart muscle is reduced. This is because the coronary arteries fill during diastole (relaxation). A tachycardia leads to a shortened diastole which can cause myocardial ischaemia.

disproportionate to its size compared to other organs in the body. The heart is an essential organ, a hard-working tissue that functions aerobically and is therefore one of the organs whose blood supply is autoregulated. This means that it receives its proportion of blood supply irrespective of small variations in normal blood pressure. The heart also has a more extensive capillary vasculature than other organs, in that nearly every cell is in direct contact with a capillary bed, facilitating fast diffusion of gases and nutrients. In addition, the amount of oxygen extracted from the blood is high, up to 75% compared to the average extraction rate of 25% for most tissues in the body. All of these adaptations help to ensure that the heart maintains its function, a crucial adaptation as without it, circulation would cease.

An important consideration in understanding the mechanics of coronary blood flow is that it is naturally interrupted. During ventricular contraction (systole), blood is ejected through the open aortic valve to the aorta. The cusps of the aortic valve close over the entrance (ostia) to the coronary arteries which reduces blood flow into them at this time (► **Box 4.3**). In addition, the coronary blood vessels that supply blood to the epicardium, myocardium, and endocardium during ventricular contraction (systole) become compressed by the surrounding muscle, particularly in the left side of the heart. This can result in an interrupted coronary blood flow, especially to the endocardial side of the myocardium.

Mechanics of the heart

Contractility

The heart's stroke volume, the volume ejected from the ventricle at each heartbeat, is determined by the preload (stretch of the myocardial fibres, myocytes), the afterload (vascular resistance), the contractility (volume and contractile force), and the synchrony of the ventricles. This is illustrated by the Frank–Starling law that shows the relationship between the ventricular end-diastolic myocardial fibre length and the ventricular performance. According

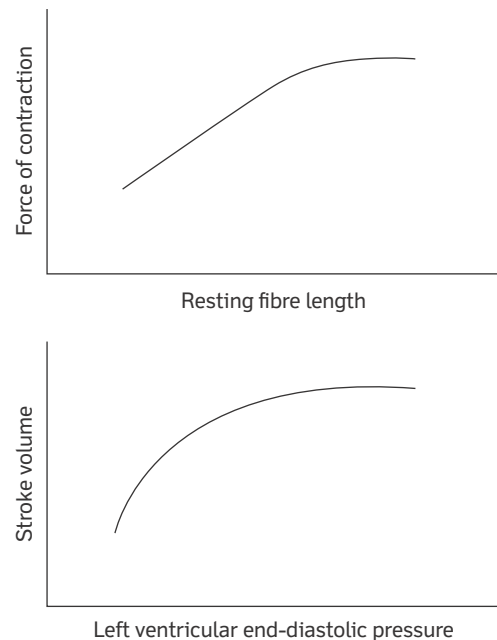


Fig. 4.8 The Frank–Starling law of the heart.

to the Frank–Starling law, an increase in venous return will increase the ventricular end-diastolic pressure and thereby stretch the cardiac myocytes prior to contraction (► **Fig. 4.8**).

The stretch increases the sarcomere length, which results in an increased generation of force. This enables the heart to eject the additional venous return and thereby increase the stroke volume. One can think of it as a slingshot: the harder you pull the rubber band, the more force is accumulated, and the longer the shot will be.

During exercise, the cardiac output, the volume ejected from the heart per minute, increases by three to four times compared to the resting state, but the stroke volume can only increase by 40–60%. Thus, the ability to increase heart rate is of key importance to increase blood flow to meet the metabolic demand from the working muscles during exercise. At low levels of exercise, the increase in heart rate and contractility are mostly a result of a reduction in vagal tone, while at higher levels of exercise, after the anaerobic threshold has been reached, the sympathetic nervous system becomes dominant. This results in the activation of catecholamines, that increase the heart rate and cardiac contractility and thereby the cardiac output. Catecholamines also cause vasoconstriction and increased systemic vascular resistance leading to an elevation in arterial blood pressure.

Cardiac cycle

The cardiac cycle is a term that describes a series of changes in pressure and volume that occur within the chambers of the heart. Pressure changes are caused by valves opening and closing to direct blood flow. The cardiac cycle consists of alternating periods of contraction (systole) and relaxation (diastole). The pressures that occur within each part of the periods vary. This is important as without the pressure differential blood flow through the heart would not occur. During the cardiac cycle, the electrical phenomena precede the mechanical, and the mechanical precede the auscultatory phenomena. The cardiac cycle includes changes that occur almost simultaneously on both sides of the heart. These changes are similar, although pressures on the right side of the heart are normally much lower than those on the left side.³⁻⁶ Therefore, mostly the events on the left side of the heart are described here. In this description, each of the seven different phases of the cardiac cycle will be presented separately and will include associated electrical events, pressure and volume changes, valve activity, and heart sounds. ► Fig. 4.9 shows the cardiac cycle.

Phase 1: atrial contraction

The cardiac cycle begins with atrial contraction or systole:

- *Electrical events:* the electrical depolarization of the atria is represented in the ECG by the P wave. Electrical depolarization leads to the mechanical contraction of the atria.^{7,8}
- *Pressure and volume changes:* during atrial contraction, the pressure in the atria increases and the blood is directed through the AV valves (mitral and tricuspid) to the ventricles. During this phase, the left ventricle is in relaxation. Before atrial contraction, the ventricle contains a large amount of blood due to passive filling. At rest and with normal heart rate, atrial contractions account for approximately 10% of ventricular filling. Atrial contraction merely assists ventricular filling with blood, but becomes more significant during exercise, especially in young people. This is because passive ventricular filling time is decreased as the heart rate increases. Therefore, ventricular filling is mainly passive and depends upon venous return.⁴ The end of this phase is marked by the end of ventricular diastole when the volume in the ventricle reaches its maximum. This volume of blood in the ventricle is called the end-diastolic volume (EDV). The EDV of the left ventricle is approximately 120 mL. The pressure level at the end of

left ventricular diastole is called left ventricular end-diastolic pressure, and is approximately 8–12 mmHg.⁸

- *Valve activity:* the AV valves open because the ventricular pressures are lower than atrial pressures.⁴
- *Heart sounds* (fourth heart sound (S₄)): an S₄ heart sound is rarely a normal finding (unlike a third heart sound (S₃)) although it can be heard in older people.^{4,9} During this phase, no heart sounds are normally audible with a stethoscope. However, in cases where the compliance of the walls of the right, or left ventricle, are reduced (e.g. left ventricular hypertrophy), an S₄ heart sound may be audible. The S₄ is produced by vibrations of the ventricular wall that occur as blood rapidly enters the ventricle during atrial systole.

Phase 2: isovolumetric contraction

The atrial contraction is followed by ventricular contraction (systole):

- *Electrical events:* following depolarization of the atria, the electrical potential travels to the AV node through the bundle of His into the ventricles via the Purkinje fibres. The isovolumetric contraction begins during the QRS complex, which represents the depolarization of the ventricles.^{6,10}
- *Pressure and volume:* at the beginning of ventricular systole, the pressure in the ventricles increases rapidly but the total volume does not change. For this reason, this phase is also called 'isovolumetric'. In this phase, the pressure in the ventricles becomes higher than in the atria.^{5,6}
- *Valve activity:* the increased pressure within the ventricles causes the closure of the AV valves. Also, the aortic valve remains closed because at this stage the pressure in the aorta is greater than the pressure in the left ventricle. The same occurs in the right ventricle. All valves are closed in this phase of the cardiac cycle.^{3,4}
- *Heart sounds* (first heart sound (S₁)): the closure of the AV valves generates the S₁ which sounds like 'lub' during auscultation with a stethoscope.⁹

Phases 3 and 4: rapid and reduced ejection

The ejection phase is divided into two separate phases—rapid and reduced ejection—which differ in the flow velocity:

- *Electrical events:* the initial part of this period is represented on the ECG by the ST segment. During

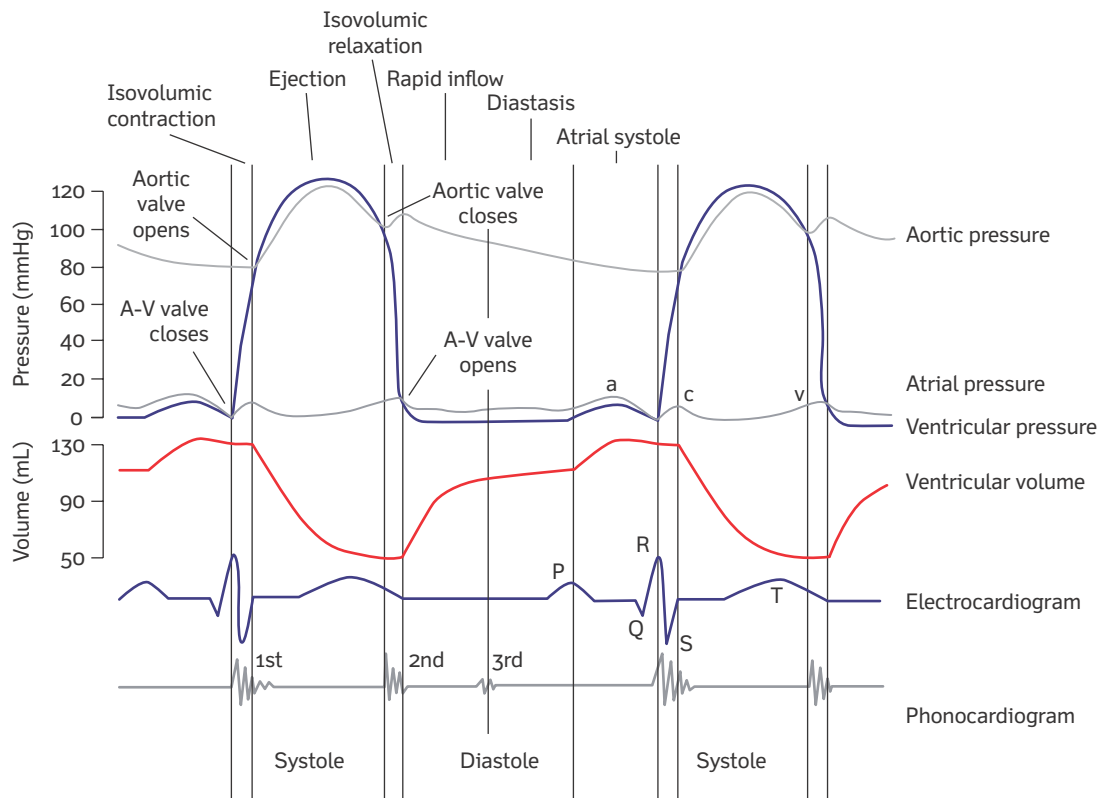


Fig. 4.9 The cardiac cycle.

Daniel Chang MD, Destiny Qx (2011) Wiggers Diagram. Licensed under CC-BY-SA 2.5 via Wikimedia Commons, accessed 24 July 2014, http://commons.wikimedia.org/wiki/File:Wiggers_Diagram.png. This image is licensed under the Creative Commons Attribution–Share Alike 2.5 Generic license. <https://creativecommons.org/licenses/by-sa/2.5/>.

reduced ejection, part of the repolarization of the ventricles is marked by the T wave on the ECG.^{7,11,12}

- **Pressure and volume:** after the end of isovolumetric contraction, the ventricles continue to contract, and the intraventricular pressures increase to a maximum level during these phases. The pressure difference allows blood to be ejected from the left ventricle through the open aortic valve into the aorta at high velocity (rapid ejection). Also, ventricular volume decreases rapidly, and the aortic volume increases. The amount of blood ejected from the left ventricle at each contraction is called the stroke volume. In parallel, the atrial filling begins. Subsequently, ventricular and aortic pressures start decreasing. The end of this phase concludes systole.^{3–6}
- **Valve activity:** the aortic valve is forced open because the pressure in the left ventricle is greater (around 80 mmHg) than the pressure in the aorta and remains open

as long as ventricular pressure exceeds aortic pressure. During ejection, the AV valves remain closed.^{3,8}

- **Heart sounds:** no heart sounds are normally heard. The presence of sounds during systole indicates valve disease (i.e. systolic murmurs).^{4,9}

Phase 5: isovolumetric relaxation

- **Electrical events:** the isovolumetric relaxation of ventricles is indicated at the end of the T wave on the ECG.
- **Pressure and volume:** at this point, diastole begins. As the ventricle relaxes, ventricular pressure decreases rapidly and falls below the aortic pressure. During isovolumetric relaxation, the volume in the ventricles remains stable and does not change. For this reason, this phase is also called 'isovolumetric'. The ventricle

does not empty completely during systole and the volume that remains in the left ventricle after ejection is called the end-systolic volume. This is approximately 50 mL of blood. The difference between the EDV and the end-systolic volume (ESV) is called stroke volume ($120 - 50 = 70$ mL). The division of the stroke volume with the EDV gives us the ejection fraction. The atrial pressure continues to increase as the flow from the pulmonary veins continues.⁴⁻⁶

- *Valve activity:* the aortic valve closes because the pressure in the aorta is greater than the pressure in the left ventricle. The pulmonary valve closes shortly after the aortic valve because inspiration delays occlusion. All valves are now closed.^{4,9}
- *Heart sounds* (second heart sound (S2)): closure of the aortic and pulmonary valve produces the S2. At the end of inspiration there is a normal split of the S2 due to delayed closure of the pulmonary valve. This sound is heard like 'dub' with a stethoscope.⁹

Phase 6: rapid ventricular filling

- *Electrical events:* no activity, but sometimes a U wave may occur.¹⁰
- *Pressure and volume:* when the pressure in the left ventricle falls below the pressure in the left atrium, the mitral valve opens, and the ventricle consequently passively and rapidly fills with blood. The volume of the ventricle is increasing rapidly. About 80% of ventricular filling occurs during this phase. However, the pressure in the left ventricle remains low because of relaxation.³
- *Valve activity:* the AV valves open because the ventricular pressures are lower than atrial pressures. The aortic and pulmonary valves remain closed.⁴
- *Heart sounds* (S3): during filling, no sounds are heard. Nevertheless, rapid flow of blood from the atria to the ventricles produces the S3, which is normally heard in children. However, the presence of S3 in middle-aged or older adults is indicative of volume overload, such as congestive heart failure.^{4,9}

Phase 7: ventricular diastasis or reduced ventricular filling

Ventricular diastasis, or reduced ventricular filling, is the longest phase of the cardiac cycle and involves the final phase of ventricular filling. At a normal resting heart rate, the duration of diastasis is longer than half of the entire

cardiac cycle. However, in periods when the heart rate is fast, the duration of the diastole becomes shorter than that of systole. For example, if the heart rate is higher than 200 bpm, the duration of diastole is reduced, and the filling of the ventricles becomes inadequate (reduced EDV). As a result, the stroke volume is reduced, and cardiac output is also reduced. Cardiac output is the product of stroke volume and heart rate: $CO = SV \times HR$. The end of diastasis marks the end of the diastole.^{3,4,6}

- *Electrical events:* it represents the beginning of the next P wave.¹⁰
- *Pressure and volume:* after rapid filling and before the beginning of atrial contraction, the pressure in the atria and ventricles is balanced. Due to the passive filling of the ventricles, the ventricular volume and pressure gradually increases. During this phase, coronary artery blood flow reaches its maximum. The pressure in the aortic and pulmonary valves continues to fall.⁴⁻⁶
- *Valve activity:* the AV valves (mitral and tricuspid) remain open and the pulmonary and aortic valves remain closed.⁴
- *Heart sounds:* no heart sounds are normally heard at this time. The presence of sounds during diastole (between S2 and S1) indicate valve disease (i.e. diastolic murmurs).⁹

Auscultation of the heart

Understanding the creation of heart sounds is the basis of effective heart auscultation. Associated with the cardiac cycle, there are four heart sounds. The origin of all sounds is based on the mechanical movement of the heart valves. In summary, S1 is generated by closure of the AV valves during systole, and S2 is generated by closure of aortic and pulmonary valves during diastole. With a stethoscope, these sounds are heard like 'lub-dub'. S3 is associated with rapid ventricular filling and S4 results from the movement of blood during atrial contraction. S3 is heard like 'lub-dub-dum' and S4 like 'da-lub-dub'. Blood turbulence during systole is also known as systolic murmur and during diastole as diastolic murmur.^{3,9}

Blood pressure

During ejection, the ventricular contraction produces the pressure necessary for the circulation of blood in the network of blood vessels. Blood pressure readings are important for assessing the haemodynamic status of patients.

Systolic blood pressure (SBP) is the highest pressure that occurs during a cardiac cycle (ventricular contraction). It is the pressure in the artery after blood is pumped out of the left ventricle during contraction. Diastolic blood pressure (DBP) is the lowest pressure measured during the cardiac cycle (ventricular filling). It is the pressure in the arteries during the relaxation of the ventricles when no blood is ejected from the left ventricle.^{6,9,13}

Pulse pressure

The difference between SBP and DBP is referred to as pulse pressure. For example, if the SBP is 120 mmHg and the DBP is 80 mmHg, the pulse pressure will be 40 mmHg. Narrow pulse pressure may be due to a decrease of stroke volume as it occurs after haemorrhage. Pulse pressure can be used as an indicator of stroke volume.¹³ On the other hand, a wide pulse pressure (>80 mmHg) is a sign of moderate to severe aortic regurgitation.¹⁴

Mean arterial pressure

► Fig. 4.10 shows systolic, diastolic, and mean arterial wave pressures. The mean arterial pressure (MAP) is defined as the average of the arterial pressure in the arterial system during a complete cardiac cycle. It is actually an important indicator of the perfusion level of vital organs and is calculated by the following equation^{10,15}:

$$\text{MAP} = \text{DBP} + (1/3 \times \text{pulse pressure})$$

or

$$\text{MAP} = (\text{SBP} + (2 \times \text{DBP})) / 3$$

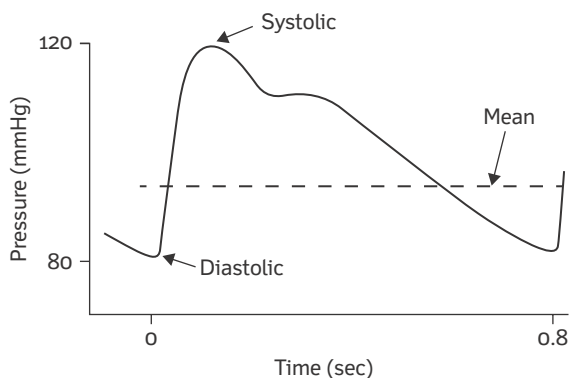


Fig. 4.10 Systolic, diastolic, and mean arterial wave pressures.

Arterial pulse

Each contraction of the left ventricle generates a pressure wave by the ejection of blood into the circulation. This wave is palpated in the arteries as a pulse. Each pulse in the arteries coincides with a cardiac cycle.⁹

Ejection fraction

Ejection fraction is the most commonly used clinical index to evaluate ventricular function. Normally, the ejection fraction is approximately between 55% and 75% and is assessed using echocardiography^{4,7,13,16}:

$$\text{EF} = \frac{\text{LVEDV} - \text{LVESV}}{\text{LVEDV}} \times 100$$

Where EF, ejection fraction, LVEDV = left ventricular end-diastolic volume, and LVESV = left ventricular end-systolic volume.

Electrical properties of the heart

Myocytes and the cardiac syncytium

Each heartbeat relies on the generation of an electrical impulse. In the normal heart, this impulse stimulates the cardiac muscle cell, or myocyte, to shorten in length and, in turn, stimulates the adjacent myocyte to do the same. This pattern of electrical activity followed by myocyte contraction enables the chambers of the heart to contract in a sequence that allows blood to be moved around and out of the heart accordingly.

In order to achieve this goal, the heart relies on two major cell types:

- Myocardial cells with primary responsibility for contraction (99%) (ventricular and atrial).
- Autorhythmic cells with responsibility for the generation of electrical impulse (1%).

These cells are morphologically, molecularly, and functionally distinct.¹⁷

Ventricular cardiomyocyte

A typical ventricular myocyte contains a central nucleus (possibly two) and around 150 myofibrils aligned along the cell's axis connecting end to end with neighbouring fibres through intercalated discs.¹⁸ These discs

contain desmosomes, strong cable-like filaments that bind myocytes together, and gap junctions that allow ions to travel from one fibre to another. These cell-to-cell junctions form strong mechanical linkages but also enable the transmission of electrical activity from one myocyte to another. Within each of these myocytes a series of subunits of sarcomeres are responsible for cardiac contractility.

Atrial cardiomyocyte

Atrial myocytes are much smaller than ventricular myocytes and have different electrophysiological and contractile properties. Atrial myocytes possess lower and shorter action potentials than ventricular myocytes,¹⁷ enabling the atria to distribute electrical impulses at a higher rate compared to the ventricles. In addition, due to the difference in the presence of myosin, atrial myocytes are known to be able to shorten at a much quicker speed than ventricular myocytes. Myosin is a fibrous protein which, together with actin, plays a key role in muscle contraction.

Sarcomeres

A sarcomere is the most basic unit that makes up striated muscle. Each sarcomere is approximately 2–2.2 μm long in its resting state and contains two chief proteins,

actin and myosin. Actin is a thin filament connected to the sarcomere's membrane (Z line), whereas the thicker myosin lies at the centre of the sarcomere with the heads of the myosin molecules producing potential bridges between the myosin and actin filaments.¹⁹ At rest, these bridges are redundant. However, when the cell is stimulated, calcium enters the cell. These additional calcium ions connect with intracellular troponin causing a chain reaction that binds the myosin bridges to the actin filament.²⁰ However, the angle of connection creates instability and the link is short lived as the actin filament disengages and connects to the next myosin site along the chain. This movement shortens the sarcomere and results in contraction (► Fig. 4.11). Contraction ceases when the calcium ions exit the cell with the actin filaments sliding back to their original position, lengthening the sarcomere once again.²¹ The energy that enables the movement of these actin filaments along the myosin cross-bridges is provided by adenosine triphosphate, which is produced by the myocyte's many mitochondria. The number of linked bridges and, therefore, the force of contraction is related to the concentration of free calcium ions.¹⁹

► Fig. 4.11 illustrates how the sarcomere is composed of different sections between two Z lines. The A band at the centre remains constant whereas, during contraction, the I bands shorten as the thin filaments in the I band slide between the thick filaments of the A band.

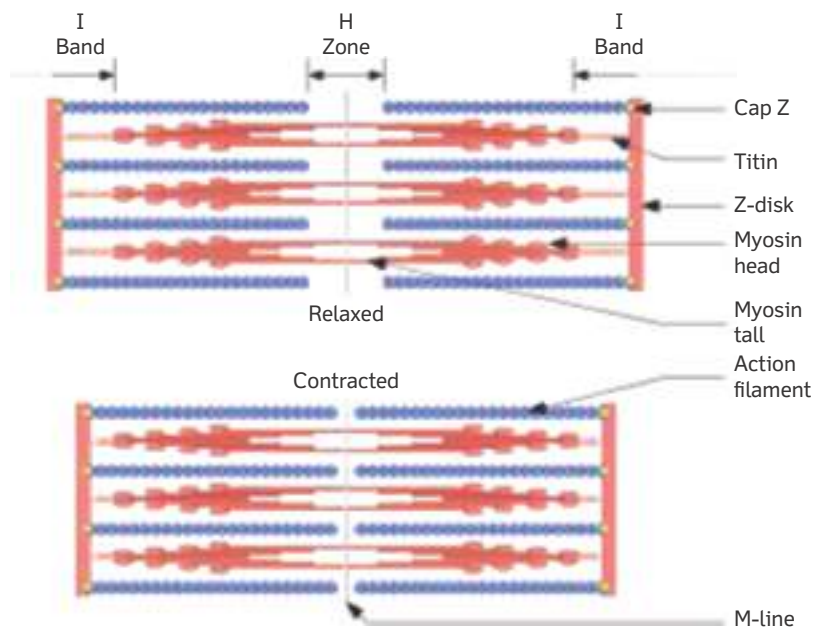


Fig. 4.11 Diagram of a sarcomere during relaxation and contraction.

Autorhythmic cells

The heart is a unique muscle in that it is capable of producing its own electrical impulses and can do so without external influence from the autonomic nervous system. While most cardiac cells are capable of initiating and transmitting electrical impulses, naturally modified autorhythmic cells generate and transmit impulses through a specialized conduction system at a higher rate than other cells within the heart. Autorhythmic cells, unlike myocytes, do not possess a resting action potential, moving constantly between -60 mV prior to depolarization to $+20$ mV post depolarization and back to -60 mV following repolarization in a three-phase process.⁷ These phases are associated with changes in cell permeability altering the rate of, mainly, sodium, potassium, and calcium across the cell membrane.²² The autorhythmic cell's negative membrane potential (-60 mV) is due to a slow outflow of intracellular potassium, lost through gated ion channels in the cell membrane.¹⁹

The coordinated way in which the action potential travels through the heart, combined with the mechanical contraction that occurs because of electrical stimulation, enables the heart to pump blood around the body in a synchronized and measured way and by doing so meet the metabolic needs of the body's organs.

Control/regulation of the heart rate and intrinsic heart rate

Heart rate is ordinarily determined by the pacemaker activity of the sinoatrial (SA) node, which has the highest intrinsic firing rate of the automaticity cells (► Table 4.2). It is located in the posterior wall of the right atrium. The

AV node has the second highest intrinsic firing rate while the Purkinje fibres in the ventricles, which also have automaticity, fire at a very slow rate. Though, as the action potential production in the SA node is faster, before the AV node or Purkinje fibres reach the threshold for an action potential, they are depolarized by the oncoming impulse from the SA node, called an overdrive suppression. There are also ectopic pacemaker cells present in all four cardiac chambers of the heart that can initiate a heartbeat. These ectopic pacemakers can become dominant if the main pacemakers are depressed, their own rhythm is enhanced, or if all conduction pathways are blocked.

Cardiac conduction

The cardiac conduction system enables heart muscle to contract (► Fig. 4.12). The electrical signal from the SA node moves through the atria and stimulates them to contract. In the AV node, the conduction of the action potential from the atria to the ventricles is slowed down to allow the ventricles to fill with blood before the contraction. The electrical activity then spreads across the ventricles through the His–Purkinje network, which is the fastest conduction pathway within the heart. The network starts with a bundle of fibres called the bundle of His and that separates into two bundles, the right and left bundle branches located in the septum, and ends in the Purkinje fibres in the apex of the heart, causing the ventricular contraction. The His bundle is placed on the right side of the interventricular septum and the right bundle branch is a direct continuation of the His bundle down the right side of the septum, while the left bundle branch, that is considerably thicker, arises almost perpendicular from the His bundle and perforates the intraventricular septum.

The bundles divide into the Purkinje fibres, a complex network of rapidly conducting fibres that branch over the subendocardial surfaces of both ventricles. The Purkinje cells have a greater conduction velocity of the cardiac impulse than any other tissue in the heart, which allows for a rapid activation of the entire endothelium surface of the ventricles.

The Purkinje fibres have a prolonged refractory period compared to the rest of the conduction system. This refractory period is rate dependent and a low heart rate will have a longer refractory period protecting the ventricles from contracting if a premature atrial depolarization is conducted over the AV node. The AV node refractory period, in contrast, increases at high firing rates, and will protect the ventricle from excitation at excessive atrial frequencies.

Table 4.2 Intrinsic rate of the cardiac pacemakers

Pacemaker	Firing rate (bpm) at rest
SA node	60–100
AV node	40–60
Purkinje fibre	20–40
Atrial ectopic foci	60–80
Junctional ectopic foci	40–60
Ventricular ectopic foci	20–40

Control of the heart rate—neurohormonal/homeostatic systems

While the heart possesses its own internal automaticity, its activity is influenced by a combination of factors, the most important of which are neural and hormonal.

The autonomic nervous system

The SA node

As stated previously, the autonomic nervous system affects, but does not control, the speed of action potential production in the pacemaker cells. Through the release of noradrenaline (norepinephrine), sympathetic nervous system activity will result in an increased heart rate (positive chronotropy), by decreasing the time it takes to produce an action potential in the SA node and increased excitability. The release of acetylcholine will activate the parasympathetic nervous system and reduce the heart rate (negative chronotropy), by increasing the time it takes to produce an action potential in the SA node.

The AV node

The conduction through the AV node may be affected by the release of acetylcholine from the vagus nerve (parasympathetic activation). Moderate vagal activity will generally only prolong the AV conduction time, while intense vagal activity could prevent impulses from passing through the AV node to the ventricles completely. The cardiac sympathetic nerves, on the other hand, enhance AV conduction by decreasing AV conduction time and enhance the rhythmicity (depolarization and repolarization) of the latent pacemakers in the AV junction.

Intrinsic heart rate

The intrinsic heart rate is the rate of the SA node after a complete blockade of the autonomic nervous system, on average at 100 bpm. In a healthy heart, the SA node is under constant influence of the autonomic nervous system where the parasympathetic nervous system dominates and regulates the resting heart rate to 60–80 bpm. Generally, an increased heart rate is caused by a decline of parasympathetic activity and a rise in sympathetic activity. A decreased heart rate is accomplished by the opposite, a rise of parasympathetic activity and a decline in sympathetic activity. Other factors such as hormones, baroreceptor

activation by a sudden change in blood pressure, cerebral centres in the thalamus or hypothalamus, and respiration might also affect the heart rate and rhythm.

The action potential

The action potential in the heart is a change in voltage across the cell membrane of specialized cardiac cells and plays an important role in coordinating the contraction of the heart. When at rest, the cardiac cell has a negative membrane potential, meaning that the inside of the membrane is more negative than the outside; it is polarized. The reason for this is the concentration of sodium ions (Na^+) and potassium ions (K^+) over the cell membrane. The ions outside the cell are mainly Na^+ , while inside the cell K^+ ions are at a higher concentration. This distribution of ions is maintained by an active transport mechanism, the sodium–potassium pump.

The negative potential over the membrane is lowered until it reaches a critical threshold that will start an action potential that changes the cell membrane's permeability for ions. This change in voltage over the cell membrane can be divided into two main phases, the depolarization and the repolarization (rhythmicity) phases. During depolarization, sodium channels open that allow positively charged ions, Na^+ , to enter the cell and to make the potential over the cell membrane positive (► Fig. 4.13). In the ventricular cells, the depolarization opens the voltage-gated calcium channels and releases Ca^{2+} from the T-tubules, the plateau phase. This influx of Ca^{2+} initiates the contraction of the ventricular cell and causes additional Ca^{2+} release from the sarcoplasmic reticulum of the cardiac cell. This is followed by an inactive period known as the refractory period. This period includes the absolute refractory period when Na^+ cannot pass through and thus no action potential can be produced; and the relative refractory period when the cell starts to recover and the membrane potential becomes more negative again and where a stronger-than-usual stimulus would be required to produce an action potential. When the repolarization phase starts, the potassium channels open and allow K^+ to leave the cell, making the membrane potential return to negative and the cell returns to its resting state (► Fig. 4.13).

Fast- and slow-response action potentials

Two main types of action potentials can be found in the heart. The cells that generate these differ physiologically,

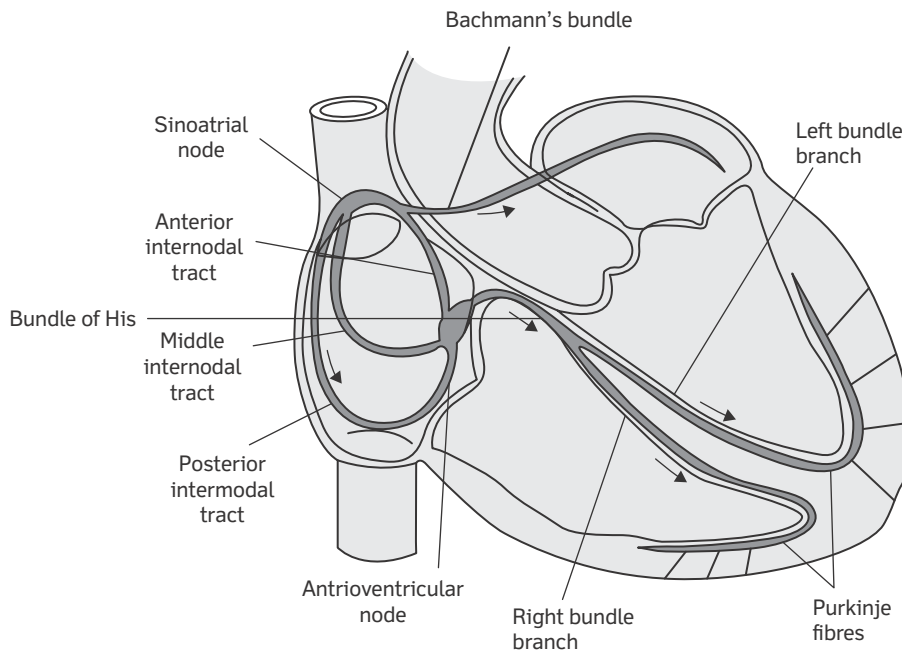


Fig. 4.12 The cardiac conduction system.

both in the type of ion channel expression and in the activation mechanisms. These differences result in the different configurations of the action potential waveform within the heart. The fast-response action potentials occur in atrial and ventricular myocardial fibres and in the Purkinje fibres. The main function of the fast-response action potential is as a conductor that leads the travelling action potential, the cardiac impulse, which results in cardiac contraction. Slow-response action potentials occur in the SA node and the AV node. Cells that have the capacity for automatic action potential generation are important for initiating the contraction of the heart and are called pacemaker cells.

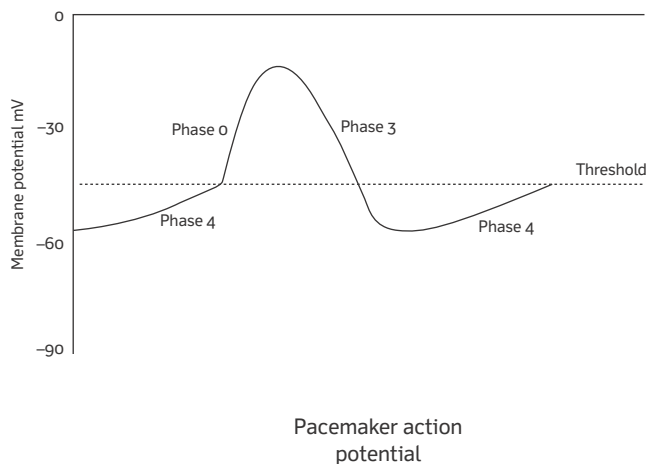
Fast-response action potentials have a very fast upstroke produced by the activation of fast sodium channels, a plateau where efflux of K^+ is balanced electrically by the influx of Ca^{2+} and the repolarization where K^+ leaves the cell (► Fig. 4.13). Slow-response action potentials, in contrast, have a resting membrane potential that is less negative, the upstroke more gradual, and the plateau less prolonged. All cardiac muscle cells are linked together by gap junctions that make it possible for the action potential to pass from one cell to another, causing the heart to contract.

Action potential and electrocardiogram

The SA node's pacemaker cells provide the signal that synchronizes the heart. The signal from the SA node spreads to, and through, the AV node, normally the only conduction pathway between the atria and the ventricles. The action potentials from the AV node then move through the bundle of His, the right and left bundle branches, and onward to the Purkinje fibres in the ventricle (► Fig. 4.13). This action potential activity, an electrical signal, will cause the contraction of the heart muscle which can be recorded on the chest surface as an ECG. The components of the ECG represent the depolarization and repolarization of the action potential in the atria and ventricles.

Recording an electrocardiograph

The accurate recording of an ECG is an essential skill. Before recording, the ECG machine should be calibrated so that a 10 mm deflection is produced by 1 mV. Moreover, the paper speed has to be 25 mm/second. Otherwise, any changes on these (paper speed and calibration) must be taken into account before proceeding



Phase 0	The membrane potential gradually and spontaneously increases (baseline drift) until a threshold potential is reached at which point 'slow L-type Ca^{2+} channels' open, the resultant influx of Ca^{2+} causing depolarization
Phase 3*	Ca^{2+} channels close; K^+ channels open. K^+ exits the cell down the electrochemical gradient (K^+ is a predominantly intracellular ion) and the cell rapidly repolarizes
Phase 4	Slow leak of cations into the cell via Na^+ leak, T-type Ca^{2+} channels, and $\text{Na}^+/\text{Ca}^{2+}$ pump leads to gradual drift of the baseline potential until threshold potential is again reached. The gradient of this drift (and hence the frequency of depolarization) is increased by sympathetic stimulation (which opens Ca^{2+} channels) and decreased by parasympathetic stimulation (which opens K^+ channels)

Fig. 4.13 Action potential/depolarization/repolarization.
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with the interpretation of the ECG. The 12-lead ECG is recorded after electrodes are placed at the four limbs and on the surface of the chest. The leads can be divided into two groups: the limb leads that record electrical activity in the frontal plane and the precordial leads that record electrical activity in the horizontal plan.^{2-4,6,11}

Limb lead positions

The limb leads consist of three bipolar and three unipolar leads that are applied to right arm, left arm, and left leg.

The electrode that is applied on the right leg is used as a ground (neutral electrode).

The three bipolar limb leads (I, II, III)

These leads are called bipolar because they record the potential difference between two points of the body:

- Lead I: the potential difference between right arm and left arm; $I = \text{RA} - \text{LA}$.
- Lead II: the potential difference between left leg and right arm; $II = \text{LL} - \text{RA}$.

- Lead III: the potential difference between left leg and left arm; $III = LL - LA$.

The Einthoven triangle

The three bipolar limb leads create the Einthoven triangle (► Fig. 4.14). When the lines of the triangle are moved inwards, they form the triaxial lead system.^{4,6,11}

According to Einthoven's equation, if we add leads I and II, we have the potential of lead III:

$$\text{Lead I} + \text{lead II} = \text{lead III}$$

This equation helps us to detect if the limb leads are positioned incorrectly. For example, normally, the sum of the R wave in leads I and II must be equal to the sum of the R wave in lead III.

The three augmented vector leads (aVR, aVL, aVF)

These leads are unipolar. They measure the potential difference between a limb lead and a central point:

- aVR: it 'sees' the heart from the right shoulder.
- aVL: it 'sees' the heart from the left shoulder.
- aVF: it 'sees' the heart from the foot.

The hexaxial reference system

As the triangle of Einthoven was used to orient the three bipolar limb leads in space, we can add the other three unipolar leads and form the hexaxial reference system. The centre of the hexaxial system is the heart and in particular

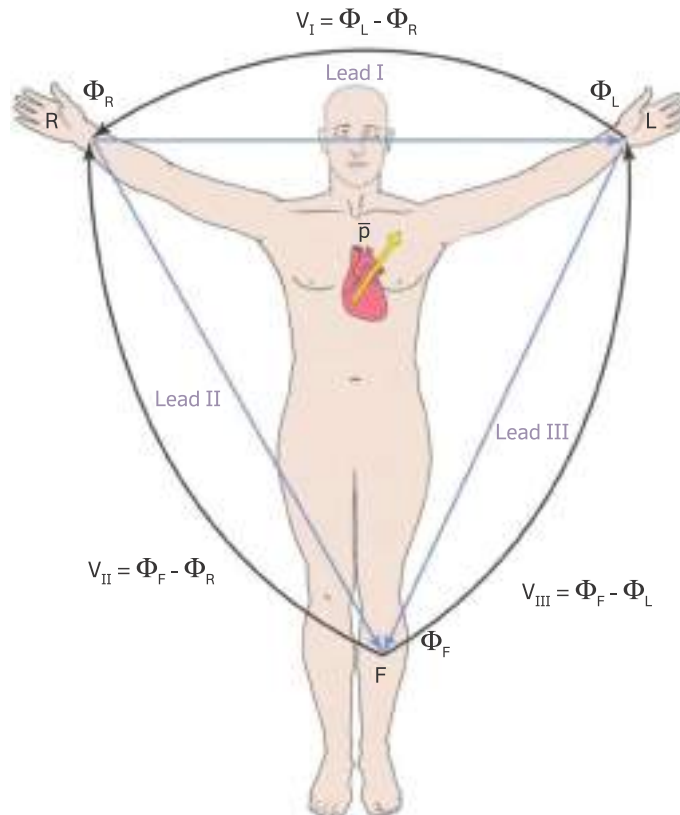


Fig. 4.14 The Einthoven's triangle. V_I = the voltage of lead I, V_{II} = the voltage of lead II, V_{III} = the voltage of lead III. Φ_R = potential at the right arm, Φ_L = potential at the left arm, Φ_F = potential at the left foot.

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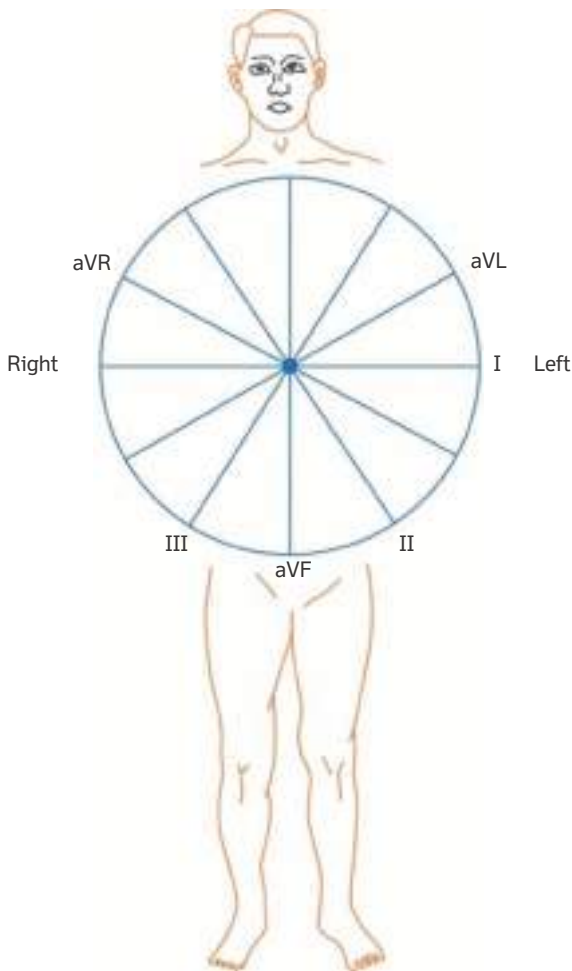


Fig. 4.15 The six limb leads arranged onto the frontal plane.

the interventricular septum. The six limb leads (bipolar and unipolar) are placed at the periphery of the circle (► Fig. 4.15) and view the centre from different degrees, separating the frontal plane into 12 parts by 30° (► Fig. 4.16).^{4,6,11}

All limb leads are oriented in the frontal plane:

- Lead I: the positive pole is designated as 0° and the negative pole as $\pm 180^\circ$.
- Lead II: the positive pole is designated as $+60^\circ$ and the negative pole as -120° .
- Lead III: the positive pole is designated as $+120^\circ$ and the negative pole as -60° .
- Lead aVR: the positive pole is designated as -150° and the negative pole as $+30^\circ$.
- Lead aVL: the positive pole is designated as -30° and the negative pole as $+150^\circ$.

- Lead aVF: the positive pole is designated as $+90^\circ$ and the negative pole as -90° .

Precordial lead positions

There are six precordial leads. The positioning of these leads on the surface of the chest can be seen in ► Fig. 4.17:

- V1, in the fourth intercostal space just to the right of the sternum.
- V2, in the fourth intercostal space just to the left of the sternum.
- V3, in the middle between V2 and V4.
- V4, in the fifth intercostal space in the midclavicular line.
- V5, in the fifth intercostal space, left anterior axillary line.
- V6, in the fifth intercostal space, left midaxillary line.

Axis determination

While the ventricles are stimulated, electrical axes are created and spread in different directions from one instant to the next. The vector of these forces resulting from the union of several forces applied at the same point is called the mean electrical axis (MEA). In particular, the MEA of the heart is the mean direction of depolarization of the ventricular myocardium in the frontal plane. As previously mentioned, all limb leads are placed in a circle surrounding the heart (hexaxial reference system) and every lead has a positive and a negative pole. Normally, in adults the MEA is between -30° and $+90^\circ$ (► Fig. 4.18). Depending on the MEA level, the mean axis may deviate to the left or to the right (► Box 4.4).^{11,23}

Clinical significance

Left axis deviation

- Left ventricular hypertrophy.
- Left bundle branch block.
- Left anterior hemiblock.
- Inferior myocardial infarction.
- Normal in pregnancy ascites.

Right axis deviation

- Right ventricular hypertrophy.
- Left posterior hemiblock.
- Anterolateral myocardial infarction.
- Right bundle branch block.
- Pulmonary embolism.
- Dextrocardia.

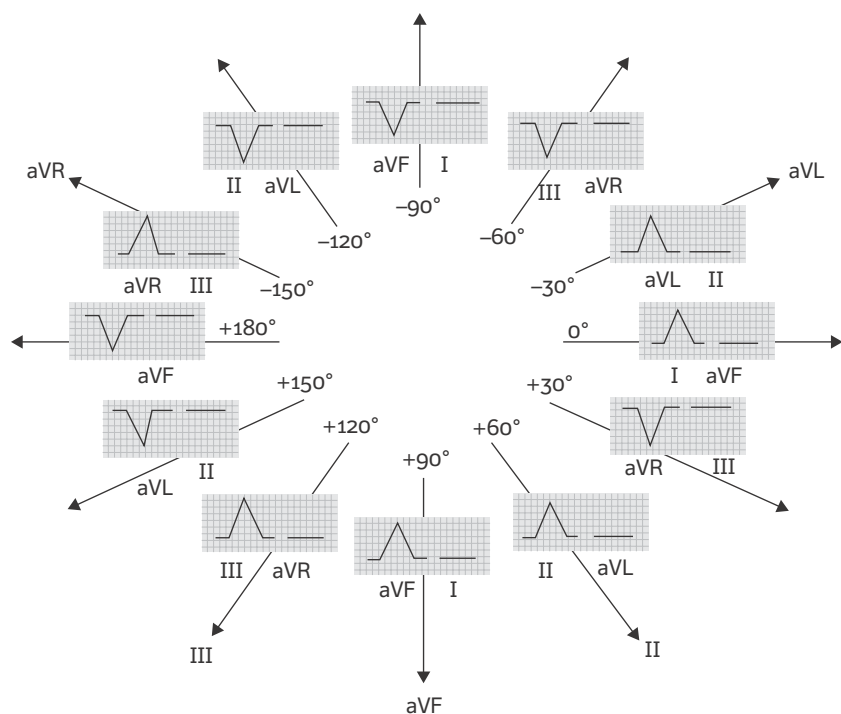


Fig. 4.16 The hexaxial reference system.

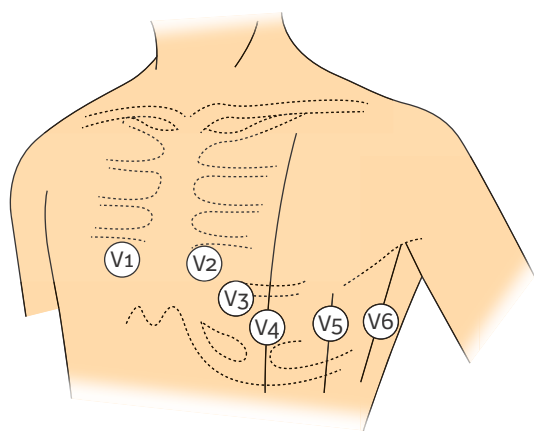


Fig. 4.17 Positions of the precordial leads.

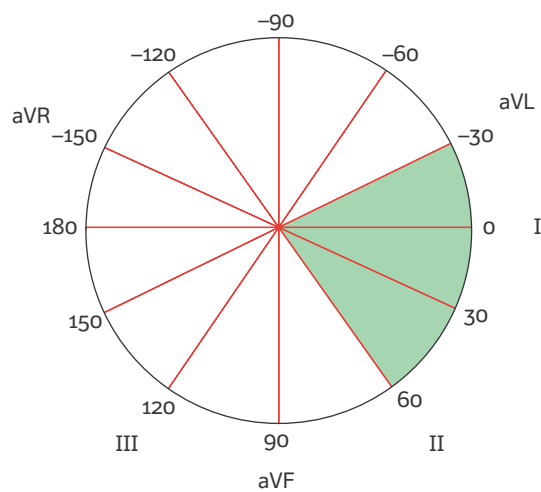


Fig. 4.18 The hexaxial reference system and the normal range for the QRS axis.

Box 4.4 Normal and abnormal ranges of the QRS axis

- Normal (0° to $+90^\circ$).
- Left axis (-30° to -90°).
- Right axis ($+100^\circ$ to $+180^\circ$).
- Extreme right axis ($+180^\circ$ to -90°).

How do you calculate the mean axis of the QRS?

There are different ways to calculate the MEA. The most accurate calculation of the axis is to transfer the net deflection of the QRS complex to the hexaxial reference system (► Fig. 4.19 and ► Fig. 4.20). However, this method is difficult in clinical practice.⁶

Quick look at the mean axis—an easy approach

Determining the axis from leads I and aVF

In clinical practice, in order to do a more timely assessment of axis deviation, we can consider the normal axis to be between 0° and $+90^\circ$ instead of -30° and $+90^\circ$. If we divide

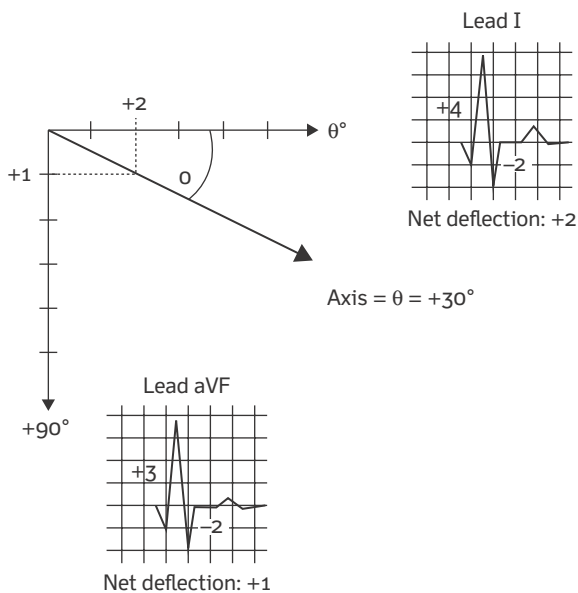


Fig. 4.19 Classical method of axis determination. Calculating the net deflection from two limb leads.

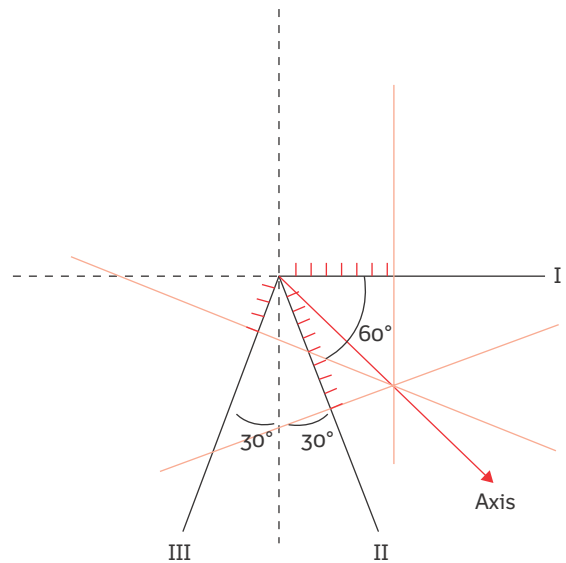


Fig. 4.20 Classical method of axis determination. Calculating the net deflection from three limb leads.

the hexaxial system into four equal parts, we can examine only leads I and aVF. If we have both positive waves, then the axis is normal. If we have a positive wave in lead I and a negative wave in lead aVF, then the axis is deviated to the left. On the contrary, if we have a negative wave in lead I and a positive wave in lead aVF, then the axis is deviated to the right. Finally, if we have both negative waves in lead I and aVF, the axis is indeterminable (► Table 4.3).²³

Determining the axis from leads I, II, and aVF

Because the normal axis is between -30° and $+90^\circ$, the above-described method may miss detection if the axis is

Table 4.3 Calculation of the QRS axis analysing the vector of forces of leads I and aVF

Axis	Lead I	Lead aVF
Normal (0° to $+90^\circ$)	Positive	Positive
Left axis (-30° to -90°)	Positive	Negative
Right axis ($+100^\circ$ to $+180^\circ$)	Negative	Positive
Extreme right axis ($+180^\circ$ to -90°)	Negative	Negative

Table 4.4 Calculation of the QRS axis analysing the vector of forces of leads I, aVF, and II

Axis	Lead I	Lead aVF	Lead II
Normal axis (+90° to -30°)	Positive	Positive	Positive
	Positive	Negative	Positive
Left axis (-30° to -90°)	Positive	Negative	Negative
Right axis (+100° to +180°)	Negative	Positive	Negative

between 0° and -30°. In this case, the method summarized in ► **Table 4.4** may be used by examining leads I, II, and aVF.²³

ECG analysis and individual parameters of an ECG

ECG components in relation to the action potential

The 12-lead ECG is now part of standard clinical practice and has an important role in aiding diagnosis, monitoring, and screening in cardiovascular disease. The ECG

can be broken down into several components and each of these components can potentially detect changes to the cardiac action potential and the electrical conduction through the heart. Being able to read and interpret the 12-lead ECG is an important part of a cardiovascular nurse's role as part of their assessment of the patient. This section will outline each component of the ECG and how it is measured. The 12-lead ECG can be broken down into the following components: P wave, PR interval, Q wave, QRS complex, ST segment, T wave, and QT interval, shown in ► **Fig. 4.21**.

The P wave represents left and right atrial depolarization and precedes the QRS complex. The PR interval is measured from the start of the P wave to the start of the QRS complex. The Q wave is the initial negative (downwards) deflection from the baseline after the P wave. The QRS complex is a measurement of the time taken from onset to completion of ventricular depolarization. After the impulse travels through the septum, the impulse then activates the subendocardial walls and spreads from the endocardium and epicardium through the ventricles. On the ECG, the ventricular activation is seen as a positive tall spike in lead I and known as the QRS complex. The width reflects the time delay from arrival of the depolarization wavefront in the ventricle to total depolarization of both ventricles and as the one of the main properties of the heart is cardiac syncytium, there should be no time delay in depolarization through the ventricles.²⁴ With the limb leads, the orientation of the

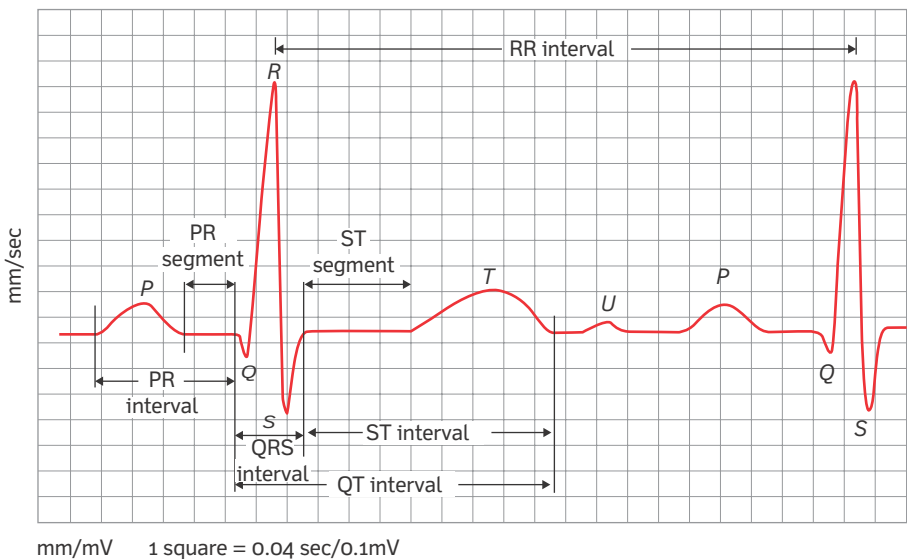


Fig. 4.21 Features of a normal ECG.

QRS complex depends on the direction of the current flow and if the direction is towards a positive electrode, a positive deflection is recorded. An isoelectric trace is recorded when current flow is perpendicular to the lead axis (hence the term isoelectric line). The QT interval is the ventricular repolarization time and is measured from the beginning of the ventricular complex to the end of the T wave (usually best seen in lead II).²⁵ The R wave is any positive (upwards) deflection of the QRS complex. The ST segment is the early stage of ventricular depolarization and is the interval between the end of the QRS complex (J point) and the onset of the T wave. The T wave represents ventricular depolarization and is the first deflection from the baseline occurring after the QRS complex.²⁴ The U wave follows the T wave and is usually upright except in aVR.

Using a systematic approach to analysis

For the cardiovascular nurse analysing a 12-lead ECG, there needs to be a systematic approach in which each element of the ECG is examined individually and then an interpretation made based on the analysis. Usually, the specific parameters measured include the following:

- Heart rate (bpm).
- Axis (normal, left, right, extreme, indeterminate).
- Conduction (rhythm and regular or irregular).
- P waves (duration, amplitude, morphology).
- Intervals: PR interval, QT/QTc intervals.
- QRS (duration, amplitude, morphology—in particular amplitude of R waves).
- ST segments (amplitude, morphology—in particular ST elevation or depression).
- T waves (amplitude, morphology).

Using this framework as the basis of your systematic approach will ensure that each component has been examined and analysed and a final interpretation made. ECG interpretation is just one part of the assessment of a patient and is part of the overall assessment which includes patient history and results from blood and enzyme tests (e.g. troponins). Moreover, the presence of disease, race, sex, and prescribed medications can also affect ECG parameters as well as the body size and age of the patient. Nurses need to be familiar with the normal values of these individual ECG components (namely, duration, height, polarity, axis, and shape) for

the P wave, PR interval, QRS complex, ST segment, and T waves. The normal characteristics of these components are described in detail in ► **Table 4.5**.

Some characteristics can vary with age (such as the QRS complex and ST segment, for example) and ethnicity (the height of R waves, for example). Therefore, when recording an ECG, the age, sex, and ethnicity of the person needs to be noted so that accurate interpretation can be undertaken.

Reference ranges for the ECG parameters

► **Table 4.6** shows the normal and abnormal parameters of ECG components which will be described individually.

Heart rate

The heart rate can be calculated using the ECG paper with the time calibration line. It can be calculated by counting the number of large squares between one QRS complex and the next and dividing 300 by this number to obtain the heart rate. If the interval between two beats is 1 second, the heart rate is then 60 bpm. The normal heart rate in an adult with no underlying disease is approximately 70 bpm, but in individuals who are extremely fit with no underlying heart disease, their resting heart rate may be closer to 40 or 50 bpm. A heart rate greater than 100 bpm is a sinus tachycardia and a heart rate less than 60 bpm is sinus bradycardia. Respiration can affect the heart rate during inspiration; this is known as inspiratory sinus arrhythmia and is a normal physiological variant. Along with the heart rate, the axis and conduction must be analysed to determine whether the rhythm is regular or irregular.

Axis

The cardiac axis refers to the general direction in which the depolarization of the heart takes place. The normal range of the QRS axis is -30° and $+105^\circ$ although values can be affected by age, sex, and body morphology. The cardiac axis is usually determined at a glance from leads I, II, and III. If these leads are positive, the axis is normal. Right axis deviation is from $+120^\circ$ to $+180^\circ$ and is associated with tall, thin adults. Left axis deviation is from -30° to -90° . Indeterminate axes (often called 'no man's land' axis) can be observed with downward deflections of leads I and II. An abnormal axis is usually seen with conduction abnormalities, in particular left and right bundle branch block. This conduction abnormality is associated

Table 4.5 Normal characteristics of an ECG in terms of duration, amplitude, polarity, axis, and shape

ECG component	Duration	Amplitude	Polarity	Axis	Shape
P wave	0.08–0.11 seconds	≤0.25 mV In V1: 0.15 mV Negative deflection <−0.1 mV	+ve: I, II, aVF, V2–V6 −ve: aVR Biphasic: V1 Upright, diphasic, flat, or inverted: III, aVL, V1–V3 Variable: V3	+60° Range 0–75° in frontal plane	Usually smooth
QRS complex	0.05–0.10 seconds Normal Q wave: <0.04 seconds	Varies with age ≥6 mm in V1, V6 ≥8 mm in V2, V5 ≥10 mm in V3, V4 Upper limit of normal is 25–30 mm Rarely >1 mm in V4–V6	+ve to equiphasic: I, II, V3–V6 +ve/−ve/equiphasic: aVF, aVL −ve: aVR Narrow Q or 1–2 mm in I, aVL, V6 Terminal forces: S in V1 and R in V6	−30° to +120° in frontal plane	+ve components: R or r wave −ve component: Q or q or S or s
ST segment		Up to 1 mm is normal >40 years: V2, V3 2 mm	+ve: I, II, V3–V6 −ve: aVR +ve: aVL, aVF but −ve if QRS is <6 mm Varies in III, V1, V2		Rounded and symmetrical
T wave		<5 mm in limb leads and <10 mm in precordial leads Limb leads: <6 mm, tallest in lead II and not less than 0.5 mm in lead I and II Precordial: tallest in V2 and V3, taller in men (6 mm), women 3–4 mm	+ve: I, II, V3–V6 −ve: aVR +ve: aVL, aVF but −ve if QRS is <6 mm Varies in III, V1, V2		Rounded and symmetrical

with underlying cardiovascular disease, especially heart failure.^{26–28)}

P waves

The P wave represents left and right atrial depolarization. The duration of the P wave is usually 0.08–0.11 seconds and the amplitude is usually between 0.1 mV and 0.3 mV. On average, the voltage is less than 0.25 mV but can have a negative amplitude of −0.1 mV. The P wave is usually positive in leads I, II, aVF, and V2–V6 and negative in aVR

and biphasic in V1. It can be either positive or negative in lead V3 and can be flat or inverted in aVL and V1–V3. It can also have a biphasic appearance in V1 (i.e. it has a positive and negative component). The normal P wave axis is 60° and its shape is usually smooth.²⁹ The P wave is not always present and sometimes not visible in some leads.

A P wave that has increased width and has a notch is associated with left atrial abnormality or right atrial hypertrophy.³⁰ Left atrial enlargement is observed with a biphasic P wave and a negative component excessively wide P wave in lead II or V1 and a peaked P wave

Table 4.6 Normal and abnormal parameters of ECG components

ECG components	Normal parameters	Abnormal parameters	Causes of abnormal parameters
P wave	Upright in most leads	Inverted Notched or tall	Junctional rhythm Atrial rhythm, atrial hypertrophy
PR interval	Duration 0.12–0.20 seconds	Duration: shorter or longer than normal	Junctional rhythm, Wolff–Parkinson–White syndrome
Q wave	Amplitude <25% of R wave amplitude	Duration 0.04 seconds or longer Amplitude at least 25% of R wave amplitude	Myocardial infarction
QRS complex	Upright, inverted, or biphasic Amplitude: 1 mm or more	Duration >0.11 seconds or more	Bundle branch block, ventricular ectopic
QT interval	Duration less than $\frac{1}{2}$ of width of the RR interval	Duration at least $\frac{1}{2}$ RR interval	Long QT syndrome, cardiac drugs, hypothermia, subarachnoid haemorrhage Short QT interval—hypercalcaemia
ST segment	In line with PR or TP segment (baseline) Shortens with increased heart rate	Duration of 0.5 mm or more from baseline	Cardiac ischaemia or infarction, early repolarization, ventricular hypertrophy, digoxin toxicity, pericarditis, subarachnoid haemorrhage
T wave	Upright, asymmetrical. Duration 0.10–0.25 seconds	Peaked, inverted, biphasic, notched, flat, or wide waveforms	Cardiac ischaemia or infarction, subarachnoid haemorrhage, left-sided tension pneumothorax, left bundle branch block, hypokalaemia
U wave	Upright with amplitude <2 mm	Peaked or inverted Amplitude >2 mm	Hypokalaemia, cardiomyopathy, ventricular hypertrophy, diabetes, digoxin, quinidine

associated with right atrial overload and is usually taller in lead I than lead III. An absence of P waves can indicate atrial fibrillation, SA block, atrial standstill, and junctional rhythm with hidden P waves. Inverted P waves in leads II, III, and aVF suggest ectopic atrial beats from low in the atria, retrograde activation from junctional beats, or an AV reentry mechanism.

Intervals

PR interval

The PR interval is the time between the beginning of the P wave and the beginning of the QRS complex and represents the beginning of atrial excitation and the beginning

of ventricular depolarization. The normal PR interval is 0.16 seconds and is usually between 0.12 and 0.20 seconds. A shortened PR interval of less than 0.12 seconds is associated with an electrical impulse coming through the AV junction, or one originating from close to the AV node. An example is Wolff–Parkinson–White syndrome where delta waves are seen as a slurring of the upstroke of the QRS complex. A prolonged PR interval is categorized as greater than 0.22 seconds and associated with heart block (see Chapters 6 and 7).³¹

QT/QTc interval

The contraction of the ventricle is marked by the beginning of the Q wave to the end of the T wave. This is known

as the QT interval with a duration of less than 0.45 seconds. It represents the interval from onset of ventricular depolarization to ventricular repolarization and varies with the heart rate. The more rapid the heart rate, the faster ventricular depolarization occurs and the smaller the QT interval. A prolonged QT interval is a known side effect of pharmacological agents such as tricyclic antidepressants and can be fatal.³² To correct for the variation in heart rate, a formula to calculate the QTc interval is used. Bazett's formula is:

$$QTc = \frac{QT \text{ (seconds)}}{\sqrt{R \text{ to R interval (seconds)}}}$$

QRS complex

The QRS complex is a measurement of the time taken from onset to completion of ventricular depolarization. The amplitude of the QRS complex can vary with age and ethnicity. The normal duration of the QRS complex is 0.05–0.10 seconds and the normal Q wave is less than 0.4 seconds. The polarity of the QRS complex can be positive to equiphasic in leads I, II, and V3–V6. In leads aVF and aVL, the polarity can be positive, negative, or equiphasic. The axis is usually from -30° to $+120^\circ$ and the shape is usually upright. The Q wave is the first deflection of the complex and is usually downward. The R wave is any upward deflection and it may be preceded by the Q wave or it may be the first deflection. The S wave is the downward deflection that occurs after the R wave. Leads V1–V6 are known as the precordial leads and reflect the thick-walled left ventricle and the R wave becomes taller as the positive current gets closer and closer to the ventricle. The V leads are seen as a good indicator of underlying cardiovascular disease.^{33–35} The size of the R wave is measured in V5 and V6 and should be less than 25 mm in older people and less than 30 mm in younger, thin people. The S wave is deepest in V1 and decreases across the rest of the precordial leads (V2–V5) and it should be less than 25 mm deep when measured from the isoelectric line.

There is a lack of consensus regarding the usual QRS complex duration which according to some should be no greater than 0.05–0.10 seconds (50–100 milliseconds) although others state 0.08–0.12 seconds.²⁴ In bundle branch block, the duration is 0.12 seconds (120 milliseconds) or more, in ventricular hypertrophy it is 0.10–0.11 seconds (100–110 milliseconds). Lead II is a poor lead for showing QRS onset as it is delayed and therefore V1 and V2 are better for measuring QRS duration. The QRS voltage also

varies according to age, ethnicity, and in those with thin chest walls.

ST segment

The ST segment is usually 1 mm and in those over 40 years of age the V2 and V3 amplitude can be up to 2 mm. The polarity varies and it is positive in leads I, II, and V3–V6 and negative in aVR. The shape should be rounded and symmetrical. In those of African ethnicity, the ST segment can appear elevated without underlying heart disease and this is why recording ethnicity is important as part of the cardiac assessment.³⁶ Any ST elevation above 2 mm is associated with myocardial infarction and ST depression is associated with myocardial ischaemia.³⁷ The greater the ST elevation or depression, the greater the degree of coronary heart disease. However, in patients with known bundle branch block, ST segments cannot be interpreted due to the widening of the QRS complex. Widespread ST-segment elevation can sometimes be seen, and it is associated with pericardial inflammation and usually an echocardiogram is urgently required to confirm the diagnosis.

T waves

The T wave amplitude is less than 5 mm in limb leads and less than 10 mm in precordial leads. Sex differences are seen in the amplitude and polarity of the T wave, but it is usually positive in leads I, II, and V3–V6. The greatest amplitude is in lead II where up to 6 mm is normal. In the precordial leads, the T wave in V3 is usually the tallest and can be up to 12 mm in height. The shape of the T wave is usually rounded and symmetrical. Isolated T-wave inversion is a normal finding that is sometimes seen on a 12-lead ECG. It is not clinically significant unless associated with symptoms or in a patient with known coronary heart disease with progressive, deep, symmetrical T-wave inversion where it is associated with ischaemia.³⁷ Tall or peaked T waves can also be observed.³⁸ Abnormal T waves are associated with many clinical pathologies.

U wave abnormalities

The U wave is not always visible on the ECG but if it is present, the U wave should be the same polarity as the preceding T wave. An abnormal U wave is usually the opposite polarity to the preceding complex. As can be seen, each ECG component has normal values for amplitude, duration, polarity, and shape and abnormalities have been outlined for all these components. Therefore, examining and analysing each component is important as any abnormality suggests a potential underlying pathology.

Conclusion

This chapter has provided an overview of the structure and function of the heart and circulatory system focusing upon the mechanical and electrical properties. An understanding of these concepts forms the basis of recognizing the signs and symptoms indicative of changes in clinical condition as well as providing important diagnostic information.

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5 Nursing assessment and care planning in the context of cardiovascular care

EKATERINI LAMBRINO, DIANE L. CARROLL, HOWARD T. BLANCHARD, ELENI KLETSIOU, FELICITY ASTIN, ALISON WOOLLEY, JO TILLMAN, RICARDO LEAL, AND ROSIE CERVERA-JACKSON

CHAPTER CONTENTS

Introduction 112

Health history 114

Initial assessment 114

Chief complaint 116

Assessment of the pain 119

Recognizing emergency situations 119

Physical examination of the cardiovascular patient 122

Cardiovascular system 125

Electrocardiogram 126

Biomarkers 129

Imaging 129

Assessment of other body systems 130

Respiratory system 130

Neurological system 131

Renal system 131

Gastrointestinal system 131

Endocrine, haematological, and immune systems 131

Integumentary system 132

Care of the deteriorating cardiovascular patient 132

Emergencies 132

Recognition 132

Assessment 133

Management 133

Conclusion 136

The patient at risk or in acute cardiogenic shock 136

Cardiogenic shock—definition 136

Cardiogenic shock—diagnosis 136

Cardiogenic shock—classification 137

Cardiogenic shock—management 137

Cardiogenic shock—mechanical circulatory support 138

Conclusion 141

In this chapter, nursing assessment strategies are explored as they apply to different stages of the care pathway. It starts with the initial assessment, which occurs at the first meeting between nurse and patient. This

assessment allows the nurse to determine the adequacy of ventilation and perfusion to ensure early prioritization of care needs, especially regarding life-threatening situations. Commonly used algorithms are shown to facilitate

this assessment. Next, a physical examination of each of the body systems is described highlighting, in particular, assessment of the cardiovascular system. Importantly, track and trigger systems to identify deterioration and the need to escalate care in emergency and acute situations are covered. In addition, classic elements of a comprehensive nursing assessment are outlined which aim to determine the baseline physical and emotional status of the patient and family using Gordon's functional health patterns framework. Special assessment considerations for specific cardiovascular conditions are discussed in more detail in other chapters, such as coronary heart disease (Chapter 6), cardiac arrhythmias (Chapter 7), valvular disease (Chapter 8), inherited cardiac diseases (Chapter 9), heart failure (Chapter 10), and prevention and rehabilitation (Chapter 11).

KEY MESSAGES

- Nursing assessment addresses the promotion of health, prevention of illness, and the nursing care of ill people.
- Nursing assessment identifies the immediate and future responses to potential and actual health problems of the cardiovascular patient.
- Care planning aims to address/resolve problems with collaborative goals identified by the cardiovascular patient.
- A physical examination, including a cardiovascular examination, is an essential part of comprehensive nursing assessment providing a wealth of information about the patient.
- The early detection of clinical deterioration is a key component in the care quality and safety agenda.
- The initial assessment in an acute care setting reviews the reason for seeking care and determines adequate ventilation and perfusion to identify the need for early intervention.
- Recognition of deterioration using appropriate track and trigger tools outlined in hospital policies allows nurses to identify the need for escalation of care.
- Timely management of deterioration of patients in emergency situations is facilitated by effective communication with specialist teams with intensive care skills.
- A comprehensive nursing assessment using a holistic patient-centred approach is completed after the initial assessment to gather further data for care planning.
- Using the format of the eleven functional health patterns for assessment, physical examination

findings, and a review of diagnostic tests, nurses use their clinical knowledge and reasoning to make judgements that identify problems that are responsive to nursing care.

- With the cardiovascular patient and their family, the nurse confirms the problems, defines the goal to be reached, and uses nursing intervention to reach the patient's goal.

Introduction

Health assessment refers to a systematic method of collecting and analysing data for the purpose of planning patient-centred care. Comprehensive assessment is very important in order to determine an accurate diagnosis and recognize all of the person's needs. Through describing a person's condition and having a holistic approach to identifying their needs, an effective and timely healthcare plan is developed and implemented (see Chapter 11 and Chapter 14).

It is important to point out how a conventional medical assessment differs from a nursing assessment, especially when the role of a nurse is taken into consideration. Virginia Henderson eloquently defined this role several decades ago: 'The unique function of the nurse is to assist the individual, sick or well, in the performance of those activities contributing to health or its recovery (or to peaceful death) that he would perform unaided if he had the necessary strength, will or knowledge.' Medical assessment conventionally collects disease-focused patient information. While this format addresses collaborative care, it does not address the promotion of health, prevention of illness, and the nursing care of ill people. Nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups, and communities, sick or well, and in all settings.¹ Nurses need and collect information that identifies the immediate and future responses to actual or potential health problems of the cardiovascular patient and their family. This information serves as a basis for determining patients' problems that are amenable to nursing care. Therefore, a nursing diagnosis is a clinical judgement concerning a human response to health conditions/life processes, or vulnerability for that response, by an individual, family, group, or community.

Circumstances contributing to the context of care include the setting or environment; the physical, psychological, or socioeconomic circumstances involving patients; and the expertise of the nurse. Because of these

Box 5.1 Types of health assessment**Comprehensive assessment**

Involves a detailed history and physical examination performed at the onset of care in a primary care setting or on admission to a hospital or long-term care facility. The comprehensive assessment encompasses health problems experienced by the patient; health promotion, disease prevention, and assessment for problems associated with known risk factors; or assessment for age- and sex-specific health problems (e.g. increased cardiovascular risk for women after menopause; see Chapter 14).

Problem-based/focused assessment

The problem-based or problem-focused assessment involves a history and examination that are limited to a specific problem or complaint (e.g. peripheral/lower extremities oedema; see Chapter 10). This type of assessment is most commonly used in a walk-in clinic or emergency department, but it may also be applied in other outpatient settings (e.g. heart failure clinics). Although the focus of data collection is on a specific problem (e.g. heart failure), the potential impact of the patient's underlying health status also must be considered (in order to find the cause of deterioration).

Episodic/follow-up assessment

This type of assessment is usually done when a patient is following up with a healthcare provider

(e.g. heart failure nurse) for a previously identified problem. For example, a patient with heart failure treated by the multidisciplinary team for peripheral oedema might be asked to return for a follow-up visit after completing a prescription of diuretics. An individual treated for an ongoing condition such as heart failure, is asked to make regular visits to the clinic for episodic assessment.

Shift assessment

When individuals are hospitalized, nurses conduct assessments each shift. The purpose of the shift assessment is to identify changes to a patient's condition from the baseline; thus, the focus of the assessment is largely based on the condition or problem the patient is experiencing and the patient's response to the therapeutic plan.

Screening assessment/examination

A short examination focused on disease detection. A screening examination may be performed in a healthcare provider's office (as part of a comprehensive examination) or at a health fair (e.g. European Society of Cardiology congress, heart failure awareness days activities). Examples include blood pressure screening, glucose screening and cholesterol screening.

variables, different types of assessments are performed (e.g. a comprehensive health assessment, a problem-based or focused health assessment, an episodic assessment (e.g. for heart failure, see Chapter 10), a shift assessment, and a screening assessment) (► **Box 5.1**). In some settings, such as a hospital or a community-based primary care setting, a comprehensive history is collected and an examination is performed (see Chapter 11). In an urgent care or emergency department setting (e.g. in an acute coronary syndrome or deteriorated heart failure episode), a problem-based or focused assessment is indicated, although additional subjective and objective data that may have a direct or indirect impact on the management of the patient are collected. In addition, if it is determined that the patient is at risk or in need of further evaluation (e.g. angiography), the patient is referred to the appropriate department (coronary unit/catheterization laboratory) so a comprehensive assessment can be completed.

Components of health assessment include conducting a health history, performing a physical examination,

reviewing other data from the health record (as available), and documenting the findings. These steps lead to data analysis and interpretation (discussed later in this chapter) so that a patient-centred plan of care can be developed and implemented. The amount of information collected by the nurse during a health history and the extent of the physical examination depend on the setting, the situation, the patient's needs, and the nurse's experience. The nurse incorporates the patient's knowledge, motivation, support systems, coping ability, and preferences to develop a plan of care that will help the patient maximize his or her potential (► **Fig. 5.1**).² Health assessment data are documented so the health status at the time of the healthcare encounter is recorded and the information is available to the rest of the multidisciplinary team involved in the patient's care.

The nursing assessment is the beginning of information collection, and subsequently, nurses continue to collect information at every interaction. The nurse's level of clinical knowledge influences the skilfulness of information

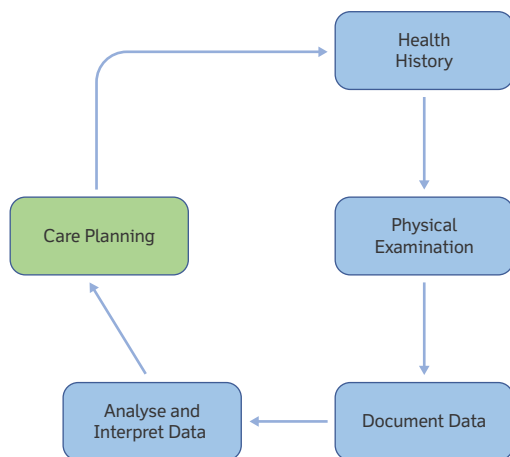


Fig. 5.1 The development of the care plan based on the assessment and data interpretation.

collection and allows for sensitivity to certain cues from the cardiovascular patient. Nurses have the knowledge to make a judgement about the information that permits explanation and prediction. In clinical practice, nurses use their clinical knowledge and reasoning and start to piece information together in a meaningful way. Then, they put a name to the problem, need, or category (nursing diagnosis) on which the nursing care plan will be based.

Health history

The nurse collects *health data* from the patient and compares these with the ideal state of health, taking into account the patient's age, sex/gender, culture, ethnicity, and physical, psychological, and socioeconomic status. Data about the patient's strengths, weaknesses, health problems, and deficits are identified (see Chapter 11 and Chapter 14).

An accurate recording of *medications* including supplements, over-the-counter medications, and herbal remedies and should be recorded and reconciled using electronic data confirmation, if available, from local pharmacies. The list should include names, last dose, and any allergies. Information about the medication and allergies can be taken from the patient and the significant others or caregivers. Also, adherence with medication should be taken into consideration with the appropriate questions asked (see Chapter 12 and Chapter 14) as well as the patient's beliefs and attitudes about their medication therapy. Assessment of level of knowledge of the current

medication and its side effects or actions is needed for the upcoming educational planning of the patient with cardiovascular disease (see Chapter 13).

Questions on *allergies* should include all possible allergic agents such as medications, foods, and the environment, as well as the nature of the reaction and its seriousness. Intolerance of medications should also be recorded. Based on the institutional and local policy, allergy history must be documented and be clearly visible to all healthcare team members. Family members should also be made aware of allergic reactions.³

Initial assessment

The focus of the initial assessment varies according to the setting and clinical presentation. The initial assessment of all patients presenting to nurses, irrespective of the cardiovascular setting, aims to determine whether the person/patient is haemodynamically stable, adequacy of ventilation and perfusion to assess the need for early intervention for life-threatening situations, whether the person is suffering from an acute cardiac event that would benefit from time-dependent therapy, and the need for symptom management (e.g. see Chapter 6). Therefore, the initial assessment is a key component of healthcare planning as it helps nurses and other healthcare professionals to prioritize problems and plan timely nursing interventions, especially when urgent action to maintain or to restore adequate ventilation and perfusion is required (► Table 5.1).

Starting with the first contact with the patient, initial clinical assessment or the general survey may include stature, overall health status, body habitus, personal hygiene, grooming, skin condition such as signs of breakdown or chronic wounds, breath and body odour, overall mood, and psychological state (see Chapter 11). At the same time, initial vital sign measurements (i.e. temperature, respiratory rate, heart rate, blood pressure with appropriate sized cuff, pulse oximetry reading, and note if on room air or oxygen), and accurately measured weight in kilograms with well-maintained scales and height measurement, so that body mass index (BMI) can be calculated for medication dosing and nutritional intake, should all take place along with the history-taking questions.⁴

Life-threatening conditions must be recognized early, therefore the initial assessment should be structured and detailed, but time-framed, as history taking and patient assessment must not delay interventions or definitive care. Following the algorithms for the assessment,

Table 5.1 Care plan

Plan of care with goals, defining characteristics, and nursing interventions	
Nursing problem	Risk-prone health behaviour—smoking ⁶
Goal	Assist patient to quit smoking to reduce a modifiable risk factor
Defining characteristic	Current smoker
Nursing interventions⁷	(See Chapter 11 for more information on how to assist patients with smoking cessation strategies) Advise on quitting smoking Assess motivation and readiness to quit smoking Negotiate strategy to quit smoking Provide smoking cessation assistance Arrange follow-up Identify a support mechanism
Nursing problem	Knowledge deficit related to new diagnosis of exertional angina ⁶
Goal	Patient will demonstrate an understanding of this condition, its causes, and appropriate relief measures for chest discomfort
Defining characteristic	New diagnosis of exertional angina
Nursing interventions⁷	Assess knowledge of causes of angina, treatment, and risk factors Identify triggers for angina that can be managed Minimize the symptoms of gastro-oesophageal reflux disease to reduce gastrointestinal symptom burden and assist patient to know difference between gastrointestinal and cardiac discomfort Develop an individualized educational plan: 1. On the proper use of nitroglycerine for chest discomfort 2. How and when to seek emergency medical services Teach use and side effects of other medications for long-term management Address need to reduce modifiable risk factors
Nursing problem	Stress overload related to change in health status and work demands ⁶
Goal	Reduce stress from new diagnosis and stressors in the work place
Defining characteristic	Nervousness, alteration in attention
Nursing interventions⁷	Identify stressors both at home and in work environment Recognize family members and colleagues that can provide emotional support and coping strategies to reduce stress Use relaxation therapies such as mindfulness meditation, relaxation response Allied health professional counselling

the assessment should be brief and the need for further assessment and life-supporting intervention should always be considered. An example of such an algorithm is 'SAMPLE' (► Box 5.2). It provides a simple process to organize this initial assessment and ensure that emergency situations can be assessed in the most optimal way.⁵

Adopting a holistic nursing, patient-centred and not solely a biomedical perspective, is outlined in the Core Curriculum for the Continuing Professional Development of Nurses Working in Cardiovascular Settings.⁸ The functional health pattern framework⁹ (► Fig. 5.2) provides a systematic approach to identifying potential or actual

Box 5.2 The SAMPLE algorithm for the assessment of medical emergency situations

- S—signs and symptoms.
- A—allergies.
- M—medications.
- P—past medical history.
- L—last meal or oral intake.
- E—events before the acute situation.

Source data from World Health Organization. The ABCDE and SAMPLE History Approach, World Health Organization 2018.

problems that nurses can consider as part of comprehensive assessment.

This framework has two principal domains, the first being physical well-being and comfort and the second, emotional and spiritual well-being. More detail on what should be assessed for each domain can be seen in ► **Table 5.2.**^{10–21} ► **Table 5.3** provides some examples of questions that can be asked to assess the health perception and management pattern.^{9,11,22} It may not be necessary to ask all of the proposed questions. The nurse’s

clinical knowledge and reasoning will help them to make judgements on which questions to prioritize. See also ► **Box 5.3**²³ for some selected validated cognitive screening tools.

Chief complaint

The first step in the evaluation of a new patient is to record the chief complaint and history. Nurses taking a history and assessing patients should make sure that, when addressing a patient, they use appropriate language relevant to the level of health literacy and use a certified and experienced translator where they are unable to communicate with the patient in their mother tongue. From the very first moment, culturally competent care and respect for privacy should be ensured and maintained throughout the healthcare continuum (see Chapter 14).

There are many algorithms that nurses can use to assess the main complaint. Use of the mnemonics P-Q-R-S-T-A and oPQRSTa (► **Box 5.4**) is considered to be an effective and a reliable approach to the assessment of symptoms and especially chest pain of any origin.²⁴ They are very useful in assessing other symptoms such as dyspnoea or shortness of breath and also provide a

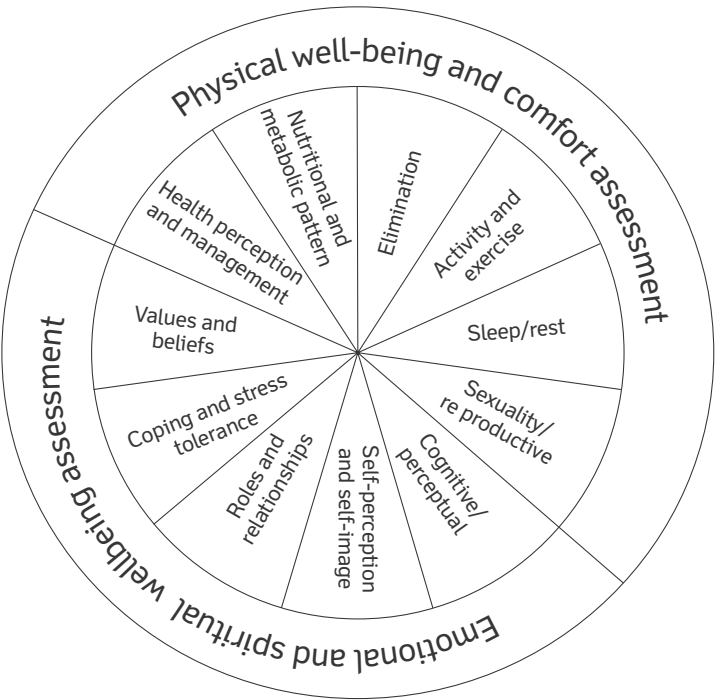


Fig. 5.2 Gordon's eleven functional health patterns.

Table 5.2 Assessment of the eleven functional health patterns

Physical well-being and comfort assessment	Emotional and spiritual well-being assessment
<i>Health perception and management</i>	<i>Cognitive/perceptual</i>
1. General perceptions of health, general health management, and disease prevention strategies that may identify a dysfunctional pattern 2. Routines to maintain health, how signs and symptoms are treated, and reasons for seeking healthcare 3. Current and past health practices and future motivation regarding health promotion, e.g. current and past smoking history and attempts at smoking cessation. Smoking is a key cardiovascular risk that nurses can address (see Chapter 11 for more detail on how nurses can address this risk factor) 4. Use and abuse of drugs (e.g. sedatives, amphetamines, opioids, ecstasy, cocaine, heroin, z drugs, and cannabis) 5. Current and past health status 6. Current and past family history of cardiovascular heart disease as an indicator to identify the risk of developing cardiovascular disease 7. Employment and work conditions 8. Social isolation/exclusion 9. Early childhood development 10. Housing 11. Access to healthcare and public health programmes¹⁰	1. Ability to use cognitive skills (perception, comprehension of ideas, perception, thinking, reasoning, and remembering, capacity for judgement) 2. Ability to use language skills, perception, memory, symbolic and imagery operations, problem-solving and decision-making^{9,11} 3. Impaired cognitive functioning as a risk factor for cardiovascular conditions—effect on healthy patterns and behaviours, ability to understand and follow healthcare advice, and influence on medication adherence¹² 4. Need for more in-depth assessment and evaluation with validated specific cognitive screening tools¹³ (Box 5.3) 5. Educational level
<i>Nutritional and metabolic pattern</i> (see Chapter 11 Prevention and rehabilitation for more detail on how to conduct a dietary assessment and features of a healthy diet)	<i>Self-perception and self-image</i>
1. Food and fluid intake taking into account age, sex, body size, and composition 2. Evaluation of nutrient intake in relation to actual or potential health problems 3. Assessment of food and fluid intake using recall or record 4. Height and weight to calculate BMI—weight in kilograms divided by height in metres squared 5. Cultural food choices, who prepares meals in the home 6. Number of meals eaten outside the home 7. Access to healthy food 8. Financial burden of food 9. Food allergies including response to the allergenic food 10. Use of and abuse of alcohol (CAGE questionnaire available in multiple languages)¹⁴	1. Evidence of low self-esteem, poor self-image (e.g. body image) 2. General appearance, non-verbal communication (such as body language, posture and movement, eye contact), voice and speech patterns 3. Identify mood disorders, negative feelings or anxiety for the present or future, depression that led to delayed medical advice seeking, or low self-esteem and value of living 4. Where appropriate, use of screening tools for anxiety, depression, or bipolar disorders (relevant to age, cultural level, health literacy, special condition, and educational level)
<i>Elimination (bowels, bladder, and skin)</i>	<i>Roles and relationships¹⁵</i>
1. Regularity and control of elimination patterns (bowels, bladder, and skin) 2. Usual urinary pattern (frequency of urination during the day, difficulty, leaking, pain, waking at night to empty the bladder)	1. Defined roles as identified by patient—importance of these roles in relation to their health situation and the perceived health habits 2. Occupation type and work conditions (working hours, absence leaves, working accident, work stress, level of income, responsibilities, social interactions, occupational satisfaction)

Table 5.2 Continued

3. Usual pattern of bowel elimination (frequency, time of the day, consistency, use of laxatives, changes in bowel pattern, interventions to maintain normal bowel pattern) 4. Maintenance of an intact skin surface—daily hygiene practices, influencing factors, skin problems in the past (see ‘Physical examination of the cardiovascular patient’ section for more detail) 5. Use of diuretics (hypertension and heart failure)—decrease of fluid adsorption causing constipation 6. Use of cardiovascular medications that increase sun sensitivity 7. Use of anticoagulant and antiplatelet agents—increased bleeding risk (bowels, bladder, skin even with minor injuries) 8. Peripheral oedema for heart failure patients	
Activity and exercise (see Chapter 11 for more detail on how to conduct a physical activity assessment and an outline of benefits of physical activity and exercise on cardiovascular health) 1. Observation of mobility, posture, and general appearance 2. Usual pattern of a carrying out activities of daily living—ability to use energy, how they feel after engaging in these activities, and how they determine how much activity they can perform 3. Subjective description of exercise and leisure time activities—problems perceived by the patient and family and their actions to relieve these problems 4. Type and amount of exercise performed, attitude, knowledge, and motivation to exercise 5. Leisure time activity includes recreational activity and the amount of time spent on these activities. Changes in these activities and asking about impact on mental health 6. Regular participation in physical activity reduces all-cause and cardiovascular mortality over a wide age range in both males and females.¹⁷ For those patients with risk factors, such as hypertension, lipid disorders, increased body weight, and diabetes, physical activity has a positive effect on reducing these risk factors	
Sleep and rest 1. Sufficiency and quality of sleep. Length of sleep at night, feeling rested when getting up, napping, difficulty falling asleep, use of sleep medications 2. Influencing factors—age, cultural norms, daily activity, diet, environment, perceived stress level, medications, and illness 3. 24-hour recall of quantity and quality, perception of their sleep experience 4. Appearance of being rested, energy level 5. Influence of medications, and comorbid illnesses, e.g. timing of taking diuretics, beta-blockers 6. Use of stimulants such as caffeine, nicotine, and alcohol can influence sleep patterns	
Coping and stress tolerance¹⁶ 1. Perceived levels of stress and potential stressors 2. Previous experiences 3. Coping strategies used to adapt to stressful situations—success and feasibility for use of these strategies in a situation of new or escalating cardiovascular disease	
Values and beliefs 1. Awareness of the personal nature of spirituality 2. Assess spiritual beliefs and appropriate source of support (e.g. chaplaincy, patient’s faith community, other professionals and specialized supportive care)¹⁷ 3. Assess spiritual distress¹⁸ and needs¹⁹	

Table 5.2 Continued

Sexuality and reproductive

1. Sexual identity and self-identity, gender identity (sex at birth), gender role behaviour (behaviour exhibited as male or female), and sexual orientation or preference²⁰
2. Past and current sexual history and reproductive patterns
3. As appropriate, assess sexual relationships, birth control methods, presence of children, impact of sexual self-identity on health, menstrual cycle experience, and menopause
4. Marginalization (lesbian, bisexual, gay, 'trans', queer (LGBTQ) community)
5. Healthcare access—negative and poorly understood healthcare needs²⁰
6. Discrepancies between expression of sexuality attained compared to what is desired
7. Sexual minority women (lesbians, bisexual) display higher rates of modifiable risk factors (smoking and elevated BMI)²¹
8. Sexual minority men (gay, bisexual) display higher rates of smoking
9. Reproductive patterns—cultural and religious norms
10. Unintended pregnancy—provision of contraceptive options if requested
11. Anxiety relating to effect of cardiovascular illness on sexuality and sexual functioning
12. Impact of cardiovascular medication on sexual function
13. Advice for post-myocardial infarction patient on gradual resumption of sexual activity and reduction of alcohol and stressors. Finding a comfortable position to enhance return to sexual activity

methodology to facilitate efficient communication to other healthcare providers. The triage of chest pain patients in the emergency department is based on careful history-taking, physical examination, recording and interpretation of a 12-lead electrocardiogram (ECG) within 10 minutes of arrival, and measurement of cardiac biomarkers.²⁵ Chapter 6 provides an example of how the initial assessment works for the example of a patient presenting with angina and suspected coronary heart disease.

Assessment of the pain

To assess the intensity of pain, scales such as a numeric rating scale (NRS), a visual analogue scale, a faces pain scale, or the Wong–Baker Faces Pain

Rating Scale can be used. The numeric scale 0–10 is still considered to be the gold standard for assessing pain severity. Selection of the appropriate pain assessment tool should be based on the characteristics of the group of patients, their backgrounds, and their communication skills.²⁶ Examples of an NRS and the Wong–Baker Faces Pain Rating Scale can be seen in ► Fig. 5.3 and ► Fig. 5.4.

Recognizing emergency situations

The 'ABCDE' (A–E) approach provides a way of systematically assessing vital systems including airway, breathing, circulation, disability, and exposure. The aim of this

Table 5.3 Health perception and management pattern questions

Potential questions for the pattern of health perception and management	1. What made you decide to seek healthcare today? 2. How do you manage signs and symptoms before seeking healthcare? 3. Do you have home remedies that you use for signs and symptoms? 4. How would you define health? 5. What do you routinely do to maintain your health? 6. Do you believe that health is a priority in your life? 7. What makes you feel less healthy? 8. Do you feel it is important to be included in decision-making about your healthcare? 9. Do you trust healthcare professional when it comes to managing your care?
Current health status	1. How would you describe your health status? 2. Compared to a year ago, how would you rate your health? 3. Do you smoke tobacco? If yes, have you tried to quit? 4. Do you use non-prescribed drugs such as opioids, marijuana, cocaine? 5. Do you take any medications prescribe by a healthcare provider? 6. Do you use non-prescription, herbal supplements, or vitamins?
Past health history	1. Birth and childhood illnesses and immunizations 2. Previous illnesses and hospitalizations 3. Accidents or injuries 4. Allergies and reactions
Family history	1. Maternal and paternal family health history 2. Does your race or ethnic affect your health? 3. Do you have a family history of any genetic disorders? 4. How do you obtain and use resources in your community to maintain family health? 5. How does your cultural background influence your health practices?
Environmental history	1. Are you affected by climate? 2. Do seasonal changes affect your health? 3. Do you think air, water, soil, or noise pollution affects your health? 4. What preventive health measure do you and your family follow to counteract the adverse effects of pollution in your environment? 5. Do you feel safe in your home, neighbourhood, and workplace? 6. Do you have and are you able to afford healthy food? 7. Do you have access to affordable healthcare?

Box 5.3 Selected validated cognitive screening tools

Folstein test/Mini-Mental State Examination (MMSE)—also available as a standard version (MMSE-2:SV).²³

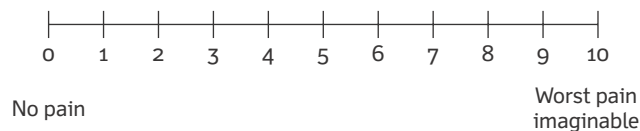
1. Assesses basic cognitive dimensions using simple tasks such as registration and recall, ability to repeat and retain three unrelated words, and then recall after a short intervention task.
2. Assesses orientation to time and place, attention and calculation, naming specific body parts or items, repetition of a sentence with words not often said

together, comprehension of a three-stage verbal command, reading and following instructions, writing a sentence, and ability to draw copying intersecting pentagons.

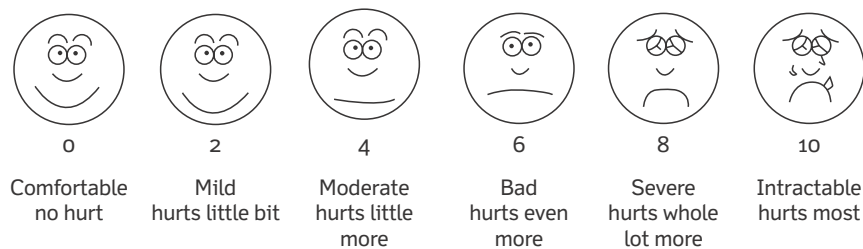
3. Takes 15 minutes to administer.
4. Includes assessment of attention, orientation, registration, recall/short-term memory, language, and visuospatial construction.
5. MMSE-2:SV available in various languages.

Box 5.4 oPQRSTa mnemonic to assess the origin of chest pain and other acute symptoms

- 1. O**—onset: can help to narrow the differential diagnosis. What was the onset? Sudden? Severe at onset? Abrupt? Starts gradually and worsens with exertion? Occurs only when activity creates an oxygen demand? Discomfort begins at lower levels of exercise or at rest?
- 2. P**—what provokes symptoms? What improves or exacerbates the condition? What were you doing when it started? Does position or activity make it worse?
- 3. Q**—quality and quantity of symptoms: is it dull, sharp, constant, intermittent, throbbing, pulsating, aching, tearing, or stabbing?
- 4. R**—radiation or region of symptoms: does the pain travel, or is it only in one location? Has it always been in the same area, or did it start somewhere else?
- 5. S**—severity of symptoms or rating on a pain scale. Does it affect activities of daily living such as walking, sitting, eating, or sleeping?
- 6. T**—time or how long have they had the symptoms. Is it worse after eating, changes in weather, or time of day?
- 7. A**—associated symptoms: what other symptoms do you have besides the chief complaint? How are they connected to the main symptom?

**Fig. 5.3** An 11-point NRS (NRS-11).

Reproduced from Basic principles of acute pain. In Brook, P., Connell, J., & Pickering, T. (Eds.), Oxford Handbook of Pain Management. Oxford, UK: Oxford University Press 2011, with permission from Oxford University Press.

**Fig. 5.4** Wong-Baker Faces Pain Rating Scale.

Reproduced from Basic principles of acute pain. In Brook, P., Connell, J., & Pickering, T. (Eds.), Oxford Handbook of Pain Management. Oxford, UK: Oxford University Press 2011, with permission from Oxford University Press.

structured and systematic assessment is to identify and prioritize the patient's most life-threatening problems first. Here also, an algorithm may be useful in establishing common situational awareness among all treatment providers.²⁷ ► **Table 5.4** shows the necessary nursing skills to administer this approach.

Physical examination of the cardiovascular patient

A physical examination by a nurse is an essential part of comprehensive nursing assessment providing a wealth of information about the patient. Nurses should

Table 5.4 Assessing vital systems using the ABCD approach

What	Objective	How	Action
A: airway	To establish the patency of the airway and assess the risk of deterioration in the patient's ability to protect their airway	1. Attempt to elicit a vocal response 2. Listen for breath sounds from mouth and nose 3. Check for airway obstruction and possible causes (fluid, foreign body, swelling, altered mental state, ability to swallow saliva, abnormal sounds, chest wall movements)	4. If obstructed, attempt to open airway—head tilt and chin-lift manoeuvre^{5,27,28} (► Fig. 5.5)
B: breathing	To check presence of breathing and that it has a normal pattern	5. Look, listen, and feel for breathing 6. Check frequency and depth 7. Check number of beats per minute (normal range 12–20 beats per minute (bpm)) 8. Check efficiency (pulse oximetry 97–100%) and arterial blood gases (ABGs) 9. Check for signs of respiratory distress or use of accessory muscles, and adventitious breath sounds, such as crackles or wheezes²⁹	10. Administer O₂ if saturation is <94% to increase saturation to between 94% and 99% 11. If history of chronic obstructive pulmonary disease, administer O₂ if saturation is below 90% on room air 12. If patient is short of breath, administer O₂ whatever the saturation level 13. Check for history of breathing problems (dyspnoea on exertion, tachypnoea, orthopnoea, paroxysmal nocturnal dyspnoea), cough (productive or not), and smoking history 14. Use dyspnoea scale to determine symptom severity (e.g. modified Medical Research Council activity-based dyspnoea scale, see ► Box 5.5)³⁰
C: circulation	To assess function of the cardiac pump	15. Check appearance and skin colour 16. Palpate the pulse (normal range 60–100 bpm) 17. Check capillary refill time—normal <2 seconds 18. Check for signs of poor perfusion (cool, moist extremities, diaphoresis, low blood pressure, tachycardia, absent peripheral pulses)	

Table 5.4 Continued

What	Objective	How	Action
		19. Inspect for pallor, cyanosis, mottling, cool, clammy skin 20. Identify systemic vasoconstriction (decreased skin perfusion, diminished pulses) 21. Check for associated respiratory distress 22. Lethargy, confusion, disorientation, anxiety, and depression may indicate associated reduced cerebral perfusion ^{3,28}	
D: disability	To assess level of consciousness	23. Use tools to assess level of consciousness i. AVPU (Box 5.6) ii. Glasgow Coma Scale (Box 5.7) 24. Monitor and document neurological status frequently for first 48 hours and compare with baseline 25. Blood glucose (glucose for hypoglycaemia) 26. Be aware of the close relationship between cerebral function and cardiac output and influence of electrolyte and acid–base variations, hypoxia, and systemic emboli 27. Anxiety and restlessness are common signs of hypoxia 28. Confusion and somnolence with worsening ABGs are a sign of cerebral dysfunction due to hypoxaemia 29. In patients with low cerebral perfusion or signs of stroke: i. Observe for right and left limb movements separately ii. Evaluate size, shape, equality, and light reactivity in pupils iii. Observe position and movement of eyes—note whether in mid position or deviated to side or downwards iv. Observe oculoccephalic reflex (doll's eyes) (► Fig. 5.6) v. Observe for presence or absence of reflexes (blink, cough, gag, and Babinski) (► Fig. 5.7)	
E: exposure	To inspect entire body	30. Check for signs of trauma, bleeding, hidden injuries, skin reactions (rash), bites, other lesions, needle marks 31. Remove clothing while respecting dignity ^{5,27,28}	

Box 5.5 Modified Medical Research Council dyspnoea scale

Grade	Degree of breathlessness scale
0	No breathlessness, except with strenuous exercise
1	Breathlessness when hurrying on the level or walking up a slight hill
2	Walks slower than contemporaries on level ground because of breathlessness or has to stop for breath when walking at own pace
3	Stops for breath after walking about 100 m or after a few minutes on level ground
4	Too breathless to leave the house, or breathless when dressing or undressing

Reproduced from Santos M, Kitzman DW, Matsushita K, Loehr L, Sueta CA, Shah AM. Prognostic Importance of Dyspnea for Cardiovascular Outcomes and Mortality in Persons without Prevalent Cardiopulmonary Disease: The Atherosclerosis Risk in Communities Study. PLoS One. 2016 Oct 25;11(10):e0165111. doi: 10.1371/journal.pone.0165111 with permission from PLOS ONE (<https://creativecommons.org/licenses/by/4.0/>).

► be aware of what is normal, the ranges of normal, and the ‘normal’ for various disease states as well as the influence of medications. Relevant guidelines of the European Society of Cardiology refer to normal ranges and clinical recommendations for the management of abnormal values (see Chapter 11 and <https://www.escardio.org/Guidelines>). Also to be taken into account is the impact of patient comorbidities, the outcome of treatments, and medical/surgical interventions. For example, the results of the cardiovascular examination will have specific variations for patients who have a cardiac surgical history, or someone who has had a heart transplant. This review serves only as a baseline for the nurse to reflect on the variability of normal versus pathology for the cardiovascular patient. What to expect of a physical examination in the context of specific cardiac conditions will be covered in later disease-specific chapters.

The physical examination begins with the nurse observing the patient.³¹ How easily is the patient roused (Glasgow Coma Scale)? Are they alert when you enter, and do they respond to their name? Do they have appropriate colouring and symmetrical facial responses and features? Can they hear and comprehend a question, formulate an answer, and articulate an appropriate response? A rapid head-to-toe check can be conducted to rule out life-threatening pathology (► **Box 5.6** and

Box 5.6 AVPU acronym to assess level of consciousness

Alert.
Voice responsive.
Pain responsive.
Unresponsive.

Box 5.7 Glasgow Coma Scale

Glasgow Coma Scale		
Response	Scale	Score (points)
Eye Opening Response	Eyes open spontaneously	4
	Eyes open to verbal command, speech, or shout	3
	Eyes open to pain (not applied to face)	2
	No eye opening	1
Verbal Response	Oriented	5
	Confused conversation, but able to answer questions	4
	Inappropriate responses, words discernible	3
	Incomprehensible sounds or speech	2
	No verbal response	1
Motor Response	Obeys commands for movement	6
	Purposeful movement to painful stimulus	5
	Withdraws from pain	4
	Abnormal (spastic) flexion to pain	3
	Extension to pain	2
	No motor response	1

Minor brain injury: 13–15 points, moderate brain injury: 9–12 points, severe brain injury: 3–8 points

Figs. 5.5–5.7). Bulging neck veins, crushing chest pain with diaphoresis, unilateral absence of lung sounds, tracheal deviation, tearing back pain, or shortness of breath with cyanosis are just some examples of abnormal findings which could be identified when a patient is in distress. Following this, a physical examination should systematically cover each of the body systems.



Feature	Response	Score
Best eye response	Open spontaneously	4
	Open to verbal command	3
	Open to pain	2
	No eye opening	1
Best verbal response	Orientated	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No verbal response	1
Best motor response	Obeys commands	6
	localising pain	5
	Withdrawal from pain	4
	Flexion to pain	3
	Extension to pain	2
	No motor response	1

Fig. 5.5 Head tilt and chin lift manoeuvre to open airway. Reproduced from Thim T, Krarup NH, Grove EL, Rohde CV, Løfgren B. Initial assessment and treatment with the Airway, Breathing, Circulation, Disability, Exposure (ABCDE) approach. *Int J Gen Med.* 2012;5:117–21. doi: 10.2147/IJGM.S28478 with permission from Dove Medical Press.

Cardiovascular system

This body system includes the heart, blood, and blood vessels. ► **Table 5.5** shows the components of this assessment. Specific tests are necessary in different cardiovascular conditions and these are referred to in the relevant chapters (prevention and rehabilitation (Chapter 11), coronary heart disease (Chapter 6), cardiac arrhythmias (Chapter 7), valvular disease (Chapter 8), inherited cardiac diseases (Chapter 9), and heart failure (Chapter 10)). The patient should be positioned so they are relaxed, and have not recently exerted themselves, for example, by just having changed into a gown or walked a short distance.

A complete set of *vital signs*—blood pressure, heart rate, temperature, respiratory rate, oxygen saturation, and peripheral pulses—is the foundation of the physical examination (► **Table 5.5**). Much information can be obtained while manually palpating arterial pulse points (► **Fig. 5.8**). Palpation of a radial pulse provides an estimation of the blood pressure, fullness and characteristics of the blood volume and flow, as well as skin temperature. Palpation of the dorsalis pedis and posterior tibial pulses are a crude indication of lower extremity flow, while concurrently assessing for peripheral oedema.

The regularity as well as speed of the *heart rate* should be documented and the manner it was obtained, that is, through palpating the radial pulse, or auscultating the pulse over the aortic valve at the right second intercostal space, or monitoring the ECG rate. Unless there is an overriding contraindication, bilateral blood pressures should be measured and the values, sidedness, and the method used to obtain, such as manual or automatic device, and size of cuff used, documented in the patient record.³² Orthostatic hypotension assessment may be indicated in some populations (e.g. older patients). Blood pressure and pulse are recorded at 1 and 3 minutes after standing. Systolic blood pressure decreases of 20 mmHg or greater, or diastolic blood pressure decreases of 10 mmHg or greater, in the first 3 minutes of standing should be reported to a treating clinician as a part of the collaborative assessment as well as for suspected hypertension.³²

Body temperature is recorded, including the temperature source. Temporal artery, oral, axillary, or pulmonary artery central temperatures are all informative, but trending of temperatures from the same source is required. Vital signs are monitored over time, as multiple data points will be compared when working towards a diagnosis.

Advanced practice nurses or those with special training should auscultate the *heart sounds* (► **Fig. 5.9**) (see also Chapter 4 and Chapter 15). This assessment may reveal pathologies discussed elsewhere in this book (e.g. Chapter 8).

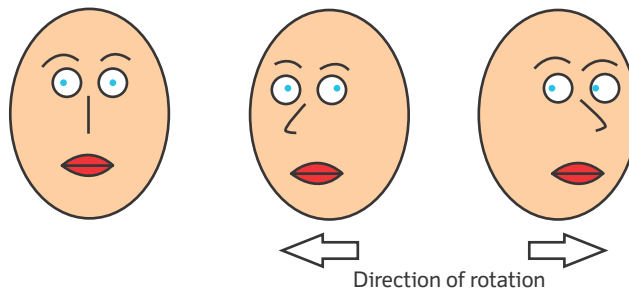
Positive oculo-cephalic reflex

Fig. 5.6 Checking the oculoccephalic reflex (doll's eyes).

Electrocardiogram

The 12-lead ECG is included in the routine assessment of the cardiovascular patient. The ECG is sensitive to changes in electrolytes, medication effects, as well as

coronary perfusion. It is a low-risk, non-invasive assessment, completed at the bedside without a need to transport the patient, and the results can be reviewed remotely by an appropriate healthcare provider. An ECG is expected to be obtained during a physical examination, prior to



Fig. 5.7 Checking the Babinski reflex.

Reproduced from Shibasaki, H., & Hallett, M., Tendon Reflexes and Pathological Reflexes. In *The Neurologic Examination: Scientific Basis for Clinical Diagnosis*. Oxford, UK: Oxford University Press 2016 with permission from Oxford University Press.

Table 5.5 Cardiovascular system assessment

Components of assessment		Units of measurement
Vital signs	Bilateral blood pressure	mmHg
	Regularity of heart rate	Beats per minute (bpm)
	Temperature	°C
	Respirations	Per minute
	O ₂ saturation	%
Presence of peripheral pulses	Temporal	
	Facial	
	Carotid	
	Brachial	
	Radial	
	Femoral	
	Popliteal	
	Posterior tibial	
Dorsalis pedis		
Peripheral oedema	Accumulation of fluid in peripheral vascular system (particularly lower limbs)	
12-lead ECG	Representation of the heart's electrical activity	
Biomarkers		
Myocardial ischaemia (see Chapter 6)	Cardiac troponin T, cardiac troponin I, and the high-sensitivity cardiac troponins ³³	
Heart failure (see Chapter 10)	B-type natriuretic peptide (BNP) and N-terminal pro-BNP (NT-proBNP) ³³	
Inflammation marker	High-sensitivity C-reactive protein ¹⁷	
Imaging	Chest X-ray	
	Radionuclide imaging	
	Computed tomography coronary angiography	
	Echocardiography	
Non-invasive	Exercise treadmill test	
	Pharmacological stress test	
Invasive	Coronary angiography	



Fig. 5.8 Arterial pulse points.

Reproduced from Thomas, J., & Monaghan, T. *The cardiovascular system*. In *Oxford Handbook of Clinical Examination and Practical Skills*. Oxford, UK: Oxford University Press 2014, with permission from Oxford University Press.

procedures or surgery, upon admission to hospital, after a procedure or surgery, with changes in symptoms, or observed change in cardiac rhythm.³³ Initial or serial ECGs may be indicative of life-threatening cardiac pathology in need of immediate intervention and escalation of care (e.g. in acute coronary syndromes; see Chapter 6).³⁴

The standard 12-lead ECG records the deflections from the isoelectric line in 12 electrical views using electrodes placed on the four limbs (right arm, left arm, right leg, left leg) and at anatomic locations on the chest (V1 through V6) (► Fig. 5.10). The six chest electrodes are placed from the patient's right to left: V1 and V2 are parasternal at the fourth intercostal space, V3 is between V2 and V4, V4 is over the fifth intercostal space at the midclavicular

line, V5 is at the same level as V4 at the anterior axillary line, and V6 is at the same level as V4 and V5 but at the midaxillary line. Monitoring of the chest electrodes provides information regarding the electrical activity deep to their location. There are variations in lead placement based on local definitions and type of monitoring system so local customs should be followed.

There are two variations of the standard 12-lead ECG which may be obtained to assess electrical activity of the posterior view, or right-sided view. Leads labelled V7 through V9 can be obtained by placing electrodes along the same line as V4, V5, and V6 (► Fig. 5.11). Lead V7 will be located at the posterior axillary line, V9 will be paraspinal, and V8 will be midway between them, near the

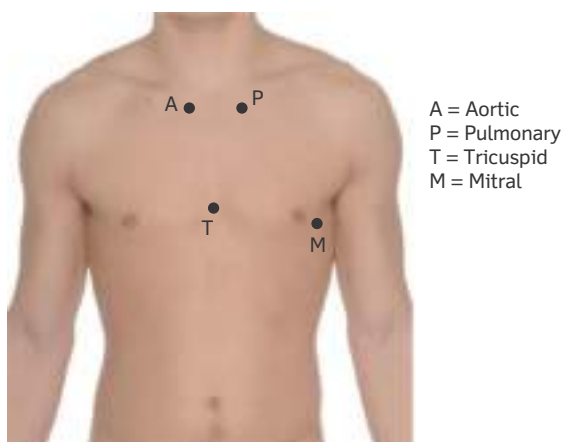


Fig. 5.9 Heart sounds auscultation.

Reproduced from Thomas, J., & Monaghan, T. The cardiovascular system. In *Oxford Handbook of Clinical Examination and Practical Skills*. Oxford, UK: Oxford University Press 2014, with permission from Oxford University Press.

border of the scapula. Right-sided leads in comparable positions to their placement on the left chest, though they will be labelled V_{3R}, and V_{4R}, will assist in the detection of right ventricular involvement.³⁴



Fig. 5.10 ECG lead placement.

Reproduced from Thomas, J., & Monaghan, T. The cardiovascular system. In *Oxford Handbook of Clinical Examination and Practical Skills*. Oxford, UK: Oxford University Press 2014, with permission from Oxford University Press.

Detection of ECG changes may be facilitated by comparing the most recently obtained ECG to an ECG measured while a patient is asymptomatic, or symptomatic with chest pain, or with shortness of breath, or other cardiac complaints. ► **Fig. 5.12** shows an ECG recording of a normally functioning heart (see also Chapter 4).

Biomarkers

Nurses should review and add appropriate biomarker results to their assessment notes. ► **Table 5.5** shows commonly used biomarkers in cardiovascular disease. Biomarker results can vary between laboratories (either differences in units or actual results). Two key aspects to take into account regarding biomarkers are the timing of the sample and trends seen in results in patients from one sample to the next. Biomarker results should be used in conjunction with other cardiac investigations, such as ECG recordings, to facilitate the diagnosis of cardiac injury or type of myocardial infarction.^{17,33,34} Cardiovascular nurses should be familiar with their institution's use of biomarkers for such conditions as myocardial ischaemia (see Chapter 6), heart failure (see Chapter 10), and inflammation (see Chapter 6 and Chapter 10).

Imaging

Imaging of the cardiovascular system can be completed with a number of modalities which are outlined in this section and in ► **Table 5.5**. Decision-making for undertaking cardiac imaging depends on the assessment of signs and symptoms, laboratory biomarkers, and ECG. When warranted, appropriate healthcare providers will add non-invasive testing, and invasive testing for definitive diagnoses.³⁵

Chest X-ray is a basic imaging modality which can provide assessment information for the cardiovascular patient and will likely be included in any interaction.³⁵ The chest radiograph, along with auscultation of breath sounds, can provide diagnostic information such as the presence and extent of a plural effusion or pneumothorax. Echocardiography is performed to assess cardiac function, structures, and circulatory flow (see Chapters 6, 8, 9, and 10).³⁵ It is better than ECG in identifying some cardiac abnormalities, such as left ventricular hypertrophy (e.g. in heart failure), but does not improve risk stratification.^{14,32} In examination of patients with hypertension, it may include evaluation of left ventricular function (see Chapter 10).³²

Non-invasive testing includes exercise testing and pharmacological stress and radionuclide imaging directly assesses myocardial viability. These tests can aid in assessing the condition of the myocardium under resting and stressed conditions.^{33–35}

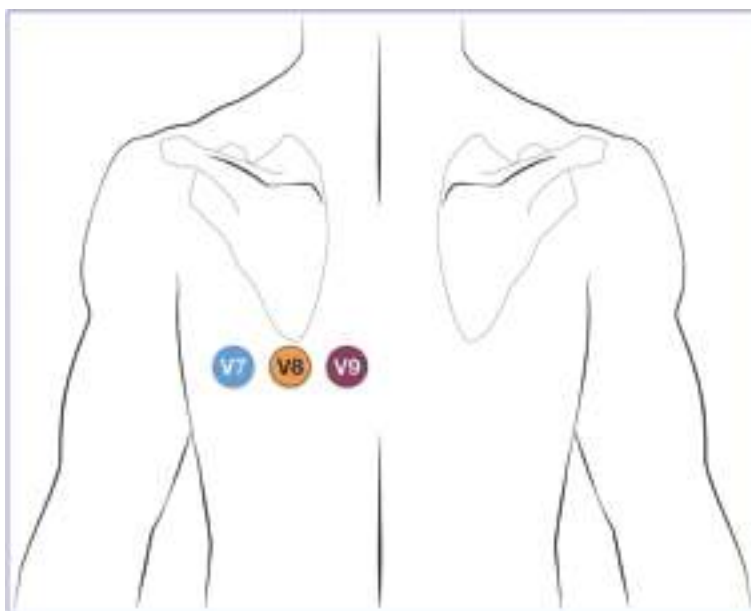


Fig. 5.11 Placement of leads V7–V9.

Invasive tests are used for a more comprehensive assessment. Computed tomography coronary angiography may be used when assessment indicates the possibility of pulmonary embolism or aortic dissection.^{17,34,35} Invasive coronary angiography is used for assessment, confirmation, and treatment of coronary artery disease (see Chapter 6).^{33,36}

Assessment of other body systems

A physical examination of the cardiovascular patient will also include an assessment of other body systems as outlined in the following sections.



Fig. 5.12 Normal ECG.

Reproduced from Kayani, W. T., Huang, H. D., Bandiali, S., Virani, S. S., Wilson, J. M., & Birnbaum, Y. (2012). ST elevation: telling pathology from the benign patterns. *Global journal of health science*, 4(3), 51–63. <https://doi.org/10.5539/gjhs.v4n3p51>. Attribution 3.0 Unported (CC BY 3.0).

Respiratory system

Respiratory function can profoundly impact a patient's performance of routine activities.³⁷ The assessment of respiratory status can begin at the interview with any known respiratory history or symptoms indicative of pathology, such as shortness of breath, dyspnoea on exertion, cough or sputum production, or the need to be elevated on pillows for sleep. The overall patient history may influence interpretation of thoracic findings. Examination may reveal findings of signs and symptoms of conditions which will need prompt referral to a clinical provider. For example, an examination with sudden onset of shortness of breath after subclavian access may lead to differential diagnosis of tension pneumothorax, or a patient with a splinted leg, who is at risk for deep vein thrombosis, may lead to differential diagnosis of pulmonary embolism. Respiratory rate is challenging to count if regular, and even more so if irregular. In case of irregular breathing, a full minute is needed to quantify. Besides rate and regularity, depth of respiration should be noted. Does the patient appear comfortable or in distress? Are the depths of the respirations constant, slow, and shallow, or deep (Kussmaul—rapid and deep), or are they fluctuating in their depth (Cheyne–Stokes)? Is the patient using accessory muscles, or are they positioning themselves to assist in their breathing? Additionally, is the length of inhalation roughly equal to the length of exhalation?³³

Assessment of oxygen saturation as measured by pulse oximetry, if available, should be documented, along

with a notation of any oxygen therapy in use. How oxygen therapy is being delivered should be documented, litres/minute or fraction of inspired oxygen if the patient is using ambient air. Difficulty in obtaining pulse oxygen saturation or concern for abnormal saturations may be an indication to obtain an arterial blood gas sample to confirm oxygen, carbon dioxide, and pH levels as normal or indicative of a metabolic or respiratory pathology.³⁷

Physical assessment of the respiratory system begins with observing attributes of the anterior and posterior chest, such as shape or obvious surgical scars. Normal chest/lung expansion can be assessed by resting both hands on the chest at the lower level of the lung fields and asking the patient to take a deep breath.³⁷ Palpation of the chest is completed to assess for crepitus, tenderness, and fremitus over lung fields. The posterior lung fields should be percussed to determine if normal, hyper-resonant, or dull, and the patient should be asked to take full breaths through the mouth while auscultating breath sounds. Percussion and auscultation are repeated on the anterior chest.^{31,37} It should be noted if the trachea is in its normal midline position.

Neurological system

A more wide-ranging neurological check can be woven into the overall cardiovascular patient assessment, although this is not a substitute for a focused neurological assessment of cranial nerve function, fine motor skills, or subtle differences in limb strength. In speaking with the patient, skilful use of questioning can elicit the orientation level of the patient. Do they know where they are, what they are there for, what the day/date is, or if a special holiday is approaching? Do they have an ease of recall, such as what you talked about when you called them at home, from the shift you shared the day before, or earlier in the examination you are performing?

This level of neurological examination should be routinely performed with a level of sensitivity to detect changes in mentation from such things as delirium caused by extended hospital stay, or the amnesic effects of medications, which may impact the ability of the patient to recall physical limitations or discharge instructions. Has the patient been falling, or losing consciousness? Safety questions can also provide insight into neurological status and provide evidence for possible cognitive impairment and the need for further investigation.³³

Renal system

The nurse must be aware of several factors in cardiovascular care which interact with renal function. The renal system is dependent upon circulation; therefore, cardiovascular

factors directly impact renal function. Renal disease may have detrimental effects on cardiac function and can influence the interpretation of cardiovascular biomarkers.³⁴ The level of hydration, the amount of fluid intake and output, daily weights, laboratory values for creatinine clearance, blood urea nitrogen, and protein and potassium levels are all reflective of renal function. These parameters impact the clearance of medications and may dictate the need for pre-hydration before a patient has invasive cardiac testing.

For the cardiovascular patient, many invasive cardiac tests involve contrast agents which are cleared through the renal system. Pre-hydration is protective of renal function and may be ordered, particularly for patients who have renal insufficiency or only have one functioning kidney.³³ Patients may require rehydration after withholding anything by mouth, without placing the patient into fluid overload or heart failure.

Physical assessment of the right kidney is possible by palpating the right flank during inspiration. The left kidney is more cephalad and normally is less likely to be felt. Percussion with a closed fist over each kidney is normally felt by the patient without causing intense pain. Sharp pain may be indicative of pathology.³¹

Gastrointestinal system

There is much focus on diets which decrease cardiovascular risk and, in combination with exercise, help in weight control³⁵ (see also Chapter 11). Measurement of waste circumference is indicative of distribution of weight. Cardiovascular patients need a functioning gastrointestinal system for ingestion of nutrition, absorption of oral medications, and health-related quality of life.

The inpatient diet needs to be monitored. One extreme is the duration of time a patient may be asked to tolerate nil by mouth. Some patients may enter hospital with little reserve and are then held without food prior to an invasive test, or multiple tests over days.

For the cardiovascular patient, gastrointestinal history could be important for knowing about a medical history of oesophageal reflux, whose symptoms could mimic the pain of a myocardial infarction or ischaemia. Nausea and vomiting may cause gastrointestinal distress from medication on an empty stomach but could also be an early indication of a vasovagal response, or an inferior myocardial infarction.

Endocrine, haematological, and immune systems

The presence of diabetes mellitus has been identified as a significant predictor of cardiovascular disease. Due to change in routines, stress, and illness, diabetic patients can be predicted

to require increased glucose monitoring and variable dosing of medications for glycaemic control. Nurses participate in the assessment of diabetic patients for level of glycaemic control by recording laboratory values of glycosylated haemoglobin and point-of-care glucose monitoring.^{33,35}

Haematological values should be monitored for anticoagulation status, bleeding disorders such as haemophilia, or clotting disorders such as factor V Leiden. Nurses can also assess for recent changes in condition which may not be included in the history but may be significant in the cardiovascular patient. Does questioning elicit reports of unusual bleeding such as oral, nasal, or rectal? Haemoglobin can be checked to rule out anaemia.³⁵ A significant number of patients with acute coronary syndromes have been shown to be anaemic, which can impact health outcomes.³⁸

Immune suppression is induced by combinations of medications after heart transplant to avoid rejection of the transplanted heart. The results of tests for drug levels should be followed to evaluate success in maintaining suppression. Immunosuppressed patients will be assessed for any indication of untoward effects, such as an infection. Immune status can include a history of vaccinations, including current influenza, or pneumonia.³⁵ Autoimmune disease, such as rheumatoid arthritis, increases risk of cardiovascular disease.¹⁷

The relationship between thyroid function and cardiovascular disease remains a topic of study. Cardiovascular risk factors as diverse as dyslipidaemia, thrombosis risk, and systemic vascular resistance have been linked to thyroid hormones. It has been concluded that even slight alteration in thyroid function can impact cardiovascular systems functioning.³⁹ The thyroid is wrapped around the trachea and can be assessed by gently palpating the anterior neck.³¹

Integumentary system

The skin examination is done by exposing an area in bright light to identify deviation from normal for the patient. Visualization of skin is required to assess for discoloration, touching the extremities for assessment of skin temperature, looking for oedema of the feet, legs, and hands, and thinning of skin. The assessment of a patient's skin is also completed to record skin lesions, signs of infection, or skin breakdown.

The cardiovascular patient may have poor circulation due to reduced cardiac output putting them at risk for skin injury during bedrest or procedural inactivity. Medications which increase blood pressure centrally can negatively impact microcirculation, and the application of devices designed to maintain haemostasis at access sites can also put the cardiovascular patient at risk for skin pressure injury. Affected skin areas over possible procedural access sites can also alter a treatment plan.

Care of the deteriorating cardiovascular patient

Emergencies

Cardiovascular emergencies are either sudden events (e.g. acute coronary syndromes) or are preceded by a noticeable deterioration in the patient's condition (e.g. heart failure). They account for approximately 10% of all emergency department visits.⁴⁰ Care of the deteriorating patient is a vital skill for all healthcare professionals. Failure to rescue leads to severe harm or death.^{36,40,41} The early recognition, assessment, and management of the deteriorating patient is required to prevent cardiogenic shock (CS), may prevent critical care admission, reduce length of stay, reduce costs, and improve survival rates.^{41–43} The statistics for survival following in-hospital cardiac arrest are poor, with only 20% of this group returning home.^{43,44} Prevention of in-hospital cardiac arrest includes interdisciplinary team education, monitoring of patients, recognition of patient deterioration, and a system to call for help and an effective response.^{43,44}

The following sections discuss the main points of recognition, assessment, and management with specific reference to the cardiovascular patient.

Recognition

The earlier deterioration is detected and acted upon, the better the outcome for the patient.^{36,43,45} The process of early recognition includes appropriate and timely monitoring of observations and can include cardiac monitoring.^{41,45} The biggest challenge health professionals face in the emergency department is to identify rapidly and accurately the small group of patients who require hospitalization for acute management and the larger group with more benign conditions who can be safely discharged from the emergency department.^{25,45} All patients should have their heart rate, respiratory rate, blood pressure, level of consciousness, oxygen saturation, and temperature recorded, and in some cases, this should also include fluid balance and specific limb observations for patients at risk of ischaemic limb. The first priority is to identify the patients who need urgent transfer to the catheterization laboratory (see Chapter 6). In case of a haemodynamically unstable patient, initial haemodynamic stabilization (e.g. CS management, drugs, intubation, and mechanical ventilation) may be necessary before the invasive procedure.^{25,40} It may be appropriate for patients to have continued monitoring of heart rate, blood pressure, oxygen saturation, respiratory rate, and level of consciousness. This may require change of

position on the ward, or movement to a higher level of care to ensure patients have the appropriate level of vigilance.⁴¹ If the patient has a respiratory or cardiac arrest, advanced life support should be commenced and this algorithm used to continue care and treatment.^{46,47} The use of track and trigger scores have been identified as useful tools to highlight the deteriorating patient and escalate care appropriately. Healthcare systems in Europe use scoring systems, such as a medical early warning system, to highlight patients who are at risk of deterioration and who may need assessment or intervention by a critical care outreach team. Most tools use a cumulative score comprising heart rate, respiratory rate, systolic blood pressure, level of consciousness, oxygen saturation, and temperature to incorporate into a score which grades the patient's condition.⁴⁸ The National Early Warning System 2 (NEWS2) is an example of such a scoring tool and is recommended to be used throughout hospital settings (► Table 5.6).

Assessment

Patients can be assessed in multiple ways; however, the universal ABCDE approach is well recognized in emergency situations. It ensures all life-threatening reversible causes are identified and prioritized systematically (see 'Recognizing emergency situations').^{43,47} The necessary skills for administering this approach are outlined in ► Table 5.4. There are multiple causes for patient deterioration. ► Table 5.7 shows the main cardiovascular causes or considerations when assessing in a deteriorated patient.

Management

The management of the deteriorating patient requires appropriate and timely escalation and treatment or management plan.^{25,36,45,51} Each hospital and department will have its own escalation policy.

Table 5.6 The NEWS2 scoring system and b. trigger score

Physiological parameter	3	2	1	Score	1	2	3
				0			
Respiration rate (per minute)	≤8		9–11	12–20		21–24	≥25
SpO2 scale 1 (%)	≤91	92–93	94–95	≥96			
SpO2 scale 2 (%)	≤83	84–85	86–87	88–92 ≥93 on air	93–94 on oxygen	95–96 on oxygen	≥97 on oxygen
Air or oxygen?		Oxygen		Air			
Systolic blood pressure (mmHg)	≤90	91–100	101–110	111–219			≥220
Pulse (per minute)	≤40		41–50	51–90	91–110	111–130	≥131
Consciousness				Alert			CVPU
Temperature (°C)	≤35.0		35.1–36.0	36.1–38.0	38.1–39.0	≥39.1	
New score				Clinical risk	Response		
Aggregate score 0–4				Low	Ward-based response		
Red score score of 3 in any individual parameter				Low–medium	Urgent ward-based response*		
Aggregate score 5–6				Medium	Key threshold for urgent response*		
Aggregate score 7 or more				High	Urgent or emergency response**		

*Response by a clinician or team with competence in the assessment and treatment of acutely ill patients and in recognising when the escalation of care to a critical care team is appropriate.

**The response team must also include staff with critical care skills, including airway management.

Table 5.7 Cardiovascular causes and considerations in a deteriorating patient

Assessment	Signs and symptoms	Cardiovascular-related causes and considerations
Airway— obstruction	Snoring Gurgling Altered voice Grunting Coughing wheezing Cyanosis Difficulty breathing Desaturation	Obstruction due to collapse or loss of consciousness (often caused by the tongue or debris such as vomit obstructing the airway)—consider possible causes such as poor cardiac output, arrhythmia, patients with heart and vascular disease are at higher risk of stroke or myocardial infarction. Don't forget hypoglycaemia as a large percentage of diabetics have cardiovascular disease
	As above Swollen face, lips, tongue Rash Swollen peripheries	Obstruction secondary to airway swelling due to anaphylaxis (histamine-induced angioedema), often patients are commenced on new medications during hospital admissions including antibiotics Urticaria and itching is associated with histamine-induced angioedema (anaphylaxis), has a rapid onset, and will develop into hypotension and shock Angiotensin-converting enzyme inhibitors can also induce angioedema (bradykinin mediated), and less likely angiotensin receptor blockers, antibiotics, and non-steroidal anti-inflammatory drugs. ^{49,50} Bradykinin-induced angioedema is likely to have a slower presentation and will develop into abdominal, peripheral, and genitourinary swelling. It is important to remember that in both cases the airway may continue to obstruct and requires early airway management. This is an emergency situation and requires a cardiac arrest call to ensure the support of an anaesthetist to manage a difficult airway
Breathing	Tachypnoea/bradypnoea Cyanosis Peripheral oedema Desaturation Pink frothy sputum	Pulmonary oedema or pleural effusion—multiple cardiac cause including heart failure (valvular disease, left or right ventricular dysfunction) or following cardiac surgery
	As above with associated chest pain	Shortness of breath could be a symptom of acute coronary syndrome or myocardial infarction or arrhythmia
	As above Associated chest pain Unilateral swollen leg/arm	Pulmonary embolus, admission to hospital is a risk factor for deep vein thrombosis/pulmonary embolism
	As above	Respiratory disease is closely linked with multiple cardiac diagnosis, sometimes undiagnosed such as chronic obstructive pulmonary disease, which could be exacerbated by medications or chest infection
	Unilateral chest movement with reduced air entry Crepitus Surgical emphysema	There are multiple iatrogenic causes of pneumothorax such as central line insertion, following surgery, pacemaker insertion, and tension pneumothorax
	Hyperventilation	Don't forget anxiety as a cause or could exacerbate underlying conditions

Table 5.7 Continued

Assessment	Signs and symptoms	Cardiovascular-related causes and considerations
Cardiovascular	Associated chest pain and shortness of breath	There are multiple causes of cardiovascular collapse, some which have been highlighted above including arrhythmia, poor cardiac output, myocardial infarction, and sepsis (infective endocarditis). Cardiac tamponade which could have been iatrogenically caused
	Nausea and vomiting	
	Collapse/syncope	
	Cool peripheries	
	Tachycardia	
	Bradycardia	
Disability	Normal pulse	Patients on beta-blockers may present with a normal pulse, and therefore may not score on track and trigger scores
	Hypotension	
	Drug history	
	Drug history	Do not forget these patients may be on multiple antihypertensive medications which could cause hypotension
	Incision/box often right upper chest, but sometimes left and abdominal. Past medical history	Arrhythmia: don't be fooled by a pacemaker, there could be mechanical failure of pacemaker/implantable cardioverter defibrillator which causes arrhythmia <i>Electrolyte imbalance can cause arrhythmia—such as hypo/hyperkalaemia—consider for those on diuretics</i> Peripheral arterial disease could be the rationale behind a unilateral poor circulation, therefore it is important to assess all peripheries Don't forget haemorrhage as a cause, patients post procedure or surgery are at higher risk especially if they are on antiplatelets or anticoagulation or both
Disability	Reduced level of consciousness	As discussed in 'Airway'—collapse could be caused by multiple cardiac causes
		Toxins, medications, and illicit drugs can cause reduced level of consciousness
		Cardiac patients are at higher risk of ischaemic or haemorrhagic stroke if on anticoagulation
		Don't forget hypo- or hyperglycaemia
		Inpatients are at higher risk of hypo- and hyperdelirium

It is very important to become familiar with your local escalation policy, including the track and trigger graded response, how to make an emergency call, and how to make cardiac arrest calls. Some hospitals will have a team of healthcare providers with intensive care skills and equipment who will target the deteriorating patient in non-critical care settings. There are multiple names for these including 'patient at risk team', 'rapid response team', 'medical emergency team', or 'outreach

team'. It is essential to establish if there is one in your hospital and how to activate this service.^{41,43} There are several factors which could influence activation of these teams.⁵²

Effective communication in emergency situations improves collaboration, efficiency, and shared situational awareness.^{40,53} A tool can be used to communicate effectively with the multidisciplinary team during an emergency situation such as 'SBAR'.⁵⁴ The SBAR

tool recommends splitting a scenario into the following categories:

- 1. Situation (patient's current state).
- 2. Background (clinical context).
- 3. Assessment (what have you found).
- 4. Recommendations (treatment suggestions).

This ensures shared information is relevant and pointed. It ensures that a concise rationale and action plan is supplied for the required treatment. There are other tools that you may find useful to hone your communication skills such as interprofessional simulation training.⁵⁵

The management plan for these patients requires treatment of underlying causes, which may not be apparent without further tests or investigations. The management plan should include the simple bedside tests: blood tests including full blood count, renal and liver function, coagulation, and venous blood gas or arterial blood gas; ECG; chest radiograph; and echocardiogram. These patients may require further investigations such as computed tomography scans or coronary angiogram, or they may require transfer to a different area of care, ensuring patient safety on transfer.^{25,36,45,51}

This section has dealt with the physical signs and symptoms, and emergency management. It is also important to support the patient and their family. They are likely to be scared and anxious; giving them information and psychological support is a vital part of your role as a nurse. Effective communication with the patient and family will decrease their anxiety and aid understanding of the current situation.

It is also important to consider that in some cases treatment will not be effective and this may lead to end of life care and palliation. In an acute deterioration, this is a difficult situation for patients and families to comprehend, especially if the patient appeared well prior to this. Ensuring effective communication, care, and consideration is paramount to their management. Most settings have a palliative care team who can support the patient, family, and clinicians to ensure a holistic care plan.

Conclusion

Emergency patient care requires quick and accurate decision-making to distinguish high-acuity patients. The priority for the interdisciplinary team is to recognize and stabilize patients with emergent cardiovascular conditions that include, but are not limited to, myocardial ischaemia/infarction and potentially life-threatening arrhythmias. Cardiac monitoring is one of the most commonly used diagnostic practices in such cases, and emergency nurses

are poised to use valuable information revealed in ECG waveforms for early triage and risk stratification.

The patient at risk or in acute cardiogenic shock

Cardiogenic shock—definition

CS is a clinical syndrome characterized by the inability of the heart to deliver an adequate amount of blood to the tissues to meet resting metabolic demands, because of impairment to its pumping function.⁵⁶ Heart failure of any aetiology can lead to acute CS, but it is estimated that up to 70% of cases result from acute myocardial infarction⁵⁷ and 5–10% of patients with acute myocardial infarction develop CS.^{58,59} It is a life-threatening condition, with an in-hospital mortality rate between 30% and 60%, and it requires urgent evaluation in a hospital setting.^{51,60}

Cardiogenic shock—diagnosis

CS is diagnosed by clinical assessment and most commonly presents as hypotension (systolic blood pressure <90 mmHg) despite adequate circulating volume with signs of hypoperfusion.⁶⁰ However, occasionally CS presents as peripheral hypoperfusion with well-maintained systolic blood pressure (non-hypotensive CS) due to compensatory vasoconstriction.⁶¹ Clinical signs of hypoperfusion are associated with a greater risk of in-hospital mortality regardless of blood pressure. Therefore, it is important to assess for hypoperfusion (► Table 5.8). While reduced cardiac index and elevated pulmonary capillary wedge pressure typically reflect CS, these parameters are not required for diagnosis.⁵¹

Table 5.8 Signs, symptoms, and biochemical indicators of hypoperfusion

Clinical signs and symptoms of hypoperfusion	Biochemical indicators of hypoperfusion
Cold and/or clammy extremities	Elevated serum lactate
Oliguria	Elevated serum creatinine
Mental confusion	Metabolic acidosis
Dizziness	
Narrow pulse pressure	

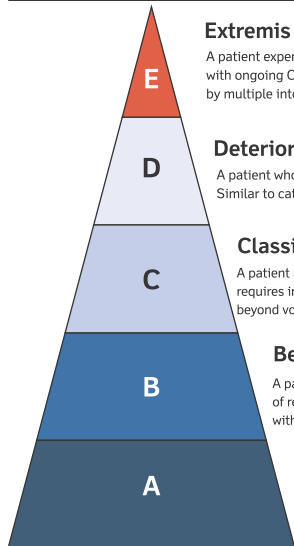
The SCAI pyramid of cardiogenic shock classification ⁴		Physical exam	Biochemical markers	Hemodynamics
	Extremis A patient experiencing cardiac arrest with ongoing CPR and/or ECMO, being supported by multiple interventions.	Near pulselessness cardiac collapse mechanical ventilation defibrillator used	CPR (A=modifier) pH $\leq$ 7.2 lactate $\geq$ 5 mmol/L	No SBP without resuscitation PEA or refractory VT/VF hypotension despite maximal support
	Deteriorating A patient who fails to respond to initial interventions. Similar to category C but getting worse.	<u>May include any of:</u> Look unwell, panicked ashen, mottled, dusky cold, clammy volume overload extensive rales killip class 3 or 4 NIV or MV altered mental status urine output $<$ 30 mL/h	Stage C and deteriorating <u>May include any of:</u> Lactate $\geq$ 2 mmol/L creatinine doubling $>$ 50% drop in GFR elevated LFTs elevated BNP	Stage C and need for multiple pressors or TCS devices SBP $<$ 90 or MAP $<$ 60 mmHg and need for drugs/device to maintain BP cardiac index $<$ 2.2 L/min/kg PCWP $>$ 15 mmHg RAP/PCWP $\geq$ 0.8 mmHg PAP $<$ 1.85 cardiac power output $<$ 0.6 W
	Classic A patient manifests with hypoperfusion that requires intervention (inotrope, pressor or TCS) beyond volume resuscitation to restore perfusion.			
	Beginning A patient who has clinical evidence of relative hypotension or tachycardia without hypoperfusion.	Elevated JVP rales in lung fields no sign of peripheral hypoperfusion	Normal lactic acid minimal renal function impairment elevated BNP	SBP $<$ 90 or MAP $<$ 60 mmHg pulse $>$ 100 bpm cardiac index $\geq$ 2.2 L/min/kg PA sat $\geq$ 65%
	At risk A patient who is not currently experiencing signs or symptoms of CS, but is at risk of developing CS.	Normal JVP normal physical exam	Normal lactic acid normal renal function	Normal BP cardiac index $\geq$ 2.5 L/min/kg CVP $<$ 10 mmHg PA sat $\geq$ 65%

Fig. 5.13 SCAI classification for cardiogenic shock.

Reproduced from Baran DA, Grines CL, Bailey S, et al. SCAI clinical expert consensus statement on the classification of cardiogenic shock: This document was endorsed by the American College of Cardiology (ACC), the American Heart Association (AHA), the Society of Critical Care Medicine (SCCM), and the Society of Thoracic Surgeons (STS) in April 2019. *Catheter Cardiovasc Interv.* 2019 Jul 1;94(1):29–37. doi: 10.1002/ccd.28329 with permission from John Wiley and Sons.

Cardiogenic shock—classification

The Society for Cardiovascular Angiography and Interventions (SCAI) classification describes five stages of CS, from 'At risk' to 'Extremis' (► Fig. 5.13).⁶²

The classification system incorporates the variability of CS presentation and aetiology, allows for reassessment and reclassification at the bedside, and correlated well with mortality risk when validated in a large cohort study.⁶³

Cardiogenic shock—management

Initial assessment

1. Full physical assessment for signs of hypoperfusion.
2. Monitoring of vital signs including continuous arterial blood pressure, pulse pressure, heart rate, ECG, and peripheral oxygen saturation.
3. Insertion of arterial and central venous catheters to allow for invasive monitoring of arterial and central venous pressure; serial measurement of arterial blood gas, central venous oxygen saturation, serum pH, lactate, and electrolytes; and safe administration of vasoactive medication.

4. 12-lead ECG.
5. Echocardiography.
6. Chest X-ray.
7. Laboratory testing of full blood count, coagulation, serum electrolytes, serum creatinine, liver function tests, and troponin.
8. Pulmonary artery catheter insertion is not recommended for all patients with CS but should be used for patients who remain hypoperfused and hypotensive despite intervention (SCAI stage D), patients with advanced right heart failure, and patients with mixed shock.⁵¹ A pulmonary artery catheter allows for measurement of cardiac index and pulmonary capillary wedge pressure.
9. In the context of an acute coronary syndrome, coronary angiography is recommended within 2 hours from admission to hospital.⁶⁰

Initial management

Initial management of patients with CS consists of fluid challenge followed by inotropes and vasopressors if required to increase cardiac output and blood pressure, and therefore improve organ perfusion (► Table 5.9).

Table 5.9 Initial management of patients with cardiogenic shock

Pre-hospital	Focus on stabilizing the circulation and oxygenation Identify and treat the underlying precipitating factor
Hospital —tertiary care centre with the capacity for 24/7 cardiac catheterization, intensive care facilities, and availability of short- and long-term MCS	Restore organ perfusion with medical or mechanical therapies Perform revascularization or surgery if required Plan long-term support or palliation if refractory CS

Fluid management

Fluid administration is used to increase stroke volume. If there are no signs of fluid overload, consider the administration of 250 mL of fluid over 15–30 minutes; measure effects on invasive and/or non-invasive cardiac output measures.

Inotropes/vasopressors

After fluid challenge, inotropes and/or vasopressors should be used to increase heart rate, contractility, and/or afterload and therefore improve cardiac output and/or blood pressure. Usually administered as continuous intravenous infusions, these medications can increase myocardial oxygen consumption and raise the risk of arrhythmias. Use is guided by continuous monitoring of haemodynamics and perfusion. Noradrenaline (norepinephrine) should be used as a first-line vasopressor, in preference to adrenaline (epinephrine), to improve perfusion pressure, measured by mean arterial pressure greater than 60 mmHg.⁵¹ If positive inotropes are required, dobutamine is used commonly, while levosimendan may be beneficial for patients with ongoing beta-blockade and to reduce pulmonary vascular resistance in cases of right ventricular failure or pulmonary hypertension. In non-ischaemic patients, milrinone can be considered, in combination with vasopressin if required to maintain blood pressure.⁶⁰ Escalating and combination inotrope and vasopressor therapy points to refractory CS and consideration for alternative treatment such as mechanical circulatory support (MCS).⁵⁹

Respiratory support

Respiratory support may be required to correct hypoxaemia and hypercapnia, manage pulmonary congestion, and reduce myocardial oxygen demand by facilitating deep sedation and suppressing spontaneous respiratory effort. Almost all patients will require oxygen therapy, while 60–80% of patients require invasive mechanical ventilation.⁵¹

Renal support

Acute kidney injury occurs in one-third of patients with CS. The requirement for renal replacement therapy to manage acute kidney injury is associated with worse prognosis.⁵¹ Continuous renal replacement therapy modalities are recommended over intermittent haemodialysis.

Cardiogenic shock—mechanical circulatory support

Patients with refractory CS (SCAI stages D and E) might require MCS, a group of device-based therapies which increase systemic blood flow and maintain organ perfusion while avoiding cardiotoxicity and long-term morbidity of medical treatment.⁶⁴ MCS can be used as temporary circulatory support (TCS) in selected patients as a bridge to recovery, re-evaluation, transplantation, or a permanent implanted left ventricular assist device.⁵¹ They are invasive therapies which are associated with risk to the patient and so should be commenced in centres experienced in their use. See ► **Table 5.10** for a guide to TCS devices.⁶⁵

Intra-aortic balloon counter-pulsation using an intra-aortic balloon pump has been the most commonly used TCS, but routine use is no longer recommended in CS as benefit has not been demonstrated.⁶⁶ Impella® (Abiomed Inc., Danvers, MA, US) uses a microaxial blood pump which supports the left ventricle. TandemHeart® (LivaNova, London, UK) uses a centrifugal pump to deliver blood flows up to 4.0 L/min through a transseptal cannula. Both devices improve haemodynamics but no survival benefit has yet been proved, although trials are ongoing.⁵⁷ Venoarterial extracorporeal membrane oxygenation (VA-ECMO) provides biventricular cardiac support using a centrifugal pump to drain blood from the venous side of the circulation to a membrane oxygenator, before returning it, oxygenated, to the arterial side of the circulation. Blood is returned either via the ascending aorta (via central cannulation) or via the iliac artery (peripheral cannulation). VA-ECMO is currently the most common type of TCS although trial evidence

Table 5.10 Guide to TCS devices

	IABP	TandemHeart®	Impella®	VA-ECMO
Mechanism	Pneumatic	Centrifugal, paracorporeal	Axial, transvalvular	Centrifugal, extracorporeal
Device configuration	Descending aorta via femoral artery	Inflow: LA via trans-septal (or RA) Outflow: femoral artery (or pulmonary artery)	Inflow: LV or (IVC) Outflow: ascending aorta (or pulmonary artery)	Inflow: femoral vein/IVC or internal jugular vein/SVC; Outflow: femoral, axillary/subclavian, or innominate artery
Type of ventricular support	LV	LV or RV	LV or RV	LV or RV
Maximum cardiac support (L/min)	0.5–1	4	2.5–5	>5
Magnitude of LV unloading	+	+++	++/+++ ^a	Variable
Afterload effect	–	+++	None	+++
Complexity of implantation	+	+++	++/+++	+
Complexity of management	+	+++	++	+++
Risk of limb ischaemia	+	+++	++	+++ ^b
Risk of haemorrhage	+	+++	+++	+++
Gas-exchange support	None	None	None	+++

IABP, intra-aortic balloon pump; IVC, inferior vena cava; LV, left ventricle; LA, left atrium; RA, right atrium; RV, right ventricle; SVC, superior vena cava; VA-ECMO, venoarterial extracorporeal membrane oxygenation. (+) low; (++) moderate; (+++) high; (–) reduced.

^a Preload is reduced while afterload is increased.

^b Can be mitigated by use of distal reperfusion cannula.

Reproduced from Abrams D, Garan AR, Abdelbary A, et al; International ECMO Network (ECMONet) and The Extracorporeal Life Support Organization (ELSO). Position paper for the organization of ECMO programs for cardiac failure in adults. *Intensive Care Med.* 2018 Jun;44(6):717–729. doi: 10.1007/s00134-018-5064-5 with permission from Springer Nature.

to support its use is awaited.⁵⁷ About 57% of patients requiring VA-ECMO due to cardiac failure survive the episode.⁶⁷ Complications associated with each device are summarized in ► Fig. 5.14.

Nursing management of the patient on VA-ECMO

1. Patient assessment, including regular physical assessment of peripheral and tissue perfusion, vital signs, respiratory function, neurological status, pain and sedation levels, kidney function, and skin integrity. A damped or flat arterial waveform, with similar systolic, diastolic, and mean arterial pressures, may be present due to absent or reduced pulsatility. Mean arterial pressure should be maintained at 65 mmHg or greater.
2. ECMO circuit assessment including lines, pump, and oxygenator. Assess for tight circuit connections, integrity of cannulae, tubing (dark red blood on

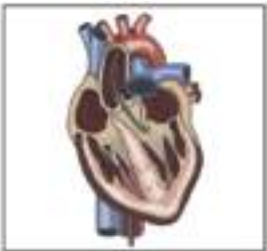
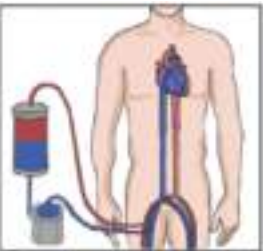
IABP	Impella	TandemHeart	ECMO
			
Device-specific complications			
IABP Spinal cord ischaemia	Impella - Frequent haemolysis* - Valvular lesions	TandemHeart - Air embolism - Cardiac perforation - Tamponade - Residual atrial septal defect - Massive right atrium to aorta shunt	ECMO - Air embolism - Increased left ventricular afterload - Left ventricular dilation - Left ventricular blood stasis - Pulmonary oedema - Differential oxygenation - Circuit clots - Disseminated intravascular or intraoxygenator coagulation - Oxygenator failure - Altered drug pharmacokinetics
Common complications			
Device insertion site - Infection - Bleeding - Vessel perforation - Retroperitoneal haematoma - Limb ischaemia - Compartment syndrome - Fasciotomy - Amputation	Neurological - CNS haemorrhage - CNS infarction - Brain death - Seizures	Acute kidney injury - Haemolysis-induced - Other causes	Haematological - Haemolysis - Acquired von Willebrand disease - Thrombocytopenia - Heparin-induced thrombocytopenia - Venous thromboembolism - Gastrointestinal or pulmonary bleeding - Bacteraemia or sepsis

Fig. 5.14 Complications associated with temporary circulatory support devices. ECMO, extracorporeal membrane oxygenation; IABP, intra-aortic balloon pump; TCS, temporary circulatory support. *Severe haemolysis might occur in the case of Impella® pump malposition. Daily Doppler echocardiography is needed to ensure correct positioning of the pump. Reproduced from Combes A, Price S, Slutsky AS, Brodie D. Temporary circulatory support for cardiogenic shock. *Lancet*. 2020 Jul 18;396(10245):199–212. doi: 10.1016/S0140-6736(20)31047-3 with permission from Elsevier.

drainage side, bright red blood on return side), and oxygenator (check for signs of clots and/or fibrin), review alarms, circuit pressures, and treatment parameters including revolutions per minute, flow, sweep gas, and fraction of inspired oxygen.

3. Limb perfusion must be monitored hourly by assessing colour, temperature, capillary refill time, and aspect. Near-infrared spectroscopy can be used to monitor perfusion. Peripheral arterial cannulation for VA-ECMO can lead to partial or complete vessel occlusion, compromising blood flow through the limb. An additional perfusion line can be used to guarantee perfusion to the cannulated limb. The

perfusion line must be monitored for flow and signs of clots or fibrin.

4. Good fluid management will support haemodynamic stability and ECMO circuit function. Jouncing lines associated with reduction in ECMO flow indicate hypovolaemia. Repeated drops in ECMO flow can lead to formation of clots and fibrin deposits, which can cause circuit failure. Intravenous fluid challenges should be used to counteract this; however, fluid overload should be avoided due to the risk of pulmonary oedema.
5. Left ventricular decompression is sometimes required and strategies include intra-aortic balloon counter-pulsation, Impella®, septostomy, and reconfiguration

of the ECMO circuit.⁵¹ Echocardiography and regular assessment for signs of pulmonary congestion should be employed to guide these strategies.

6. Neurological assessment should be performed hourly and include assessment of pupils (size, shape, reaction) and depth of sedation. In adults, intracranial haemorrhage incidence in patients on ECMO is 2–21%, while acute ischaemic stroke is estimated at 1–33%.⁶⁸
7. Management of anticoagulation and haemostasis using local protocols for titrating anticoagulants (usually administered as continuous infusions to maintain ECMO circuit patency) and blood product transfusion, with regular monitoring of coagulation and full blood count.
8. Assessment and interventions to promote skin and mucous membrane integrity are important due to the high risk of skin and mucous membrane damage. Patients in CS on VA-ECMO are usually immobile, deeply sedated, and require very careful movement to protect cannulae and ECMO flow. Pressure-relieving mattresses, regular repositioning, and regular mouth and eye care should be provided.

Temporary circulatory support—outcomes

TCS should be commenced as a bridge to recovery, transplant, or destination therapy (permanently implanted MCS device). In situations where the patient does not meet the criteria for transplant or permanent MCS, and where CS persists, withdrawal of life-sustaining treatment and palliation is indicated.

Recovery is confirmed through weaning trials: first weaning vasopressor support, then TCS. If TCS can be weaned without compromising haemodynamic stability or requiring high doses of inotropes/vasopressors, the support can be stopped. Patients who are unable to be discontinued from MCS should be considered for long-term options, namely a durable left ventricular assist device or heart transplantation.

Regular discussion should take place during TCS with those close to the patient, and the patient themselves if possible, about prognosis, progress, and goals of care. This should accompany regular discussion by the multidisciplinary team, including palliative care specialists. If continued life-sustaining treatment is no longer considered to be in the patient's best interests, such as following irreversible neurological injury or absence of myocardial recovery with contraindication to a transplant or permanent assist device, the focus of care should move to palliation

Table 5.11 The predictors of in-hospital survival after VA-ECMO

Risk factors associated with hospital mortality	Chronic renal failure
	Longer duration of mechanical ventilation prior to ECMO
	Associated organ failure
	Pre-ECMO cardiac arrest
	Congenital heart disease
	Lower pulse pressure
Protective factors	Lower serum bicarbonate
	Younger age
	Weight between 76 and 89 kg
	Acute myocarditis
	Post-transplant
	Refractory ventricular tachycardia/fibrillation
	High diastolic blood pressure
	Lower peak inspiratory pressure

and withdrawal of TCS. ► **Table 5.11** shows the predictors of in-hospital survival after VA-ECMO based on predicting survival after ECMO for refractory CS.⁶⁹

Conclusion

In this chapter we described a strategy for the nursing assessment of a cardiovascular patient. We covered the importance of an initial assessment in prioritizing problems and planning timely interventions, especially where urgent action is required. Some tools were presented to facilitate the conduct of an initial assessment. Next, a physical examination of the cardiovascular patient was described with a special focus on the examination of the cardiovascular body system. In addition, we highlighted the importance of track and trigger systems to recognize deterioration in relation to emergency situations and CS. Finally, we reminded nurses entering into cardiovascular care specialization to maintain a holistic approach to assessment and care planning using the functional health patterns framework.

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6 Care of the patient with coronary artery disease

VALENTINO ORIOLO, MARGARET CUPPLES, NEIL ANGUS,
SUSAN CONNOLLY, AND FELICITY ASTIN

CHAPTER CONTENTS

Introduction 146

Epidemiology 146

Pathophysiology 147

Risk factors for coronary atherosclerosis 149

Clinical manifestations of coronary artery disease 149

Clinical presentation 152

Angina 152

Assessment and management of patients with suspected acute coronary syndromes 152

Coronary artery bypass graft 155

Illustrative case studies for acute coronary syndromes 156

Priorities for nursing care 169

Chronic coronary syndromes 172

Priorities for nursing care 172

Other clinical conditions associated with atherosclerosis 174

Acute aortic syndrome 174

Peripheral artery disease 174

Conclusion 174

In this chapter, a brief overview of the epidemiology and pathophysiology of coronary artery disease and coronary risk factors is presented. The main focus of the chapter is the management and nursing care of patients with coronary artery disease manifesting as acute coronary syndromes. A series of case studies of acute coronary syndromes illustrates the key stages in patient management and nursing care. For completeness, a brief outline of the key features and management priorities for patients diagnosed with chronic coronary syndromes and other clinical conditions associated with atherosclerosis is included.

KEY MESSAGES

- Atherosclerosis is a disease of ageing that causes coronary heart disease.
- Coronary artery disease can manifest as acute or chronic coronary syndromes.
- Rapid and accurate risk stratification and assessment of patients presenting with chest pain improves patients' outcomes.
- There is no single diagnostic test for acute coronary syndromes.

- Accurate interpretation of the patient's history and presenting symptoms, electrocardiogram changes, and biomarkers form the foundation of clinical decision-making.
- Patients and those close to them need emotional support to help them through what can be a life-threatening experience.
- Tailored information and cardiovascular prevention and rehabilitation are needed to help patients to recover and self-manage their medications and lifestyle to optimize health and well-being.
- The coronavirus disease 2019 (COVID-19) pandemic has necessitated rapid changes in the way cardiovascular services are configured.

Introduction

The terms coronary artery disease (CAD), ischaemic heart disease, and coronary heart disease all describe the condition in which epicardial arteries that supply the heart with oxygenated blood become narrowed or blocked by atherosclerotic plaque accumulation. For the purpose of this chapter, we will use the term CAD. CAD remains a major cause of morbidity and mortality in Europe and worldwide.^{1,2} Coronary atherosclerosis is a disease of ageing that develops over a lifetime. It typically leads to cardiovascular disease including CAD. By middle age, most people will have some degree of atherosclerosis. During the early stages people are often asymptomatic, but in later life progressive atherosclerosis may lead to the clinical manifestations of conditions categorized either as chronic coronary syndromes (CCS)³ or acute coronary syndromes (ACS).^{4,5}

ACS is a generic term that describes syndromes caused by decreased blood flow to the myocardium leading to ischaemia, injury, and necrosis.^{4,5} CCS was previously known as stable CAD. This terminology has fallen out of favour because the nomenclature does not reflect current clinical practice.³ CAD is a dynamic, rather than a stable, condition and the underlying atherosclerotic process and altered arterial function can be modified by environmental and lifestyle factors as well as pharmacological therapies.

The clinical outcomes for patients presenting with the manifestations of CAD have improved considerably with the advent of new treatments and advances in non-invasive diagnostic testing. Cardiovascular nurses need to be equipped to support both the physical and psychological well-being of patients with CAD, as well as those close to them. It is important that nurses understand

how and why CAD develops as well as the characteristics of different clinical presentations and their associated management.

A comprehensive account of the management and care of patients presenting across the full continuum of CAD is beyond the scope of this chapter. To develop a more comprehensive understanding of the care of a patient diagnosed with CAD, the material in this chapter can be supplemented by cross-referencing to information contained elsewhere in this textbook:

- Chapter 4 ('Anatomy and physiology of the healthy heart'): this chapter describes the mechanisms of electrical conduction in the heart, the characteristics of a normal electrocardiogram (ECG), and a step-by-step approach to ECG analysis which can be applied to the case studies in this chapter.
- Chapter 5 ('Nursing assessment and care planning in the context of cardiovascular care'): this chapter describes the steps involved in a comprehensive health assessment and a focused cardiovascular assessment. Content about clinical deterioration and cardiogenic shock is also included.
- Chapter 7 ('Care of the patient with cardiac arrhythmias'): this chapter provides a detailed description of common arrhythmias, some of which are referred to in the case studies within this chapter.
- Chapter 11 ('Cardiovascular prevention and rehabilitation'): this chapter provides details on the cardiac rehabilitation process which starts in hospital and continues on into early recovery. A range of patient-reported outcome measures are also described which are relevant to the care of a patient with CAD.
- Chapter 12 ('Pharmacology for cardiovascular nurses'): this chapter describes the common medications used in the care of a patient with CAD and addresses some common challenges such as non-adherence.
- Chapter 13 ('Patient education and communication'): this chapter provides details on therapeutic patient education and communication techniques that can be applied in clinical practice and highlights the importance of health literacy and the provision of accessible health information.

Epidemiology

CAD remains the leading single cause of mortality, responsible for 862,000 deaths (19% of all deaths) among men and 877,000 deaths (20%) among women each

year, with mortality rates generally higher in Central and Eastern Europe than in Northern, Southern, and Western Europe.⁶ Although mortality rates have declined since the 1960s (more significantly in high-income countries than in middle-income countries) due to both improvements in treatments and declines in risk factors (e.g. smoking, high blood pressure), there has been a slowing of the reduction in the past few years. Moreover, data from the UK have recently shown a rise in mortality from cardiovascular disease for the first time in 50 years in those under 75 years in 2017.⁷ The reasons for this increase are not yet fully understood but the obesity/diabetes epidemic is thought to be a contributory factor. What is not yet known is whether this trend is also occurring more widely across Europe as the last published statistics relate to 2016 data.⁶

European-level data on the various diagnoses that constitute CAD are not yet available although registries for ACS (both ST-segment elevation myocardial infarction (STEMI) and non-ST-segment elevation myocardial infarction (NSTEMI)) are in development under the auspices of the European Society of Cardiology (ESC) EURObservational Research Programme (EORP). In the UK, data from the Myocardial Ischaemia National Audit Project (MINAP) registry would suggest that the ratio of STEMI to NSTEMI is approximately 40:60 although this figure may be skewed as not all NSTEMIs are recorded on the registry. Data from the large SWEDEHEART registry in Sweden have shown a decline in the 1-year case fatality rate from both STEMI (from 21% to 14%) and NSTEMI (from 26% to 15%) between 1995 and 2014, principally due to improved implementation of evidence-based treatments (revascularization strategies and pharmacotherapy).^{8,9} The advent of the high-sensitivity troponin (hs-Tn) assay has likely led to a decrease in the reported incidence of unstable angina (UA) because cases previously diagnosed as UA (with normal creatinine kinase levels) are now diagnosed as ACS (or non-ST-segment elevation (NSTEMI-ACS)) with the additional finding of elevated hs-Tn levels.⁵ Troponin is a protein involved in both musculoskeletal and cardiac muscle contraction. It is classified into three subtypes—troponin C, troponin I, and troponin T—with troponin I and troponin T described as being more cardiac specific.¹⁰ The hs-Tn test is the latest generation of cardiac enzyme testing that allows for detection of very low levels of troponin.

The epidemiology of angina is not well understood as attention has largely focused on ACS and there have been few population studies of incident angina. This is somewhat surprising as these studies suggest that angina pectoris (the term that describes the chest pain/discomfort

associated with CAD) is the most common presentation of ischaemic heart disease. A population-wide study in Finland⁹ using primary care electronic records for the whole country estimated the annual incidence of angina, based on (1) new nitrate prescription and (2) test positivity (either stress test or invasive coronary angiography). Findings showed that the total annual incidence was approximately 2 per 100 population and several times higher than the incidence of non-fatal myocardial infarction (MI). It also clearly demonstrated that angina is not a benign disease, with significantly higher standardized mortality ratios for CAD in the angina cases observed in both sexes (test positive > nitrate positive) compared to the general population, with a strong graded inverse relationship with age.¹¹

Another factor influencing population data is the impact of the coronavirus disease 2019 epidemic. While comprehensive data are not yet available, the COVID-19 pandemic could increase CAD mortality rates through several mechanisms. Patients with pre-existing health conditions, such as CAD, who contract COVID-19, are known to have poorer outcomes and COVID-19 itself can trigger cardiovascular comorbidities such as ACS and arrhythmia.¹² The cessation of elective cardiology services during the COVID-19 pandemic combined with patient-related delays in presentation with ACS at accident and emergency departments will also impact epidemiological trends.

Pathophysiology

The association between thrombotic coronary artery occlusion and MI has been apparent for many years, but far less was known about the underpinning pathophysiology and clinical features until relatively recently.¹³ The heart muscle, or myocardium, requires a supply of oxygenated blood so that it can contract rhythmically and effectively to fulfil the metabolic demands of all parts of the body. This function depends both on the patency of the coronary arteries, allowing carriage of a sufficient blood flow, and on the extraction of nutrients from the blood by the myocytes. The major vessels supplying the myocardium (the right coronary artery and the left main coronary artery dividing into the left anterior descending and circumflex coronary arteries) and their main branches lie on the epicardial surface of the heart while smaller branches enter into the depths of the muscle (see Chapter 4 for more detail). These smaller arteries and arterioles are the main sites of cellular transfer of nutrients to the myocardium.

Atherosclerosis is caused by an inflammatory process. The initial stage in atherosclerosis development occurs when the normal functioning of endothelial cells which allow smooth flow of blood along the vessel is disrupted. The trigger is an inflammatory response, with release of cytokines and cell surface adhesion molecules such as VCAM-1, causing monocytes and T lymphocytes to adhere to the endothelium. A change in shape of the endothelial cells increases the permeability of the arterial wall, allowing lymphocytes and lipoprotein particles, especially low-density lipoprotein (LDL), to enter the intima. Once under the endothelial surface, monocytes differentiate into macrophages, take up oxidized LDL, and become lipid-laden 'foam cells' which eventually die, but the lipid accumulates forming fatty streaks which evolve over time into atherosclerotic plaques. These plaques, composed of a lipid core surrounded by smooth muscle cells and connective tissue fibres, may undergo calcification. In the initial stages of the development of coronary atherosclerosis, the diameter of the arterial lumen remains unaffected as there is expansion of the media and the external elastic membrane during atheroma development (known as positive remodelling).

Ultimately, however, plaque progression/growth will start to impact luminal size (negative remodelling) and start to cause clinical manifestations of CCS such as stable angina or ACS. Coronary atherosclerosis/plaque formation is a dynamic process and plaque stability depends on multiple factors¹³ including their composition, size, location, and the strength of their cap. Stable plaques causing greater than 70% occlusion of the coronary arteries tend to cause the symptoms of stable angina, whereas ACS typically arise from the rupture/erosion of non-obstructive vulnerable plaques that tend to be lipid rich, have a thin cap, and a high concentration of inflammatory cells (► Fig. 6.1).¹⁴ Plaque rupture results in the exposure of thrombogenic plaque components such as tissue factor in the coronary circulation which leads to the activation of the coagulation cascade with thrombus formation and acute myocardial ischaemia.

The thrombus can be fibrin rich, fully occluding the arterial lumen and causing a STEMI (ST-segment elevation-ACS). Platelet-rich thrombi can cause more transient luminal occlusion and result in UA or NSTEMI-ACS.

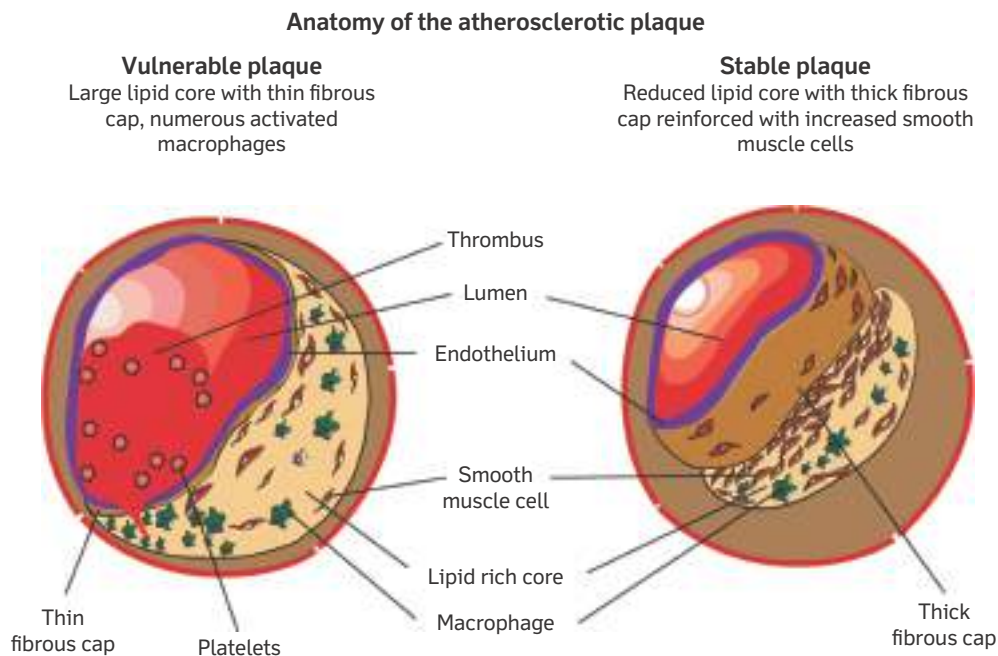


Fig. 6.1 Characteristics of a vulnerable rupture-prone atherosclerotic plaque compared with a stable plaque.

Reproduced from Landmesser U, Koenig W. From risk factors to plaque development and plaque destabilization. In The ESC Textbook of Preventive Cardiology. Ed: Gielen S, De Backer G, Piepoli M, Wood D. Oxford, UK, European Society of Cardiology. 2015 with permission from Oxford University Press.

Risk factors for coronary atherosclerosis

Many causative factors are involved in the development of atherosclerosis (see Chapter 1 and Chapter 11). Various risk factors modulate the impact of causative mechanisms which include the effects of chronic inflammation and infection on the arterial wall and implicate the role of the immune system and genetics.¹⁵ The INTERHEART case–control study showed that just nine potentially reversible risk factors and health behaviours (smoking, dyslipidaemia, hypertension, diabetes, obesity, psychosocial factors, diet, alcohol, and sedentary lifestyle) account for greater than 90% of the population attributable risk of MI in all regions of the world.¹⁶ Of all these risk factors, hypertension is quantitatively the leading contributor to ischaemic CAD morbidity and mortality, given its prevalence in the global population. Of note, the risk of ischaemic CAD among people with hypertension is often increased by coexisting morbidities (e.g. dyslipidaemia, diabetes, obesity). ► **Table 6.1** shows the principal risk factors for coronary atherosclerosis (both modifiable and non-modifiable).

Mechanisms by which various risk factors impact the development of atherosclerosis have been identified. The increased pressure on blood vessel walls associated with hypertension can cause mechanical injury, stimulating the inflammatory process described previously and promoting formation of atherosclerotic plaques. Smoking causes vascular damage, mediated by nicotine and other chemicals contained within tobacco smoke, which can result in vasoconstriction, raised fibrinogen levels, increased plasma viscosity, and thrombosis. Cigarette smoking is also

associated with dyslipidaemia, with higher levels of LDL and lower levels of high-density lipoprotein cholesterol. Hypercholesterolaemia promotes subendothelial uptake of cells and particles and LDL oxidation, with consequent deposition of atherosclerotic plaques in arterial walls. In diabetes, the products of disturbed glucose metabolism may themselves directly cause endothelial damage, provoking an inflammatory reaction. Chronic renal disease, a contributory cause of hypertension and diabetes, and of other metabolic abnormalities, has also been identified as increasing the risk of developing atherosclerosis through the processes of abnormal cellular function.

The impact of psychosocial stressors (stress at work or home, financial stress, recent major life events, and depression) is attributed to a combination of biological and behavioural effects, including increased sympathetic nervous system output and adverse lifestyle behaviours (smoking, poor diet, alcohol, physical inactivity), which contribute to the development of hypertension and dyslipidaemia.¹⁷

The mediation pathways for the impact of physical inactivity in promoting atherosclerosis have been largely attributed to changes in inflammatory biomarkers, including fibrinogen, lipids, and blood pressure.

It is clear that many of the important risk factors for CAD are lifestyle-related behaviours that are potentially modifiable. As CAD is a chronic condition, the adoption of healthy lifestyle changes and the cessation of harmful ones can help to prevent the development of atherosclerosis. In patients with established CAD, atherosclerotic plaque accumulation can potentially be stabilized or potentially reversed by healthy lifestyle changes.

Clinical manifestations of coronary artery disease

CAD is a dynamic and chronic condition and the way in which it manifests can be very different across individuals. The reduction or cessation of blood flow through the coronary arteries that supply the myocardium can cause to myocardial ischaemia which can lead to tissue injury and necrosis. The way in which CAD manifests depends upon the underlying characteristics of the atherosclerotic plaque and coronary circulation. Myocardial ischaemia may be caused by atherosclerotic plaque accumulation in the coronary arteries, acute coronary artery thrombosis, or microvascular or vasospastic disease. Pathologically sustained myocardial ischaemia disrupts myocyte (cardiac cell) metabolism and the

Table 6.1 Risk factors for coronary atherosclerosis

Non-modifiable risk factors	Modifiable risk factors
Age	Hyperlipidaemia/raised LDL cholesterol
Sex	Hypertension
Family history	Diabetes
Ethnicity	Smoking
	Diet
	Overweight/obesity
	Physical inactivity
	Excess alcohol consumption
	Psychosocial stress, depression
	Substance misuse e.g. cocaine

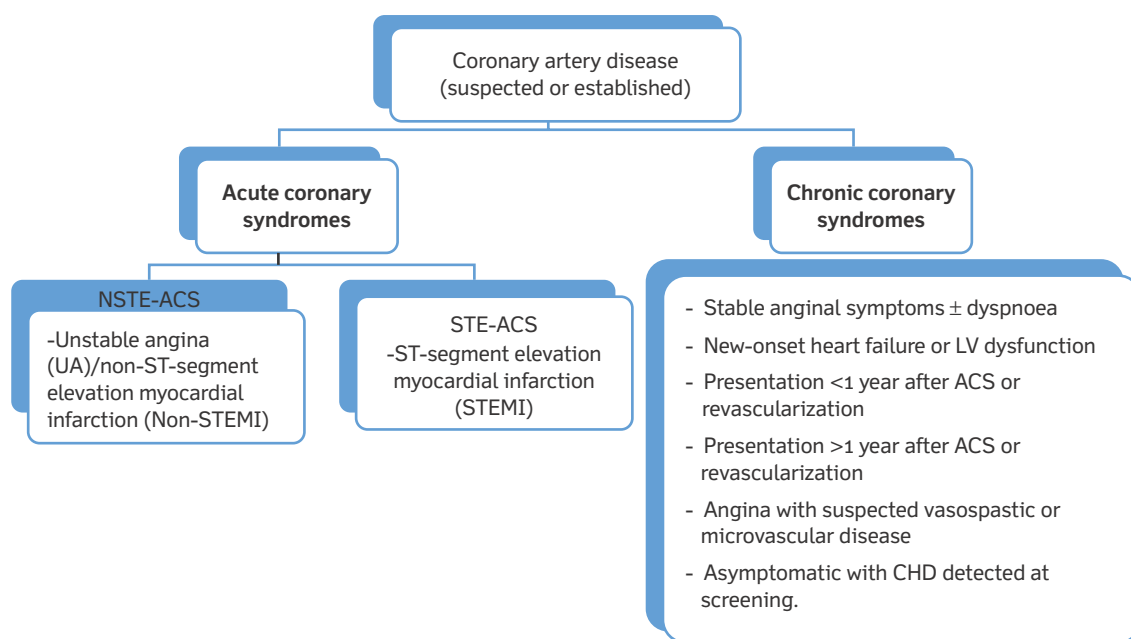


Fig. 6.2 An overview of acute and chronic coronary syndromes. CHD, coronary heart disease; LV, left ventricular.

Source data from 2019 ESC Guidelines for the diagnosis and management of chronic coronary syndromes: The Task Force for the diagnosis and management of chronic coronary syndromes of the European Society of Cardiology (ESC) Knuuti J, Wijns W, Saraste A et al., ESC Scientific Document Group, 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation: The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC), European Heart Journal, Volume 39, Issue 2, 07 January 2018, Pages 119–177, <https://doi.org/10.1093/eurheartj/ehx393>; Collet JP, Thiele H, Barbato E, ESC Scientific Document Group, 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: The Task Force for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation of the European Society of Cardiology (ESC), European Heart Journal, ehaa575, <https://doi.org/10.1093/eurheartj/ehaa575>.

contractile structures of affected cells. MI results from the death (necrosis) of myocytes.¹⁸ At the outset, myocardial ischaemia arises due to an imbalance between myocardial oxygen supply and demand. Sudden cardiac death occurs in about half of patients with ACS before they reach hospital.¹⁹

Depending on the clinical presentation, CAD can be categorized as CCS³ or ACS.^{4,5} However, in reality, these categories may not be mutually exclusive. This is because many patients with CCS may have also had an episode of ACS (► Fig. 6.2). Each individual will have their own unique trajectory. The risk of a future cardiac event will vary considerably due to the dynamic nature of CAD and the associated functional alterations in the coronary circulation. ► Fig. 6.2 provides an overview of CCS and ACS in the context of CAD including the revised subcategories of clinical presentations within CCS.

MI is a condition that falls within the classification of ACS but can present with several different underlying causes. The Fourth Universal Definition of Myocardial Infarction differentiates between myocardial injury and acute MI and provides a useful classification system describing the range of clinical presentations of acute MI.²⁰

Myocardial ischaemia may be obvious clinically or detected by acute ECG alterations. When accompanied by changes in the concentration of cardiac troponin (cTn), a diagnosis of acute MI is established.

If there are changes in cTn levels without clinical evidence of myocardial ischaemia then a diagnosis of acute myocardial injury can be determined. Myocardial injury requires evidence of raised cTn, with at least one value exceeding the 99th percentile of the upper reference limit (URL), that is, the 99th percentile URL (14 ng/L) is the upper reference range for the biomarker and therefore the

majority of people will have a value that falls below the upper reference range of that sample.

Myocardial injury is considered acute if a rise and/or fall of cTn is detected. Myocardial injury is associated with adverse clinical outcomes for patients and is a prerequisite for a diagnosis of MI. Myocardial injury can also be caused by non-ischaemic cardiac conditions such as myocarditis and non-cardiac conditions including renal failure.

Acute MI describes the circumstance in which there is evidence of acute myocardial injury combined with clinical evidence of myocardial ischaemia.^{20,21} Thus, for a diagnosis of MI, at least one of the following features (additional to myocardial injury) must be present:

- Symptoms of myocardial ischaemia (typically chest pain).
- New ischaemic ECG changes and/or development of pathological Q waves on the ECG.
- Imaging evidence indicating new loss of viable myocardium.
- Regional myocardial wall motion abnormalities or identification of coronary thrombus by angiography or at autopsy.

In clinical practice, patients with chest pain, or other ischaemic symptoms, and who develop new ST-segment elevation in two contiguous ECG leads, or new left bundle branch block, are considered to have a STEMI. In contrast, clinical presentations that do not include ST-segment elevation are designated as NSTEMI. The pathological correlate at the myocardial level is cardiomyocyte necrosis (NSTEMI) or, less frequently, myocardial ischaemia without cell damage (UA).⁵ In addition to these categories, MI presentations can be classified into various subtypes dependent on clinical, pathological, and prognostic differences.^{21–23}

A consistent and clear classification system for MI is important from regulatory and scientific perspectives and also in clinical practice in order to determine the most appropriate and evidence-based patient management strategy. The following subtypes are outlined in the Fourth Universal Definition of Myocardial Infarction²⁰:

- *MI type 1*: results spontaneously from the disruption of an atherosclerotic plaque (rupture, ulceration, fissuring, dissection, or erosion) in one or more coronary arteries accompanied by thrombus formation. In combination, these events decrease myocardial blood flow and

result in myocyte necrosis. In this dynamic situation, the relative contribution of plaque and thrombus may vary and thrombus can embolize resulting in myocyte destruction downstream from the primary lesion.

- *MI type 2*: when a condition, other than coronary artery plaque instability, contributes to a mismatch between myocardial oxygen supply and demand. This may occur in patients known to have a CCS (e.g. angina pectoris) who develop an intercurrent illness or acute physiological stress such as gastrointestinal bleeding resulting in a sudden and precipitous reduction in the oxygen-carrying capacity of haemoglobin. Sustained bradyarrhythmias and tachyarrhythmias can also result in myocardial ischaemia and injury causing a type 2 MI. Each of these physiological insults leads to insufficient coronary blood flow, myocardial ischaemia, and an inability to respond to increased myocardial oxygen demands brought about by an intercurrent condition.
- *MI type 3*: describes sudden cardiac death from a suspected MI when biomarkers were not available or obtained prior to death. The patient may have presented acutely with features typical of myocardial ischaemia or infarction, new ECG changes, or life-threatening arrhythmias such as ventricular fibrillation. In some instances, the MI may be reclassified following a postmortem examination.
- *MI type 4*: occurs as a complication of percutaneous coronary intervention (PCI) or stent thrombosis. Myocardial injuries can occur perioperatively or later due to complications arising from the use of devices such as intracoronary stents. The occurrence of procedure-related myocardial injury is determined by the measurement of cTn prior to the procedure and repeated 3–6 hours later. Arbitrarily, a cTn rise of more than five times the 99th percentile URL in patients with normal baseline values is diagnostic.
- *MI type 5*: associated with coronary artery bypass graft (CABG) procedures. A range of factors may result in myocardial injury during CABG procedures. These include processes relating to perioperative cardiac preservation (e.g. cardiopulmonary bypass) as well as traumatic injury to the myocardium during surgery. Increases in cTn are generally expected during CABG procedures; however, the guidance suggests that a type 5 MI should be diagnosed only when cTn levels exceed more than ten times the 99th percentile URL in the first 48 hours following surgery from a normal baseline measure. ECG, angiographic, or imaging

evidence, signalling new myocardial ischaemia/new myocardial injury, should also accompany biomarker measurement.

- *Myocardial infarction with non-obstructive coronary arteries (MINOCA)*: a subtype of MI that is recognized.²³ This refers to patients with a MI in the absence of angiographically defined CAD (narrowing >50% diameter stenosis of a major epicardial vessel). MINOCA is a condition in which an ischaemic mechanism is the cause of myocyte injury. The prevalence of MINOCA may account for 6–8% of patients with MI. This condition is more common in women and patients who present with NSTEMI rather than STEMI. It is thought that atherosclerotic plaque disruption and coronary thrombosis may be a cause of MINOCA (i.e. type 1 MI). However, coronary spasm and spontaneous dissection may also be implicated (i.e. type 2 MI). In such instances, it can be difficult to determine the pathological basis for MI.

From this classification, it is clear that the aetiology of myocardial ischaemia is varied. In patients presenting with symptoms suggestive of decreased coronary blood flow (e.g. chest pain), the healthcare professional should adopt a systematic approach. The assessment of the presenting complaint and associated signs and symptoms are important steps in the assessment process (see Chapter 5 for more detail).

Clinical presentation

The assessment of chest pain and/or dyspnoea is an important aspect of a focused cardiovascular assessment (refer to Chapter 5 for a detailed account of a focused cardiovascular assessment). Angina is a presenting complaint for many patients with CAD.

Angina

Angina pectoris is a medical term that refers to the symptoms of chest pain or discomfort that occur during periods of myocardial ischaemia. The term is derived from the Latin meaning a strangling feeling in the chest. Several factors can cause a mismatch between the oxygen supply and myocardial tissue demand leading to myocardial ischaemia: coronary artery stenosis, coronary artery spasm, hypotension, tachyarrhythmias, severe anaemia, thyrotoxicosis, hypertensive emergencies, or severe aortic valve stenosis.⁵

Angina may be classified as being ‘typical’, ‘atypical’, or ‘non-anginal’ chest pain. Typical angina has three characteristics: patients report constricting discomfort in the front of the chest, in the neck, jaw, shoulder or arm, precipitated by physical exertion, and relieved by rest or nitrates within 5 minutes.³ Atypical angina is suspected if two of the aforementioned characteristics are noted, and non-anginal chest pain if only one, or none, of the characteristics are present.³

Interestingly, the majority of patients with suspected CAD present with atypical angina. A smaller proportion present with typical angina symptoms (10–15%).³ Patients with acute MI presenting with no symptoms tend to have worse clinical outcomes compared to those who do exhibit symptoms.²⁴ There are several potential causes of acute chest pain, as shown in ► **Table 6.2**. The majority of patients presenting with acute chest pain will not have ACS.

Stable angina typically develops when there is a fixed lesion in a coronary artery that causes a 70% stenosis of the lumen of a major epicardial coronary vessel (e.g. left anterior descending, circumflex, or right coronary artery) or a 50% stenosis of the left main coronary artery. The symptoms indicative of stable angina are somewhat predictable, have a trigger such as physical exertion, and resolve within a few minutes. Stable angina falls within the category of CCS.³

The Canadian Cardiovascular Society developed a useful classification system, shown in ► **Table 6.3**. The framework classifies angina severity into four classes depending on the description of angina symptoms.²⁵

The Canadian Cardiovascular Society Grading Scale is recommended as a tool to evaluate the severity of exertional angina that is a feature of CCS.²⁵

Assessment and management of patients with suspected acute coronary syndromes

The rapid assessment and risk stratification of patients with suspected ACS saves lives and is central to effective management and care. The overarching treatment goals are to improve myocardial perfusion to minimize myocardial ischaemia, injury, or infarction, minimize complications, and prevent adverse cardiovascular events.^{4,5} A significant number of patients who develop ACS do not survive.⁵ Restoring the patency of coronary arteries improves survival rates in patients with ACS, but to

Table 6.2 Differential diagnoses of ACS in the setting of acute chest pain

Cardiac	Pulmonary	Vascular	Gastro-intestinal	Orthopaedic	Other
Myopericarditis	Pulmonary embolism	Aortic dissection	Oesophagitis,	Musculoskeletal	Anxiety
Cardiomyopathies ^a	(Tension)-pneumothorax	Symptomatic aortic	Peptic ulcer, gastritis	Chest trauma	Herpes zoster
Tachyarrhythmias	Bronchitis, pneumonia	Stroke	Pancreatitis	Muscle injury/inflammation	Anaemia
Acute heart failure	Pleuritis		Cholecystitis	Costochondritis	
Hypertensive emergencies				Cervical spine pathologies	
Aortic valve stenosis					
Takotsubo syndrome					
Coronary spasm					
Cardiac trauma					

Bold = common and/or important differential diagnoses.

^aDilated, hypertrophic and restrictive cardiomyopathies may cause angina or chest discomfort.

Collet JP, Thiele H, Barbato E, et al; ESC Scientific Document Group. 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. Eur Heart J. 2020 Aug 29;ehaa575. doi: 10.1093/eurheartj/ehaa575 © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

maximize the potential benefit this must be done as soon as possible.⁴

Pre-hospital delay time has been recognized as an important factor in predicting poor patient outcome. Despite the development of several interventions

designed to reduce patient delay times, only about half of these interventions are effective.²⁶ The way that health services are configured also influences the time taken from symptom onset to restoring coronary blood flow. For example, access to effective pre-hospital care and

Table 6.3 Canadian Cardiovascular Society grading scale for angina severity

Class	Description of angina severity	
I	Angina only with strenuous exertion	Presence of angina during strenuous, rapid, or prolonged ordinary activity (walking or climbing the stairs).
II	Angina with moderate exertion	Slight limitation of ordinary activities when they are performed rapidly, after meals, in cold or windy weather conditions, in response to emotional stress, or on wakening, but also walking uphill, climbing more than one flight of ordinary stairs at a normal pace and in normal conditions. .
III	Angina with mild exertion	Having difficulties walking one or two blocks, or climbing one flight of stairs, at normal pace and conditions.
IV	Angina at rest	No exertion needed to trigger angina.

Reproduced from Campeau L. Letter: Grading of angina pectoris. Circulation. 1976 Sep;54(3):522–3 with permission from Wolters Kluwer.

cardiac catheterization laboratories that are open 24/7 are factors that can influence the survival outcomes of patients presenting with ACS.

The initial assessment is based on the integration of low-likelihood and/or high-likelihood features derived from the clinical setting (i.e. symptoms, vital signs), the 12-lead ECG, and the cTn concentration determined at presentation to the emergency department and serially thereafter.⁵ The history of the presenting complaint, the typicality of the anginal pain, and the coronary risk factor profile are also important when assessing patients with suspected ACS. These data will assist in the diagnosis of patients presenting with ACS such as STEMI. Biomarkers such as troponin allow risk stratification and subsequent diagnosis in patients presenting with NSTEMI-ACS. Troponin results during serial sampling should be interpreted as a quantitative marker: the higher the level at initial testing (0-hour level) or the absolute change during serial sampling, the higher the likelihood for the presence of MI. (See Chapter 5 for an account of a focused cardiovascular assessment.)

The algorithm shown in ► Fig. 6.3 provides a useful guide when assessing a patient presenting with cardiac-sounding chest pain; history, clinical findings, and presentation should be considered amid the patient's comorbidities and risk factors for CAD.

Triage decisions are made based upon a rapid rule-in or rule-out framework. The advent of the COVID-19 pandemic requires the additional assessment of infective status for patients and the use of personal protective equipment to protect staff.¹²

The distinction between UA and non-STEMI can only be made retrospectively on the basis of serial cTn measurements. Both conditions fall under the umbrella of NSTEMI-ACS. In UA, the cardiac biomarkers remain normal or only very minimally elevated.

The key features of management are to restore coronary blood flow as soon as possible through the administration of medicines such as antiplatelet agents (aspirin and P₂Y₁₂ inhibitors such as clopidogrel, prasugrel, or ticagrelor) and injectable anticoagulants (such as Xa inhibitors).¹² In conjunction with interventions to restore coronary blood flow, intravenous opioids are administered to relieve pain and anxiolytics, such as benzodiazepines, help to relieve high levels of anxiety. Oxygen is no longer routinely administered but titrated if arterial oxygen saturation is less than 94%.²⁷

Primary percutaneous coronary intervention (PPCI) remains the reperfusion treatment of choice for patients

with STEMI, ideally within 120 minutes from diagnosis of STEMI based on the history and presenting complaint.⁴ If PPCI is not achievable within 120 minutes from diagnostic ECG, perhaps because the patient is unable to access a centre capable of 24/7 PPCI, the patient should be considered for fibrinolytic therapy. Patients who receive fibrinolytic therapy should subsequently undergo routine PCI 2–4 hours after successful lysis. ► Fig. 6.4 illustrates the optimal reperfusion times in patients presenting with STEMI.

In patients presenting with STEMI, the aims are (► Fig. 6.4):

- To minimize the delay between first medical contact and diagnosis of STEMI to 10 minutes or less.
- To minimize diagnosis to reperfusion time to 120 minutes or less if patient presenting to a non-PPCI centre:
 - In a non-PPCI centre, aim for transfer to a PPCI centre in 30 minutes or less and reperfusion in 90 minutes or less (total time ≤120 minutes).
 - If PPCI is not achievable in 120 minutes or less, aim for fibrinolysis strategy.
- To minimize diagnosis to reperfusion time to 60 minutes or less if patient presents directly to a PPCI centre.

The patient pathway for NSTEMI-ACS is shown in ► Fig. 6.5 and focuses upon risk assessment. Patients at very high risk should undergo invasive therapy within 2 hours of diagnosis. Patients at high risk should be considered for early invasive therapy, ideally within 24 hours of diagnosis; patients at low risk should ideally be considered for selective invasive strategy ischaemic testing prior to invasive therapy. These patients should be managed as per the 2019 ESC Guidelines for the diagnosis and management of CCS.⁵

In patients presenting with NSTEMI-ACS, the reperfusion timings will be dependent on a number of variables. Similar to the STEMI pathway, the timing for reperfusion is critical in patients with very high-risk or high-risk features (► Fig. 6.5). A reperfusion time of 2 hours or less and 24 hours or less should be aimed for in patients with very high and high risk, respectively.⁵ Patients with very high-risk features presenting to non-PCI centres should be immediately transferred to a PCI centre for immediate invasive strategy. Patients with high-risk features presenting to non-PCI centres should be transferred to a PCI centre on the same day, aiming for invasive management within 24 hours of NSTEMI-ACS diagnosis.⁵

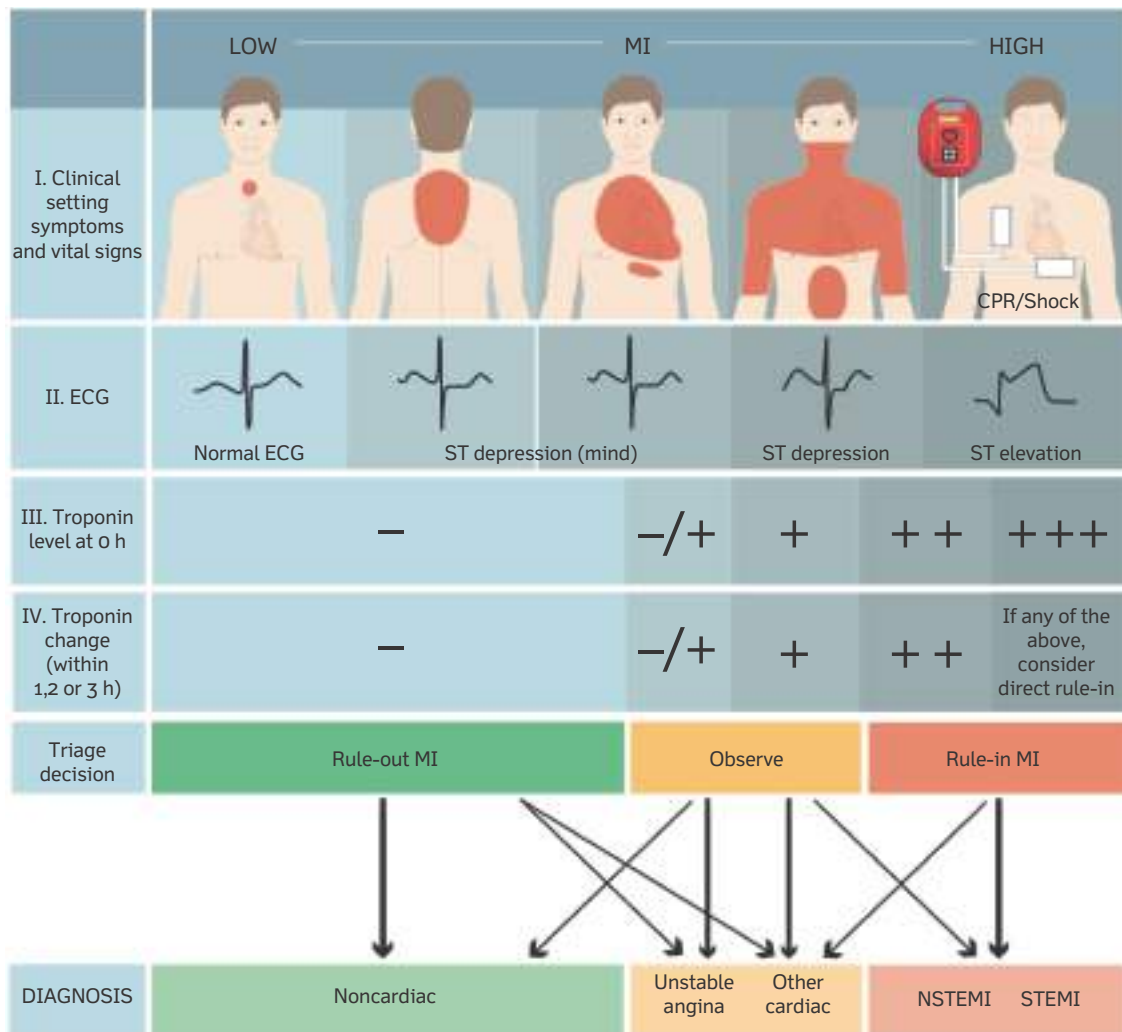


Fig. 6.3 Diagnostic algorithm and triage in acute coronary syndromes. CPR, cardiopulmonary resuscitation; ECG, electrocardiogram/electrocardiography; MI, myocardial infarction; NSTEMI, non-ST-segment elevation myocardial infarction; STEMI, ST-segment elevation myocardial infarction.

Collet JP, Thiele H, Barbato E, et al; ESC Scientific Document Group. 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. *Eur Heart J*. 2020 Aug 29;ehaa575. doi: 10.1093/eurheartj/ehaa575 © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

Coronary artery bypass graft

CABG can be considered as an alternative reperfusion strategy to PCI in patients with stable CAD. The risk of surgical mortality should be assessed using a validated risk score such as the European System for Cardiac Operative Risk Evaluation (EuroSCORE II)^{28,29} and the Society of Thoracic Surgeons (STS) score.^{30–32}

Clinical characteristics that favour surgical intervention include, but are not limited to, diabetes, reduced left ventricular function, contraindication to dual antiplatelet therapy, and recurrent in-stent restenosis. Additionally, the anatomical complexity and technical difficulty should be evaluated. The SYNTAX score supports the decision-making process when considering CABG over PCI.³²

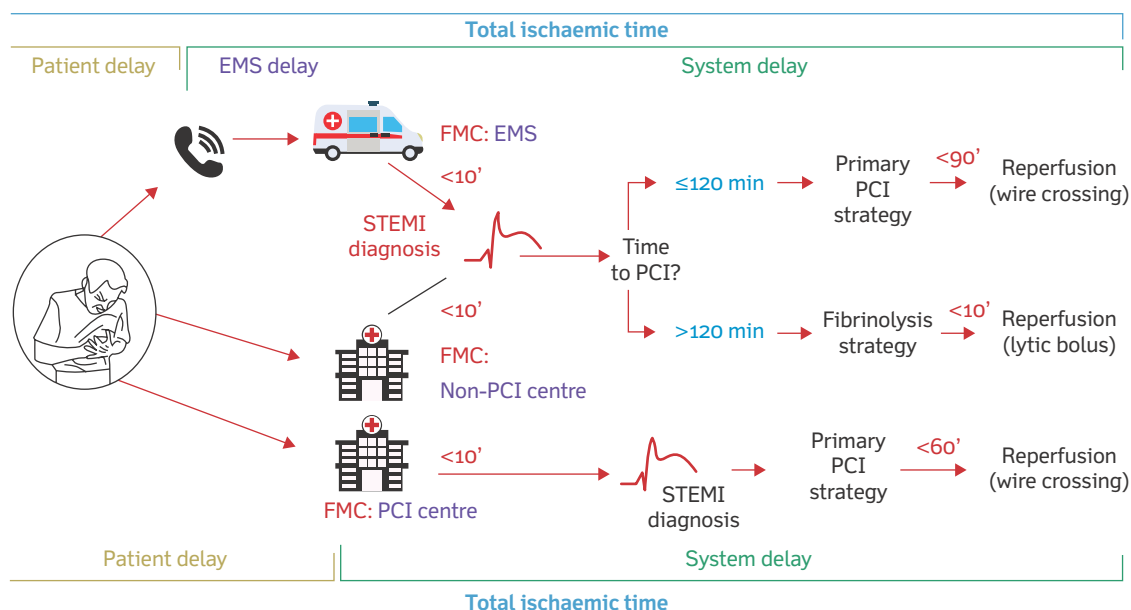


Fig. 6.4 STEMI pathway. EMS, emergency medical system; FMC, first medical contact; PCI, percutaneous coronary intervention; STEMI, ST-segment elevation myocardial infarction.

Ibanez B, James S, Agewall S, et al; ESC Scientific Document Group. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation: The Task Force for the management of acute myocardial infarction in patients presenting with ST-segment elevation of the European Society of Cardiology (ESC). *Eur Heart J*. 2018 Jan 7;39(2):119–177. doi: 10.1093/eurheartj/ehx393. PMID: 28886621. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

By combining a number of parameters (e.g. the number of lesions, the length of segment, and the aetiology of the occlusion) a numerical score is obtained. A high SYNTAX score (≥ 33) is indicative of more complex disease and CABG should be considered as an option over PCI due to its mortality benefit.³³ CABG is also the preferred strategy in patients requiring concomitant interventions (e.g. patients with aortopathy and valvular disease requiring surgical intervention). ► **Fig. 6.6** summarizes factors to be considered during the decision-making process regarding revascularization approaches. Patients' preferences should also be considered.

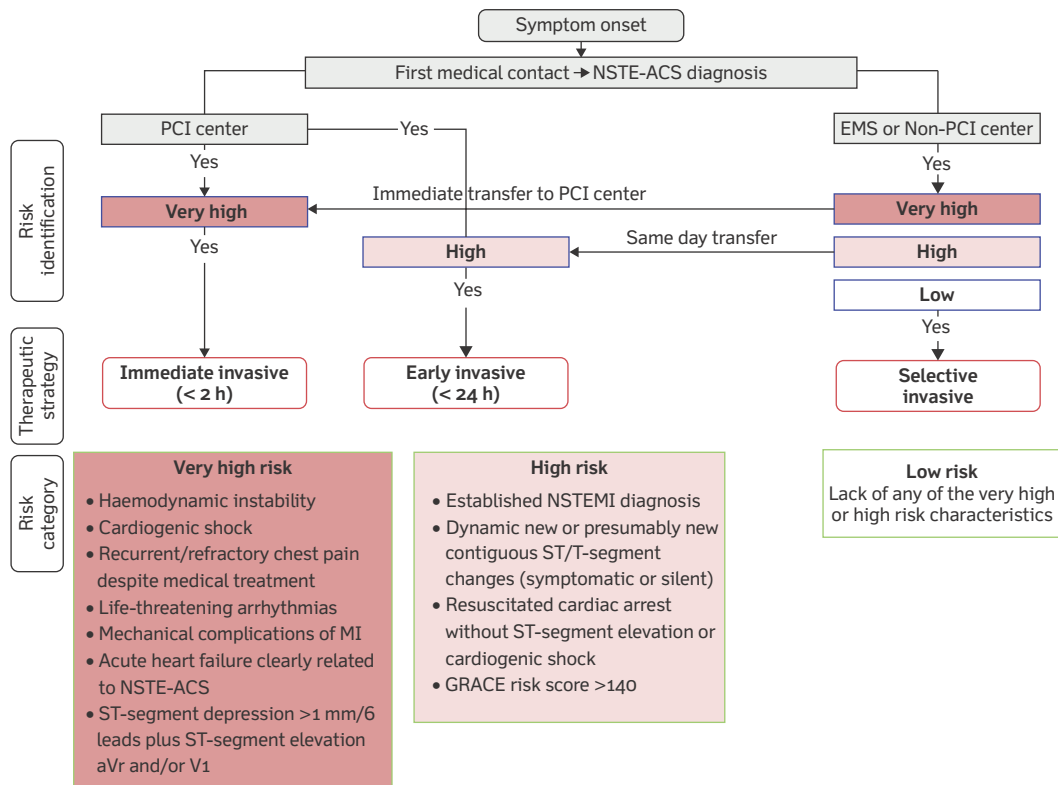
In summary, myocardial revascularization should be performed to improve coronary perfusion, symptoms of myocardial ischaemia, and prognosis. In patients presenting with ACS, PPCI/PCI should be completed in a timely fashion. CABG should be considered in patients with multivessel CAD, significant comorbidities, in-stent restenosis, and high SYNTAX score.³⁴

Illustrative case studies for acute coronary syndromes

In this section, a series of illustrative case studies will be presented to outline the assessment and management of patients with suspected ACS. A diagnosis of ACS is primarily based on patient history and presenting complaints as well as serial ECGs and cardiac biomarkers, such as hs-TnT; hs-TnT, is used to measure any potential heart damage⁴⁹ and diagnose MI. A hs-TnT value above the 99th percentile is considered indicative of MI.⁴⁹

Case study 1. A patient diagnosed with NSTEMI-ACS: UA

UA is defined as myocardial ischaemia at rest or on minimal exertion in the absence of acute cardiomyocyte injury/necrosis.⁵ It is caused by a platelet-rich thrombus causing transient luminal occlusion.



EMS = emergency medical services; GRACE = Global Registry of Acute Coronary Events; MI = myocardial infarction; NSTE-ACS = non-ST-segment elevation acute coronary syndrome; NSTEMI = non-ST-segment elevation myocardial infarction; PCI = percutaneous coronary intervention.

Collet JP, Thiele H, Barbato E, Barthélémy O, Bauersachs J, Bhatt DL, Dendale P, Dorobantu M, Edvardsen T, Folliguet T, Gale CP, Gilard M, Jobs A, Jüni P, Lambrinou E, Lewis BS, Mehilli J, Meliga E, Merkely B, Mueller C, Roffi M, Rutten FH, Sibbing D, Siontis GCM, ESC Scientific Document Group. 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation: The Task Force for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation of the European Society of Cardiology (ESC), European Heart Journal, ehaa575, <https://doi.org/10.1093/eurheartj/ehaa575>

Fig. 6.5 NSTE-ACS pathway. EMS, emergency medical services; GRACE, Global Registry of Acute Coronary Events; MI, myocardial infarction; NSTE-ACS, non-ST-segment elevation acute coronary syndrome; NSTEMI, non-ST-segment elevation myocardial infarction; PCI, percutaneous coronary intervention.

Collet JP, Thiele H, Barbato E, et al; ESC Scientific Document Group. 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. Eur Heart J. 2020 Aug 29;ehaa575. doi: 10.1093/eurheartj/ehaa575 © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

Presenting complaint

Mr Ali is a 38-year-old male Asian taxi driver, who presents to the emergency department with chest pain.

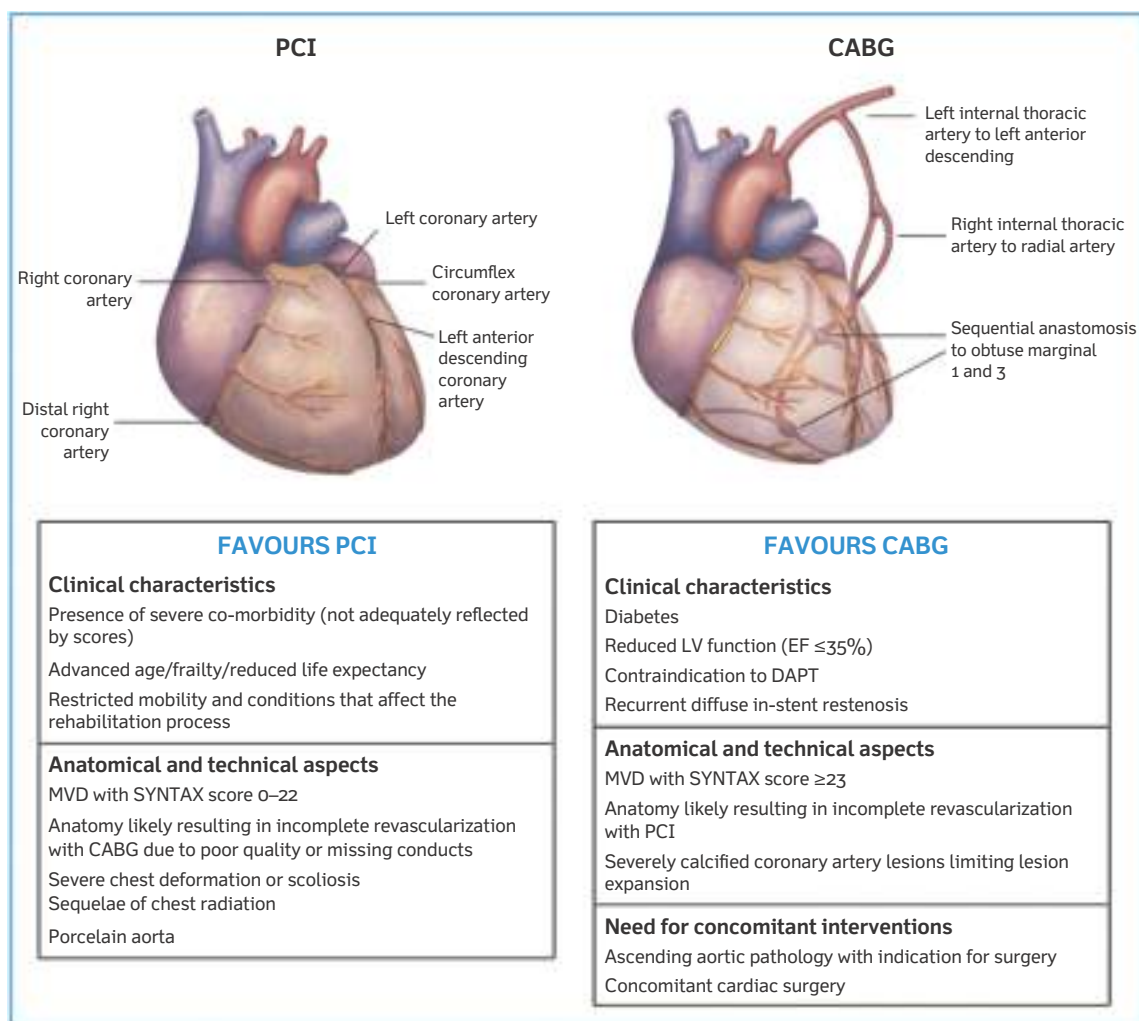
History of the presenting complaint

Mr Ali describes noticing a decreased exercise tolerance over the previous 4 weeks with an associated feeling of 'discomfort in his chest'. He also noticed that during stressful situations (e.g. during 'rush hour') he becomes sweaty and

clammy and at times experiences a sensation of a 'fist on his chest'. These episodes have increased in frequency and occurred on two separate occasions while at rest.

Baseline assessment

A cardiovascular assessment was performed. Mr Ali's blood pressure was elevated (168/93 mmHg), but equal bilaterally, pulses were equal, and heart rate was in the normal range (60 beats per minute (bpm)). Mr Ali's ECG demonstrated sinus rhythm with no evidence of



CABG = coronary artery bypass grafting; Cx = circumflex; DAPT = dual antiplatelet therapy; EF = ejection fraction; LAD = left anterior descending coronary artery; LIMA = left internal mammary artery; LV = left ventricular; MVD = multivessel coronary artery disease; PCI = percutaneous coronary intervention; PDA = posterior descending artery; RA = radial artery; RIMA = right internal mammary artery; SYNTAX = Synergy between Percutaneous Coronary Intervention with TAXUS and Cardiac Surgery.

^aconsider no-touch off-pump CABG in case of porcelain aorta.

2018 ESC/EACTS Guidelines on myocardial revascularization, European Heart Journal, Volume 40, Issue 37, 1 October 2019, Page 3096, <https://doi.org/10.1093/eurheartj/ehz507>

Fig. 6.6 Percutaneous coronary intervention versus coronary artery bypass graft.

Neumann FJ, Sousa-Uva M, Ahlsson A, et al; ESC Scientific Document Group. 2018 ESC/EACTS Guidelines on myocardial revascularization. Eur Heart J. 2019 Jan 7;40(2):87–165. doi: 10.1093/eurheartj/ehy394. Erratum in: Eur Heart J. 2019 Oct 1;40(37):3096. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

ST-segment abnormality (see ► Fig. 6.7 for ECG and analysis) and a hs-TnT value was reported at 6 hours from the onset of pain as 16 ng/L (reference range: normal value <14 ng/L; indeterminate 15–30 ng/L; positive >30 ng/L).

Discussion

The history of the presenting complaint identifies some features ('red flags') that are of concern. There is a noticeable pattern of a gradual decrease in exercise tolerance. Mr Ali also reports symptoms developing during stressful



Fig. 6.7 Mr Ali's 12-lead ECG.

situations, with progressively earlier onset. This pattern of angina is often referred to as crescendo angina,⁵ also known as UA, and is indicative of atherosclerotic plaque progression. Left untreated, this will lead to atherosclerotic plaque rupture with subsequent inflammatory response leading to thrombus formation.

Thrombus formation will decrease coronary artery flow, both on exertion and at rest, causing the symptoms reported by the patient; UA is classified as an ACS. The symptoms reported by the patient are suggestive of typical anginal pain³: a constricting discomfort in the chest lasting approximately 15–20 minutes, with the presence of autonomic features such as nausea and sweating, precipitated by exertion and sometimes relieved by rest.

A cardiovascular focused history is critical when assessing patients presenting with chest pain. In this case, there is a significant coronary risk factor profile. Mr Ali is Asian and has comorbidities of poorly controlled hypertension and type 2 diabetes (tablet controlled). Mr Ali smokes 20 cigarettes per day and has done for 18 years and has attempted to quit in the last 6 months. Mr Ali has a strong family history of premature CAD (his father had a STEMI at 54 years of age). Of all of the coronary risk factors, family history is unmodifiable and hence most significant, but often overlooked. When evaluating coronary risk factors, details about the family history can help to stratify the likelihood of a coronary event.

Management

Mr Ali's presentation is suggestive of UA. The nursing management will focus upon monitoring the recurrence of symptoms, cardiovascular stability (by monitoring baseline observations—blood pressure, pulse, heart rate, and

respiration rate), and regular serial ECG recordings. During each interaction with the patient, a simple 'end-of-bed assessment' can be useful in identifying signs and symptoms of distress and 'clues' or indicators of clinical deterioration (see Chapter 5 for details about clinical deterioration and cardiogenic shock). For example, is the patient frightened, pale, and clammy? Is the work of breathing laboured, fast, or irregular? Performing a brief initial assessment can often be sufficient to highlight any 'red flags' in the patient presentation.

A 12-lead ECG should be performed at first medical contact with a maximum target delay of 10 minutes. Serial ECGs should be recorded every 15 minutes if symptoms continue, after 30 minutes of absence of symptoms, and hourly (for 4 hours) after symptoms are alleviated. Lead placement is critical and this should not change between procedures as this can result in lead misplacement and inaccurate ECG recording. Potential ECG changes may be caused by operator error and not a change in the patient's condition (see Chapter 4 for details of how to record an accurate ECG). The nurse plays an important role in the interpretation of the ECG and it is important to use a structured approach (see Chapter 4 for a detailed description of ECG analysis and also Chapter 7 for care of the patient with a cardiac arrhythmia).

Each element of Mr Ali's ECG (► Fig. 6.7) is examined individually and then an interpretation made based on the analysis. The specific parameters measured include the following:

- Heart rate (bpm).
- Axis (normal, left, right, extreme, or indeterminate).
- Conduction (rhythm and regular or irregular).

- P waves (lead II gives the best view of P waves. Look at PR interval, P-wave duration, amplitude, and morphology).
- Intervals: PR interval, QT/QTc intervals.
- QRS (duration, amplitude, morphology, in particular amplitude of R waves).
- ST segments (amplitude, morphology, in particular ST elevation or depression in contiguous leads).
- T waves (amplitude, morphology).

When applying this framework to Mr Ali's ECG, the following findings can be described:

- Heart rate (bpm): 60 bpm.
- Axis (normal, left, right, extreme, or indeterminate): normal.
- Conduction (rhythm and regular or irregular): regular sinus rhythm.
- P waves (duration, amplitude, morphology): normal duration, amplitude, and morphology (see Chapter 4).
- Intervals: PR interval, QT/QTc intervals: PR interval 180–200 milliseconds, QTc 400 milliseconds.
- QRS (duration, amplitude, morphology, in particular amplitude of R waves): QRS duration 100 milliseconds (two small squares) of normal morphology and good R-wave progression. R-wave amplitude suggestive of left ventricular hypertrophy.
- ST segments (amplitude, morphology, in particular ST elevation or depression): no evidence of ST-segment depression or elevation.
- T waves (amplitude, morphology): hyperacute T waves in precordial leads.

This informs an understanding of the underlying pathophysiological process at the time of the ECG. Mr Ali's ECG demonstrates normal sinus rhythm at a rate of 60 bpm which is regular. The axis is normal and the PR interval, QRS width, and QTc are within normal ranges. There is good R-wave progression and a suggestion of left ventricular hypertrophy on the leads that represent the left ventricle (V5, V6, I, and aVL, see Chapter 5). There is no evidence of ST-segment changes but the T waves appear to be slightly hyperacute. This ECG meets diagnostic voltage criteria for left ventricular hypertrophy—a condition in which the left ventricle of the heart becomes thickened in response to pressure overload due to conditions such as hypertension or aortic stenosis.

For patients presenting with an UA, oral dual antiplatelet therapy, subcutaneous anticoagulant, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, and

statins are recommended.¹⁷ Dual antiplatelet therapy will inhibit platelet activity and aggregation; anticoagulants will inhibit the coagulation cascade and fibrin clot formation; beta-blockers will inhibit autonomic response and reduce myocardial oxygen demand; ACE inhibitors will decrease preload and afterload, and inhibit cardiac remodelling; and statins will decrease cholesterol formation (see Chapter 12 for more details). A structured approach to diagnostic decision-making (► **Table 6.4**) supports the critical analysis and evaluation of patient data collected when assessing patients presenting with chest pain of suspected cardiac origin. Completing each stage of the process will support critical thinking and guide the diagnosis. Mr Ali has a diagnosis of UA and will require a selective invasive strategy to evaluate his coronary circulation and assess the degree of coronary artery stenosis.

Prior to discharge, the patient and family should be counselled about the implications of this event. The patient should be reminded about the importance of aggressive lifestyle modification including smoking cessation and blood pressure and diabetes control.

It is important to include a discussion about exercise regimens (including intimate personal relations) and the use of glyceryl trinitrate (GTN). The patient should be given a 'GTN protocol' to refer to and instructions on when to call for help.

Case study 2. A patient diagnosed with Prinzmetal angina

Prinzmetal angina, also known as variant angina, is a form of angina manifesting with chest pain and transient ECG changes caused by coronary artery spasm.³⁵

Presenting complaint

Miss Taylor is a 28-year-old female white British office worker, who presents to the emergency department after one episode of palpitations and chest tightness.

History of the presenting complaint

Miss Taylor, who is not from the surrounding area, attended a friend's party, during which she consumed a significant amount of alcohol (approximately 30 units)-containing high-energy drinks and approximately 2 g of cocaine. During the early hours of the morning, Miss Taylor attempted to use the toilet but felt dizzy, her heart was racing, and she had a 'funny feeling in the chest'. Unable to walk to the toilet, she decided to consume an additional gram of cocaine to aid her attempt to reach the toilet. When the patient arrived at the bathroom, she had a presyncopal episode with worsening palpitations and

Table 6.4 Mr Ali: diagnostic decision-making framework

History of the presenting complaint	Is there a clear pattern? E.g. are the symptoms associated with physical exertion, or emotional stress? Are the symptoms occurring more frequently in response to less physical effort?	Decreased exercise tolerance over the previous 4 weeks with associated feeling of a 'discomfort on his chest'. Mr Ali also noticed that the symptoms occurred during stressful situations (e.g. during 'rush hour'). These episodes have increased in frequency and occurred on two separate occasions while Mr Ali was at rest
Typicality of symptoms	Is the pain in the chest radiated and/or exertional?	Mr Ali reports discomfort in the chest which is non-radiating and now occurring at rest
'Red flags'	Is there symptom progression? E.g. are the symptoms occurring at an earlier stage of a walk? Are the symptoms now occurring at rest?	Initial decreased exercise tolerance with increasing symptom frequency during emotional distress and now occurring at rest
Coronary risk factors	Sex, age, ethnic background, smoker, high blood pressure, high cholesterol, diabetes, family history of CAD	Male 38-year-old Asian taxi driver with multiple coronary risk factors both modifiable and unmodifiable
'End-of-bed assessment'	Does the patient look unwell? Diaphoretic? Does the patient feel clammy? Is the patient reporting nausea and vomiting? Does the patient feel as if they are going to die?	Mr Ali was comfortable at rest
Cardiovascular assessment	Are baseline observations (blood pressure, heart rate, respiratory rate, pulse oximetry, and temperature) within normal ranges? Is the blood pressure equal in both arms? Are peripheral pulses equally palpable bilaterally? What does the ECG show? Is it sinus rhythm? Is it regular/irregular? Is the rate fast or slow (>100 bpm or <60 bpm)? Is there a P wave? Is there a QRS after each P wave? Is the PR interval in normal range (<200 milliseconds/5 small squares)? Is the QRS width in normal range (<120 milliseconds/3 small squares)? Is the ST segment levelled with the isoelectric baseline (e.g. is there ST-segment elevation/depression)?	A cardiovascular assessment was performed. Blood pressure was elevated (168/93 mmHg), but equal bilaterally, pulses were equal, and heart rate was in normal range (60 bpm). The ECG demonstrated sinus rhythm (Fig. 6.7). No sign of abnormalities in the ST segment
hs-TnT	Is the hs-TnT value above normal level? The term myocardial injury should be used when there is evidence of elevated cTn values with at least one value above the 99th percentile URL. The myocardial injury is considered acute if there is a rise and/or fall of cTn values ¹⁶	A hs-TnT value was reported at 6 hours from the onset of pain as 16 ng/L (reference range: normal value <14 ng/L; indeterminate 15–30 ng/L; positive >30 ng/L)
Diagnosis	Cardiac chest pain? Stable angina? ACS?	NSTE-ACS: UA

subsequent chest tightness. A concerned friend called the emergency services and Miss Taylor was taken to the emergency department.

Baseline assessment

Miss Taylor looked anxious, tachypnoeic (respiratory rate >20 breaths per minute), diaphoretic (sweating heavily), and was still intoxicated. A cardiovascular assessment revealed significantly increased systolic and diastolic blood pressure (190/120 mmHg), equal bilaterally. Pulses were equal, fast, and irregular (120–150 bpm). Miss Taylor's ECG showed a fast, irregularly irregular heart rate with no clearly visible P waves (► Fig. 6.8). Miss Taylor had no history of modifiable or unmodifiable coronary risk factors.

Discussion

Miss Taylor presented with several 'red flags' in the history of the presenting complaint. She had consumed large quantities of alcohol and high-energy drinks in the preceding 24 hours. Miss Taylor also admitted taking illicit drugs: cocaine. A combination of high-energy drinks containing stimulants such as caffeine combined with cocaine use (an adrenoceptor agonist) resulted in hypertension, a rapid, irregular heart rate, and subsequent chest pain.

Adrenoceptors (including alpha, beta 1, and beta 2) are receptors on cells in the body that mediate physiological responses to hormones such as catecholamines. Through this mechanism, adrenoceptors mediate physiological parameters such as blood pressure, heart rate, and bronchial dilatation/constriction. When the adrenoceptors are overstimulated, as in Miss Taylor's case, an 'overdrive effect' occurs which causes the presenting symptoms. The chest pain is likely to be resulting

from a supply–demand mismatch and/or coronary artery spasm. Miss Taylor is tachycardic (i.e. her heart rate is >100 bpm). A rapid heart rate affects the timing of the cardiac cycle; ventricular relaxation (diastole) is when the coronary arteries fill with oxygenated blood. A rapid heart rate can lead to a shorter ventricular diastole which can decrease coronary circulation causing myocardial ischaemia leading to chest pain (supply–demand mismatch). Additionally, cocaine can accelerate atherosclerotic plaque formation, causing coronary spasm with subsequent platelet activation. This can cause chest pain and, in some cases, MI.³⁶

Management

Miss Taylor's presentation is suggestive of Prinzmetal angina. The nursing care of Miss Taylor should include reassurance, repetition of baseline observations, until heart rate and blood pressure have returned to normal parameters, and ECG monitoring as previously described. Patients presenting with cocaine-induced palpitations and chest pain are often diagnosed as having Prinzmetal angina. The symptoms are caused by a temporary increase in coronary vascular tone (vasospasm) causing a marked, but transient reduction in coronary artery diameter and decreased coronary perfusion.⁵

A hs-TnT was measured at 21 ng/L which falls within the indeterminate range (normal value <14 ng/L; indeterminate 15–30 ng/L; positive >30 ng/L). TnT can be useful in determining any cardiac myocyte death. Patients should be treated with antiplatelets, nitrates (sublingual or intravenous), and oral benzodiazepines. Beta-blockade should not be administered in the first 24–48 hours after cocaine use as this can cause rebound hypertension.³⁶ Beta-blockers will block beta-receptors (part



Fig. 6.8 Miss Taylor's 12-lead ECG.

of the adrenoceptors). This will subsequently result in overstimulation of alpha-receptors with significant vasoconstriction and a rise in blood pressure. Miss Taylor has been diagnosed with Prinzmetal angina; she may, or may not, undergo coronary angiogram, as the aetiology of the symptoms appears to be evident.

Using the decision aid framework (► Table 6.5), a summary of the cardiovascular assessment highlights the high-risk behaviour of Miss Taylor. The holistic care of this patient should include a discussion of lifestyle change, behaviour modification, and referral to further supportive resources such drug and rehabilitation teams or equivalent (this will vary based on location).

Table 6.5 Miss Taylor: diagnostic decision-making framework

History of the presenting complaint	Is there a clear pattern? E.g. are the symptoms associated with exertion, or emotional situation? Are the symptoms occurring more frequently and require less effort?	Palpitations and chest tightness after consuming approximately 30 units of alcohol, high-energy drinks, and approximately 2 g of cocaine
Typicality of symptoms	Is the pain in the chest radiated and/or exertional?	Chest pain and palpitations with presyncope (feeling faint)
'Red flags'	Is there symptom progression? E.g. are the symptoms occurring at an earlier stage of a walk? Are the symptoms now occurring at rest?	Symptoms onset after consumption of stimulants, alcohol, and illicit drugs
Coronary risk factors	Sex, age, ethnic background, smoker, high blood pressure, high cholesterol, diabetes, family history of CAD	Female 28-year old white British office worker with no coronary risk factors
'End-of-bed assessment'	Does the patient look unwell? Diaphoretic? Does the patient feel clammy? Is the patient reporting nausea and vomiting? Does the patient feel as if they are going to die?	Miss Taylor looked anxious, tachypnoeic, diaphoretic, and was intoxicated
Cardiovascular assessment	Are baseline observations (blood pressure, heart rate, respiratory rate, pulse oximetry and temperature) in normal ranges? Is the blood pressure equal in both arms? Are peripheral pulses equally palpable bilaterally? What does the ECG show? Is it sinus rhythm? Is it regular/irregular? Is the rate fast or slow (>100 bpm or <60 bpm)? Is there a P wave? Is there a QRS after each P wave? Is the PR interval in normal range (<200 milliseconds/5 small squares)? Is the QRS width in normal range (<120 milliseconds/3 small squares)? Is the ST-segment levelled with the isoelectric baseline (e.g. is there ST-segment elevation/depression)?	A cardiovascular assessment revealed significantly increased systolic and diastolic blood pressure (190/120 mmHg), equal bilaterally. Pulses were equal, fast, and irregular (100–150 bpm). ECG was fast, irregularly irregular, with no clear visible P waves and lateral ST-segment depression (Fig. 6.8)
hs-TnT	Is the hs-TnT value above normal level? The term myocardial injury should be used when there is evidence of elevated cTn values with at least one value above the 99th percentile URL. The myocardial injury is considered acute if there is a rise and/or fall of cTn values ¹⁶	A hs-TnT value was measured at 21 ng/L suggestive of myocardial injury (reference range: normal value <14 ng/L; indeterminate 15–30 ng/L; positive >30 ng/L)
Diagnosis	Cardiac chest pain? Stable angina? ACS?	Prinzmetal angina

Using the systematic approach to the ECG analysis, the following can be described:

- Heart rate (bpm): 120–150 bpm.
- Axis (normal, left, right, extreme, or indeterminate): normal.
- Conduction (rhythm and regular or irregular): irregularly irregular.
- P waves (duration, amplitude, morphology): unable to identify clear P waves.
- Intervals: PR interval, QT/QTc intervals: unable to calculate PR interval, QTc approximately 410–500 milliseconds.
- QRS (duration, amplitude, morphology, in particular amplitude of R waves): QRS duration 100 milliseconds (two small squares) of normal morphology and fair R-wave progression.
- ST segments (amplitude, morphology, in particular ST elevation or depression): ST-segment depression V6 (likely related to the rapid heart rate).
- T waves (amplitude, morphology): T-wave inversion in leads I and aVL.

The ECG (► **Fig. 6.8**) demonstrates a fast, irregularly irregular rhythm, with normal axis and a heart rate of approximately 120–150 bpm. There are no clearly identifiable P waves, thus the PR interval cannot be calculated. The QRS is normal in width, there is ST-segment depression in V6, and TWI in leads I and aVL. These changes are indicative of myocardial ischaemia and are likely to be secondary to a supply–demand mismatch due to the rapid heart rate. Given the irregularly irregular tachycardia and absence of clearly visible P waves, this ECG meets diagnostic criteria for atrial fibrillation. The troponin rise is indicative of myocardial injury secondary to a supply–demand mismatch, giving a diagnosis of type 2 MI.²⁰

Case study 3. A patient presenting with NSTEMI-ACS: NSTEMI

NSTEMI is defined as angina caused by partial occlusion of an epicardial coronary artery leading to myocardial death/necrosis in the absence of diagnostic criteria for STEMI.

Presenting complaint

Mr Baker, a 51-year-old white British businessman, presents to the emergency department with one episode of severe chest pain.

History of presenting complaint

Two weeks prior to his attendance, Mr Baker experienced severe chest pain, lasting approximately 2 hours. He described the pain as a ‘vice-like’ sensation and reported feeling ‘sweaty, clammy, and nauseous’. Mr Baker decided not to investigate symptoms because of the COVID-19 pandemic. Since the episode of chest pain, he has been experiencing increasing shortness of breath and a feeling of heaviness on minimal exertion, radiating to his jaw and left arm. Prior to attending the emergency department, Mr Baker visited his general practitioner who performed a 12-lead ECG and called an ambulance on seeing the results.

Baseline assessment

On arrival at the emergency department, Mr Baker looked pale, diaphoretic, and had ongoing symptoms of chest pain. On further enquiry, Mr Baker explained that he had a significant family history of premature CAD; both parents suffered an MI in their late 50s. He also reported being a type 2 diabetic but was not consistently adherent to his prescribed medication. Additional coronary risk factors included untreated hypertension, elevated cholesterol, living alone, clinical depression, and a high alcohol consumption (approximately 40 units per week).

On initial assessment, Mr Baker’s blood pressure was significantly raised (187/99 mmHg) and his heart rate was regular (75 bpm). The ECG (► **Fig. 6.9**) demonstrated electrical activity with correlated atrial and ventricular activity. The QRS was abnormal, and the heart rate was measured at 75 bpm. A deep TWI was present in the anterior leads (V1–V4).

Discussion

The history of the presenting complaint is typical for acute atherosclerotic plaque rupture (type 1 MI). The patient suffered an episode of severe central chest pain lasting approximately 2 hours and associated with autonomic features. An atherosclerotic plaque rupture causes an inflammatory response with subsequent platelet activation and aggregation, leading to an increased level of thrombin. This can in turn activate the coagulation cascade and ultimately lead to a fibrin clot formation. A fibrin clot will cause coronary stenosis causing the symptoms experienced by the patient.

The ‘red flags’ are evident during the ‘end-of-bed assessment’. Mr Baker has ongoing symptoms of chest pain and is diaphoretic and clammy. Moreover, Mr Baker has multiple coronary risk factors and has been non-adherent with his medications.



Fig. 6.9 Mr Baker's 12-lead ECG.

A hs-TnT was measured at 1200 ng/L (reference range: normal value <14 ng/L; indeterminate 15–30 ng/L; positive >30 ng/L). This, in addition to the history of the presenting complaint, coronary risk factor profile, and ECG, led to a diagnosis of a NSTEMI. A NSTEMI is characterized by symptoms suggestive of cardiac chest pain, with raised hs-TnT value and absence of ST-segment elevation on the ECG. Mr Baker's ECG demonstrates a deep T wave inversion in the anterior leads (► **Fig. 6.9**). This is often referred to as Wellens' syndrome. This is highly specific for a critical stenosis of the left anterior descending artery. Patients diagnosed with NSTEMI should receive oral dual antiplatelet therapy, subcutaneous anticoagulant, and should undergo an angiogram with potential PCI within 24 hours of diagnosis.⁴

Management

Mr Baker's presentation is suggestive of NSTEMI. The nursing care for Mr Baker should include sublingual nitrates and analgesia, if ongoing symptoms, regular ECG, baseline observations.

Using the decision aid framework (► **Table 6.6**), ACS is highly likely. The typicality of symptoms, the coronary risk factor profile, and the 'end-of-bed assessment' reinforce the likelihood of the diagnosis. While a cardiovascular assessment highlights high blood pressure as a significant finding, the ECG and hs-TnT assay confirm the diagnosis of NSTEMI.

Prior to discharge, the patient and family should be counselled about the implications of this event. Cardiovascular prevention and rehabilitation, health education, and lifestyle changes should be discussed at this early stage and prior to discharge, with emphasis on exploring the reasons for non-adherence to prescribed medications. It is important to include a discussion about

resumption of physical activity and exercise including intimate relations and the use of GTN.

Using the systematic approach to the ECG analysis, the following can be described:

- Heart rate (bpm): 75 bpm.
- Axis (normal, left, right, extreme, or indeterminate): normal.
- Conduction (rhythm and regular or irregular): regular.
- P waves (duration, amplitude, morphology): P-wave morphology, amplitude, and duration, normal.
- Intervals: PR interval, QT/QTc intervals: PR interval 160 milliseconds, QTc 580 milliseconds. QTc should be interpreted with caution. In this instance, it is prolonged because of the T-wave abnormality rather than an arrhythmogenic aetiology.
- QRS (duration, amplitude, morphology, in particular amplitude of R waves): QRS duration 100–120 milliseconds with morphology suggestive of a conduction delay. R-wave progression is poor.
- ST segments (amplitude, morphology, in particular ST elevation or depression): evidence of subtle ST-segment depression in V5 and V6.
- T waves (amplitude, morphology): deep TWI in V1–V5, suggestive of myocardial ischaemia (Wellens' syndrome).

The ECG (► **Fig. 6.9**) demonstrates normal sinus rhythm with a rate of 75 bpm and a normal axis. The PR interval is in the normal range but the QTc is prolonged. An abnormal T-wave morphology can affect the QTc, so this finding requires further investigation and careful interpretation. There is subtle ST-segment depression in V5 and V6, suggestive of cardiac ischaemia in those leads.

Table 6.6 Mr Baker: diagnostic decision-making framework

History of the presenting complaint	Is there a clear pattern? E.g. are the symptoms associated with exertion, or emotional situation? Are the symptoms occurring more frequently and require less effort?	Mr Baker presented to the emergency department with one episode of severe chest pain. Two weeks prior to his attendance, he had experienced severe chest pain, lasting approximately 2 hours
Typicality of symptoms	Is the pain in the chest radiated and/or exertional?	Pain was described as a 'vice-like' sensation and patient reports feeling 'sweaty, clammy, and nauseous'
'Red flags'	Is there symptom progression? E.g. are the symptoms occurring at an earlier stage of a walk? Are the symptoms now occurring at rest?	Since the episode of chest pain, he has been experiencing increasing shortness of breath, feeling of heaviness on minimal exertion, radiated to jaw and left arm
Coronary risk factors	Sex, age, ethnic background, smoker, high blood pressure, high cholesterol, diabetes, family history of CAD	Male 51-year-old white businessman with both parents having suffered a MI in their late 50s. He also reported being a type 2 diabetic but was taking his medication inconsistently. Additional risk factors included untreated high blood pressure and cholesterol, living alone, clinical depression, and high alcohol consumption (approximately 40 units per week)
'End-of-bed assessment'	Does the patient look unwell? Diaphoretic? Does the patient feel clammy? Is the patient reporting nausea and vomiting? Does the patient feel as if they are going to die?	Mr Baker looked pale, diaphoretic, with ongoing symptoms of chest pain
Cardiovascular assessment	Are baseline observations (blood pressure, heart rate, respiratory rate, pulse oximetry and temperature) in normal ranges? Is the blood pressure equal in both arms? Are peripheral pulses equally palpable bilaterally? What does the ECG show? Is it sinus rhythm? Is it regular/irregular? Is the rate fast or slow (>100 bpm or <60 bpm)? Is there a P wave? Is there a QRS after each P wave? Is the PR interval in normal range (<200 milliseconds/5 small squares)? Is the QRS width in normal range (<120 milliseconds/3 small squares)? Is the ST segment levelled with the isoelectric baseline (e.g. is there ST-segment elevation/depression)?	On initial assessment, Mr Baker's blood pressure was significantly raised (187/99 mmHg) and the heart rate was regular (75 bpm). The ECG (Fig. 6.9) demonstrated a heart rate of 75 bpm. The QRS was abnormal, and a deep TWI was present in the precordial leads (V1–V6)
hs-TnT	Is the hs-TnT value above normal level? The term myocardial injury should be used when there is evidence of elevated cTn values with at least one value above the 99th percentile URL. The myocardial injury is considered acute if there is a rise and/or fall of cTn values ¹⁶	A hs-TnT value was measured at 1200 ng/L (reference range: normal value <14 ng/L; indeterminate 15–30 ng/L; positive >30 ng/L)
Diagnosis	Cardiac chest pain? Stable angina? ACS?	NSTE-ACS, NSTEMI

Given the history of the presenting complaint, the coronary risk factor profile, and the significant TnT rise, this ECG meets the diagnostic criteria for NSTEMI.

Case study 4. A patient diagnosed with STEMI

Angina is caused by occlusion of an epicardial coronary artery often caused by plaque rupture leading to coronary thrombosis with myocardial death/necrosis.

Presenting complaint

Mr Wright, a 53-year-old Afro-Caribbean male, employed as a university researcher, presents to the emergency department with central crushing chest pain.

History of presenting complaint

Mr Wright called an ambulance following an onset of crushing central chest pain, which radiated to his left jaw and arm. Mr Wright had used his GTN spray twice with no relief. He described the pain as 'severe and crushing ... almost as if someone was sitting on my chest'. Mr Wright recognized the pain as something he should report urgently as he had previously had a MI.

Baseline assessment

On arrival at the emergency department, the patient was complaining of ongoing 'severe chest pain and heaviness' and looked pale, diaphoretic, and apprehensive. He was normotensive (131/84 mmHg) and his heart rate was within the normal limits (70–75 bpm). The patient was known to be a type 2 diabetic, hypertensive, and a tobacco smoker. Mr Wright had previously had a MI and PCI. His ECG (► Fig. 6.10) demonstrated normal sinus rhythm

with P and QRS correlation and of normal interval. The heart rate was regular. The ECG revealed ST-segment elevation in leads II, III, and aVF with reciprocal changes in leads I and aVL and the precordial leads.

Discussion

The history of the presenting complaint, the coronary risk factor profile, 'end-of-bed assessment', and ECG are all significant 'red flags' which when combined suggest a diagnosis of STEMI (► Table 6.7). Patients presenting with a STEMI should be managed as a medical emergency and should undergo immediate PPCI.⁵ Waiting for a hs-TnT assay is not required to aid diagnosis. These patients need to undergo PPCI as soon as feasible to aid coronary reperfusion (► Fig. 6.4) and decrease myocardial necrosis.⁴ In patients with ST-segment elevation, the atherosclerotic plaque rupture instigates an inflammatory response with platelet activation. Subsequently, due to the significant injury, activation of the coagulation cascade leads to fibrin clot formation with a total occlusion of the coronary artery. Total occlusion of the coronary artery leads to a loss of coronary flow, cardiac myocyte death, and ultimately heart failure, if not treated promptly.⁵

PPCI provides a rapid and effective access to the coronary circulation to evaluate the severity of the coronary occlusion. Once the culprit occlusion is identified, a PCI is attempted to restore flow to the affected area. A prompt coronary flow restoration prevents significant cardiac myocyte death and decreases the likelihood of ventricular dysfunction.

Management

Mr Wright's presentation is suggestive of STEMI. Mr Wright should be transferred to the catheterization



Fig. 6.10 Mr Wright's 12-lead ECG.

Table 6.7 Mr Wright: diagnostic decision-making framework

History of presenting complaint	Is there a clear pattern? E.g. are the symptoms associated with exertion, or emotional situation? Are the symptoms occurring more frequently and require less effort?	Sudden onset of crushing central chest pain. Pain described as 'severe and crushing ... almost as if someone was sitting on my chest'. Patient recognized pain as previously had a MI
Typicality of symptoms	Is pain in the chest, radiated and exertional?	Central chest pain, radiated to left jaw and arm
'Red flags'	Is there symptom progression? E.g. are the symptoms occurring at an earlier stage of a walk? Are the symptoms now occurring at rest?	'Severe and crushing ... almost as if someone was sitting on my chest'. Typical anginal pain, with previous MI
Coronary risk factors	Sex, age, ethnic background, smoker, high blood pressure, high cholesterol, diabetes, family history of CAD	Male 53-year-old Afro-Caribbean with type 2 diabetes, high blood pressure, high cholesterol, and previous MI
'End-of-bed assessment'	Does the patient look unwell? Diaphoretic? Does the patient feel clammy? Is the patient reporting nausea and vomiting? Does the patient feel as if they are going to die?	Clammy, diaphoretic, and apprehensive
Cardiovascular assessment	Are baseline observations (blood pressure, heart rate, respiratory rate, pulse oximetry and temperature) in normal ranges? Is the blood pressure equal in both arms? Are peripheral pulses equally palpable bilaterally? What does the ECG show? Is it sinus rhythm? Is it regular/irregular? Is the rate fast or slow (>100 bpm or <60 bpm)? Is there a P wave? Is there a QRS after each P wave? Is the PR interval in normal range (<200 milliseconds/5 small squares)? Is the QRS width in normal range (<120 milliseconds/3 small squares)? Is the ST segment levelled with the isoelectric baseline (e.g. is there ST-segment elevation/depression)?	Mr Wright was normotensive (131/84 mmHg) and his heart rate was within the normal limits (70–75 bpm). The patient was known to be diabetic (type 2), hypertensive, having previously had a MI and PCI. His ECG (Fig. 6.10) demonstrated normal sinus rhythm with P and QRS correlation and of normal interval. The heart rate was regular. The ECG revealed ST-segment elevation in leads II, III, and aVF with reciprocal changes in lead I, lead aVL, and precordial leads
hs-TnT	Is the hs-TnT value above normal level? The term myocardial injury should be used when there is evidence of elevated cTn values with at least one value above the 99th percentile URL. The myocardial injury is considered acute if there is a rise and/or fall of cTn values ¹⁶	hs-TnT value not measured as not a priority in this presentation. Diagnosis guided by history taking, clinical examination, and ECG
Diagnosis	Cardiac chest pain? Stable angina? ACS?	ACS: STEMI

laboratory for PPCI with continuous cardiac monitoring, a defibrillator, and emergency drugs. Patients diagnosed with STEMI are at high risk for arrhythmias such as ventricular tachycardia or ventricular fibrillation (see Chapter 7). The nursing care prior to PPCI

should include reassurance, analgesia, and antiemetic as required, a focused cardiovascular assessment, and serial ECGs. Patients presenting with STEMI are at risk of cardiogenic shock, severe bradycardia, and atrioventricular block and should be carefully monitored.

Cardiogenic shock is characterized by a persistent hypotension, with a systolic blood pressure less than 90 mmHg, despite adequate intravascular volume. It manifests in 6–10% of all STEMIs²² and remains the leading cause of death in this patient population with an estimated mortality rate of approximately 50%. The aetiology of cardiogenic shock should be identified promptly and treated accordingly. This may include hypovolaemia or drug-induced hypotension and arrhythmias. The nursing care of patients prior to PPCI should focus on continuous cardiovascular monitoring and effective recognition and management of imminent clinical deterioration (see Chapter 5 for details on cardiogenic shock).

Sinus bradycardia can be common in inferior STEMI because the right coronary artery provides oxygenated blood to the sinoatrial node. Type 1 second-degree block (Mobitz I) is also associated with inferior wall MI but rarely causes haemodynamic instability. Should the patient become haemodynamically compromised, intravenous atropine should be given or pacing considered.³⁴ Type 2 second-degree block (Mobitz II) or complete atrioventricular dissociation (third-degree heart block) are indications for cardiac pacing.

Post PPCI, the patient should be closely monitored. The nursing care for patients post PPCI and/or permanent pacemaker insertion should include access site and wound management. Monitoring of the access site will be dependent on the operator approach. Radial artery access for PCI is the preferred site where possible as it is associated with fewer complications than a femoral artery PCI.⁵ However, in patients with cardiogenic shock, an intra-aortic balloon pump may be inserted via the femoral artery. The nursing management of the femoral access site will reflect local guidelines and the availability of closure devices (see Chapter 5 for details on cardiogenic shock and an introduction to intra-aortic balloon pumps and other types of circulatory support).

Wound management post permanent pacemaker insertion is another key aspect of the nursing care. The ability to identify signs of infection and/or sepsis will improve patients' outcomes and hospital discharge times.³⁷ In a wound infection, the skin will be hot and tender to touch with localized swelling. Systemic signs of sepsis include tachypnoea, tachycardia, hypotension, and fever.

Before discharge from hospital, Mr Wright should start cardiovascular rehabilitation with advice given about his recovery and about how he can modify his lifestyle and adhere to his prescribed medication to improve his heart health and health-related quality of life.

Using the systematic approach to the ECG analysis, the following can be described:

- Heart rate (bpm): 70–75 bpm.
- Axis (normal, left, right, extreme, or indeterminate): normal.
- Conduction (rhythm and regular or irregular): regular with sinus arrhythmia.
- P waves (duration, amplitude, morphology): P-wave morphology, amplitude, and duration, normal.
- Intervals: PR interval, QT/QTc intervals: PR interval 160 milliseconds, QTc 432–447 milliseconds.
- QRS (duration, amplitude, morphology, in particular amplitude of R waves): QRS duration 100 milliseconds. R-wave progression is poor.
- ST segments (amplitude, morphology, in particular ST elevation or depression): evidence of significant ST-segment depression in inferior leads and leads II, III, and aVF with reciprocal change (ST-segment depression) in lead I, lead aVL, and precordial leads.
- T waves (amplitude, morphology): hyperacute inferior T-wave morphology deep T wave inversion with ST-segment depression in V1–V6.

The ECG (► Fig. 6.10) demonstrates normal sinus rhythm with a normal axis and a rate of 70–75 bpm. The P-wave morphology, PR interval, and QRS duration are in the expected range and the QTc is normal. There is significant ST-segment elevation in the anterior leads with reciprocal changes in lead I, lead aVL, and precordial leads with hyperacute T waves. This ECG meets the diagnostic criteria for STEMI.

In summary, when caring for patients presenting with symptoms suggestive of myocardial ischaemia, a systematic approach will facilitate patient assessment. Subsequently, adequate risk stratification will dictate the pharmacological and invasive management (e.g. PCI) of patients presenting with an ACS. Although PCI and PPCI have become the revascularization strategy of choice for the management of ACS, in patients with stable CAD, CABG can also be considered as an alternative reperfusion strategy.³⁴

Priorities for nursing care

The general principles of nursing care for patients with suspected ACS are similar, but obviously the treatments will vary according to ACS classification as per the illustrative case studies. The patient's experience of healthcare is an important indicator of care quality.

1. *Care coordination and teamwork:* the nurse plays a crucial role in the wider team by coordinating, managing, and delivering prescribed treatments and interventions in a timely manner for patients with ACS. This is vital given the association between prompt treatment and positive patient outcomes. Missed and delayed medicines are a common cause of medication error which can lead to adverse patient outcomes.³⁸ Administering treatments such as medication and oxygen (if prescribed) in a timely manner is very important. The nurse may also play a role in the instigation of other diagnostic tests and assessments such as 12-lead ECG recording and serial troponins.
2. *Assessment of signs and symptoms:* a key priority in the management of patients with suspected ACS is to assess, monitor, and relieve chest discomfort/pain associated with myocardial ischaemia. Chest pain may be evidenced by verbal and non-verbal signs as well as changes in vital signs such as pulse and blood pressure (Chapter 5 provides an overview of pain assessment scales that can be used to assist patients in describing and quantifying any discomfort/pain that they are experiencing). It is important that assessment data are accurately documented so that the effectiveness of any pain relief can be evaluated. A 12-lead ECG measures the heart's electrical activity and shows the progression of depolarization and repolarization and cardiac rhythm; recordings during and after episodes of chest pain are important to assess for signs of myocardial ischaemia (see case studies and Chapter 4 for details about ECG analysis). It is important that relevant diagnostic findings are communicated to the cardiology team in a timely way to guide decision-making about treatment. Following the administration of narcotics for pain relief, blood pressure, respiratory rate, and oxygen saturation should be closely monitored. (Chapter 12 provides an overview of medicines commonly used in cardiovascular care such as analgesics, antianginals, beta-blockers, anxiolytics, antiplatelet agents, anticoagulants, thrombolytics, and diuretics. The potential complications that may also arise from their use are also described.) The nurse plays an important role in evaluating the effectiveness of prescribed medications and looking out for any potential adverse effects.
3. *Timely recognition, critical thinking, and management of clinical deterioration:* nurses play a vital role in rapid recognition of clinical deterioration. Cardiac monitoring, with appropriately set alarms, will

provide ongoing continuous ECG data and other haemodynamic and respiratory parameters. This is important for ACS patients as a way of maintaining haemodynamic stability; recognizing signs and symptoms of clinical deterioration, taking appropriate action, and informing senior staff in a timely way is vital. Many healthcare organizations have automated early warning score systems used in ward areas which are useful but not foolproof.³⁹ An overreliance on such systems is not recommended as, ultimately, experienced nurses' perceptions of a patient's potential for clinical deterioration are more accurate than most published warning scores.⁴⁰ It is important to call for help if you are concerned and cannot get help through your rapid response system as per your local protocol.

Patients with ACS are at risk from decreased cardiac output, excess fluid volume, and ineffective tissue perfusion (see Chapter 4 and Chapter 5 for a more detailed explanation). The nurse needs to understand how physiological parameters interact to enable them to interpret the significance of any changes in vital signs and effectively recognize and manage clinical deterioration. Advanced practitioners will develop the skills to assess jugular venous pressure and auscultate heart and breath sounds to provide additional clinical data which can be indicative of changes in circulating fluid volume (see Chapter 5 for more detail). The nurse will also support the patients through a wide range of potential invasive and non-invasive diagnostic tests which provide important data from which physiological parameters are monitored and interventions planned. For example, serial ECGs and biomarkers, electrolytes, arterial blood gases, clotting times, chest X-rays, echocardiography, and coronary angiography.

4. *Creating a healing environment and promoting sleep, rest, and well-being:* in high-technology areas such as critical care, there is often an emphasis on the technological aspects of patient care. An important and often overlooked part of the nurse's role is to promote patient comfort and make the care environment as conducive to healing as possible. Sleep is an important biological function that supports patient healing but ward inpatients often report poor sleep quality and quantity as hospital environments are very noisy.⁴¹ Care processes such as recording observations and taking bloods should be bundled together as far as possible to minimize night-time sleep disturbance. Offering patients ear plugs or eye masks, or asking them to bring in their own if they

are not available, is one approach that can improve the quality and quantity of inpatient care.⁴² Patients also report noise from the built environment, staff, and other patients as sources of night-time sleep disturbance.⁴¹

5. *Reduced mobility and physical activity limitations:* guidelines vary, but a short period of bed rest to reduce myocardial workload is recommended for patients recovering from ACS. It is important that the patient is positioned comfortably with sufficient pillows and blankets as per their preference. The patient can be positioned in a semi-upright position to maximize lung inflation if they are haemodynamically stable. To avoid complications associated with immobility such as thromboembolic events, the nurse can advise the patients about leg exercises and help them with the application and removal of antiembolic stockings. As recovery progresses, the level of activity will be gradually increased, or decreased, in response to changes in physiological parameters such as pulse, blood pressure, and presence of dyspnoea.

Basic hygiene needs are important to the well-being of patients. Ensuring that a patient's skin is kept clean and free from pressure injury is an important goal of nursing care. Some patient groups are particularly prone to pressure injury. In cardiology settings, a reduced left ventricular ejection fraction predicts in-hospital pressure ulcer development in patients recovering from MI.⁴³ Patients will also appreciate the opportunity to clean their teeth regularly and wash their hands after using a commode.

6. *Nutrition and elimination:* small nutritious meals at regular intervals are advised for patients with ACS. A nutritional assessment may be indicated particularly in elderly patients. Nutritional status is reported to be an independent predictor of long-term mortality in septuagenarian patients of the same magnitude as the GRACE score.⁴⁴ Recording an accurate fluid balance is important to detect signs of haemodynamic instability and acute kidney injury. The administration of analgesics may lead to constipation which should be avoided as straining at stool, also known as Valsalva manoeuvre, can induce bradycardia.
7. *Psychological support for patients and significant others:* psychological support for the patients with ACS and those close to them is very important as depression and anxiety among survivors and spouses is common. Fear, anxiety, denial, hostility, and grief are common emotions experienced by patients diagnosed with ACS and represent a normal response to a

life-threatening event. However, if negative emotions are sustained in the longer term, intervention may be warranted. Each patient will respond differently and it is important to be accepting and supportive of their responses during hospitalizations, but reinforcing denial should be avoided if at all possible. It is important to ask the patient about how they are feeling and to listen actively to their responses (see Chapters 11 and 13). Your behaviour and manner will also convey a non-verbal message to the patient and their family. When information about diagnosis and prognosis is communicated, it is preferable to have significant others present for support as patients often cannot remember verbal information. It may be helpful to use non-pharmacological interventions to reduce psychological distress and some relaxation techniques have been shown to be beneficial in cardiology settings.⁴

8. *Cultural and spiritual care:* an important part of person-centred care is to recognize an individual's needs and preferences for their healthcare. Cultural and religious practices are an important part of an individual's identity and healthcare provision should reflect these. Spirituality is not necessarily connected with religion; patients will have different ways of meeting their own spiritual needs which may be associated with feeling hope, gratitude, a sense of belonging or purpose, to name a few.
9. *Patient education and discharge processes:* patients diagnosed with ACS are often discharged after a short hospital admission and there is a need for nurses, and other members of the multidisciplinary team, to provide timely advice and support. This begins in the peri-infarct phase and extends throughout cardiovascular prevention and rehabilitation. The key aims are always to facilitate a return to health and as normal a life as possible while minimizing the potential for recurrent cardiac events.

Patients and relatives have a variety of educational, lifestyle, physical, and psychological needs and questions following an ACS. Typical questions relate to causation, what patients can or should be doing now and in the future, and medicine management. Ideally, a cardiac liaison nurse or a member of the cardiovascular prevention and rehabilitation team should be involved at an early stage to address such concerns. This type of approach has been demonstrated to positively influence subsequent uptake of rehabilitation programmes.⁴⁵ The initial focus of information is on what has occurred and what will happen next regarding

cardiovascular prevention and rehabilitation and medical follow-up. Medicines need to be discussed in sufficient detail to ensure their purpose is understood. Information about when and how to take medicines and their potential side effects should also be included. At the time of hospital discharge, it is important to advise who can be contacted if problems arise. Provision of supplementary printed or digital literature is also useful at a time when there can be so much new information to absorb. This should be in a form that is both accessible and understandable. An immediate discharge summary should be provided with key information for primary health and cardiovascular prevention and rehabilitation teams as well as patients and relatives. Suggested content is listed in ► **Box 6.1**.

The early post-discharge period involves ongoing interaction between hospital, primary care, and cardiovascular prevention and rehabilitation services and good coordination and communication are essential. Attendance at and completion of an exercise-based cardiovascular prevention and rehabilitation programme is of demonstrated benefit in reducing cardiovascular mortality and subsequent hospital admission rates and access is a prominent recommendation of both European⁴⁶ and UK clinical guidelines⁴⁷ (see Chapter 11 for additional details). This should begin as soon as possible after admission and before discharge from hospital. An invitation to attend an out-patient cardiac rehabilitation session should ideally

Box 6.1 Discharge summary content

1. Hospital identification number.
2. Contact details for responsible hospital team/discharging professional.
3. Medical diagnosis.
4. Discharge medication—including dose, duration (especially antiplatelet therapy), and titration needs (beta-blockers and ACE inhibitors).
5. Agreed targets for blood pressure, weight, smoking cessation, cholesterol, and alcohol consumption.
6. Information: physical activity including resumption of sex, return to work, driving, travel/holidays, and other relevant activities.
7. Follow-up: out-patient appointments and cardiovascular prevention and rehabilitation arrangements.
8. Information on psychological support needs for patients and significant others.

be received within 10 days of discharge from hospital but it is known that this often takes longer and overall uptake of cardiovascular prevention and rehabilitation remains suboptimal.

Beyond the initial rehabilitation period, continuing emphasis should be given to secondary prevention including optimization of medication, health education, behaviour change, lifestyle and risk factor management, and psychological health. Depending on local arrangements, a hospital follow-up consultation 1 year after the index event can provide an ideal opportunity to reinforce the need for lifestyle improvements, encourage medicine adherence, and implement changes to antiplatelet regimens if this is indicated. Patients with CAD and their partners are prone to anxiety and depression. A range of patient-reported outcome measures are completed as part of cardiovascular prevention and rehabilitation (see Chapter 11 for additional details). Successful cardiovascular prevention and rehabilitation following ACS is crucially dependent on effective multidisciplinary working in partnership with patients and their relatives at all stages.

Chronic coronary syndromes

In considering CCS, there are at least six potential clinical presentations for this group of conditions: (1) suspected CAD and 'stable' anginal symptoms, and/or dyspnoea; (2) new onset of heart failure or left ventricular dysfunction and suspected CAD; (3) asymptomatic or with stabilized symptoms less than 1 year after ACS, or revascularization; (4) asymptomatic or symptomatic greater than 1 year after initial diagnosis or revascularization; (5) angina and suspected vasospastic or microvascular disease; and (6) asymptomatic, with CAD detected at screening.³ Each clinical presentation is associated with a different level of risk for a future cardiovascular event such as death or MI.³ Those without ACS will be assessed for pre-test probability and clinical likelihood of coronary heart disease.³ The main diagnostic pathways for patients presenting with CCS are shown in ► **Fig. 6.11**.

To establish a diagnosis of obstructive CAD in patients with a low to intermediate pre-test probability of CAD, an anatomical test such as coronary computed tomography angiography will be conducted. Functional tests such as exercise ECG or nuclear stress testing may also be used.

Priorities for nursing care

The nurse plays an important role in caring for patients undergoing invasive or non-invasive tests from

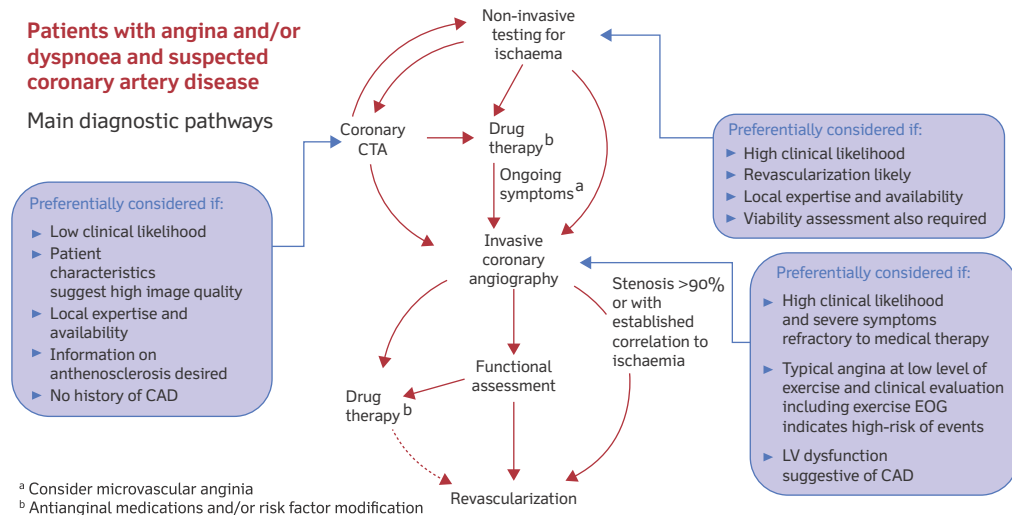


Fig. 6.11 Diagnostic and management pathways for patients with angina/dyspnoea and suspected CAD.

Collet JP, Thiele H, Barbato E, et al; ESC Scientific Document Group. 2020 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. Eur Heart J. 2020 Aug 29;ehaa575. doi: 10.1093/eurheartj/ehaa575 © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

taking a patient history, seeking informed consent, and preparing the patients for the procedure to ensure that the procedure is conducted safely. For many patients, this can be a stressful experience so it is important that the nurse provides reassurance and effective education about aftercare. For the purpose of this section, we will focus upon the management and nursing care of the patient with one clinical presentation, namely stable angina.

The mainstay of treatment is the control of symptoms and the reduction of the risk of adverse events associated with CAD. The optimization of medication therapy is the first-line treatment for patients with stable angina to relieve angina symptoms and reduce the risk of future adverse cardiovascular events. The management priorities for the patient with stable angina are to provide information and support to enable them to self-manage angina symptoms. Health professionals play a key role in supporting patients to manage their medications so that they understand the rationale for the prescription, side effects to look out for, and how to administer them correctly (e.g. nitrate spray/tablets). Recommended drugs include nitrates, calcium channel blockers, beta-blockers, ACE inhibitors, antithrombotic agents (e.g. aspirin or clopidogrel), and lipid-lowering medications. Non-adherence to cardiovascular medications is commonplace and may be intentional or non-intentional; the

factors influencing medication adherence are complex and influenced by several factors (see Chapter 12 for details about common cardioprotective medications and non-adherence).

Coronary revascularization may be considered for patients with angina symptoms that are not satisfactorily controlled if optimal medical therapy is not effective.³ Recent trials have indicated that PCI reduces ischaemic burden in patients with stable CAD but may not necessarily improve survival or reduce risk for recurrent MI compared to optimal medical therapy alone.⁴⁸

Nurses and allied health professions play a key role in providing effective therapeutic patient education and self-management support to patients and those close to them. Effective self-management support promotes healthy lifestyle change (smoking cessation, a heart healthy diet, 30–60 minutes of physical activity most days, and a healthy weight <25 kg/m²).³ For patients diagnosed with stable angina, it is important to help them to understand why the symptoms occur and ensure that they know when to seek medical assistance. Patients will also need support to balance periods of physical activity and rest so that they can pace themselves to enable them to manage activities of daily living. These measures in conjunction with the prescription of cardiovascular medications maximize patient health, well-being, and quality of life (see Chapters 11–13).

Other clinical conditions associated with atherosclerosis

Acute aortic syndrome

Atherosclerotic plaque rupture can occur throughout the cardiovascular system. An increased cardiovascular risk factor profile can precipitate plaque formation leading to CAD, acute aortic syndrome (AAS) and peripheral artery disease.

Cardiovascular risk factors include family history of cardiovascular disease (such as CAD, cerebrovascular disease, and aortic aneurysm), early onset of cardiovascular disease in a first-degree relative aged 55 years or younger, and premature cardiovascular-related death. Patients' risk factors include history of high blood pressure, diabetes, hypercholesterolaemia, smoking, kidney disease, poor dietary habits, and sedentary lifestyle.

AAS is caused by a tear in the aorta that allows infiltration of the blood from the cardiovascular lumen into the media.⁴⁹ This causes aortic dissection. Aortic dissection has been classified into types I, II, and III or type A and type B.^{49,50} It is a life-threatening condition. Patients with aortic dissection are likely to present with sudden and severe onset of chest pain, described as a 'ripping' or 'tearing' which radiates into the interscapular area. In patients presenting with symptoms suggestive of aortic dissection, the likelihood of AAS should be evaluated. This is dependent on several factors: pre-existing conditions (e.g. family history, known existing aortic aneurysm or valve disease, previous aortic surgery, and connective tissue disorders), pain characteristics as previously described, and 'red flag' findings on clinical examination. These include systolic pressure discrepancy, focal neurological deficit, and shock.

A definitive diagnosis is obtained by medical imaging such as a computed tomography scan. Once the diagnosis has been confirmed, patients should undergo immediate emergency surgery. As haemodynamic instability is frequently present, careful monitoring of baseline observation is required. Chest pain caused by AAS is severe: nursing care should be holistic, providing adequate analgesia and comfort to the patient and their relatives.

Peripheral artery disease

Peripheral artery disease encompasses all arterial disease: cerebrovascular disease, upper and lower extremities artery disease, mesenteric artery disease, and renal artery

disease.⁵¹ Patients with acute plaque rupture will present with different symptoms, based on the territory affected.

An inflammatory response and thrombus formation in the cerebral circulation may lead to a stroke or transient ischaemic attack. Patients may present with focused neurological symptoms such as unilateral weakness of upper and lower limbs, slurred speech, and blurred vision. The acronym FAST (Facial drooping, Arm weakness, Speech difficulties, Time to call for medical help)^{52,53} is used to help with the diagnosis of stroke. Patients presenting with symptoms suggestive of stroke should undergo brain imaging as soon as possible with a non-enhanced computed tomography scan. This will guide the ongoing management of the patient which may include thrombolysis or thrombectomy.⁵³

Patients presenting with suspected transient ischaemic attack should receive immediate antiplatelet therapy (aspirin 300 mg, unless contraindicated) with subsequent specialist advice and consideration for magnetic resonance imaging to assess any level of ischaemia or detect any haemorrhage.⁵³

The nursing care for patients presenting with symptoms suggestive of stroke should include a baseline assessment of vital signs and continuous monitoring of level of consciousness. Stroke can be a life-changing event and the nursing care of patients with subsequent permanent weakness should include careful physical and psychological support.

Family members should be included in the cardiovascular prevention and rehabilitation programme and this should begin as soon as the patient has overcome the acute presentation.

Other clinical conditions associated with the cardiovascular system are listed in ► **Box 6.2**. Many of these are covered in other chapters in this book.

In summary, nurses and allied health professionals play a key role in caring for patients presenting with cardiovascular disease. Early recognition and management of an acute syndrome will improve survival rates.^{4,5} A holistic approach to patient care is important to improve care quality and the inpatient hospital experience.

Conclusion

This chapter has presented the anatomy and physiology of the coronary arteries, with associated pathophysiology. The mechanisms involved in the atherosclerotic plaque formation were described and the chapter illustrated how risk factors contribute to atherosclerotic plaque rupture

Box 6.2 Clinical conditions associated with the cardiovascular system

- Upper and lower extremity artery disease.
- Mesenteric artery disease.
- Renal artery disease.
- Diseases of arteries and veins: venous insufficiency and thromboembolism.
- Aortic dissection.
- Hyperlipidaemia.
- Hypertension: primary and secondary.
- Hypotension: dizziness and syncope, and postural.
- Dyspnoea: orthopnoea and paroxysmal nocturnal dyspnoea.
- Palpitations.
- Disorders of heart wall: pericardium, myocardium, and endocardium.
- Valve disease: aortic stenosis, mitral stenosis, and infective endocarditis.
- Shock: impairment of cellular metabolism and organ dysfunction.

and coronary ischaemia. Coronary ischaemia can manifest in several different ways, as illustrated in the case studies, requiring a systematic approach to patient assessment. This approach includes history taking, 'end-of-bed assessment', and nursing and medical management of patients. Each patient with ACS requires angiography: the different options for reperfusion therapy were presented. In patients with STEMI, timing is of the essence and reperfusion should be achieved within 120 minutes of first diagnostic ECG.⁴⁵ In patients with NSTEMI and UA, timing of reperfusion will depend on risk stratification: ongoing symptoms, ECG changes, and the likelihood of a further event.⁴⁵

Finally, other diseases associated with the cardiovascular system were outlined with greater emphasis on AAS⁵⁰ and cerebrovascular events.⁵³ Diagnosis of these life-threatening and life-changing conditions is based on clinical findings and confirmed by computed tomography. Prompt surgical, pharmacological, or invasive intervention will improve survival and quality of life. Other less common conditions that can cause angina include syndrome X—a condition in which microvascular dysfunction causes angina in patients with epicardial coronary arteries that appear to be normal on angiography.

Nurses play a key role in the health professional team providing care to patients and those close to them. The role of the nurse in cardiology settings varies considerably across different countries. An advanced level

of technical knowledge is required for nurses working in today's healthcare organizations, which needs to be balanced alongside the provision of empathic and compassionate care.

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7 Care of the patient with cardiac arrhythmias

GERALDINE LEE, NINA FÅLUN, NEIL ANGUS, JEROEN HENDRIKS,
TONE M. NOREKVÅL, SELINA KIKKENBORG BERG,
AND DONNA FITZSIMONS

CHAPTER CONTENTS

Introduction 180

Epidemiology and pathophysiology 180

Clinical presentation 180

Signs and symptoms 180

Diagnostic tests and differential diagnosis 181

Electrocardiographic monitoring 182

Bradyarrhythmias—diagnosis, treatment, care, and prevention 186

Tachyarrhythmias—diagnosis, treatment, care, and prevention 193

Patient experience of living with an arrhythmia 199

Catheter ablation 200

Temporary cardiac pacing 200

Permanent cardiac pacing 200

Implantable cardioverter defibrillators 200

Surgical procedures 202

Evaluation, discharge home, and follow-up 202

Example—follow-up and outpatient care of patients with atrial fibrillation 202

Stroke prevention in atrial fibrillation 203

Self-care, patient education, and health 205

Risk factors 205

Prevention 205

Implantable cardioverter defibrillator—education and psychoeducation 205

Cardiovascular prevention and rehabilitation 206

Implantable cardioverter defibrillator 206

Palliative care 206

Implantable cardioverter defibrillator—deactivation discussions 206

Conclusion 207

This chapter discusses the care of patients with cardiac arrhythmias. It describes the different types of arrhythmias, their treatment, and nursing priorities for patient care.

KEY MESSAGES

- Cardiac arrhythmia is a common complication of acute coronary syndrome, cardiomyopathy, and inherited cardiac conditions. Other regulatory imbalances such as electrolyte disturbance, thyroid dysfunction, or drug interactions can also predispose to arrhythmias.
- Patients can be asymptomatic, but in many cases palpitations, dyspnoea, chest pain, or syncope are experienced. Some arrhythmias can be life-threatening and require emergency intervention.
- Cardiac monitoring and interpretation of the 12-lead electrocardiogram is the cornerstone of diagnosis.
- The psychosocial impact and lifestyle implications of cardiac arrhythmia can be challenging for patients

and their families and nursing care should focus on education and support to facilitate shared decision-making and adherence to selected therapies.

Introduction

The term cardiac arrhythmia refers to any rhythm that is not sinus rhythm and because the electrical conduction through the heart is affected, they can reduce the cardiac output with serious consequences for the patient. The main types of arrhythmias are:

- Atrial fibrillation (AF).
- Supraventricular tachycardia (SVT).
- Bradycardia (defined as a heart rate <50 beats per minute (bpm)).
- Heart block, where there is a conduction delay or impedance in the atrioventricular (AV) conduction pathway.
- Ventricular fibrillation (VF), which fortunately is rare but can be fatal.

Arrhythmias can present in isolation or with acute events, such as a myocardial infarction, or acute coronary syndrome (ACS) and can originate in the atria or in the ventricles. Depending on their location, they can be deemed asymptomatic/non-urgent (i.e. the person feels unwell, but their cardiac output is not significantly compromised) or life-threatening (i.e. they significantly impact the cardiac output and unless resolved immediately, lead to cardiac arrest). Therefore, early diagnosis is important, especially in the presence of other cardiac-related pathologies and for many, once detected and treated, patients can lead a normal life.

Epidemiology and pathophysiology

Arrhythmias are a common cardiovascular complaint, generally associated with older age and often in those with other cardiovascular conditions such as coronary heart disease or valvular disease.¹ However, they also occur in younger people, in particular SVTs. In the UK, there are approximately 2 million people living with an arrhythmia and although they can affect any age group, they tend to be predominantly in older people, especially in those with coronary heart disease.¹ While historic estimates suggest that up to 90% of patients with ACS will experience an arrhythmia in the peri-infarct period,² the incidence of

life-threatening arrhythmias in the early period following ACS has decreased in recent decades. This improvement is attributed to widespread availability of effective revascularization strategies, including thrombolysis and percutaneous coronary intervention, as well as increased use of beta-blockers.³

The majority of arrhythmias are caused by conduction abnormalities in the AV pathway. These arrhythmias can be as a result of another cardiac condition that causes structural and electrical changes to occur within the heart, or they can be genetic abnormalities, associated with channelopathies and abnormal conduction pathways. Therefore, the management of the arrhythmia relies on a thorough history taking, clinical assessment, 12-lead ECG, and other diagnostic tests to confirm the diagnosis and to determine the best possible treatment for each individual. The normal conduction system and heart rhythm have been outlined in Chapter 4.

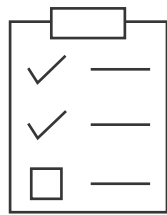
Clinical presentation

The presentation of an arrhythmia varies depending on the particular rhythm disturbance and whether the patient has a history of coronary heart disease, heart failure, or underlying valvular disease. A patient presenting with an acute myocardial infarction, for instance, may experience heart block and thus obtaining an accurate history, undertaking a thorough clinical assessment, and performing a 12-lead ECG is important in determining the underlying pathology (see also Chapter 4). Some people, especially those with AF or atrial flutter, may have experienced no symptoms and often the detection of the arrhythmia is an incidental finding.

There are key questions to ask at the time of presentation, as shown in ► Fig. 7.1.

Signs and symptoms

With the tachyarrhythmias described previously (AF, SVT), some people will complain of feeling their heart beating very fast and having chest discomfort. If it is their first time with symptoms, especially of SVTs, many mistakenly believe they are having a heart attack, as they may experience chest pain. Other symptoms include feeling light-headed or breathless, being tired, and feeling nauseated. In terms of signs, people present with tachycardia, hypotension, tachypnoea, polyuria, diaphoresis, and nausea/vomiting. They may be pale and anxious, especially if they have never had symptoms



What were you doing when your symptoms started?
 Is there anything you do that stops your symptoms?
 have you had similar episodes before today?
 if so, how often and how long did the symptoms last?



Do you have a diagnosed heart problem?
 Does anyone in your family have heart problems?



Do you have any chest pain?
 Do you feel dizzy, faint, or light-headed?
 Have you ever passed out/lost consciousness?



Do you take any prescribed/over-the-counter medications?
 Do you take any other drugs such as amphetamines, etc.?
 How many units of alcohol do you drink per day?

Fig. 7.1 Key questions to ask at the time of clinical presentation of an arrhythmia.

before. ► **Table 7.1** shows the common, uncommon, and rare symptoms reported by patients with SVTs and Fig. 7.1 is a useful guide when taking a history.

Those experiencing bradycardia or heart block may present with reduced conscious level and feel nauseous/vomiting, fatigued, short of breath, and light-headed. Some patients may present with syncope and it is imperative to determine if the cause is cardiac or non-cardiac (i.e. neurological). As well as recording heart rate, blood pressure, temperature, oxygen saturation, and respiratory rate as part of the clinical assessment, obtaining a 12-lead ECG is important. Taking a thorough clinical history is important and will assist in determining if the rhythm disturbance is due to an underlying cardiac pathology (see also Chapter 4 and Chapter 5).

Diagnostic tests and differential diagnosis

An understanding of the coronary blood supply and the cardiac conduction system and skills in basic ECG

interpretation are necessary for the assessment and effective management of arrhythmias in the acute setting (see Chapter 3). Accurate patient evaluation requires awareness of possible presenting signs and symptoms (► **Table 7.1**), thorough history taking, clinical assessment, timely review of a 12-lead ECG, and use of additional diagnostic tests (e.g. cardiac troponins) in order to confirm the diagnosis. Evaluation must be followed by prompt and appropriate intervention, based on the patient's haemodynamic status, in order to ensure optimal patient outcomes.

For those with suspected SVTs, a treadmill exercise may be useful to determine if the heart rate and blood pressure are a response to minimal exercise—this is especially valid in those with a reported low level of physical activity. As well as diagnostic testing, blood tests should be routinely considered to ensure there is no underlying pathology contributing to or causing the arrhythmia; these include a complete blood count, fasting blood glucose, and thyroid function screen (especially relevant in AF). To rule out any underlying valvular or structural heart disease, a transthoracic echocardiogram should be performed and this is a recommendation in those with AF as

Table 7.1 Most common symptoms during sustained SVT

Common	Uncommon	Rare
Chest discomfort or pressure	Chest pain	Asymptomatic
Dyspnoea	Diaphoresis	Tachycardiomyopathy
Light-headedness, dizziness, or presyncope	Nausea	Sudden death with WPW syndrome
Palpitations	Syncope	
Polyuria		

WPW, Wolff–Parkinson–White.
Katrītis DG, Boriani G, Cosio FG, et al. European Heart Rhythm Association (EHRA) consensus document on the management of supraventricular arrhythmias, endorsed by Heart Rhythm Society (HRS), Asia-Pacific Heart Rhythm Society (APHRS), and Sociedad Latinoamericana de Estimulación Cardíaca y Electrofisiología (SOLAECE). *Europace*. 2017 Mar 1;19(3):465–511. doi: 10.1093/europace/euw301. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

part of their initial assessment to ensure that the AF is not valvular AF.⁵ Electrophysiology studies need to be performed for those with tachycardias where the underlying mechanism is uncertain and in SVTs to determine if the SVT is a sinus node reentrant tachycardia or focal atrial tachycardia.

Electrocardiographic monitoring

ECG monitoring is one of the most valuable diagnostic tools in modern medicine. The main purpose of the monitoring of cardiac patients is to detect and treat adverse arrhythmias.⁶ It was introduced to intensive cardiac care units (ICCU) with specialized monitors and devices in the early 1960s.⁷ ‘A crucial advance, not only in coronary care but in hospital medicine generally, was giving nurses the responsibility for the detection and treatment of arrhythmias, including defibrillation’⁸. In the mid 1970s, in-hospital telemetries were introduced to European hospitals, and arrhythmia monitoring became less cumbersome. During the last four decades, portable telemetry monitoring has been widely used for in-hospital detection of arrhythmias in a diverse group of medical and surgical patients. Indeed, it is still a cornerstone of care in most

critical care settings, but definitive guidance regarding the indications, type and duration of monitoring are required.⁹

In-hospital continuous ECG monitoring

Types of cardiac monitoring and devices used

Continuous bedside monitoring of the ECG is automatic for all patients admitted to ICCUs and nurses bear significant responsibility for their management. While these provide a level of reassurance for the clinical team, the associated wires and noises can be anxiety provoking for the patient and careful education and reassurance is required to ensure patients understand the functionality and limitations of this intervention. The purpose of the continuous monitoring is (1) immediate recognition of sudden cardiac arrest to improve time to defibrillation; (2) to recognize deteriorating conditions that may lead to a life-threatening, sustained arrhythmia; (3) to facilitate management of arrhythmias even if not immediate life-threatening; and (4) to facilitate diagnosis of arrhythmias or cause of symptoms as syncope and palpitations and subsequent guide appropriate management.¹⁰

ECG transfer from ambulances to hospital

Acquisition of a prehospital 12-lead ECG in patients with suspected ST-elevation myocardial infarction is recommended to detect life-threatening arrhythmias and allow prompt defibrillation if indicated.

Holter monitoring

A Holter monitor is a small, wearable device that keeps track of the patient’s heart rhythm for up to 7 days. The main aim of the monitoring is to analyse the electrical activity of the heart outside of the clinical setting. A Holter monitor is most often used when a person experiences transient episodes of symptoms that might be explained by a heart rhythm disturbance.

Implantable loop recorder

An implantable loop recorder is a small electrophysiology device used for long-term monitoring of a patient’s heart electrical activity and is recommended when symptoms (e.g. syncope) are sporadic and suspected to be related to arrhythmia and when a symptom–rhythm correlation cannot be established by conventional diagnostic techniques. The implantable loop recorder is inserted just beneath the skin of the patient’s chest and can record heart rhythms for up to 3 years. It is continuously looping its memory and has automatic triggers to store recordings. The implantable loop recorder can also be patient activated.

Mobile cardiac telemetry devices

These provide real-time, outpatient pocket ECG monitoring for up to 30 days. ECG data are transmitted automatically via smartphones to a diagnostic laboratory where monitor watchers can notify physicians when significant arrhythmias occur. Mobile cardiac telemetry devices are used when in-hospital telemetry monitoring and/or Holter monitoring have failed to detect arrhythmia. More recent technology using skin patches has shown good preliminary results. There are also new ambulatory devices being trialled to detect AF including photoplethysmography that are worn on the wrist. Use of these new technologies has made detecting arrhythmias easier and faster and therefore has the potential to assist healthcare professionals to instigate the appropriate treatment more efficiently, although ethical issues need to be considered.

Clinical guidelines and practice standards

Diagnostic tools like resting 12-lead ECG, serial ECGs, or Holter monitoring are frequently suggested in European Society of Cardiology (ESC) Guidelines. However, continuous monitoring by telemetry to diagnose complex arrhythmias, detect early warning signals of potentially life-threatening events, or as follow-up after invasive treatment or surgery is rarely included. Overall, most ESC Guidelines do not have clear recommendations for appropriate use of continuous arrhythmia monitoring by in-hospital telemetry, even though telemetry monitoring

is widely used in non-critical care wards and the monitoring decreases the need for beds in intensive care units.⁹ However, in more recent ESC Guidelines, recommendations are included (► Table 7.2).

In order to make evidence-based decisions regarding the appropriate use of scarce resources such as monitoring, clinicians require guidance. In 2004, the American Heart Association (AHA) recognized this challenge and developed a comprehensive set of practice standards for in-hospital cardiac monitoring to help assess which patients were appropriate for admission to non-critical telemetry beds.¹¹ These were based primarily on expert opinions. Similarly, the 2017 update to the practice standards was developed using limited trial data.¹⁰ The AHA practice standards classify patients as follows: class I (monitoring should be performed), class II (monitoring reasonable to perform/may be considered), and class III (monitoring no benefit/not recommended). These practice standards are not limited to indications for telemetry only, but include recommendations for ST-segment and QT interval monitoring—as well as for patient care issues and recommendations on how telemetry should be organized and integrated into clinical practice. However, these recommendations do not seem commonly implemented in European hospitals.

Inappropriate telemetry monitoring is common in most clinical settings. Lack of guidance, time, and resources may result in non-adherence to guidelines and inadequate arrhythmia surveillance—with both over- and

Table 7.2 ESC Guideline recommendations: indications for in-hospital ECG monitoring

Indication	Recommendations	Class	Level
Syncope ¹	Immediate in-hospital monitoring (in-bed or by telemetry) is indicated in high risk patients	I	C
STEMI ²	It is indicated that all STEMI patients have ECG monitoring for a minimum of 24 hours	I	C
NSTEMI	NSTEMI at low risk for cardiac arrhythmias ≤ 24 hours	*ND	*ND
	NSTEMI at intermediate or high risk for cardiac arrhythmias ≥ 24 hours	*ND	*ND
Atrial fibrillation and stroke ³	In patients with TIA or ischemic stroke, screening for AF is recommended for short term ECG monitoring (followed by continuous ECG monitoring for at least 72 hours)	I	B

*ND, not defined.

1: 2018 ESC Guidelines for the diagnosis and management of syncope

2: 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with ST-segment elevation

3: 2016 ESC Guidelines for the management of atrial fibrillation

under-monitoring. Often, concern for clinical deterioration rather than a concern for development of arrhythmias influences telemetry ordering and guidelines adherence.¹² This may cause inconsistent monitoring, which has the potential to compromise patient safety and care outcomes.

Monitor stations and electronic ordering systems

Management of patients at risk of serious arrhythmias is a joint collaboration between nurses and physicians in ICCUs and in medical and surgical wards. The monitor station is usually located in intensive care units and administered by dedicated monitor watchers. Intensive care and cardiac nurses are key professionals who respond to device alarms and manage central monitor stations. Alarms released from multiple telemetry units must be recognized, interpreted, and used to guide appropriate treatment in a timely manner. Accordingly, calling the central ICCU monitor station regarding ward interventions when complex arrhythmias are reported is important feedback.¹³ It is debatable whether it is advantageous to use dedicated monitor watchers. Using dedicated monitor watchers is resource demanding and it is unknown whether it improves patient outcomes. However, when nurses fail to interpret ECG monitoring data, it may cause inconsistent monitoring, which also potentially compromises patient safety.⁹ Telemetry is a powerful tool for real-time monitoring of a patient's heart rhythm. Nevertheless, the number of telemetries available is a limited resource in most hospitals. Computerized order entry systems, usually based upon hospital-driven protocols derived from the AHA practice standards, are

increasingly used to reduce inappropriate telemetry surveillance. To order telemetry, physicians must select an indication for monitoring. This order must be revised within predefined timeframes for each telemetry indication. Giving nursing staff assessment tools to discontinue telemetry when appropriate, the average numbers of patients monitored by telemetry is proven to be decreased with up to 70% and the average length of stay on telemetry to be reduced from 58 to 31 hours.¹⁴

Arrhythmia monitoring

Most common arrhythmias observed by in-hospital telemetry are AF or atrial flutter, and non-sustained VF. Patients pre-diagnosed with heart failure, arrhythmias, chest pain, and syncope of suspected cardiac origin at hospital admission have the most frequent event rate.¹³ Arrhythmias of any kind are revealed in 24–33% of patients monitored by telemetry, of which up to 10% are potentially life-threatening events.¹⁵ The mortality rate in monitored patients is low, as 1.7–4.0% of the monitored population dies before hospital discharge. Nevertheless, in-hospital telemetry monitoring is proven to be an independent and strong predictor of survival of cardiac arrest before hospital discharge.¹⁶ Arrhythmia detection is reported to affect clinical change of management in 7–18% of all patients monitored.¹³ Compliance with recommendations for length of stay on telemetry according to the AHA practice standards is inconsistent, and both over- and under-monitoring is frequently reported.

Accurate electrode positioning is a crucial skill in cardiovascular nursing (► Fig. 7.2). Ensuring consistent lead placement over time is crucial to avoid changing the QRS

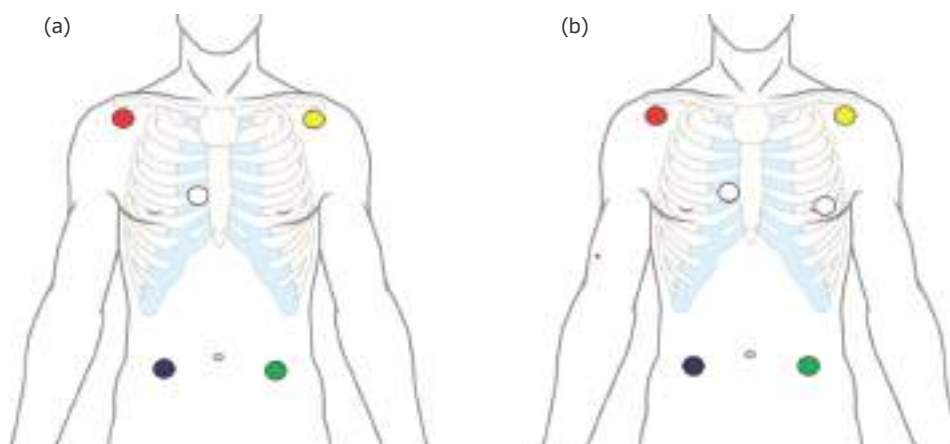


Fig. 7.2 (a) ECG standard five-lead placement. (b) ECG standard/HEXAD six-lead placement.

morphology and thereby cause a potential misdiagnosis. In a critical care unit, the bedside cardiac monitor (oscilloscope) provides a continuous display of the patient's heart rhythm. It is important to select the correct monitoring leads for arrhythmia identifications, usually lead II to diagnose atrial activity and measure heart rate. At the monitor station, two leads will be screened, usually lead II and a second lead, V2 or V5, to distinguish between arrhythmias and artefacts and to track variation in ST-segment elevation. The Mason–Likar ECG configuration includes limb position (shoulders and hips) and one or two precordial electrodes (V1 and/or V5) (► Fig. 7.2). Mispositioned arm electrodes attached closer to the heart or sternum, or mispositioned precordial leads (V) attached closer to the heart, may change QRS morphology resulting in misdiagnosis of arrhythmias and ischemia.¹³ Both the limb electrodes and the V electrodes are frequently mispositioned. Overall, 26–38% of the electrodes are reported to be mispositioned incorrectly in clinical practice.^{6,14,17}

Cardiac nurses also raise the quality of arrhythmic surveillance by properly preparing the skin in male patients and thorough hair clipping at electrode sites. Low adherence to this recommendation can be a major problem, since electrically noisy signals due to poor electrode attachment produce artefacts that can simulate ventricular tachycardia (VT) and lead to subsequent inappropriate treatment.¹¹ Changing electrodes every 48 hours at a minimum, or as recommended by the manufacturer, is important. It is a class IC recommendation in the 2017 update to the AHA practice standards. Cleaning the electrode area with soap and water to remove skin oils and debris and drying it prior to electrode placement has a class IB recommendation. A non-adherence practice might affect telemetry monitoring. Electrodes may dry out or be disconnected from the patient, increasing electrical impedance, in turn reducing signal quality. Standardization of skin preparation procedures improves electrical conduction, reduces artefacts, and leads to fewer false alarms.^{9,10}

Medical equipment shared between different wards and patients is a potential source of nosocomial infections. Telemetry units are frequently shared among different wards and patients. Therefore, disposable protection covers it is crucial for decreasing potential contamination. Disposable ECG lead wires are also recommended. Usually, nurses spend an average of 20 minutes per patient per day on telemetry maintenance, including changing batteries, addressing alarms, and notifying clinicians.¹² Nurses must have a high level of knowledge of and skill in telemetry monitoring to respond appropriately when arrhythmias occur. In many countries, master's degree programmes in

cardiac or intensive care nursing education include heart rhythm interpretation in their curriculum. However, there is a paucity of in-hospital educational programmes in cardiac monitoring.

Alarm fatigue

Alarm fatigue is defined as being immune and desensitized by the noise caused by technical support and devices within hospital units.¹⁸ In the last decade, the number of devices with alarms in hospital settings has increased exponentially. Alarms are released from equipment as monitors, ventilators, infusion pumps, feeding pumps, and pulse oximeters. The audible alarm burden for one bed in an ICCU is estimated to 187 per day. ECG monitors are identified as the alarm source in 37% of all alarms in an ICCU.¹⁹ Alarms were intentionally created to enhance patient safety, but now alarms have become an urgent patient safety issue themselves. The overwhelming numbers of false alarms contributes to alarm fatigue and thereby create safety issues. Nurses might ignore alarm signals, turn down the volume, adjust the alarm setting, or deactivate alarms, compromising patient safety. Monitor alarms are intentionally set for high sensitivity, with numerous false alarms as a result, causing alarm fatigue. Eliminating unnecessary telemetry monitoring in patients and discontinuing monitoring when it is no longer clinically indicated might decrease this alarm burden and reduce serious events related to alarm fatigue. The sensory overload when nurses are exposed to excessive numbers of alarms might lead to both desensitization and missed alarms and challenge patient safety. Implementing off-site central monitoring by monitoring technicians may reduce the high alarm burden related to on-site monitoring of non-critically ill patients.

Patient information and support

It has long been recognized that most patients monitored consider non-invasive devices and telemetries as a source of discomfort and anxiety, and up to 60% do not receive any explanation on in-hospital monitoring.²⁰ It is important to inform the patient that the monitor is only reading their heart rate and they must inform the cardiac nurses if they experience symptoms including chest pain, palpitations, or breathlessness. Some patients might find the arrhythmia surveillance quite daunting. Placing a telemetry unit with associated wires on a patient's chest is reported to cause sleep disturbances and to exacerbate a patient's delirium.²¹ Accordingly, information should be tailored to the needs of the patient's age, hearing ability,

and cognitive level.⁶ Several factors have been identified that disrupt the proper flow of information in a healthcare setting, thus affecting optimal delivery of the information patients need. Often, telemetry monitoring is initiated as the patient arrives in the coronary care unit. The environment at arrival is typically hectic, with multiple interruptions as nurses are multitasking to meet the needs of all patients in their care. This may lead to inadequate delivery and receipt of important information. Furthermore, failure in communicating relevant and sufficient information at patient handover between shifts may reduce the quality of information given to patients.

Nurses play a key role in the monitoring and diagnosis of cardiac arrhythmia. In ► **Table 7.3** we provide an overview of common cardiac arrhythmias with associated rhythm strips, characteristics of diagnosis, symptoms, and potential treatments. These will be expanded in more depth later in the chapter. The primary aim of arrhythmia management is to restore normal sinus rhythm when possible, although patients displaying signs of haemodynamic compromise or circulatory collapse will require immediate intervention with the aim of controlling ventricular rate and optimizing cardiac output.²² A range of pharmacological and electrical interventions including synchronized cardioversion, cardiac pacing, and defibrillation may be indicated. In the acute setting, patients with arrhythmias may be completely asymptomatic with uncompromised cardiac output. However, arrhythmia onset may in some instances lead to significant reductions in cardiac output and result in a high risk of life-threatening patient deterioration (see also Chapter 5).

Bradyarrhythmias—diagnosis, treatment, care, and prevention

Bradycardia is defined as a heart rate less than 50 bpm and occurs in up to 18% of patients with ACS.²³ Patients with bradycardia are often asymptomatic and normotensive and no treatment is required. Furthermore, endurance athletes often have a resting heart rate less than 50 bpm with no clinical sequelae noted. However, slow heart rates resulting from myocardial infarction or ischaemia may require prompt pharmacological or electrical intervention particularly if signs of haemodynamic compromise are evident.

Sinus bradycardia

In the acute cardiac patient, sinus bradycardia is seen most often in inferior myocardial infarction, as it is the right coronary artery that provides the sinoatrial (SA)

node blood supply in most people. This rhythm disturbance is often transient, occurring in the first few hours of an infarct and typically resolving in the first 24 hours. An increase in vagal tone due to nausea and pain may contribute to sinus bradycardia, so these symptoms should be adequately treated as a priority. If a patient has received beta-blockers, calcium channel blockers, or digoxin in the pre-infarct period this may also explain sinus bradycardia, so it is important to obtain and carefully evaluate the patient's medication history. When there is evidence of haemodynamic compromise, with symptoms such as dyspnoea, dizziness, hypotension (systolic blood pressure <90 mmHg), or if ischaemic ECG changes are noted, then sinus bradycardia can be treated initially by judicious administration of intravenous atropine in small doses (0.5–1 mg).²⁴ This may be sufficient to improve symptoms and atropine can be administered, in repeated doses, up to a maximum total of 3 mg. It should be noted that atropine administration may cause reflex tachycardia thereby increasing myocardial oxygen demand and intensifying any underlying ischaemia. If bradycardia and associated haemodynamic compromise persist despite administration of atropine, then temporary cardiac pacing may occasionally be indicated.

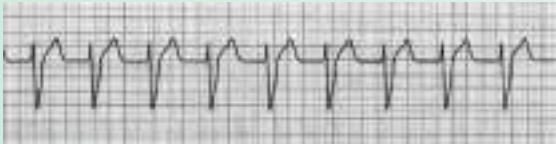
Junctional rhythm

If the SA node fails to generate the impulses needed to stimulate cardiac contraction, then cells in the atrioventricular (AV) node area may assume the role of pacemaker. Cardiac rhythms originating in the AV node region are described as junctional rhythms. AV nodal impulses may be conducted in a retrograde (backwards) or antegrade (forwards) direction through the ventricular bundle branches. When retrograde conduction occurs, inverted P waves may be seen immediately following QRS complexes, the reverse of normal conduction. On occasion, QRS complexes may mask P waves. Junctional rhythms typically have a rate of around 50 bpm and QRS complexes are narrow.

Idioventricular rhythm

Idioventricular rhythm (IVR) occurs when an area other than the SA or AV node takes over as pacemaker. Widened QRS complexes are visible on the ECG. IVR is referred to as an 'escape' rhythm in which contractile impulses originate at ventricular level. IVR is typically of short duration and associated with a heart rate of 40 bpm or less. As with other bradyarrhythmias, treatment is determined by consideration of the underlying cause and assessment of any associated symptoms. In the acute setting,

Table 7.3 Arrhythmia types

Type of arrhythmia	Characteristics of diagnosis	Symptoms	Treatment
Sinus bradycardia  (1)	Regular bradycardia with resting ventricular rate <50 bpm P waves with constant morphology precede every QRS complex P waves positive in limb lead II	Increase in vagal tone due to nausea and pain Dyspnoea Dizziness Hypotension	Administration of 0.5–1 mg of intravenous atropine, up to a maximum of 3 mg
Junctional rhythm  (2)	Rate of around 50 bpm QRS complexes are narrow AV node impulses may be conducted in retrograde (backwards) or antegrade (forwards) Retrograde—inverted P waves may be seen immediately following QRS complexes	Can be due to bradycardia and/or loss of AV synchrony Light-headedness Palpitations Effort intolerance Chest heaviness Dyspnoea	Cardiac pacing in symptomatic patients
Idioventricular rhythm  (3)  (4)	Widened QRS complexes visible on ECG IVR of short duration Heart rate of ≤ 40 bpm	Acute setting—accelerate IVR (heart rate 100–120 bpm) may occur	Treatment determined by consideration of the underlying cause and assessment of associated symptoms

(continued)

Table 7.3 Continued

Type of arrhythmia	Characteristics of diagnosis	Symptoms	Treatment
First-degree AV block  (1)	PR interval is prolonged (>200 ms) Heart rate often normal (60–100 bpm) Conduction of atrial impulses is delayed at the level of the AV node Heart rhythm remains regular, with a QRS complex following each P wave	May be asymptomatic or if ventricular rate is slow may have symptoms of bradycardia	Generally well tolerated and often does not require treatment. If prolongation of the PR is extreme (>440 ms) and patient is symptomatic cardiac pacing may be required Any electrolyte imbalances should be corrected
Second-degree AV block—Mobitz type I  (1)	Progressive lengthening of the PR interval over several cardiac cycles prior to an atrial impulse being completely blocked at the AV node level On the ECG when an atrial impulse is blocked, a P wave is visible but no QRS complex follows Ventricular rate is irregular The heart rate may be low to normal (40–70 bpm)	May be asymptomatic; however, slow or irregular ventricular rates may cause chest pain and symptoms of bradycardia	Tends to be transient and treatment may not be necessary In cases with haemodynamic compromise, administration of intravenous atropine or temporary cardiac pacing may be necessary
Second-degree AV block—Mobitz type II  (1)	Variable non-conduction of atrial impulses There is no preceding lengthening of the PR interval Dropped beats may follow a regular or irregular pattern and this block occurs below the level of the AV node in the AV bundle or one or more of its distal branches	Fatigue Dyspnoea Hypotension Reduced cardiac output—pallor, diaphoresis Chest pain Syncope Sudden cardiac arrest	Atropine may be given to increase the heart rate in symptomatic patients Cardiac pacing will be required because of the increased risk of clinical deterioration with progression to complete heart block or asystole
Third degree (complete) AV block  (1)	Effectively no transmission of electrical impulses between atria and ventricles See text for further characteristics depending on the location of the escape rhythm	Symptomatic hypotension Light-headedness Dizziness Syncope Fatigue Chest pain Asystole	In complete AV block (with no ventricular escape rhythm) asystole will occur and the patient will require immediate resuscitation Cardiac pacing is likely to be required Depending on myocardial damage, a permanent pacemaker may be required

Asystole



(1)

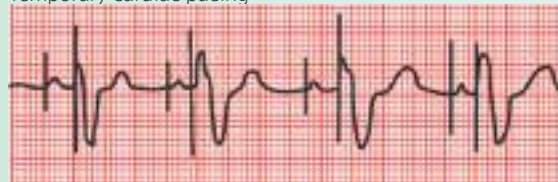
In asystole, all functional myocardial activity has ceased

In practice, asystole may be preceded by the occurrence of a bradyarrhythmia or a degree of heart block

Possible secondary conditions include hypoxia, hypovolaemia, hypothermia, hyperkalaemia or hypokalaemia, metabolic disorders, thrombosis, tension pneumothorax, cardiac tamponade, and toxins

In patients with viable myocardium, it may be possible to establish effective cardiac pacing via transcutaneous, transoesophageal, or endocardial routes—though clinical outcomes in this patient group are generally very poor

Temporary cardiac pacing



(5)

Probably better omitted as not an arrhythmia but a treatment for other arrhythmias

Probably better omitted as not an arrhythmia but a treatment for other arrhythmias

Probably better omitted as not an arrhythmia but a treatment for other arrhythmias

Sinus tachycardia



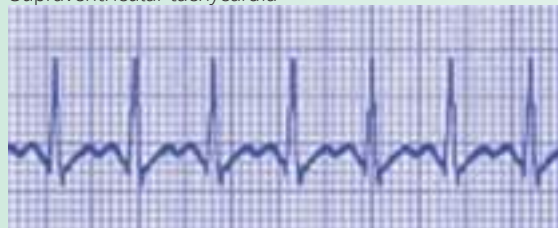
(1)

Increase in sympathetic nervous system activity caused by pathological stressors such as myocardial ischaemia and low cardiac output

Hypotension
Shock
Dyspnoea
Signs of pulmonary congestion or heart failure

Beta-blockers or calcium channel blockers to heart slow rate
Ablation procedures if inappropriate and persistent

Supraventricular tachycardia



(1)

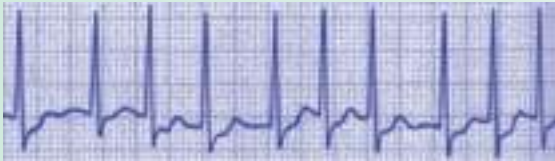
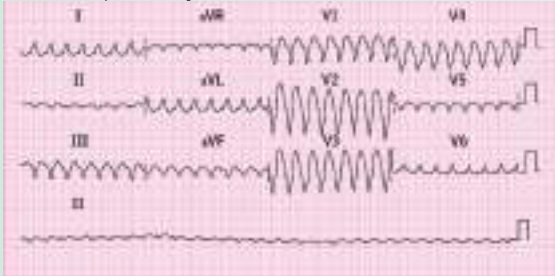
QRS complexes are usually narrow (0.04–0.12 sec)
SVT often has a rapid, regular rhythm although this may be irregular if AF or atrial flutter is present

Palpitations
Sensation of rapid, racing heart
Dizziness
Chest pain
Dyspnoea
Diaphoresis
Syncope

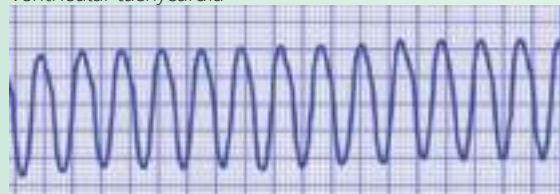
Carotid sinus pressure
Vagal manoeuvres
Cardioversion
Medicines—adenosine, beta-blockers, calcium channel blockers, antiarrhythmic agents

(continued)

Table 7.3 Continued

Type of arrhythmia	Characteristics of diagnosis	Symptoms	Treatment
Paroxysmal atrial tachycardia  (2)	Rapid heart rate of 160–220 bpm P waves are usually regular and identical in shape, suggesting a single point of origin, but on examination of the ECG these may be inverted on lead II signalling an abnormal atrial origin	Dizziness Palpitations Chest pain Dyspnoea	If the patient is stable, vagal stimulation may be successful in terminating the arrhythmia Adenosine may be given to try and terminate the arrhythmia In more persistent and troublesome cases, antiarrhythmic medication or ablation therapy may be indicated
Atrial fibrillation  (1)	AF can present as a narrow complex tachycardia Heart rhythm is always irregularly irregular If there is aberrant conduction AF will present as a broad complex tachycardia Rapid heart rate No discernible P waves are visible on the ECG	Irregularly, irregular pulse Palpitations Fatigue Dyspnoea Hypotension Chest pain	Complex management covering five treatment domains. See main text for details
Broad complex tachycardia  (6)	QRS complex >120 ms Caused by ventricular conducting system not functioning (bundle branch block) or AV node dysfunction. May be supraventricular or ventricular in origin	Depend on the haemodynamic consequences of arrhythmia rather than its origin. May cause: Dizziness Palpitations Chest pain Heart failure Syncope	If patient is unstable: Life support as appropriate Identify/treat reversible causes Synchronized direct current shocks Amiodarone

Ventricular tachycardia



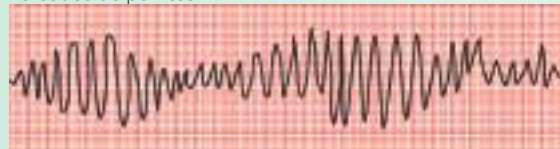
(1)

VT should be strongly suspected if the ventricular rate exceeds 100 bpm (often higher) and QRS complexes are widened with an abnormal shape or when there is dissociation between atrial and ventricular activity or when fusion beats are present

Dramatically reduced cardiac output
Altered or lost consciousness
Risk of developing pulmonary oedema, heart failure, and cardiogenic shock

If there is loss of consciousness due to reduced cardiac output, immediate defibrillation is indicated
Haemodynamically stable patients may be treated with intravenous antiarrhythmic agents with amiodarone being the drug of choice
Patients may require cardioverter defibrillator implantation

Torsades de pointes



(5)

Polymorphic QRS complexes that move about the isoelectric baseline of the ECG producing a spindle-shaped pattern
Often associated with a prolonged QT interval

Palpitations
Dizziness
Nausea
Diaphoresis
Chest pain
Dyspnoea
Hypotension
Syncope

Intravenous magnesium administration
A beta-blocker, not sotalol as it increases the QT interval, or cardiac pacing may also be beneficial
Antiarrhythmics must be avoided as they tend to prolong the QT interval and may worsen the condition

Ventricular fibrillation



(1)

VF is characterized by chaotic and irregular ventricular activity with deflections of variable height and width visible on the ECG
No QRS complexes are identifiable
Myocardial muscle contraction is absent
Cardiac output ceases

Rapid loss of consciousness
Pulseless

Application of basic and advanced life support
Early defibrillation

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(2) Reproduced from Myerson, S., Choudhury, R., & Mitchell, A. (Eds.), Emergencies in Cardiology. Oxford, UK: Oxford University Press 2009 with permission from Oxford University Press.

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(5) Reproduced from Thomas, J., & Monaghan, T. The cardiovascular system. In Oxford Handbook of Clinical Examination and Practical Skills. Oxford, UK: Oxford University Press 2014, with permission from Oxford University Press.

(6) Reproduced from Wilkinson, I., Raine, T., Wiles, K., Goodhart, A., Hall, C., & O'Neill, H. Oxford Handbook of Clinical Medicine. Oxford, UK: Oxford University Press 2017 with permission from Oxford University Press.

typically in the first 24 hours following myocardial infarction, accelerated IVR (heart rate 100–120 bpm) may occur. This is thought to be the result of reperfusion of ischaemic myocardial tissue. It is generally transient and well tolerated by patients.²⁵

Atrioventricular (heart AV) block

In healthy people, electrical impulses produced by the SA node spread across the atria resulting in depolarization and contraction of the atrial muscle. Thereafter, impulses are conveyed via the AV node and bundle branches and result in coordinated ventricular depolarization and contraction. AV block occurs when there is a delay or failure in the conduction of electrical impulses needed to stimulate ventricular contraction. This can occur at the level of the AV node or further down the conduction system. It may be transient or permanent. The epidemiology of AV block, otherwise known as heart block, is much harder to quantify and many cases are undiagnosed until the patient presents with another, often related complaint. There are several types including first-degree, second-degree, and third-degree heart block; in addition, congenital heart block, where the incidence of congenital AV block has been reported at between 1 in 15,000 and 1 in 20,000 births.²⁶ For some patients, there are no symptoms and it is thought that a percentage of the population has first-degree heart block. However, for those associated with cardiovascular conditions such as coronary heart disease, heart failure, or valvular disease, the patient may be extremely symptomatic and require urgent intervention (see Chapters 6, 8, and 10).

In the acute setting, AV block may be a consequence of medicines that slow or impair AV node conduction, for example, beta-blockers, digoxin, or calcium channel blockers. Myocardial ischaemia, infarction, and electrolyte imbalances such as hyperkalaemia may also cause AV block. In inferior infarction, AV block is most likely to arise at the level of the AV node. In anterior infarction, the development of AV block is generally at the level of the AV bundle or branches (fascicular block). When assessing AV block, the PR interval on the ECG is measured. The PR interval represents the time taken for electrical impulses to travel between the SA node and the ventricles prior to ventricular contraction. A normal PR interval is between 0.12 and 0.2 seconds (3–5 small squares on the ECG). Prolongation of the PR interval indicates AV block.

First-degree AV block

In first-degree block, the PR interval is prolonged (>200 milliseconds) although the heart rate is often normal (60–100 bpm). Conduction of atrial impulses is delayed at the level of the AV node. The heart rhythm remains regular with a QRS complex following each P wave. First-degree block is generally benign and well tolerated by patients; however, in the acute context, the patient should be continuously monitored as there is a risk of progression to second- or third-degree block.

Second-degree AV block

Second-degree block has two variants, Mobitz type I (Wenckebach) and Mobitz type II AV block, each with distinctive characteristics. In Mobitz type I block there is progressive lengthening of the PR interval over several cardiac cycles prior to an atrial impulse being completely blocked at the AV node level. On the ECG, when an atrial impulse is blocked a P wave is visible but no QRS complex follows. The ventricular rate is irregular but usually follows a predictable pattern of dropped beats. The heart rate may be low to normal (40–70 bpm) with the patient's symptoms and haemodynamic stability being determined by the ventricular rate.

Mobitz type II AV block is characterized by variable non-conduction of atrial impulses. There is no preceding lengthening of the PR interval. Dropped beats may follow a regular or irregular pattern and this block occurs below the level of the AV node in the AV bundle or one or more of its distal branches. This form of AV block is less common than Mobitz type I block but is more likely to be associated with extensive anteroseptal myocardial damage and haemodynamic instability. In Mobitz type II AV block, there is an increased risk of progression to third-degree (complete) heart block.

If the cause is thought to relate to the action of medicines on the AV node, these can be stopped. This type of block is usually transient, with minimal haemodynamic impairment. It tends to resolve within a few days; however, in cases where haemodynamic compromise or instability is evident, then administration of intravenous atropine or temporary cardiac pacing may be necessary. For Mobitz type II, in the acute setting atropine may be given to increase the heart rate in symptomatic patients. Cardiac pacing will also be required because of the increased risk of clinical deterioration with progression to complete heart block or asystole.

Third-degree (complete) AV block

In complete heart block, there is effectively no transmission of electrical impulses between atria and ventricles. If a focus (or foci) near the AV node takes over as pacemaker, the resulting escape rhythm may sustain adequate ventricular contraction and cardiac output with a heart rate in the range of 40–60 bpm. If the escape rhythm originates from a location in the nodal region, then ventricular depolarization will look normal on the ECG and QRS complexes will be narrow. If the escape rhythm originates lower in the conduction system, this will be a less reliable pacemaker, with a slower heart rate. The associated QRS complexes will be broad indicating aberrant conduction through the ventricular myocardium. Complete heart block is unlikely to be well tolerated by acute patients who may develop symptomatic hypotension and cardiac pacing is likely to be required.

Decisions about whether to implant a permanent pacemaker depend on the primary cause and assessment of the patient's underlying cardiac rhythm after the acute phase of illness has passed. In acute inferior infarction, complete heart block is often transient and may resolve in the first week making permanent pacing unnecessary. Conversely, in anterior infarction, complete heart block is more likely to be persistent and to indicate substantial myocardial damage. This is associated with poorer clinical outcomes and is likely to require implantation of a permanent pacemaker.

In complete AV block with no ventricular escape rhythm, ventricular standstill (asystole) will occur and the patient will require immediate resuscitation. The ECG may show a normal regular pattern of atrial depolarizations (P waves); however, QRS complexes are absent.

Asystole

Some secondary conditions may precipitate asystole in acute illness. These conditions include hypoxia, hypovolaemia, hypothermia, hyperkalaemia or hypokalaemia, metabolic disorders, thrombosis, tension pneumothorax, cardiac tamponade, and toxins.²⁷ It is essential that these are excluded or treated when attempting to resuscitate an asystolic patient.

It may be possible in asystolic patients with viable myocardium to establish effective cardiac pacing via transcutaneous, transoesophageal, or endocardial routes; however, clinical outcomes in this patient group are generally very poor.²⁸

Tachyarrhythmias—diagnosis, treatment, care, and prevention

Tachyarrhythmias are disturbances of heart rhythm with an inappropriately fast heart rate (>100 bpm) and are classified by their ECG morphology (shape) as narrow or broad complex, and by their origin as supraventricular or ventricular. In the acute context, patients with tachyarrhythmias are often symptomatic with varying degrees of haemodynamic instability, in some instances requiring urgent intervention. Ventricular tachyarrhythmias are an important cause of cardiac arrest and sudden cardiac death in acute cardiac patients. Persistent tachycardia is undesirable in patients with myocardial ischaemia and infarction as when the heart rate is rapid, the diastolic phase of the cardiac cycle is shortened. This has multiple negative effects including decreased time within the cardiac cycle to allow adequate atrial and ventricular filling, increased myocardial oxygen demand, and a reduction in coronary blood flow. Cumulatively, these effects reduce coronary and tissue perfusion, cardiac output, and blood pressure. Furthermore, normal compensatory mechanisms to adjust coronary blood flow in situations of increased myocardial demand are unlikely to be effective in the ACS patient (see Chapter 6).

Sinus tachycardia

Sinus tachycardia occurs in up to 30% of acute myocardial infarction patients²⁹ due to an increase in sympathetic nervous system activity caused by pathological stressors such as myocardial ischaemia and low cardiac output evidenced by hypotension and shock. Sinus tachycardia is commonly seen at presentation and tends to reduce as pain, nausea, and initial anxiety are relieved. However, in a proportion of patients, especially those with extensive anterior infarctions, sinus tachycardia may persist and signal significant left ventricular impairment. The occurrence of persistent or late sinus tachycardia is therefore an adverse prognostic indicator associated with substantial increases in morbidity and early mortality.³⁰ It is important in such patients to optimize care to limit further myocardial damage and ensure the best possible clinical outcomes. Most patients receive early beta-blockade as part of the routine management of acute myocardial infarction; however, caution is required in patients with sinus tachycardia who may have large infarctions, symptomatic hypotension, and signs of pulmonary congestion or heart failure.

Supraventricular tachycardia

SVT is sometimes referred to as 'narrow complex tachycardia', occurring when the heart rate at rest increases to over 100 bpm (see ► **Table 7.5** at the end of the chapter for a case study example). The term groups together tachyarrhythmias that originate from abnormal foci above the level of the AV node. Unfortunately, there is a paucity of data on SVT population epidemiology,⁴ with one estimate from the US, suggesting there are 89,000 new cases annually, and 570,000 patients with paroxysmal SVT. Across Europe, the incidence of SVT is approximately 35 cases per 100,000 patients with a prevalence of 2.25 cases per 1000 in the general population and females have a greater risk of paroxysmal SVT compared to males.⁴ In terms of age at presentation, lone paroxysmal SVT occurs in younger people (mean age 37 years) compared to those with underlying cardiovascular disease (mean age 67 years). The younger patients also had a faster paroxysmal SVT heart rate (mean 186 vs 155 bpm) and were more likely to have presented to the emergency department with their SVT.³¹

In SVT, myocardial depolarization proceeds normally after atrial impulses are conducted to the AV node and therefore QRS complexes are usually narrow (0.04–0.12 seconds). SVT often has a rapid, regular rhythm although this may be irregular if AF or atrial flutter is present. It can, on occasions, be difficult to differentiate between SVT with aberrant ventricular conduction and VT. Symptoms can be rare (i.e. once a year) or frequently (several times a day) and often resolve without treatment after a few minutes. However, for others, their SVT can last several hours, and they may attend their local emergency department for treatment. The precipitants of SVT are related to age, sex, and associated comorbidities with two distinct subsets of patients identified—those with other cardiovascular disease and those with lone paroxysmal SVT. SVTs are also reported in pregnancy; there is limited data on incidence of arrhythmias in pregnancy, although there is some evidence that first presentations are often seen in pregnant women with no previous history of palpitations.³²

Paroxysmal atrial tachycardia

Paroxysmal atrial tachycardia is a 'reentrant arrhythmia' resulting from the presence of abnormal electrical connections in the cardiac conduction system. This can be congenital or acquired and atrial tachycardia is particularly associated with non-ischaemic heart disease and pulmonary conditions. It is usually episodic (paroxysmal) and patients may present acutely with a rapid heart rate

between 160 and 220 bpm. P waves are usually regular and identical in shape, suggesting a single point of origin, but on examination of the ECG these may be inverted on lead II, signalling an abnormal atrial origin.

If a patient with a regular narrow complex tachycardia is stable, then vagal stimulation may be successful in terminating it. This can be achieved by use of Valsalva manoeuvres or carotid sinus massage. The latter should only be attempted when the presence of carotid bruits has been excluded. If these measures are unsuccessful in terminating the arrhythmia, then adenosine may be given to try and terminate the arrhythmia. To be effective, adenosine has to be given rapidly due to its very short half-life. In more persistent and troublesome cases, antiarrhythmic medication or ablation therapy may be indicated.

Irregular narrow complex tachycardias

Irregular narrow complex tachycardias are most likely to be due to atrial flutter with variable block or to AF.

Atrial fibrillation (AF)

AF³³ is the most common arrhythmia and it is thought that, worldwide, 33 million people live with this arrhythmia.³⁴ It is associated with irregular impulses within the atria causing the atria to fibrillate and fire irregularly at rates of between 80 and 200 bpm. There are certain conditions associated with it including hyperthyroidism, mitral valve disease, and other metabolic disorders. AF is associated with an increased risk of thromboembolic complications such as ischaemic stroke and transient ischaemic attack, complications such as heart failure, cognitive impairment, reduced quality of life, and an elevated risk of mortality. AF poses a substantial burden on the healthcare system, with AF-related hospitalizations as the main cost driver.

In 2010, approximately 33.5 million individuals globally were affected with AF, higher prevalence rates were seen in low- to middle-income countries.³⁴ Estimates have indicated that this number will rise tremendously and by 2050 there will be 15.9 million individuals with AF in the US alone.³⁵ Individuals with AF have a fivefold higher risk of stroke compared to those without AF. Moreover, AF is independently associated with increased mortality rates: a twofold increased risk of all-cause mortality in women and a 1.5-fold increase in men.⁵ AF occurs due to the discharge of very high numbers of electrical impulses from multiple ectopic sites in the atria of the heart. No discernible P waves are visible on the ECG and as high numbers of atrial impulses continually bombard the AV node, it becomes refractory to further stimulation and impulses are

variably conveyed to the ventricular system. The net effect is an irregularly, irregular cardiac rhythm often associated with a rapid heart rate. In ACS, new-onset AF commonly occurs in the first 72 hours and is an important prognostic indicator often associated with severe damage to the left ventricle and heart failure leading to increased short- and longer-term mortality.³⁶

AF is considered a progressive condition which may start with short episodes that in due course may occur more frequently and episodes may be more persistent. Factors such as ageing and cardiovascular conditions such as hypertension and diabetes, as well as exposure to risk factors such as obesity, induce structural and electrical remodelling in the atria of the heart, predisposing to the development or worsening of AF. Structural remodelling leads to electrical dissociation, which favours the process of reentry. AF episodes often initiate by rapid focal activity around the pulmonary veins, but can also be induced by reentrant wavefronts. AF-induced electrical remodelling refers to the fact that the atrial myocardium responds to a high rate of the fibrillation atria, by shortening the atrial refractoriness and atrial action potential. Due to the related increased repolarization, AF keeps itself alive, which has been expressed as 'AF begets AF'.³⁷

Types of AF

AF is a chronic condition, which commences in short episodes, advancing to longer and more recurrent episodes. If untreated, it is likely that AF will result in a permanent arrhythmia. AF may be found in patients with severe symptoms and limited in their daily activities as well as patients being completely asymptomatic (see ► Table 7.4 at the end of the chapter for a case study example). Based on the presentation, duration, and termination of the arrhythmia, the following types of AF have been identified:

- *First diagnosed AF*: has not been diagnosed before, evidence for the arrhythmia is recorded on ECG.
- *Paroxysmal AF*: self-terminating AF, mostly within 48 hours, although some episodes may last for up to 7 days. Note: episodes that are converted within 7 days should be considered paroxysmal.⁵
- *Persistent AF*: AF continuing longer than 7 days, including episodes that have been terminated by cardioversion after at least 7 days.
- *Permanent AF*: AF that is accepted by the patient and the treating physician. This means that the aim to achieve sinus rhythm is abandoned and a rate control strategy is pursued, to prevent potential complications and to reduce symptoms.

Table 7.4 CHA₂DS₂-VASc score and individual determinants

CHA ₂ DS ₂ -VASc risk factor	Points
Congestive heart failure	+1
Signs/symptoms of heart failure or objective evidence of reduced left ventricular ejection fraction	
Hypertension	+1
Resting blood pressure > 140/90 mmHg on at least two occasions or current antihypertensive treatment	
Age 75 years or older	+2
Diabetes mellitus	+1
Fasting glucose >125 mg/dL (7 mmol/L) or treatment with oral hypoglycaemic agent and/or insulin	
Previous stroke, Transient Ischaemic Attack, or Thromboembolism	+2
Vascular disease	+1
Previous myocardial infarction, peripheral artery disease, or aortic plaque	
Age 65–74 years	+1
Sex category (female)	+1

Kirchhof P, Benussi S, Kotecha D, et al. 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. Eur J Cardiothorac Surg. 2016 Nov;50(5):e1–e88. doi: 10.1093/ejcts/ezw313. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

Thromboembolic complications

AF is associated with an increased risk of thromboembolic complications such as stroke or transient ischaemic attack. It is therefore crucial to determine the available risk factors that may elevate the risk of stroke in individuals with AF and calculate the yearly risk of stroke accordingly, in order to initiate appropriate stroke prevention (Table 7.4).

AF diagnosis

At the initial assessment, comprehensive medical evaluation is warranted and includes the assessment of medical history and concomitant conditions, as well as clinical examination. In symptomatic patients with suspected AF, the arrhythmia needs to be documented via a 12-lead

ECG, which is considered the gold standard to confirm AF diagnosis, demonstrating an irregular ventricular rate and absence of discernible P waves. Prolonged monitoring via Holter recording (24-hour or 7-day period) or implanted loop recorder in certain cases, aims to capture heart rate and rhythm and any irregularities. A transthoracic echocardiogram is recommended in all patients with AF to identify structural diseases such as valvular disease, and assess left ventricular size and function and other parameters of the heart. An exercise stress test should take place in those patients with symptoms of myocardial ischaemia, testing the cardiac capacity in responding to exercise. Kidney and thyroid function, serum electrolytes, and a full blood count should be evaluated.⁵

Silent AF and screening

Before the diagnosis of AF is set, patients may have symptoms that trigger screening for an irregular heart rhythm. However, many patients will be asymptomatic, meaning an absence of symptoms or complaints. Silent or undetected AF is common, especially in the elderly³⁸ and may lead to disabling consequences such as stroke or mortality. Recording of an ECG is considered an effective method to document AF,³⁹ although in cases of paroxysmal episodes this may not be effective. However, novel technology for prolonged monitoring or screening is evolving. Nevertheless, detection of AF is crucial in order to prevent worsening of the arrhythmia and prevention of complications. Therefore, opportunistic screening is recommended in patients over 65 years of age, by pulse taking or an ECG.⁵ Once the recording of AF on an ECG has been established, the diagnosis of AF can be confirmed.

Wearables for detection of AF

The proportion of incident AF yielded by opportunistic screening is relatively low, and paroxysmal AF is often missed. The Apple watch, which was recently evaluated in the Apple Heart Study, demonstrated that wearable technology can safely identify heart rate irregularities confirmed to be AF.⁴⁰ Such devices can have an important role in the detection and management of AF and prevention of complications such as stroke but further research is needed on their efficacy. However, a 12-lead ECG should still be in place to confirm the findings and is the cornerstone in commencing AF treatment.⁴¹

Treatment/management

The management of AF is complex and should cover five treatment domains, as outlined in ► Fig. 7.3:^{33,42}

1. *In the acute phase, it is crucial to apply rate and/or rhythm control strategies* aiming to improve symptoms and restore haemodynamic stability. A combination of these strategies may apply. In the acute setting, the preferred pharmacological rate control strategy includes beta-blockers and diltiazem or verapamil.^{43,44} Acute restoration of sinus rhythm can be achieved with electrical or pharmacological cardioversion. Pharmacological cardioversion may be effective in 50% of cases and does not require fasting or sedation.⁴⁵ Electrical cardioversion has demonstrated better results (e.g. restoration of sinus rhythm and less hospitalization)^{46,47} and is recommended over pharmacological cardioversion in the acute setting. Agents such as flecainide or propafenone are effective but cannot be used in patients with structural heart disease. Alternatively, ibutilide, vernakalant (in patients with mild heart failure), or amiodarone may be considered. Patient characteristics and underlying conditions will guide the choice of medication.
2. *Identification and treatment of precipitating factors* is necessary to reduce the cardiovascular risk profile and associated AF risk burden. These may include underlying cardiovascular conditions as well as modifiable risk factors. Exposure to these risk factors may lead to the development or worsening of AF and their management should be integrated in the AF management approach. The attention on obesity as a risk factor for AF⁴² and potentially for ischaemic stroke, thromboembolism, and death in patients with AF⁴⁸ has increased significantly over time. Specialized risk factor clinics with a focus on intensive weight reduction alongside management of other risk factors has demonstrated significant reduction of AF recurrences and symptom burden.^{49,50} Moreover, long-term sustained weight reduction is associated with significantly improved maintenance of sinus rhythm.⁵¹ It is therefore crucial that weight loss, as well as management of other risk factors in obese patients with AF, should be considered as an integral part of AF management.⁵
3. *Assessment of stroke risk and determine the necessity to initiate oral anticoagulation therapy* to prevent thromboembolic complications. It is recommended that this assessment is guided by the CHA₂DS₂-VASc score (► Table. 7.4),⁵² which is a point system to determine the yearly risk of stroke in patients with AF. The score assesses the presence of conditions which increase the risk of stroke in patients with AF, such as congestive heart failure (1 point); hypertension (1 point); age 65–74 years (1 point) or above 75 years (2 points); diabetes mellitus (1 point); previous stroke, transient ischaemic attack (TIA), or thromboembolism (2 points); vascular disease (1 point); and female

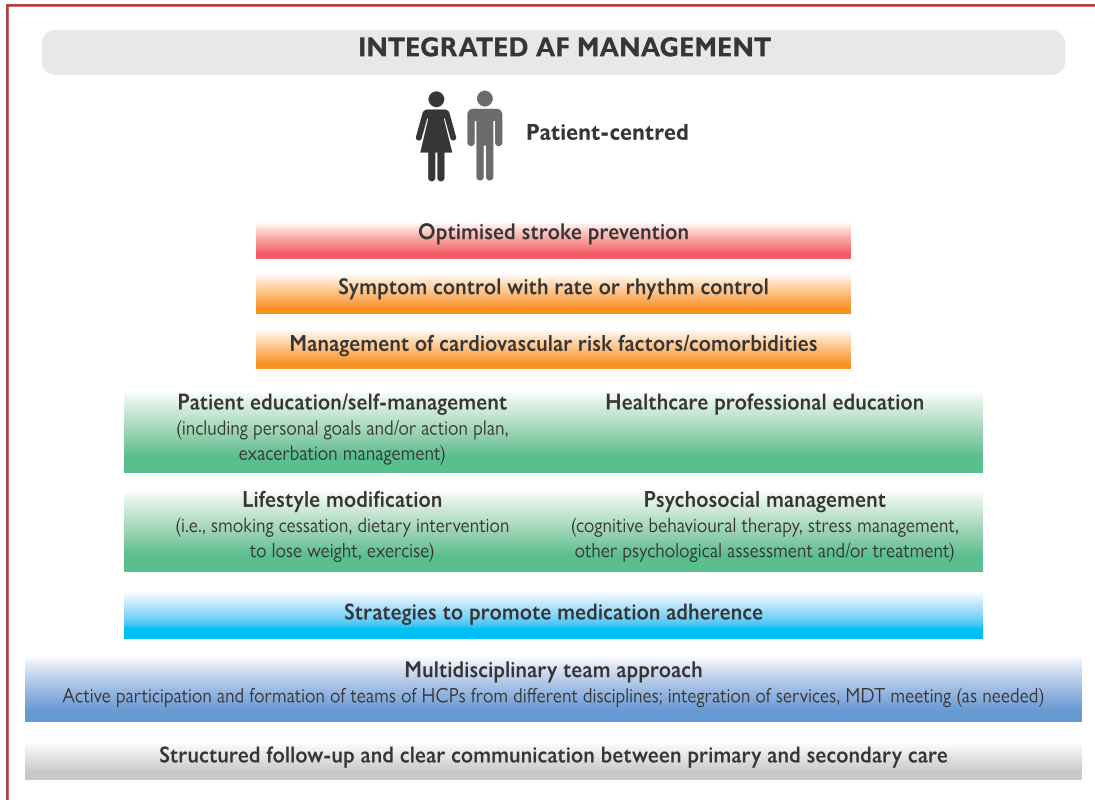


Fig. 7.3 Components of integrated AF management. AF = atrial fibrillation; HCP = healthcare professional; MDT = multidisciplinary team.

Hindricks G, Potpara T, Dagres N, et al; ESC Scientific Document Group. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS): The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC) Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC. *Eur Heart J*. 2021 Feb 1;42(5):373–498. doi: 10.1093/eurheartj/ehaa612. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

sex (1 point). Patients without stroke risk factors ($\text{CHA}_2\text{DS}_2\text{-VASc}$ score = 0), do not need anticoagulant therapy. As a class I recommendation, men and women with 2 or more points on the score need to be treated with oral anticoagulation therapy. In those patients with only 1 point on the score, the class IIa recommendation is that oral anticoagulation should be considered, taking contraindications and patient preferences into account. Even though female sex yields a $\text{CHA}_2\text{DS}_2\text{-VASc}$ score of 1, in the absence of additional stroke risk factors, this does not qualify for anticoagulation therapy to be considered.⁵ Anticoagulation therapy can be provided by means of a vitamin K antagonist (VKA) which requires monitoring of the international normalized ratio, or a non-vitamin K antagonist oral anticoagulant

(NOAC). Large trials have demonstrated safety and effectiveness of the NOACs and there is a clear preference in the use of NOACs compared to VKAs, supported by ESC guidelines⁵ (see also Chapter 12).

4. *Evaluation of the heart rate to consider a rate control strategy*, which aims to reduce the heart rate to improve symptoms and preserve left ventricular function. Rate control is an essential aspect of AF management to improve AF-related symptoms without applying a rhythm control strategy. The optimal heart rate target in patients with AF remains variable. The Rate Control Efficacy in Permanent AF (RACE II) study compared patients with a strict heart rate target of less than 80 bpm at rest, or a lenient heart rate of less than 110 bpm, demonstrating no significant differences in a composite outcome of cardiovascular mortality or

clinical conditions requiring hospitalization.⁵³ Therefore, a resting heart rate of less than 100 bpm can be considered as an appropriate heart rate target in a rate control strategy. In general, beta-blockers, digoxin, diltiazem, or verapamil are recommended medications to apply a rate control strategy in patients with AF with a left ventricular ejection fraction (LVEF) greater than 40%. Given that diltiazem and verapamil may have a negative inotropic effect in patients with heart failure, beta-blockers and digitalis are recommended in patients with AF with LVEF less than 40%.⁵

5. Assessment of AF-related symptoms and determination of the need for a rhythm control strategy by means of long-term antiarrhythmic pharmacological treatment, cardioversion, or invasive ablation procedures. Applying a rhythm control strategy aims to improve AF-related symptoms and to maintain sinus rhythm. A rigorous assessment of underlying cardiovascular conditions is important and safety considerations should guide the choice of drug. The spectrum of a rhythm control strategy ranges from long-term pharmaceutical therapy to cardioversion and invasive ablation procedures. In some cases, a 'pill-in-the-pocket approach' will be applied. This means that selected patients with infrequent paroxysmal episodes of symptomatic AF will be instructed to self-administer a single dose of flecainide or propafenone to restore sinus rhythm. This approach has been proven effective, is practical, and may be more convenient for patients.⁵⁴ In general, the following recommendations should be considered when applying a long-term rhythm control strategy in patients with AF⁵:

- Aim to improve symptoms, and restore and maintain sinus rhythm. In patients with permanent AF (i.e. accepted AF), the priority is a rate control strategy and no longer to achieve sinus rhythm.
- Cardioversion of AF is recommended in symptomatic patients with persistent or long-standing persistent AF and as part of a rhythm control strategy.
- The choice between electrical and pharmaceutical cardioversion should be guided by clinical aspects such as haemodynamic instability, as well as patient and physician preferences.
- In haemodynamically unstable patients, electrical cardioversion is recommended to restore cardiac output.
- In patients without a history of ischaemic or structural heart disease, pharmacological cardioversion by means of flecainide, propafenone,

or vernakalant is recommended. However, in those patients with a history of ischaemic or structural heart disease, amiodarone is the recommended agent for cardioversion of AF.

- The choice of an antiarrhythmic drug requires careful evaluation of underlying cardiovascular conditions, as well as potential side effects, patient preferences, and symptom burden.
- Structured evaluation of patients on antiarrhythmic drugs should be in place to confirm their suitability for treatment.

Broad complex tachycardia

As noted previously, broad complex tachycardias can occur due to SVT or AF with aberrant ventricular conduction or from a ventricular origin. In order to differentiate between these, careful analysis of a 12-lead ECG is required. In acute settings, if there is obvious and severe circulatory collapse then management should proceed on the assumption of a ventricular cause as the risk to the patient of an untreated ventricular tachycardia is much greater.

Ventricular tachycardia (VT)

Ventricular tachyarrhythmias are among the most life-threatening in acute cardiac patients and often occur early following ACS onset. VT occurs when three or more ventricular extra systoles occur consecutively. VT may be intermittent or sustained and is caused by an ectopic focus in the left or right ventricle discharging electrical impulses at a rate in the range of 120–250 bpm independently of the normal conduction system. In the acute cardiac patient, VT may arise from a single area of enhanced electrical automaticity thereby producing abnormal but identical QRS complexes (monomorphic VT) or from several areas of ectopic activity when consecutive QRS complexes will look different (polymorphic VT). ECG criteria for determining VT are not absolute but it should be strongly suspected if the ventricular rate exceeds 100 bpm (often higher) and QRS complexes are widened with an abnormal shape or when there is dissociation between atrial and ventricular activity or when fusion beats are present. Fusion beats occur when there is a collision between antegrade atrial and retrograde ventricular depolarization. In instances of very rapid ventricular rates, there are multiple risks to patients including dramatically reduced cardiac output, with altered or loss of consciousness and potential deterioration to VF. A modest reduction in cardiac output and coronary blood flow may be tolerated in the short term, but the risk of developing

pulmonary oedema, heart failure, and cardiogenic shock are greatly increased.

Acute management of VT requires identification and management of reversible causes; however, if there is loss of consciousness due to reduced cardiac output, immediate defibrillation is indicated. Patients with sustained VT who are haemodynamically stable may be treated with intravenous antiarrhythmic agents with amiodarone being the drug of choice. It is also important to assess and correct any detectable electrolyte abnormalities including hypokalaemia (low serum potassium) and hypomagnesaemia (low serum magnesium) in this patient group. If sinus rhythm is not restored, synchronized cardioversion or overdrive pacing may be attempted. Patients who remain at high risk of further ventricular arrhythmias may also require pharmacological maintenance therapy and cardioverter defibrillator implantation.

Ventricular fibrillation (VF)

VF causes cardiac arrest and untreated will lead to death. VF is characterized by chaotic and irregular ventricular activity with deflections of variable height and width visible on the ECG. No QRS complexes are identifiable. In the absence of coordinated ventricular depolarization, myocardial muscle contraction is absent and cardiac output ceases with a resulting rapid loss of consciousness. VF most commonly occurs in the early hours following myocardial infarction and is thought to be the primary mechanism of pre-hospital sudden cardiac death in patients with ACS. VF may be preceded by an episode of VT or precipitated by the occurrence of ventricular ectopic beats during the repolarization phase of the cardiac cycle ('R on T' ectopic). The probability of a successful clinical outcome in VF is enhanced by early recognition, effective application of basic and advanced life support, and early defibrillation.

Torsade de pointes

Torsade de pointes or 'twisting of the points' is a recognized variant of VT. It is characterized by a distinctive ECG pattern in which polymorphic QRS complexes that move about the isoelectric baseline of the ECG produce a spindle-shaped pattern. This arrhythmia, which can be congenital or acquired, is often associated with a prolonged QT interval. In the acute context, this may be caused by myocardial ischaemia or infarction and can result in loss of consciousness and progression to VF with a risk of death.

Management includes intravenous magnesium administration. This is often effective in terminating the arrhythmia. A beta-blocker (but not sotalol as it increases the QT interval) or cardiac pacing may also be beneficial.⁵⁵

Antiarrhythmics must be avoided as they tend to prolong the QT interval and may worsen the condition.

Patient experience of living with an arrhythmia

While the diagnosis and treatment of cardiac arrhythmia is an acute priority, it is crucial that individualized patient experiences of living with an arrhythmia are understood by healthcare professionals, as well as being considered when determining a treatment/management plan. The importance of patient- and family-centred care has been highlighted in ESC Guidelines, particularly in patients with ventricular arrhythmias who are at risk of sudden cardiac death.⁵⁶ In general, arrhythmias have a significant psychosocial impact on patients, affecting many facets of a normal life—such as sporting activities,⁵⁷ the ability to drive,⁵⁸ and sleep quality.⁵⁹ Additionally, such conditions also often have a negative impact on sexual relations, with cardiac patients frequently reporting at least one sexual problem after a cardiac event.⁶⁰ Such problems are commonly associated with being male,⁶⁰ possibly due to erectile dysfunction—which was reported by patients with an implantable cardioverter defibrillator (ICD) as an area of significant concern, along with lack of interest in sex and an overprotective partner.⁶¹ Sexual issues may also be linked to body image concerns, which are particularly common in female patients with an ICD under the age of 50 years.⁶² Many of the issues discussed here are prevalent in patients with an ICD, which is likely linked to the shock-related anxiety and fear⁶³ that are often experienced in this population (see Chapter 10 and Chapter 14). These sections also discuss further psychosocial effects of having an ICD and the issues surrounding deactivation discussions. Taking patients with AF as a further example, a qualitative study of 25 patients showed these individuals to suffer both discomfort and limitations in their daily life.⁶⁴ Specifically, patients reported impacts including anxiety, emotional concerns, that symptoms were affected by distress/exertion, and a lack of knowledge and security regarding AF.

Patient experience can be improved by nursing interventions that focus on how the patient's arrhythmia impacts their everyday life and addressing any potential concerns; as well as through initiatives such as multimedia educational resources⁶⁵ and nurse-led clinics. Taking AF clinics as an example, these have been shown to be cost-effective, reduce mortality rates, and improve medication adherence.⁶⁶ However, more research into patient perspectives of these clinics is necessary, as findings related to patient knowledge and satisfaction were mixed.⁶⁶

Individualized and more systematic efforts to improve patient knowledge, ability to manage, and overall experience with their arrhythmia are critical. For example, patients with AF who had high illness acceptance levels were shown to have significantly better quality of life.⁶⁷ Later in this chapter, an example of a patient-centred and integrated approach to follow-up and outpatient care for patients with AF is provided (see ‘Example—follow-up and outpatient care of patients with atrial fibrillation’). Interestingly, the aforementioned study also showed female sex to be a predictor of worse quality of life in AF,⁶⁷ while women have also been shown to delay access to medical help after a cardiac event when compared to men⁶⁸ and be more psychosocially impacted by having an ICD.⁶⁹ These issues, along with the previously mentioned body image concerns in female patients with an ICD, may indicate that the efforts of healthcare providers need to be tailored based on sex—as well as being specific to each individual patient.

Catheter ablation

For SVTs and AF, catheter ablation may be beneficial. In SVT, ablating part of the conduction pathway by radiofrequency waves or, less frequently, freezing, cryoablation, has been shown to reduce symptoms and stop (i.e. ablate) the rhythm disturbance.⁷⁰ However, the efficacy of ablation varies with rates for SVT ablation showing very modest long-term clinical success ranging from 23% to 83%.⁴

In the case of AF, ablation aims to isolate the pulmonary veins from the body of the left atrium. This is done to prevent the electrical signals that originate between the entrance of the pulmonary vein and the left atrium triggering AF and producing a line of scar around each vein and thus reducing frequency of AF. The procedure is often referred to as pulmonary vein isolation and the efficacy of the procedure is mixed, with some patients experiencing symptoms within a few months of their procedure and sometimes requiring repeat procedures.⁷¹ One study found the earlier patients reported symptoms after the procedure, the greater the likelihood that the procedure had not been successful.⁷² With ventricular disturbances, radiofrequency ablation is the method used, especially in those with structural heart disease such as heart failure and cardiomyopathy.⁷³ From a nursing perspective, it is important that the patient is fully aware of the variable success rate of the procedure and they may require life-long medication for their AF.

Temporary cardiac pacing

When the conduction system of the heart fails at the level of the SA node, sites lower in the conduction system may

assume the role of pacemaker. Cardiac rhythms arising from sites other than the SA node have slower heart rates and are less reliable as pacemakers. Cardiac pacemakers can be inserted to treat symptomatic bradycardia (heart rate <40 bpm) or heart block that has resulted in a low systolic blood pressure or when there is a risk of ventricular asystole. The risk of asystole is greatly increased in patients with second-degree (Mobitz type II) or complete heart block. Temporary cardiac pacing requires direct electrical stimulation of the myocardium by artificial means. This is usually achieved by placement of an endocardial lead (electrode) introduced percutaneously via a large central vein such as the right internal jugular, right subclavian, or femoral vein. The lead is advanced, under continuous X-ray screening, into the right atrium and across the tricuspid valve into the right ventricular apex. After placement the lead is connected to an external pulse generator (battery) in order to stimulate myocardial contraction and control the heart rate. Following positioning, the location and stability of the pacing lead is confirmed by asking the patient to take deep breaths or cough and by X-ray. The threshold voltage required to stimulate myocardial depolarization (capture) is also confirmed before setting the pacing device to a suitable level in excess of the minimum voltage required. During the period that a patient is pacemaker dependent, the underlying heart rate and rhythm and capture threshold must be regularly reviewed.

Endocardial pacing requires specialist expertise and equipment and if this is not immediately available, and the clinical need is pressing, a transcutaneous pacing device may be utilized as a bridge measure. This non-invasive method of pacing is most suitable when used as an emergency treatment until endocardial pacing can be established. It applies a pacing stimulus to the heart directly via electrodes placed on the thoracic wall. Although less reliable than endocardial pacing, this intervention offers a rapidly deployable option for non-specialists that may be sufficient to maintain an adequate circulation until endocardial pacing can be established. The main disadvantage of transcutaneous pacing is the discomfort that may be experienced by alert patients who may consequently require a sedation.

Permanent cardiac pacing

If a patient is at continuing risk of life-threatening arrhythmias, or their underlying heart rhythm is inadequate to maintain an effective circulation, or symptoms persist beyond the acute phase of cardiac illness, then a permanent pacemaker is required. This process, requiring a local anaesthetic, places an endocardial pacing lead(s) via the venous system and connects this/these to a pulse generator (battery) located in a subcutaneous pouch created in the chest wall.

Implantable cardioverter defibrillators (ICD)

Type of device

ICDs have been used in patients for more than 30 years. The efficiency of the ICD has been shown superior to medical treatment, with an early meta-analysis demonstrating a reduction in arrhythmic mortality of 50%. In the early era, the ICD was placed in the abdomen and implanted surgically via thoracotomy with epicardial leads fixed to the ventricles. Later, a complete transvenous system was introduced, and is still the standard. The main component of the ICD system is a defibrillation lead, advanced into the right ventricle over either the cephalic vein or the subclavian vein, and connected to the device that is placed subcutaneously in the left pectoral region. The ICD consists of the battery and an electronic system detecting and storing arrhythmia episodes, and delivering therapy. Efficacy testing of the device during the implantation procedure was standard practice for many years, but availability of high-energy devices in parallel with technical developments changed clinical practice and this is now rarely done.⁷⁴ A recent development is a completely subcutaneously implantable ICD system which consists of a subcutaneous device connected to a subcutaneous lead that is placed along the left side of the sternum. One of the main advantages of the subcutaneous ICD system is the prevention of device-related endocarditis (see Chapter 8) that causes significant complications in patients with the conventional transvenous ICD systems. However, the subcutaneous device is not suitable for patients who require bradycardia pacing, patients who need cardiac resynchronization therapy, or patients suffering from tachyarrhythmia that can be easily terminated by antitachycardia pacing.⁵⁵ A wearable external defibrillator has also been developed consisting of electrode pads, leads, and a defibrillator attached to a vest. This wearable device may be considered as a bridge to implantation or in patients with poor left ventricular systolic function who are at risk of sudden cardiac death for a limited period, but who are not candidates for an ICD. For patients with LVEF less than 35% and left bundle branch block, cardiac resynchronization is indicated provided there has been at least 3 months of optimal pharmacological therapy.⁵⁵ The cardiac resynchronization therapy defibrillator has leads placed in the right atrium and ventricle and in the left ventricle through the coronary sinus vein. The device is programmed to treat heart failure by synchronizing the function of the left and right ventricles and act on ventricular arrhythmias (see Chapter 10).

Indications

Patients are treated with an ICD for the prevention of sudden cardiac death on two main indications:

- Primary prevention: in individuals who are at risk of but have not yet had an episode of sustained VT, VF, or resuscitated cardiac arrest.
- Secondary prevention: individuals who have survived a prior sudden cardiac arrest or patients with haemodynamically not tolerated or recurrent sustained VT after myocardial infarction.

ICD therapy is also recommended in patients with symptomatic heart failure (New York Heart Association class II–III) and LVEF less than 35% after more than 3 months of optimal medical therapy.

Types of therapy

The ICD can be programmed to a whole range of therapies depending on the detected heart rates and cycle length. Cardiac defibrillation aims to return abnormally fast or disorganized rhythm with an electric shock. A shock is applied when very fast heart rates are detected, while antitachycardia pacing is administered first in slower VT in order to avoid shock if possible. A vast number of VTs are non-sustained and terminated spontaneously. The ICD also has a brady pacing function. ICDs may cause complications including inappropriate shocks (20%), lead failure (17%), and, as mentioned, device-related infection (6%).⁷⁵ Often patients with an ICD are treated with medications in order to minimize both appropriate and inappropriate ICD therapy. In secondary prevention (patients post myocardial infarction and in patients with heart failure), amiodarone reduces the occurrence of ventricular arrhythmias.^{55,76} Patients with an ICD have significantly reduced ICD interventions when prescribed amiodarone, particularly when combined with beta-blockers.⁵⁵ However, nurses should be knowledgeable about the side effects of both these drugs, and amiodarone in particular (see Chapter 12). Follow-up of patients is mandatory and has traditionally been performed in the outpatient clinic at regular intervals. However, increasingly patients are followed up by remote monitoring. This is convenient for patients in rural areas, and also has a health economic advantage. The face-to-face meeting with the cardiologist and nurse is still important, and remote monitoring should be coupled with the possibility of telephone contact.

Restrictions

Arrhythmias can affect many areas in the lives of patients and families, such as ability to drive, intimate relations,

sleep quality, body image concerns (particularly in younger women), and participation in organized sports (particularly in children and adolescents).⁵⁵ Some of these areas are affected by ICD therapy as well. The ICD device is built with protective shields so that the majority of items will not affect the device. However, electromagnetic fields may temporarily cause disturbances, depending on the distance to the ICD and strength of the electromagnetic field. Items not in good working order may also cause electrical current into the body. If the patient is feeling dizzy, light-headed, has a change in heart rate, or receives a shock while using a device, he or she should be advised to move away from it. Any temporary effect is unlikely to cause reprogramming or damage to the ICD, but the specialist centre should be contacted in due course (or immediately if symptoms persist). Special considerations should be made regarding certain household items (induction hob on a cooker/stove, electronic weighing scales, metal detectors, electric fence), tools (boat engines, gasoline powered tools, welding equipment, jumper cables), and communication equipment (amateur radio/walkie talkie), and a recommended distance of 30 cm should be kept. Items with a minimal risk, but which should be kept at a distance of at least 15 cm, include mobile phones, tablets, wireless communication devices, electric drills, hedge trimmers, hair dryers, electric shavers, toothbrush charging bases, and magnets in the wheels of exercise bikes. An exhaustive list can be obtained from the ICD manufacturer. Anti-theft detectors and airport security systems are most likely safe if the person walks normally through and does not stop and linger. Handheld wands should not be held over the device. Patients should be advised to carry their ICD identification card on their person. Certain medical procedures can also affect the ICD. Patients should be advised to inform their treating physician or dentist that they have an ICD. Modern ICD devices are compatible with magnetic resonance imaging procedures under certain conditions and patients can safely undergo magnetic resonance imaging scans. Transcutaneous electrical nerve stimulation and therapeutic ultrasound (often performed by physiotherapists), radiation therapy, and external defibrillation are acceptable with precautions and distance to the ICD. In order to maximize the derived benefit of the ICD, these issues need to be addressed in the care and counselling of patients. Importantly, the ICD-related information should be tailored to the needs of the patient taking age, sex, and comorbidities into consideration.

Surgical procedures

In the case of tachyarrhythmias with underlying structural heart disease, surgical ablation is beneficial. It is usually

undertaken on patients who need to have cardiac surgery for other pathologies, such as valve replacement/repair, and therefore the procedure can be done as one operation. It is commonly known as the maze procedure.⁷⁷ In terms of AF, the biatrial Cox–Maze procedure has an approximately 90% success rates for all types of AF.⁷⁸ The main risk factor associated with surgical procedures is stroke but a recent long-term follow-up of the Maze procedure reported good outcomes for patients with reduced AF burden and a low incidence of stroke.⁷⁹

Evaluation, discharge home, and follow-up

Example—follow-up and outpatient care of patients with atrial fibrillation

In most patients, regular follow-up is needed to ensure continued management and should warrant the implementation and/or modification of the initial, integrated management plan. A structured follow-up implies review on a regular basis, in particular when initiating or adjusting pharmacotherapeutic therapy, in order to monitor adherence, side effects, and adverse effects. Also, continuous patient education as well as coordination of care and communication among the different care providers involved, is crucial. An integrated approach to manage the care for AF³³ patients has demonstrated significant improvements in clinical outcomes⁸⁰ and is the recommended AF management approach by international guidelines.^{42,81} Such an integrated care approach consists of four major fundamentals⁴²:

1. *Patient-centred care*: patients should be placed in a central role in their care process and should be actively involved in decision-making. Continuous patient education covering aspects such as AF as a condition, symptom recognition, potential complications, and treatment options, is crucial and aims to empower patients to undertake self-management and lifestyle activities which may result in improved adherence and willingness to be involved in shared/informed decision-making.
2. *Multidisciplinary team approach*: the management of AF has become complex and a multidisciplinary AF team approach (e.g. specialized AF-Clinic) may be warranted rather than the delivery of care by one single healthcare professional alone. Such an approach encourages integration and collaboration between primary and secondary healthcare services,

and creates important opportunities for nurses and allied health professionals in educating patients and coordinating care, while closely collaborating with a medical specialist in an interdisciplinary way.

3. *Technology tools:* smart technology tools can be used to provide patient education and support self-management and therapy adherence, but also to support decision-making in the treatment team. Such tools have the potential to improve communication within the AF team as well as to enhance the delivery of evidence-based care and consequently improve outcomes.³³ Examples may include web-based interfaces, smartphone technology, as well as computerized tools (see also Chapter 11 and Chapter 13).
4. *Comprehensive management and access to all treatment options:* comprehensive treatment is required in which all facets of AF management (e.g. rate and rhythm control, prevention of thromboembolic complications, risk factor management, and lifestyle modification) will be covered and a diversity of specialists should be involved. Complex cases, such as patients requiring complex invasive procedures, or those patients with recurrent bleeding, could be underpinned by a dedicated AF Heart Team.⁸²

Stroke prevention in atrial fibrillation

To determine the yearly risk of stroke in patients with AF, it is recommended to follow a risk stratification scheme such as the CHA₂DS₂-VASc score (see 'Treatment/management' in the 'Atrial fibrillation' section of this chapter and ► **Table 7.4**). The ESC Guidelines for the management of AF provide clear recommendations on when anticoagulation should be administered.

Vitamin K antagonists and non-vitamin K antagonist oral anticoagulants

The first anticoagulants used in the prevention of thromboembolic complications in the management of AF were warfarin and other VKAs. These anticoagulants have demonstrated positive effects in reducing thromboembolic risk and complications. VKAs have a narrow therapeutic interval, which requires patients to be regularly monitored and dose adjustments to achieve an adequate time in therapeutic range.⁵ Also, these are currently the only anticoagulation treatment in patients with AF with mechanical heart valve prosthesis and mitral valve disease.⁸³

More recently, NOACs have been introduced (also see Chapter 8 and Chapter 12). Although these products have a shorter half-life compared to VKAs (in some cases a twice-daily dose is required), they have a predictable effect

and regular monitoring is not required. Therefore, strict adherence to the prescribed treatment regimen is crucial. Caution is required in patients with chronic kidney disease and application of adjusted doses may be required. The NOACs include the direct thrombin inhibitor dabigatran and the factor Xa inhibitors apixaban, edoxaban, and rivaroxaban. Large phase III trials have been performed and demonstrated safety and effectiveness in terms of important clinical endpoints such as mortality, stroke or systemic embolism, and major bleeding.^{84–87}

Antiplatelets

Antiplatelet (aspirin) cannot be used as an alternative to oral anticoagulants. Monotherapy is not recommended for stroke prevention in AF management nor as an addition to VKAs or NOACs.⁵ Large trials have demonstrated better effects in terms of preventing strokes compared to single or dual antiplatelet therapy (i.e. aspirin and clopidogrel).⁸⁸ Moreover, antiplatelet therapy carries a greater risk of bleeding.⁸⁹ See Chapter 12.

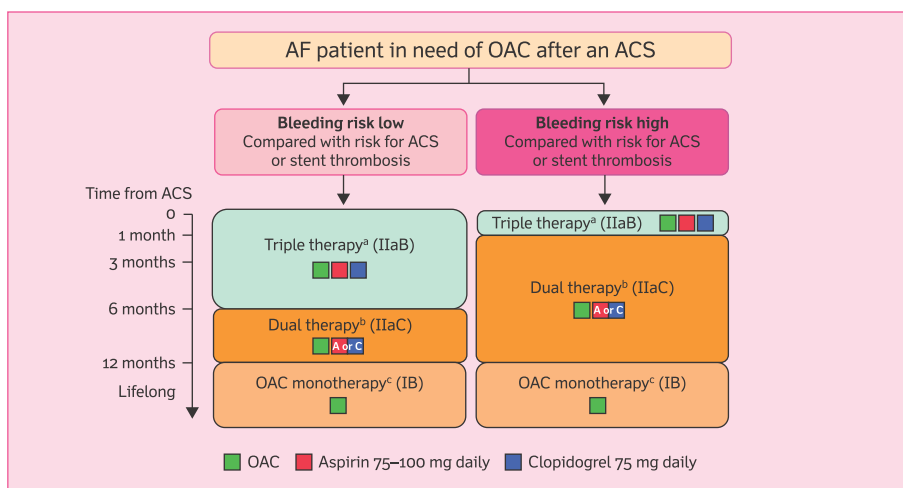
Alternative treatment approaches

Left atrial appendage occlusion or exclusion may be considered for stroke prevention in those patients with contraindications to long-term oral anticoagulation therapy.³³ These procedures may be considered in patients with AF undergoing cardiac surgery and the procedure can be performed simultaneously. The Watchman device has been compared to warfarin and demonstrated non-inferiority for the prevention of stroke.⁹⁰

Combined antithrombotic and antiplatelet therapy after a cardiac ischaemic event

Careful consideration of antithrombotic therapy is required in patients with AF suffering a myocardial infarction. Aspects such as the stroke risk, bleeding risk, and risk of ACS should be included in the consideration, given that co-prescription of anticoagulation and antiplatelet therapy increases the risk of major haemorrhage.⁹¹ The ESC Guidelines⁴² provide the following recommendations in patients with AF at risk of stroke to prevent recurrent coronary and cerebral ischaemic events (► **Fig. 7.4** and ► **Fig. 7.5**):

- After elective coronary stenting for stable coronary artery disease, combination triple therapy with aspirin, clopidogrel, and an anticoagulant should be considered for 1 month.
- After an ACS with stent implantation, combination triple therapy with aspirin, clopidogrel, and an oral anticoagulant should be considered for 1–6 months.



ACS = acute coronary syndrome; AF = atrial fibrillation; OAC = oral anticoagulation (using vitamin K antagonists or non-vitamin K antagonist oral anticoagulants);

PCI = percutaneous coronary intervention.

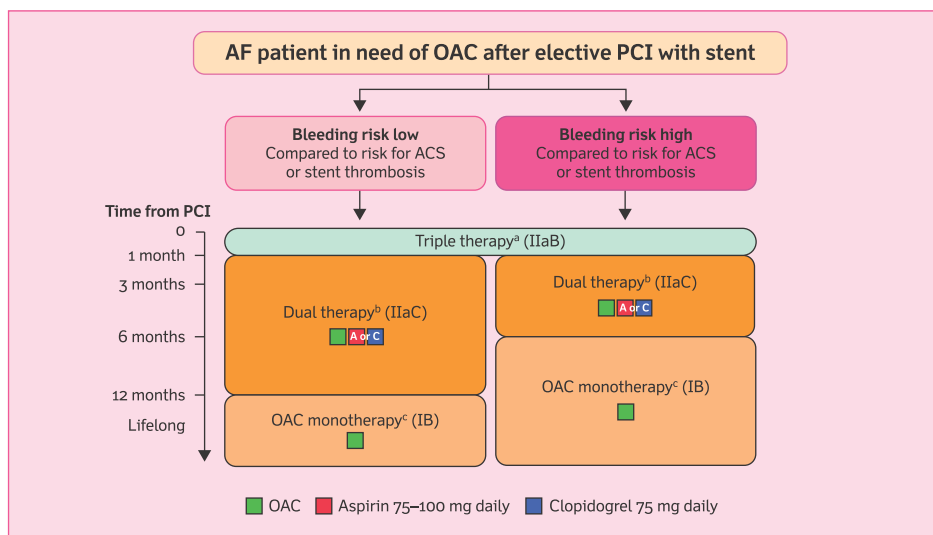
^aDual therapy with OAC and aspirin or clopidogrel may be considered in selected patients, especially those not receiving a stent or patients at a longer time from the index event.

^bOAC plus single antiplatelet.

^cDual therapy with OAC and an antiplatelet agent (aspirin or clopidogrel) may be considered in patients at high risk of coronary events.

Fig. 7.4 Antithrombotic therapy after an acute coronary syndrome in patients with AF requiring oral anticoagulation.

Kirchhof P, Benussi S, Kotecha D, et al. 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. Eur J Cardiothorac Surg. 2016 Nov;50(5):e1–e88. doi: 10.1093/ejcts/ezw313. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.



ACS = acute coronary syndrome; AF = atrial fibrillation; OAC = oral anticoagulation (using vitamin K antagonists or non-vitamin K antagonist oral anticoagulants);

PCI = percutaneous coronary intervention.

^aDual therapy with OAC and aspirin or clopidogrel may be considered in selected patients.

^bOAC plus single antiplatelet.

^cDual therapy with OAC and an antiplatelet agent (aspirin or clopidogrel) may be considered in patients at high risk of coronary events.

Fig. 7.5 Antithrombotic therapy after elective percutaneous intervention in patients with AF requiring anticoagulation.

Kirchhof P, Benussi S, Kotecha D, et al. 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS. Eur J Cardiothorac Surg. 2016 Nov;50(5):e1–e88. doi: 10.1093/ejcts/ezw313. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

- After an ACS without stent implantation, dual treatment with an oral anticoagulant and aspirin or clopidogrel should be considered for up to 12 months.
- The duration of the combination antithrombotic therapy should be kept to a limiting period, balancing the estimated risk of recurrent coronary events and bleeding.⁵

Self-care, patient education, and health

Risk factors

For SVTs, alcohol, caffeine, tiredness, or drugs can trigger symptoms and therefore using appropriate communication techniques to make lifestyle enquiries and elicit an accurate history is an important first step. Advising the patient to reduce their caffeine and alcohol intake and to refrain from taking drugs such as amphetamines may be beneficial. For AF, underlying cardiovascular conditions may be present for a long time without causing obvious symptoms for the patient. However, these conditions may cause atrial remodelling, which may have started long before the first episode of AF manifests.⁹² Besides genetic factors, numerous cardiovascular markers for the progression of AF have been identified including age, hypertension, heart failure, valvular heart disease, previous stroke/transient ischaemic attack, chronic obstructive pulmonary disease, sleep apnoea, diabetes mellitus, obesity and inactive lifestyle, smoking, and alcohol abuse.

Prevention

For arrhythmias associated with acute presentations, the related risk factors for cardiovascular disease need to be assessed and managed. The common risk factors are the modifiable behavioural-related risk factors that include a diet high in saturated fat and processed food, smoking, lack of physical activity, and excessive alcohol intake as well as the known risk factors such as hypertension, hypercholesterolaemia, diabetes mellitus, sleep apnoea, and obesity. In relation to SVTs, for those who experience symptoms and can identify triggers, they need to be educated in reducing or avoiding the known triggers and these include alcohol, stress, and potentially caffeine, although there is some evidence recently that caffeine plays a minor role in triggering SVTs.⁹³ There is now evidence that excessive alcohol has a key role in symptoms, especially in AF, and moderate or minimal drinking is associated with a significantly reduced burden of AF symptoms.⁹⁴

Implantable cardioverter defibrillator—education and psychoeducation

Although the ICD is very successful in preventing sudden cardiac death, patients still suffer from the symptoms and awareness of the underlying disease and the knowledge of relying on a life-saving electronic device. Studies have shown most patients live well with their ICD. However, patients living with an ICD can suffer from anxiety, fear of shock, and avoidance of situations, places, and objects that patients associate with shock. About 25% of patients suffer from anxiety and 15% depression.⁹⁵ It can lead to social isolation, avoidance of physical activity (including sexual activity), and mood disorders. Patients may also suffer from phantom shocks, a phenomenon of perception of an ICD shock without actually having received a shock.⁹⁶ Women are generally more affected by psychosocial outcomes than men.⁹⁹ In addition, it has been suggested that negative emotions could be the cause rather than the result of arrhythmia, and that psychological stress can increase the risk of shock. Furthermore, psychosocial status seems to predict mortality.⁹⁷ Even though many patients with an ICD have heart failure, their conditions are complicated by their high risk of sudden cardiac death and their mental struggle to live with an implanted device. Furthermore, the ICD population is heterogeneous in those treated with an ICD for secondary prevention. Many of them do not have heart failure but suffer from an arrhythmic disease. These patients might experience greater uncertainty⁹⁸ whereas patients treated with an ICD for secondary prevention who have heart failure, might experience lower physical function and quality of life.

Effects of psychoeducation

A few small psychoeducational intervention studies have demonstrated improvements in anxiety, depression, quality of life,⁹⁹ physical outcomes,¹⁰⁰ as well as fewer unplanned hospital admissions and calls to healthcare providers.^{99,100} Interventions with cognitive behavioural therapy can reduce anxiety in patients with an ICD.¹⁰¹ Also, ICD-specific cardiac rehabilitation and e-learning seems helpful in improving health outcomes.¹⁰²

Sexuality

Patients may experience sexual dysfunction and a decrease in sexual activity after implantation of an ICD. Sexual dysfunction is common in patients with an ICD and is not limited to erectile dysfunction, but also orgasmic function, desire, intercourse, and overall satisfaction are affected. The ICD implant is often followed by long-term abstinence

from sexual activity and/or an emerging fear of having sexual activity after ICD implantation. These experiences are often linked to exercise intolerance, medication side effects, and psychological problems, such as anxiety and depression. The concerns cover fear of the ICD firing during sexual activity, an over-protective partner, erectile dysfunction, and lack of sexual interest. It is reasonable to return to sexual activity after an ICD is implanted, and it is generally safe for those who had the ICD implanted for primary prevention or for secondary prevention, if moderate physical activity does not precipitate arrhythmias. During sexual counselling, it may be reasonable to address the following areas: timing of safe resumption of sexual activity, what to do if a shock occurs during sex, explanation that an ICD shock will not harm their partner, the level of sexual activity that is safe, how to deal with changes in sexual desire or function, and prepregnancy counselling for women who wish to become pregnant. Referral to sexual rehabilitation might be suggested since sexual rehabilitation improves sexual function and exercise capacity.

Cardiovascular prevention and rehabilitation

Implantable cardioverter defibrillator

Outpatient cardiovascular prevention and rehabilitation is indicated in patients receiving an ICD, but the extent to which it impacts shock status of the patient is controversial.¹⁰² A Cochrane review found no documentation for effect of exercise-based cardiac rehabilitation on any outcome (mortality, adverse events, quality of life) except physical capacity, potentially due to small sample sizes in the trials.¹⁰³ Patients both with primary and secondary prevention ICDs benefit from exercise training. International policy statements encourage cardiac patients to be active for a minimum of 2.5 hours per week in multiple sessions each lasting at least 10 minutes.¹⁰⁴ Low participation rates in cardiovascular prevention and rehabilitation programmes is a global problem. The literature reports female sex, age, comorbidity, socioeconomic burden, distance, and disbelief in the beneficial effect as the most important barriers to participation. Patients with a primary prevention ICD are less physically active than patients with a secondary prevention ICD. Low physical activity in patients with an ICD might be influenced by fear of exercise-induced shock and low New York Heart Association class (see also Chapter 11).

Palliative care

(See also Chapter 14.)

ICD—deactivation discussions

The use of ICD therapy as patients approach end of life is contentious.^{105–107} Terminally ill patients are more likely to develop hypoxia, pain, heart failure, and electrolyte disturbances predisposing them to arrhythmias and thus increasing the frequency of shock therapy from ICDs.¹⁰⁸ It has been found that around 20% of patients with ICDs receive shocks in the final weeks of their lives.¹⁰⁹ Deactivation of the shock function of an ICD in a patient who is dying of a terminal illness, whether cardiac or another condition, prevents the delivery of painful ICD shocks. Individual consideration should be given based on the four ethical principles: respect for patient autonomy, beneficence, non-maleficence, and justice. Honouring both informed consent and informed refusal by the patient to deactivate their device is an integral part of these principles. Cognitively competent patients who wish to have their ICD deactivated to prevent further suffering are entitled to have this performed. If the patient loses capacity and is therefore unable to make an informed decision, an advance directive or next of kin should be consulted. In cases where the clinician refrains from deactivation due to personal beliefs, a second physician willing to carry out the procedure should be involved.^{108,109} The ESC Guidelines recommend that professionals discuss end of life issues with all patients before device implantation and at significant points along the illness trajectory.⁵⁵

Discussing deactivation with the patient and family at the end of life is imperative in order to enable choice and prevent undue distress.¹¹⁰ These discussions should be initiated without delay, and should coincide with the agreement on a 'do not attempt cardiopulmonary resuscitation' order.¹⁰⁵ The patient should also be informed that the decision to deactivate his/her device can be reversed and the patient can choose to reactivate all device functions. The results of the discussion should be noted in medical records, following certain requirements and taking local rules and legislation into account. A multi-disciplinary team effort (physicians, nurses, allied health professionals) is important in order to guide the patient through the decision and following procedure. Before, during, and after deactivation, patients should not be left alone, and family support should be encouraged. Deactivation is a procedure achieved by device reprogramming, or application of a magnet directly over the

Box 7.1 Key elements of nursing roles in the care of patients with arrhythmias

- Setting up and managing continuous cardiac monitoring to identify and promptly treat arrhythmias including defibrillation.
 - Discontinuing monitoring when appropriate according to agreed protocols.
 - Interdisciplinary working with physicians and other members of the multidisciplinary team.
- Demonstrating understanding and knowledge of drugs used in the care of arrhythmia patients.
 - Providing education and support to facilitate shared decision-making and adherence to selected therapies.
 - Advocating for appropriate management decisions around care, for example, patient awareness of procedure success rates and ICD deactivation.

device. Nurses need to know where the magnet is kept and how to use it. However, placing a magnet on the patient is an intervention depending on a physician’s order. In device reprogramming, it may be preferable to suspend only antitachycardia therapies and maintain pacing for bradycardia to avoid symptomatic deterioration. A pacemaker, as opposed to an ICD, will not resuscitate a patient, but can prevent symptomatic bradycardia and worsening of heart failure, and thus improve quality of life of the patient.^{106,108} The ESC Guidelines recommend that ICD deactivation should be considered when clinical conditions deteriorate.¹¹⁰ However, care of patients does not end with device deactivation, and palliative care interventions to minimize symptoms need to be implemented^{106,107} (see Chapter 14).

Conclusion

Cardiac arrhythmias are a common cardiovascular complaint which are typically asymptomatic or ‘non-urgent’, though some can be life-threatening. Given that most patients can lead a normal life once arrhythmias are detected and treated, they should always be considered when caring for any patient with a cardiovascular disorder. The cornerstone skill in this area is patient monitoring, through proper ECG technique and interpretation—allowing the various rhythm types to be quickly identified and appropriately treated. However, care should extend beyond solely managing symptoms and should include a focus on the holistic needs of patients and carers. It is crucial that patients are supported through changes in their everyday life, as well as with anxiety, emotional issues, and changes

Table 7.5 Case studies—arrhythmic heart disease

	Atrial fibrillation	Supraventricular tachycardia
1. Patient population and medical history	Ronan is an 83-year-old widower who lives alone in the same town as his daughter and grandchildren. Ronan lost his wife 8 years ago, but has an active social life and has adapted well to living alone. His previous medical history includes a history of hypertension, smoking, diabetes, and aortic valve replacement 5 years ago that was complicated by renal failure. For the past month, he has felt increasingly short of breath and easily fatigued	Sarah is a 17-year-old student in her final year of high school. She lives with her parents and two younger siblings. Sarah has no pre-existing medical conditions, according to her mother she has always been a very healthy and active child. She is on the school’s basketball team. For the past 2 years Sarah has experienced episodes of tachycardia every other month with a sudden onset and stop. These were accompanied by palpitations, breaking into a sweat, and dizziness and lasted for up to 30 minutes. Sarah could not identify a specific trigger. In the last 3 months, these episodes happen more frequently, once or twice per week, and they last longer. Sarah is scared. She no longer dares to participate in basketball practice and other social activities, always afraid that the next episode might start. She misses interacting with her friends

(continued)

Table 7.5 Continued

	Atrial fibrillation	Supraventricular tachycardia
2. Clinical presentation	Ronan presents to his family doctor who is concerned about his worsening symptoms. He can only walk 1–2 blocks on flat ground without stopping and has great difficulty climbing stairs. The doctor explains that he needs to investigate these symptoms and refers him for an urgent outpatient assessment with the rapid access cardiac team	Now that Sarah's paroxysmal tachycardias happen more frequently, an episode can be documented by Holter monitoring and her physician refers Sarah to an electrophysiologist. He confirms a narrow complex tachycardia with a rate of around 180 bpm. All other tests, including echocardiogram, are normal
3. Evaluation pathway	The rapid access cardiology nurse sees Ronan 3 days later. She undertakes a thorough assessment and orders an ECG and echocardiogram as well as a full range of blood tests. The cardiologist and nurse meet with Ronan to review his case. The doctor states that Ronan has AF which puts him at significant risk for stroke with a CHA ₂ DS ₂ -VASc score of 5. The clinic nurse reports that Ronan is independent with all his activities of daily living, is moderately frail, has an alcohol consumption of 20 units per week, and normal body mass index. He is highly motivated to be treated, hoping that his symptoms will improve and restore his quality of life	The electrophysiologist discusses with Sarah and her parents all possible treatment options, including antiarrhythmic medication and catheter ablation. Sarah's perceived psychological strain is high. She misses her social activities and is concerned about the tachycardia occurring during her final exams. She just wants her normal life back as quickly as possible. Therefore, the electrophysiologist recommends an electrophysiological study with possible catheter ablation of the tachycardia which he suspects to be an AV nodal reentry tachycardia. Sarah and her parents agree to this approach
4. Treatment	The nurse discusses Ronan's test results with him and reassures him that his valve is OK. She explains the ECG results including what AF is in simple terms. She discusses how it increases the chance of stroke, offering him an opportunity to ask questions and a patient booklet for advice. Ronan states he wants to maintain his current quality of life and reduce the risk of stroke. He asks if tablets can help him, and is reassured that while the tablets available do not stop AF, they can reduce his risk of stroke. The cardiac team recommends lifestyle modification and beta-blocker therapy as the preferred option for Ronan	Sarah is admitted on the day of her procedure. She undergoes electrophysiological study with percutaneous access through the femoral vein and conscious sedation. An AV nodal reentry tachycardia can be induced and successfully ablated by slow pathway modification. No other arrhythmias are inducible A nurse talks to Sarah about her fears and together they explore some strategies to deal with them including the option of accessing a patient support group for young people with arrhythmia in the region
5. In-hospital nursing care and priorities	Ronan states that he has no problem taking medication and that his pharmacist will add this new tablet to his daily pill box. When the nurse discusses lifestyle modification with Ronan and explains that alcohol consumption increases the risk of AF, Ronan states that he would prefer to reduce his alcohol intake than suffer disability from a stroke. He does not want to abstain from alcohol altogether. Together Ronan and the nurse agree goals of having at least 4 alcohol-free days per week and make a plan to reduce his alcohol intake to 6 units per week. The nurse offers Ronan her card with access to a cardiac helpline for advice and arranges a follow-up call with Ronan in 4 weeks and a clinic review in 12 weeks	Immediately after the procedure, Sarah is transferred to the cardiology ward where the cardiac nurse monitors her to ensure vascular haemostasis, haemodynamic stability, and absence of new arrhythmias. After 6 hours of strict bed rest, Sarah can get up and take care of herself. No complications occur and Sarah can be discharged the next day. Following advice from the nurse, Sarah is referred to a psychologist

Table 7.5 Continued

	Atrial fibrillation	Supraventricular tachycardia
6. Discharge planning and follow-up	At follow-up, Ronan is doing well and not experiencing any problems associated with his new medication. He discloses difficulty maintaining his alcohol-free days and they renegotiate a plan he feels is more realistic, which includes limiting alcohol to 2 units per day	Sarah stays at home for 3 days after the discharge, before she returns to school. She follows the recommendations to refrain from physical exercise and not lift anything heavy for 10 days. Sarah recovers quickly from the procedure. She regains confidence and resumes playing basketball and meeting friends. She perceives that her parents are very protective and feels it useful to discuss these issues with her psychologist. A follow-up Holter monitoring 3 months after the procedure shows no relevant arrhythmia

to their sexual relations. Such support should be patient centred and focus on continuous patient education and comprehensive treatment through a multidisciplinary team approach. In addition to alleviating patient burden, this would also aid in supporting patients to make positive lifestyle adjustments (diet, exercise, alcohol intake, smoking, etc.) and in their adherence to interventions and medical treatments. While quality of life improvements are possible for the majority of patients, palliative care is an important consideration for those with ICDs and deactivation discussions should be considered where appropriate.

► **Box 7.1** outlines the key nursing priorities identified in this chapter in the care of patients with arrhythmias. In addition, ► **Table 7.5** provides two case study examples.

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8 Care of the patient with valvular heart disease

TONE M. NOREKVÅL, BRITT BORREGAARD, TINA B. HANSEN,
TRINE B. RASMUSSEN, AND SANDRA B. LAUCK

CHAPTER CONTENTS

Introduction 216

Epidemiology 216

Pathophysiology 217

Aortic stenosis 217

Aortic regurgitation 217

Mitral stenosis 218

Mitral regurgitation 218

Infective endocarditis 218

Clinical presentation 219

Aortic stenosis 219

Aortic regurgitation 219

Mitral stenosis 219

Mitral regurgitation 220

Infective endocarditis 220

Assessment pathway 220

Cardiac imaging and other diagnostic tests 220

Additional considerations for infective endocarditis 221

Functional assessment and frailty 222

Comprehensive management plan 222

The Heart Team approach and specialized care 223

Medical management 225

Surgical valve replacement and repair 226

Transcatheter valve replacement and repair 227

Surgical treatment of infective endocarditis 231

Medical management: integrating a palliative approach 231

After a heart valve procedure: follow-up 232

Facilitating safe transition home 232

Surveillance and monitoring 232

Post-procedure echocardiography 234

Considerations for antithrombotic management 234

Endocarditis prophylaxis 235

Patient education and information during follow-up 235

Mental health 237

Physical and cardiac rehabilitation 237

Follow-up: patient-reported outcomes and experiences 237

Conclusion 238

This chapter covers the care of patients with valvular heart disease. It addresses the principles of interdisciplinary working of members of the Heart Team and identifies the nursing priorities for patient care.

KEY MESSAGES

- The natural history of valvular heart disease is associated with significant mortality and morbidity,

increased symptoms, and poor quality of life, as well as high rates of hospital readmission and healthcare utilization.

- In the past decade, there has been a paradigm shift in the management of valvular heart disease with the rapid emergence of minimally invasive transcatheter options for patients with varying surgical risk profiles and valve diseases.
- Acquired valvular heart disease is primarily a disease of ageing. A comprehensive understanding of frailty, including the pathophysiology, screening, and clinical implications, is a core competency of cardiovascular nurses who provide care to patients with complex valvular heart disease.
- The multidisciplinary Heart Team for the provision of comprehensive, collaborative care to patients with valvular heart disease guides the assessment pathway and treatment recommendations. This team-based approach aims to leverage the strengths and skills of its members to optimize the safety and quality of patient care.
- Endocarditis is an infection of the endocardial surface involving the heart valves and/or surrounding structures typically caused by bacteria. Close monitoring for early signs of disease progression, inadequate infection control, and complications is essential to prevent clinical deterioration.
- Patients recovering from infective endocarditis will often have been physically inactive for weeks or months due to diagnostic delay, their symptom burden, long-term hospitalization, and possible postsurgical restrictions.
- The implications of changes in haemodynamics, the trajectory of heart failure, and the variation in clinical presentation across age groups and pathologies create unique challenges to optimize outcomes and support patients and their family.

Introduction

Degenerative valvular disease is the next cardiovascular epidemic in developed countries. Prevalence rises markedly with age, from less than 2% in patients under the age of 65 years, to 8.5% in those aged 65–75 years, and 13.2% after the age of 75 years.¹ The natural history of valvular heart disease is associated with significant mortality and morbidity, increased symptoms, and poor quality of life, as well as high rates of hospital readmission and healthcare utilization. The complexity of the care of patients with valvular heart disease is compounded by the

impact of concomitant conditions including heart failure, the multisystem impact of impaired cardiac output, and age-associated frailty. In addition, patients present with significant variation in clinical status depending on aetiology, disease progression, and treatment decisions. Cardiovascular nurses require foundational knowledge about the pathology and clinical presentation of valvular heart disease, the unique assessment findings and diagnostic modalities, and the treatment management options. The spectrum of these conditions encompasses multiple disease processes associated with individual or combined heart valves. The focus of this chapter is restricted to the acquired valvular heart diseases most frequently seen in cardiovascular nursing practice: aortic valve disease, mitral regurgitation, and infective endocarditis.

Epidemiology

The prevalence of valvular heart disease is challenging to quantify due to the variation in clinical presentation and often latent disease progression, the absence of systematic disease surveillance and delay to diagnosis, and the compounded effect of comorbidities. Epidemiological considerations include distinct groups that experience high rates of valvular heart disease in Europe including the elderly, the heart failure population, people living with cardiac devices and/or at high risk of blood-borne infections, and people originally from countries with higher rates of rheumatic heart disease. Of these, the ageing population represents the single most important driver of disease prevalence. For example, according to a population-based study in Norway that spanned over 14 years, aortic stenosis was prevalent in 0.2% of people in the 50- to 59-year-old cohort, 1.3% in the 60- to 69-year-old cohort, 3.9% in the 70- to 79-year-old cohort, and 9.8% in the 80- to 89-year-old cohort.² This pattern is similarly seen in the setting of mitral valve disease, which follows closely the epidemic of heart failure.

The incidence of infective endocarditis has also been rising in middle and high income countries (industrialized is a dated term) countries, while the epidemiological profile has evolved significantly in the past decade. This increase is associated with the growing prevalence in degenerative valvular disease in the elderly population, increasing use of prosthetic valves and implantable cardiac devices in cardiac treatment, exposure to invasive procedures and nosocomial bacteraemia, and the devastating effects of the epidemic of addiction and high-risk intravenous drug use.^{3,4} More than one-third of affected patients are over 70

years old in higher-income countries due to the increased vulnerability of older people to infection and the higher likelihood of invasive treatments; men outpace women at a ratio of approximately 2:1.³ The incidence of endocarditis is reported to be between 3 and 10 per 100,000 person-years; as many cases are either not identified, or diagnosed postmortem, prevalence is higher than documented.^{3,4} Although improvements in diagnostic tools, novel antibiotics, and changes in treatment regimens have improved survival since the 1960s, prognosis remains devastatingly poor, with 10–25% in-hospital and 20–40% 1-year mortality. Risk factors for poor outcome in the setting of endocarditis include heart failure, renal failure, advanced age and involvement of the central nervous system, most often cerebral embolisms, and social determinants of health.

Pathophysiology

The impaired function of heart valves to respond to intracardiac pressure changes to open and close appropriately in a carefully timed sequence may be the result of multiple mechanisms and pathologies (see also Chapter 4). Importantly, the lack of regulation of haemodynamic flow associated with restricted or regurgitant valves can have deleterious effects on cardiac function and cardiac output, and can be a trigger and accelerator of the cascade of heart failure. Central to the pathophysiology of most valvular heart diseases, the following concepts are essential:

- Stenosis: narrowing, thickening, or vegetations restrict forward blood flow resulting in the inability of the valve leaflets to adequately open.
- Regurgitation or insufficiency: inability of the valve leaflets to close appropriately to prevent backward flow, resulting in leaking from an area of higher pressure to lower pressure.
- Pressure gradient: the difference in pressure (measured in mmHg) between two chambers and/or vessels. The pressure gradient is a measurement of the grade of haemodynamic significance of valvular heart disease.

Aortic stenosis

Aortic stenosis occurs when the orifice of the aortic valve is reduced, preventing the valve from opening fully and reducing blood flow from the left ventricle into the aorta. There are three known causes of aortic stenosis: rheumatic disease, calcific disease, and congenital valve disease.

In North America and Europe, calcific disease of a native trileaflet valve or a congenitally bicuspid valve remains the most common cause of aortic stenosis.

The mechanism of calcification is due to an inflammatory process caused by mechanical stress, lipid deposition, and some characteristics similar, but not entirely, to arterial atherosclerosis. These changes are known to occur earlier in bicuspid valves than in normal tricuspid valves, presumably attributed to increased mechanical stress and earlier initiation of the inflammatory process in the asymmetrical bicuspid valve.

Aortic stenosis can be viewed on a continuum from aortic sclerosis to severe aortic stenosis. Aortic sclerosis is characterized by calcification or focal leaflet thickening of the valves with preserved normal function. As aortic stenosis develops, the leaflets thicken, calcium nodules form, new blood vessels appear, and blood flow through the left ventricular outflow tract is increasingly obstructed. Left ventricular output is initially maintained by adaptation of the increasingly hypertrophic left ventricle. This compensation mechanism serves to normalize the left ventricle wall stress.

Progression of aortic stenosis produces a reduction in valve area and an increased pressure gradient across the valve. As the aortic leaflets thicken and calcify, antegrade velocity initially remains normal until the orifice area reaches less than half of the normal valve area of about 3–4 cm² in adults. As aortic stenosis becomes increasingly haemodynamically significant, there is rising pressure overload on the left ventricle which decompensates with a decline in cardiac output and a rise in pulmonary artery pressure. In advanced stages of the disease, secondary pulmonary hypertension may result in right-sided heart failure.

Aortic regurgitation

Aortic regurgitation occurs when blood flows backwards across the aortic valve from the aorta into the left ventricle during diastole due to an incompetent valve. In chronic aortic regurgitation, the left ventricle enlarges to maintain a normal cardiac output. Increased afterload is compensated for by left ventricular hypertrophy, but decompensation and systolic left ventricular dysfunction may gradually develop. Acute aortic regurgitation is a sudden haemodynamically significant aortic incompetence which causes an abrupt increase in end-diastolic pressure, decreased cardiac output, and heart failure which can progress to cardiogenic shock (see also Chapter 5). The most common causes of chronic aortic valve regurgitation are

diseases of the aortic leaflets or the aortic root. Aortic leaflet conditions include degenerative leaflet calcifications, a bicuspid aortic valve, damaging processes such as infective endocarditis, or rheumatic fever. In contrast, aortic root conditions comprise idiopathic root dilatation, aortic dissection, Marfan syndrome, collagen vascular disease, and syphilis.

Mitral stenosis

The primary cause of mitral stenosis is rheumatic heart disease, which accounts for approximately 98% of clinical presentations; prevalence, morbidity, and mortality are highest predominantly in developing or economically marginalized countries. Patients can present at all ages, and may have concomitant valvular heart disease. In contrast, degenerative calcific mitral stenosis is mostly seen in elderly patients.

Rheumatic valvular heart disease causes thickening of the valve leaflets by fibrous distortion, which, combined with increasingly rigid cusps, results in narrowing of the valve. Over time, the mitral valve area decreases and the left atrial pressure increases to exert force and eject blood into the left ventricle. A pressure gradient develops between the left atrium and the left ventricle to help assist the diastole. The elevated left atrial pressures are transmitted to the pulmonary veins and the right side of the heart. On exertion, as cardiac output and jet velocity across the mitral valve increase, the transmitted pressure gradient becomes exponentially larger, and pulmonary oedema can occur.

Mitral regurgitation

Mitral regurgitation results from the incomplete closure of the mitral valve and a pressure gradient between the left ventricle and the left atrium, which leads to abnormal systolic backward flow of blood from the left ventricle to the left atrium. Mitral regurgitation causes left ventricle volume overload. Due to the increased volume, left atrial pressure rises, leading to compensatory left atrial enlargement.

As mitral regurgitation worsens and the stress on the left ventricle increases, left ventricular hypertrophy develops to maintain normal left ventricular pressures. Eventually, systolic heart failure ensues. In chronic mitral regurgitation, symptoms may be delayed for years due to the adaptation of the left ventricle. In acute mitral regurgitation, the left ventricle is unable to compensate properly, causing patients to experience significant haemodynamic instability.

Mitral regurgitation can arise either due to disease of the mitral valve apparatus known as organic mitral regurgitation (primary), or due to left ventricular disease or remodelling due to idiopathic cardiomyopathy or coronary artery disease known as functional mitral regurgitation (secondary or ischaemic cardiomyopathy). The causes of organic mitral regurgitation comprise degenerative mitral regurgitation (including leaflet prolapse, mitral annular calcification, and myxomatous changes), rheumatic heart disease, and infective endocarditis which can result in leaflet perforation and chordal rupture.

Infective endocarditis

Endocarditis is an infection of the endocardial surface involving the heart valves and/or surrounding structures. The infection may involve the native heart valves, but also implanted cardiac devices/implants, such as pacemakers (see also Chapter 7) and heart valve prostheses. Endocarditis can be non-infectious, although typically it is an infection caused by bacteria or, more rarely, fungi. Bacteria may invade and damage the tissue causing heart valve destruction, and leading to acute heart failure (30–50%). Bacterial vegetations can dislodge into the vascular circulation, resulting in thromboembolic events (20–30%), including stroke (15–20%) and more peripherally, commonly to the spleen.^{3,4} Approximately 70% of all cases of endocarditis involve native heart valve tissue, 20% heart valve prosthesis, and 10% cardiac devices. Due to a higher flow across the left-sided valves, the higher risk of lesions, and bacterial growth, the left-sided heart valves are more frequently affected, accounting for 80–85% of cases; the aortic and mitral valves are equally affected in 10% of these cases.^{3,4} Right-sided and device-related endocarditis remain rare, although growing numbers of device endocarditis have been reported; this may be due to the increase in, and complexity of, cardiac device treatment. Once the valvular apparatus is critically diseased, pathophysiological processes are similar to those described previously in the case of aortic or mitral regurgitation.

The triggering event of an endocardial infection is epithelial damage of the heart valves or endocardium in combination with bacteraemia. The natural defence system of the endothelium against infection is reduced once the damage occurs and bacteria may attach to its flawed surface. Groups at risk include people with congenital heart disease, degenerative heart valve disease, and intracardiac devices and prosthesis, and individuals who are subject to blood-borne infections and septicæmia.

through the use of intravenous drugs. In addition, haemodialysis catheters, dental infections, and colonic polyps present additional routes of microbial entry. The most common pathogens are staphylococci and streptococci, which together account for more than 70% of all cases of infective endocarditis, whereas enterococci infection is seen in increasing numbers in the elderly population. The pathogen creates solid vegetations or masses consisting of bacteria, white blood cells, fibrin, and platelets that invade and destroy the surrounding tissue. The vegetations may dislodge into the circulation, and can cause harmful and potentially deadly complications, particularly cerebral and other embolic events.

Clinical presentation

Aortic stenosis

Aortic stenosis has a prolonged asymptomatic latent period that creates unique challenges for a timely diagnosis and treatment plan. The compensatory mechanisms described earlier coupled with the potential patient perception that changes in health status may be the result of normal ageing can defer diagnostic investigations. The onset of symptoms of aortic stenosis marks a pivotal delineation in the determination of prognosis: left untreated, the risk of sudden death for severe aortic stenosis ranges from 8% to 34% after the onset of symptoms, and survival is limited to 1–3 years.

At their earliest stage of diagnosis, patients are likely to present with a decrease in exercise tolerance, fatigue, and/or dyspnoea on exertion. On examination, a slow rate of increase in the carotid pulse, a mid to late peaking intensity of a systolic murmur, and a reduced intensity of the second heart sound are consistent with signs of severe aortic stenosis. Advanced disease is characterized by the onset of one or more of the triad of manifestations of aortic stenosis—heart failure, angina, and/or syncope (see more information on these conditions in Chapters 6, 7, and 10)—which can be explained by the following mechanisms:

- Heart failure: left ventricular pressure overload increases when aortic stenosis becomes more haemodynamically compromising; the increased wall stress leads to left ventricular hypertrophy and the subsequent cascade of left ventricular diastolic dysfunction, increased end-diastolic pressure, and pulmonary congestion. Exertional symptoms are caused by impaired cardiac output.

- Angina: in the absence of concomitant coronary artery disease, angina in the setting of left ventricular dysfunction is the result of decreased coronary supply due to diastolic dysfunction, left ventricular hypertrophy, and mechanical compression.
- Syncope/presyncope: decreased cerebral perfusion and peripheral vascular resistance can cause patients to experience syncope or presyncope, especially in the most advanced stages of aortic stenosis.

Aortic regurgitation

Once symptomatic, patients with aortic regurgitation typically present with signs of left-sided heart failure, including dyspnoea on exertion, orthopnoea, and fatigue. Patients may experience angina in the absence of arteriosclerotic disease due to decreased aortic diastolic pressure and increased oxygen demand. Acute aortic regurgitation rapidly leads to dyspnoea or pulmonary oedema and/or cardiogenic shock due to the rapid elevation of end-diastolic pressures in the left ventricle. Some patients even with severe chronic aortic regurgitation may remain asymptomatic for a long time. In this setting and when left ventricular function is preserved, the probability of adverse events is low. In contrast, when the left ventricular end-systolic diameter is 50 mm or larger, the probability of death, symptoms, or left ventricular dysfunction is reported to be 19% per year.⁵ In symptomatic patients with severe chronic aortic regurgitation, mortality without surgical treatment may be as high as 10–20% per year.⁵ In acute presentations, haemodynamic instability is associated with a poor prognosis in the absence of treatment.

Mitral stenosis

Symptoms usually appear gradually over years, with patients first reporting dyspnoea on exertion triggered by infection, stress, pregnancy, or atrial fibrillation. Atrial fibrillation often begins in paroxysms and eventually becomes chronic with high risk of left atrial thrombus formation. Progression of disease with increasing left atrial and pulmonary venous pressures will cause progressive dyspnoea and heart failure. At more advanced stages, patients may experience fatigue due to low cardiac output, weakness, or, when right ventricular failure is present, abdominal discomfort due to hepatomegaly.

Severe rheumatic mitral stenosis is commonly observed in teenagers or young adults, although most patients usually do not experience symptoms until the second to fourth decade of life. Survival in asymptomatic patients

with rheumatic mitral stenosis is generally good, however, depending on country. Symptomatic patients have a poor prognosis with a 5-year survival of only 44%.⁶

Mitral regurgitation

Similar to aortic stenosis, patients with chronic mitral regurgitation may be asymptomatic for years as compensatory mechanisms are activated. Initial signs include exercise intolerance, dyspnoea, orthopnoea, palpitations, new atrial arrhythmias, and lower extremity oedema. The gradual onset of symptoms may cause patients to seek medical care for subacute and vague symptoms, including fatigue and inability to sleep. Auscultation reveals a holosystolic murmur which is best heard at the apex. In moderate to severe mitral regurgitation, a third heart sound gallop is audible because of the high diastolic flow into the ventricle; in acute mitral regurgitation, the non-compliance of the left chambers can be manifested in a fourth heart sound gallop. Left ventricular dilatation can cause patients to have a left laterally displaced point of maximal impulse in advanced disease.

As disease progresses, left-sided heart failure and symptoms related to low cardiac output intensify. Patients can further develop right-sided heart failure due to increased pressures from the left heart affecting the right ventricle.

In contrast, symptoms progress rapidly in acute presentations as compensatory mechanisms fail to maintain the balance of oxygen supply and demand; tachycardia in response to reduced forward stroke volume, severe dyspnoea due to pulmonary congestion and oedema, and signs of left or biventricular failure due to pulmonary hypertension require immediate medical attention. Anxiety, diaphoresis, and decreased breath sounds can manifest worsening decompensation. In patients with severe chronic mitral regurgitation who are asymptomatic, the 5-year all-cause mortality rate is estimated at 22%, while cardiovascular mortality rate is 14%.⁷ Acute mitral regurgitation carries a poor prognosis in the absence of intervention.

Infective endocarditis

The rate of symptom development and clinical deterioration in the setting of infective endocarditis depends on the pathogen and patients' overall health vulnerabilities. The initial symptoms often resemble those of other infections such as influenza or pneumonia and may include unspecific symptoms like fever, chills, fatigue, muscle pain, loss of appetite, and general discomfort. Consequently,

patients may be misdiagnosed and treatment may be delayed. Given the potential rapid onset of septicaemia and haemodynamic instability, this delay in diagnosis can result in debilitating or fatal complications.

The most common objective clinical findings of endocarditis are fever and a new heart murmur corresponding to heart valve insufficiency. Signs and symptoms of microembolization and immunological responses such as petechiae (tiny purple or red spots on the skin, whites of the eyes, or inside the mouth), splinter haemorrhages (thin, red to reddish-brown lines of blood under the nails), Janeway lesions (red spots on the soles of the feet or the palms of the hands), Osler nodes (red, tender spots under the skin of the fingers or toes), and Roth spots (red spots with white or pale centres on the retina) may be present. The diagnosis of infective endocarditis is based on the modified Duke criteria, of which the most decisive ones are positive blood cultures with typical endocarditis pathogens and evidence of endocardial involvement with positive echocardiography or other imaging modalities.^{3,4}

Assessment pathway

The assessment pathway for valvular heart disease is complex; it requires a multimodality and multidisciplinary approach to develop a comprehensive understanding of the patient's disease state and to develop a tailored treatment plan. In addition to the central importance of detailed physical assessment described elsewhere in this text (see Chapter 5), cardiac imaging, additional considerations in the setting of endocarditis, and functional and frailty assessment are particularly salient to the management of complex valvular heart disease.

Cardiac imaging and other diagnostic tests

Transthoracic echocardiography remains the most critical diagnostic modality for assessing the presence and severity of valvular heart disease. This non-invasive imaging provides images of calcified or flailed leaflets, mobility, valve structure, and anatomy. Measurement of left ventricular mass, ejection fraction, and transvalvular pressure gradients, velocity, and areas provide important diagnostic information. In many situations, transoesophageal echocardiography is required to perform a precise diagnosis both of the disease pathology and mechanism of valve disease. This information is furthermore important for assessment of surgical timing and detailed surgical planning.

Computed tomography (CT) is emerging as a powerful diagnostic tool, particularly in the setting of procedure planning for transcatheter treatment options. CT can determine annulus size and shape, risk of annular injury and coronary occlusion in the setting of aortic valve deployment, and provide imaging guidance in advance of angiographic procedures.

Other useful diagnostic modalities include 12-lead electrocardiography (ECG) to screen for left ventricular hypertrophy, chest radiography to assess for signs of heart failure, including cardiomegaly, prominent ascending aorta, and/or pulmonary venous congestion. Left and right cardiac catheterization and coronary angiography can augment haemodynamic assessment and identification of concomitant coronary artery disease. Measurement of plasma concentration of B-type natriuretic peptide (BNP) and N-terminal pro-BNP may be useful to document disease progression.

Additional considerations for infective endocarditis

Initial diagnostic procedures include investigations to confirm or deny the Duke criteria (► Fig. 8.1) and include a thorough medical history to identify predisposing factors and bacterial port of entry; auscultation; bloodwork including cultures to identify pathogen, biochemical infection response, and organ function; transoesophageal (and transthoracic) echocardiography; ECG investigating possible atrioventricular conduction disturbances; and, particularly in suspected prosthetic endocarditis, also positron emission tomography CT.^{3,4} Screening in relation to weight loss and nutritional status, risk of pressure ulcers, falls assessment, functional capacity and frailty assessment are also relevant investigations at the time of hospital admission serving as a baseline for nursing strategies during a lengthy treatment.

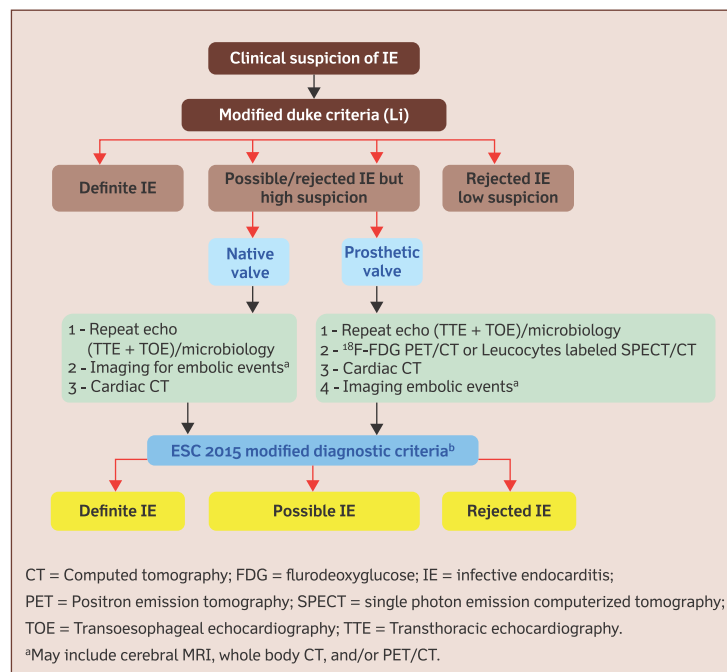


Fig. 8.1 Modified Duke criteria for the diagnosis of infective endocarditis (IE).

Habib G, Lancellotti P, Antunes MJ, et al; ESC Scientific Document Group. 2015 ESC Guidelines for the management of infective endocarditis: The Task Force for the Management of Infective Endocarditis of the European Society of Cardiology (ESC). Endorsed by: European Association for Cardio-Thoracic Surgery (EACTS), the European Association of Nuclear Medicine (EANM). Eur Heart J. 2015 Nov 21;36(44):3075–3128. doi: 10.1093/eurheartj/ehv319 © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

Functional assessment and frailty

Acquired valvular heart disease is primarily a disease of ageing. The assessment of physical, mental, and social functional status and frailty is essential to determine patients' health status and support treatment decisions. A comprehensive understanding of frailty, including the pathophysiology, screening, and clinical implications, is a core competency of cardiovascular nurses who provide care to patients with complex valvular heart disease.

What is frailty?

Frailty is different from ageing and helps explain the heterogeneity of older adults. Frailty is a complex health state, often defined as an age-related, multisystem syndrome that increases health vulnerabilities and risks of adverse events (e.g. significant decline, functional impairment, death) when exposed to stressors (e.g. hospitalization, illness), compared with patients of the same age. Clinically, frailty can be conceptualized as a continuous spectrum of impaired resilience.⁸ The challenge for patients with valvular heart disease is to maintain the fragile balance between their physical, mental, and social health status reserve; manage their accumulation of deficits and the impact of social determinants of health; and withstand the potential stressors associated with treatment. Decreased physical activity and impaired walking performance, diminished energy level and endurance (e.g. fatigue), weakened strength and balance, poor cognition, depressed mood, impaired nutritional status, and unintentional weight loss further compound the effects of comorbidities, disabilities, and socioeconomic determinants of health (e.g. social support, income, education).⁹ This reduced reserve affects multiple organ systems and is associated with increased risks, including longer length of stay, delirium and other in-hospital complications, morbidity, and mortality.¹⁰ The loss of physiological reserves and the progressive accumulation of deficits further worsen the effects of the cycle of frailty in people with valvular heart disease.

Although interrelated, frailty differs and is distinct from disability and comorbidity. Disabilities can be broadly defined as difficulty or dependency in carrying out activities of daily living or instrumental activities of daily living. Comorbidity refers to the burden of illness or disease, defined by the total burden of physiological dysfunction that affects patients' reserve. Frailty can worsen as a result of both disabilities and comorbidities.¹¹

Why measure frailty?

The predictive value of frailty continues to be highlighted in multiple clinical trials and national registries. There is

a widespread clinical consensus that the assessment of frailty augments the comprehensive evaluation of patients, informs treatment decision and early discharge planning, and supports individualized care to mitigate risks and optimize outcomes.¹² There is increasing evidence that the devastating effects of frailty can be attenuated by exercise and nutrition interventions to improve physical functioning after valvular heart disease treatment.¹³

How is frailty measured?

The absence of consensus surrounding assessment tools, the unstandardized measurements employed in research and clinical care, and the lack of validation in the valvular heart disease population continue to be significant barriers to the incorporation of frailty measurement in practice. The following are among the most consistently used instruments:¹⁴

- *Fried Scale*: this is the most frequently cited frailty scale and has been demonstrated to predict mortality and disability in patients with cardiac disease. The scale captures the core phenotypic domains of frailty and encompasses slowness, weakness, low physical activity, exhaustion, and shrinking (unintentional weight loss), with three or more of five criteria required for a diagnosis of frailty.
- *Short Physical Performance Battery*: the scale captures slowness, weakness, and balance and is measured by a series of timed physical performance tests—gait speed, chair rises, and tandem balance; each is scored 0 to 4 (low score = low physical function). A total score of 5 or less out of 12 is required for a diagnosis of frailty.
- *Study of Osteoporotic Fractures Index*: the index is a composite score of three frailty criteria to predict risk—weight loss of 5% or more over 3 years; ability to perform five sequential chair rises with arms folded on chest; and answer to question 'Do you feel full of energy?'
- *Essential Frailty Toolset*: the scale was recently validated in patients undergoing aortic valve replacement. It includes four indicators: ability to perform five chair rises in less than 15 seconds; cognitive status measured by the MiniCog (three-word recall and clock test drawing); and recent serum haemoglobin and albumin (► Fig. 8.2).

Comprehensive management plan

The following section provides an overview of multidisciplinary approaches to patient management, nursing

	Five chair rises <15 seconds	0 points
	Five chair rises ≥15 seconds	1 points
	Unable to complete	2 points
	No cognitive impairment	0 points
	Cognitive impairment	1 point
	Hemoglobin ≥13.0 g/dL ♂	0 points
	≥12.0 g/dL ♀	
	Hemoglobin <13.0 g/dL ♂	1 point
	<12.0 g/dL ♀	
	Serum albumin ≥3.5 g/dL	0 points
	Serum albumin <3.5 g/dL	1 point

Fig. 8.2 The Essential Frailty Toolset measurements and scoring.¹⁴

Reproduced from Lauck SN, TM. Frailty, quality of life, and palliative approach. In: Transcatheter Aortic Valve Replacement Program Development: A Guide for the Heart Team. New York 2019 with permission from Wolters Kluwer.

care, and treatment options, including surgical and minimally invasive procedures, and recommendations about integrating a palliative approach among patients with different valve diseases will be given and are summarized in ► **Box 8.1**. This information augments the foundational recommendations provided in the European Society of Cardiology (ESC) and other guidelines.^{3,15}

The Heart Team approach and specialized care

The concept of a multidisciplinary Heart Team for the provision of comprehensive, collaborative care to patients with valvular heart disease has emerged across regions and guidelines as a standard of care to guide the assessment pathway and treatment recommendations. This team-based approach aims to leverage the strengths and skills of its members to optimize the safety and quality of patient care (see also Chapter 3). The Heart Team comprises core and extended members who collectively provide care across the continuum (► **Fig. 8.3**). Although the foundation of the team may be the cardiothoracic surgeon and interventional cardiologist, each additional member provides value. Discussions centred on treatment options

(e.g. surgical repair or replacement, percutaneous option, or medical management) are strengthened by the contributions of surgeons, cardiologists, imaging specialists, nurses, and other stakeholders. This team is best suited to discuss the management of concomitant conditions (e.g. the need for coronary revascularization) and individualized procedure planning. Mortality risk models including the EuroScore and the Society of Thoracic Surgeons (STS) score, are commonly used to assess and predict outcomes after surgery in terms of survival and major complications.¹⁵ These risk scores can help guide the multidisciplinary team's evaluation of risk and benefits, and provide individualized treatment recommendations.

There are multiple layers of responsibility across multiple specialties, roles, and training. The formal responsibilities in patient assessment, treatment decisions, and procedural planning vary across valvular heart disease programmes, but all play pivotal roles in shepherding patients on the pathways of diagnosis, treatment, and follow-up. Although the distinct benefits associated with the Heart Team approach have yet to be fully evaluated, the aim is to provide high-quality, patient-centred care. Continuity is established and maintained from the time of initial consultation, procedure, and follow-up, which, in

Box 8.1 Key elements of nursing roles in the care of patients with valvular heart disease

1. Care coordination, patient and family education, early and ongoing discharge planning, and case management as part of the heart care interdisciplinary team.
2. Comprehensive understanding of frailty and its implications for patients with complex valvular heart disease.
3. Capacity to conduct a comprehensive face-to-face or telephone assessment to ascertain health status (e.g. shortness of breath, palpitation, syncope, change in physical condition, nutritional status, sleep patterns, mental health, and impact of comorbidities) in the outpatient clinic setting.
4. Exceptional communication skills applied to both patients families and the healthcare team.
5. Clinical observations of patients' haemodynamic condition immediately following valve surgery: rapid changes in condition, observation of fluids and monitoring of cardiac rate and rhythm, and appropriate use of vasoactive agents and fluid management.
6. Educating patients to observe for signs of wound infections after discharge for valve surgery.
7. Detection, treatment, and identification of the underlying causes of delirium.
8. Supporting the patient with delirium: decreasing visual and auditory stimuli, resuming day/night circadian rhythm, family support, and therapeutic communication skills.
9. Following nursing protocols or care standards for care of patients having TAVI: recovery from sedation/anaesthesia, vascular access haemostasis, cardiac rhythm monitoring, neurological status, readiness for mobilization, and renal function.
10. Special roles in the care of patients with infective endocarditis:
 - a. Careful and comprehensive baseline assessment for nursing strategies addressing a long treatment duration.
 - b. Specialist care coordination: role as the cross-disciplinary contact.
 - c. Managing complications related to antimicrobial treatment: opportunistic infections such as oral or genital candidiasis, drug fever, skin rashes, and diarrhoea.
 - d. Understanding of complex care needs for patients with diabetes, haemodialysis, and stroke sequelae (patient population with a high comorbidity burden).
 - e. Development of a strong therapeutic relationship to address adherence given the length of treatment (see Chapter 12 and 13).
 - f. Nurse-led follow-up clinics post discharge to monitor symptoms and provide education to support self-care.

similar specialities, has been found to affect the overall patient experience. Barriers to the development of a Heart Team approach include the absence of a valve programme coordinator (e.g. nurse), effective communication, scheduling and coordination, and 'programme culture' that is not conducive to interdisciplinary practice, also referred to as 'multidisciplinary' in the literature on the management of valvular heart disease. The pivotal role of cardiovascular nurses in the continuum of care of this complex patient group is increasingly noted in American and Canadian guidelines but currently absent from the ESC guidelines. The recognition of nurses is in the value of care coordination, patient and family education, early and ongoing discharge planning, and case management.

Nursing competencies in the outpatient clinic setting centre on the capacity to conduct a comprehensive in-person or telephone assessment to ascertain health status (e.g. shortness of breath, palpitation, syncope, change in physical condition, nutritional status, sleep

patterns, mental health, and impact of comorbidities), and exceptional communication skills applied to both patients and the healthcare team.

In addition, specialized clinics in high-volume referral centres provide access to multidisciplinary expertise, integrated care processes for surveillance and follow-up, and the provision of multiple treatment options. In particular, the ongoing monitoring of cardiac echocardiography findings is essential to guide treatment, and contribute to the early recognition of disease progression.

Further, the emergence of multiple treatment options is an opportunity for the Heart Team to promote shared decision-making and the use of decision aids to incorporate patients' values and priorities. By this, the team can strengthen a patient-centred approach¹⁶—including ensuring that patients and families are informed and participate fully in their treatment plan—and optimize risk-stratified procedure planning to tailor care to individual needs.¹⁷

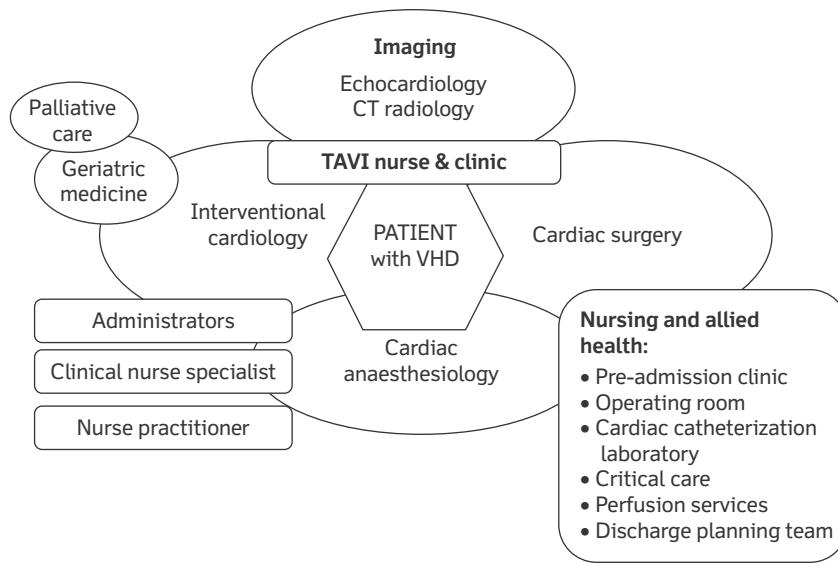


Fig. 8.3 The Heart Team approach in the management of valvular heart disease (VHD).

Although the Heart Team approach has been promoted primarily in the setting of the treatment of aortic stenosis and mitral regurgitation, a similar philosophy and approach is recommended as best practices in the management of infective endocarditis. In particular, coordinated and expert interdisciplinary care is essential as patients may require various treatment modalities, can have uneven recovery trajectories, are subject to significant complications, and may be transferred between and within institutions at various timepoints of treatment. Multidisciplinary endocarditis teams are recommended in the treatment/management and include consultants in cardiology with specialist competencies in echocardiography of valve disease, cardiac surgery, infectious diseases and/or medical microbiology, and radiology, as well as cardiac care nurses with specialist competencies (see also Chapter 3) in caring for patients with endocarditis and who will often function as the cross-disciplinary contact.³

Medical management

Valve replacement or repair is the primary treatment strategy for most valvular heart diseases as disease progression cannot be otherwise treated. The careful consideration of timing of intervention, risks and benefits, symptom burden, and patient preference are essential to developing a comprehensive management plan.

The concomitant presence of heart failure symptoms is particularly salient to patient management. Existing guidelines provide detailed recommendations to treat volume overload and other manifestations of decompensating cardiac function. Similarly, treatment with angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, and beta-blockers are useful in patients with heart failure or hypertension.¹⁵ In acute mitral regurgitation, treatment with nitrates and diuretics is recommended to reduce filling pressures. Specific clinical guidelines to further optimize the medical treatment for symptoms and comorbidities should be included, as appropriate.¹⁵

Special considerations: medical management of infective endocarditis

The medical management of infective endocarditis merits further discussion. The treatment of bacteraemia entails an average of 4–6 weeks of high-dosage intravenous antibiotic therapy in accordance with current guidelines.^{1,2} Identifying and treating the infection site is a crucial part of the treatment to prevent infection exacerbation or recurrence. Additional prophylaxis may include tooth extractions, removal of intestinal polyps, and harm reduction strategies for intravenous drug users. Various outpatient antimicrobial treatment options have been found to be effective, including partial oral treatment at home,¹⁸ and may be a treatment alternative for some patients.

During the course of illness, patients will often suffer considerable weight loss and depleted muscle mass, as a result of reduced appetite and/or physical activity. Other physical complications and discomforts, such as arrhythmia, heart failure symptoms, sleep disturbances, nausea and vomiting, pain, and skin itching, are also characteristic of infective endocarditis. Given the potentially poor prognosis, patients may struggle with concerns about survival, recovery, family, and work.⁶

An integral part of the management of patients with infective endocarditis is specialized care. Close monitoring for early signs of disease progression, inadequate infection control, and complications is essential to prevent clinical deterioration. This entails routine surveillance of bloodwork and ECG, observations for immunological and thromboembolic manifestations, and signs and symptoms of complications. Factors that may affect recovery and that should be assessed and addressed as part of qualified care for patients with endocarditis also include nutritional therapy, physical activity initiatives, mental health management, sleep quality management, and interventions aimed at risk reduction for people struggling with addictions.

Complications related to antimicrobial treatment include the management of opportunistic infections such as oral or genital candidiasis, drug fever, skin rashes, and diarrhoea. As the comorbidity burden in this patient population is relatively high, complex care for patients with diabetes, haemodialysis, and stroke sequelae are important competencies for cardiovascular nursing. Given the length of treatment and the need for adherence to treatment, a strong therapeutic relationship with patients and their caregivers is essential to ensure a good outcome.

Surgical valve replacement and repair

Understanding the basics

Surgical valve replacement or repair usually requires a sternotomy incision (a vertical line incision along the sternum) and the use of cardiopulmonary bypass, although minimally invasive surgical techniques (e.g. mini-sternotomy) are also available for selected patients.

In patients with aortic stenosis, valve replacement remains the dominant strategy, although newer solutions involving valve repair are gaining some attention. When replacing the aortic valve, the surgeon excises the diseased valve and replaces it with either a biological or a mechanical valve, based on clinical indication and patient preference. As biological valves degenerate over time, they may need to be replaced, and are most commonly offered to patients over the age of 65 years.

Below this age, current recommendations include the selection of a mechanical valve, where the degeneration is a lesser issue. Importantly, living with a mechanical valve requires lifelong anticoagulation to prevent valve thrombosis.¹⁵

In patients with mitral regurgitation, treatment depends on disease severity, and anatomical considerations. Valve repair is the recommended strategy to optimize outcomes. Mitral valve repair includes patching holes in the valve, reconnecting valve leaflets, removing excess valve tissue to improve closing of the valve, and replacing cords. Commonly, the surgeon tightens or reinforces a ring around the valve (annulus), a procedure known as valve annuloplasty. If a repair is not feasible, valve replacement may be necessary. As with replacements of the aortic valve, both mechanical and biological replacements are prosthesis options.

Treatment considerations and recommendations depending on the valve affected can be reviewed more thoroughly in current clinical guidelines.¹⁵

Priorities of care

- The main focus in the immediate postoperative period is the patient's haemodynamic condition. Clinical observations performed by critical care nurses include rapid changes of the condition, observation of fluids, and monitoring of cardiac rate and rhythm, with the appropriate use of vasoactive agents and fluid management.
- Sternal precautions are performed to prevent separation and dehiscence of the sternal bone by avoiding excessive tension on the surgical incision. Sternal precautions also reduce pain and help prevent infections. These include:
 - Not lifting more than 2 kg in each hand (local variations might occur).
 - Not pushing or pulling with the arms.
 - Not reaching behind the back or reach both arms to the side.
 - Not reaching both arms over the head.
- Postoperative mobilization begins on the first postoperative day and supports the patient to recover and helps to prevent atelectasis. When mobilizing the patient, sternal precautions are part of the daily routine, and require ongoing reminders and coaching.
- As with postsurgical care in general, nutritional status, fluid intake and output balance, and prevention of constipation should be considered and included in the care of the patient.

- Wound care is an important part of postoperative care; local guidelines on bandages/dressings should be followed. The wound should be inspected daily during admission and after removal of the dressing. The nurse must teach the patient how to observe for signs of infections after discharge. Although not a common complication, 1–4% of all patients experience deep sternal wound infections after cardiac procedures. This serious complication is associated with increased morbidity and mortality. Similarly, among patients with a concurrent coronary artery bypass graft procedure, wound care of the incision of the leg (or arm) must be performed thoroughly.
- Another potential area of awareness is the patient's overall health status. In addition to the functional decline immediately after surgery, patients might also experience impaired mental health.^{19,20} The underlying heart valve disease and the stress of undergoing heart valve surgery can affect quality of life and mental health.²¹ Patients may also experience non-specific symptoms, including anxiety, depression, and pain (see also Chapter 11).²⁰
- Discharge planning begins at admission by including both the patient and caregivers in what to expect when going home. The patients might need help resuming activities of daily living, and adhering and adapting to sternal precautions when resuming normal activities.

Potential complications

In the early recovery period, common complications include atrial fibrillation and other arrhythmias, heart failure, bleeding, and pleural and pericardial effusions. Furthermore, chest pain and pain management due to sternal discomfort are essential areas of awareness.

Postoperative delirium is a potentially devastating complications that occurs in a significant proportion of patients undergoing open heart surgery. Delirium is a disturbance of awareness with a reduced capacity to focus, sustain, or change focus.¹⁹ The onset of delirium affects both the patient and family caregivers.²² Older age, pre-existing psychological disorders, alcohol use, high comorbidity burden, low serum albumin, medical treatment with antidepressant agents, opioids, and benzodiazepines are known risk factors. Several screening tools are available to assess and monitor delirium, including the Confusion Assessment Method (CAM)²³ which has been used in patients after aortic valve replacement and demonstrated a prevalence of delirium of 60% after surgery.¹⁰ Nurses play an essential role in both detecting, treating,

and identifying the underlying causes of delirium. To support the patient with delirium, recommendations include decreasing visual and auditory stimuli, the use of a quiet room, resumption of day/night circadian rhythm (e.g. use of clocks, calendar, natural light/darkness), the use of usual hearing aid and glasses, family support, and therapeutic communication skills (see also Chapter 13).¹⁹ Patients may have long-lasting memories of their delirium; thus, nursing competency in the management of this complication is essential for patient safety and optimal outcomes.²²

Transcatheter valve replacement and repair

In the past decade, there has been a paradigm shift in the management of valvular heart disease with the rapid emergence of minimally invasive transcatheter options for patients with varying surgical risk profiles and valve diseases. These procedures share similar features that include transfemoral or minimally invasive alternative vascular access, catheter-based delivery of the valve replacement or repair device, and the possibility of a rapid recovery given the avoidance of thoracotomy and cardiopulmonary bypass. This field of practice is advancing rapidly. The following is limited to two established treatment options that are now widely available across regions: transcatheter aortic valve implantation (TAVI) and transcatheter mitral valve repair using percutaneous mitral leaflet plication.

Transcatheter aortic valve implantation

In 2010, the findings of the Placement of Aortic Transcatheter Valve (PARTNER) clinical trial first established TAVI as the standard of care for inoperable patients. Subsequently, recent research has supported the increasing use of TAVI as a safe and effective treatment also for lower-risk patients.^{15,24,25} The care of TAVI patients is rapidly becoming a core competency of cardiovascular nursing in cardiac centres.

Understanding the basics

TAVI is a minimally invasive valve implantation procedure that uses a catheter and expandable stent technology to deliver a device within the native or failed bioprosthetic surgical aortic valve. Original calcified valve leaflets are displaced by the TAVI valve using balloon-, self-, or mechanically expandable mechanisms to seat the device within the diseased orifice. For most patients, vascular access is usually through the femoral artery; in the setting of

excessive arterial calcification and/or tortuosity, an alternative minimally invasive surgical approach—for example, the subclavian artery, the ascending aorta, or the cardiac apex—can be selected.

In earlier years, TAVI was often performed under protocols similar to cardiac surgery, including under general anaesthesia, with the use of multiple invasive lines, and in an operating room, while most patients recovered in a critical care unit and remained in the hospital for more than 5 days. Increasingly, TAVI programmes have adapted their processes of care to better match the procedure and technology, and mitigate the risks associated with the extended admission of frail elderly. In most cases, TAVI can be safely performed under local anaesthesia, without a central venous line or urinary catheter, and in a hybrid suite or a cardiac catheterization laboratory, with minimal requirements for critical care recovery and a length of stay of 1–2 days.¹⁷ However, this minimal length of stay is still to be implemented in most clinical practices in Europe.

Priorities of care

Early recovery focuses on the rapid return to baseline status, the careful monitoring for potential complications, and preparation for discharge and safe transition home. Nursing protocols or care standards ought to highlight (1) recovery from sedation/anaesthesia, (2) vascular access haemostasis, (3) cardiac rhythm monitoring, (4) neurological status, (5) readiness for mobilization, and (6) renal function. In addition, vigilant scrutiny of mental status and infection can assist in the early recognition of delirium and sepsis, and help mitigate known risks that elderly patients face during hospital admission. An example of a nursing care pathway that was evaluated in a multicentre study is provided in ► **Table 8.1**.²⁶

Potential complications

Outcomes in contemporary TAVI continue to improve, and most patients have excellent results. Nevertheless, cardiovascular nurses must be aware of potential adverse events that warrant monitoring, early recognition, and intervention. These outcomes are collectively grouped and defined by the Valve Academic Research Consortium (VARC2)²⁷ and include the following with some highlighted aetiologies:

- Mortality: includes in hospital and up to 30 days post procedure.
- Myocardial infarction: obstruction of coronary blood flow due to leaflet displacement over the ostia.

- Stroke: dislodged calcium from the diseased valve leaflets.
- Bleeding (minor and major): vascular injury, internal bleeding (e.g. stroke).
- Acute kidney injury: administration of contrast.
- Vascular access complications (minor and major): puncture, catheter apparatus, and/or closure device injury.
- Conduction disturbances and arrhythmias: implant-related damage to conduction tissue requiring new permanent pacemaker.

In addition, elderly patients are at higher risk for accelerated deconditioning due to periprocedure stressors, impaired mobilization, and delayed resumption of normal hydration, nutrition, and activities of daily living. In the longer term there is also excess risk of prosthetic endocarditis after TAVI as compared to medical treatment.

Transcatheter mitral valve repair (mitral valve leaflet plication)

Building on the legacy of cardiac surgery and the established Alfieri procedure that involves the suturing of mitral valve leaflets, transcatheter mitral valve repair may be indicated for higher surgical risk patients who present with primary (e.g. degenerative) or secondary (e.g. functional) mitral regurgitation.

Understanding the basics

Mitral valve leaflet plication is a minimally invasive procedure that involves vascular access in the femoral vein, and advancing a delivery catheter across the intra-atrial septum to the diseased mitral valve. Guided primarily by transoesophageal echocardiography, the operator grasps the valve leaflets and deploys one or more clips, thus joining the leaflets and reducing the valve orifice area. Transoesophageal echocardiography imaging is used to confirm the decrease in regurgitant flow across the mitral valve.

Mitral valve leaflet plication is routinely performed in a hybrid suite or in a cardiac catheterization laboratory through a transfemoral route under general anaesthesia because of the need for transoesophageal echocardiography and the variable procedure times. Patients usually remain haemodynamically stable throughout the procedure and have minimal critical care requirements in the early recovery period. Most patients spend 1–2 days in hospital.

Table 8.1 TAVI post-procedure protocol

Interventions/ component of care	0–6 hours	6–12 hours	12–18 hours	18–24 hours	24–36 hours
Goal of care #1: return to baseline haemodynamic and neurological status					
Vital signs	Q15 min × 4 Q1 h × 3	Q4 hours			
Neuro vital signs and Cincinnati Stroke Scale assessment	Q15 min × 4 Q30 min × 2 Q1 hour × 3	Q4 hours			
Goal of care #2: vascular access haemostasis					
Vascular access monitoring	Q15 min × 4 Q1 hour × 3	Q4 hours			
Diagnostic tests	CBC			CBC	
Pain assessment	Assess and treat access sites and/or back/postural pain discomfort as required. Avoid opioids and sedative hypnotics to minimize risk of delirium. Communicate abnormal findings early				
Goal of care #3: absence of new conduction delay					
Cardiac rhythm monitoring	Continuous monitoring. Analyse PR interval and cardiac rhythm with each set of vital signs				
Diagnostic tests	12-Lead ECG				
Communication	Inform physician of any new intraventricular conduction delay				
Goal of care #4: removal of invasive monitoring devices					
Peripheral/central vascular access	If goal of care #1 achieved, remove central venous and peripheral arterial catheters	Apply saline lock to peripheral intravenous access			Remove saline lock before discharge
Goal of care #5: early mobilization and return to baseline elimination, hydration, and nutrition					
Mobilization and activity	Head of bed flat ×2 hours, then ↑ 30° Total bedrest ×4 hours then stand at side of bed	Mobilize short distance Up in chair	Facilitate uninterrupted sleep Encourage self-care behaviour	Mobilize for 5–10 min every 4–6 hours	

(continued)

Table 8.1 Continued

Interventions/ component of care	0–6 hours	6–12 hours	12–18 hours	18–24 hours	24–36 hours
Elimination— avoid urinary catheterization	Monitor eGFR ×1 Mobilize to commode and/or standing position when bedrest completed	Mobilize to toilet Anticipate low urine output in the early recovery period until return to baseline hydration status eGFR POD 1			
Hydration and nutrition	NPO until haemostasis and confirmed clinical stability IV infusion 50–75 mL/hour	If LVEF ≥50%: encourage fluids If LVEF <50%: encourage fluids within limit of any pre-procedure fluid restrictions Up in chair for meals Encourage nutritional intake and preferred foods			
Goal of care #6: readiness for next-day discharge					
Patient and family education	Teaching about maintaining vascular access haemostasis	Teaching about importance of return to baseline status (e.g. motivation for mobilization) Begin discharge teaching		Complete discharge teaching	
Discharge planning		Confirm discharge plan with patient and family		Assess readiness for discharge	Confirm discharge criteria

CBC, complete blood count; eGFR, estimated glomerular filtration rate; ECG, electrocardiogram; IV, intravenous; LVEF, left ventricular ejection fraction; min, minutes; NPO, nothing by mouth; POD, postoperative day; Q, every.

Priorities of care

In the early recovery period, priorities include (1) recovery from general anaesthesia and (2) vascular access haemostasis. Given the heart failure burden associated with mitral regurgitation, close monitoring of cardiac function may be warranted.

Potential complications

The procedure is generally well tolerated. Venous access reduces the risk of severe vascular injury; nevertheless, bleeding following arterial or ventricular access remains one of the most frequent major complications. Rates of pericardial tamponade and clip-specific complications (e.g. embolization and/or detachment) are low.²⁸

Surgical treatment of infective endocarditis

In patients with infective endocarditis, surgery has two primary objectives: removal of the infected tissues and reconstruction of the cardiac morphology, as well as replacement or repair of the affected valve(s). The primary focus of the infection responsible for the infective endocarditis should preferably be treated before surgery is performed.³ The timing of surgery depends on the consideration of haemodynamic impairment, the benefits of sufficient infection control, and risks of embolism and other complications. Patient care is consistent with the priorities and potential complications described in previous sections.

In the setting of endocarditis related to an implanted device, complete hardware extraction in addition to the antibiotic regimen are essential. At that time, the clinical team and the patient may re-evaluate the indication for device treatment and reimplantation as the risk of repeat infection is high. In some cases, lifelong antibiotics may be an appropriate strategy, particularly among older and more frail patients to mitigate further risks.

Medical management: integrating a palliative approach

The treatment of patients who are dying 'with' valvular heart disease but not 'from' valvular heart disease does little to modify the poor prognosis associated with comorbidities, excessive frailty, and disability. The futility of treatment in patients with excessive comorbidities, functional and cognitive decline, and/or frailty is well established. The adoption of a palliative approach can help improve continuity of care and support patients' transition to a focus on symptom management.

Palliative approach and valvular heart disease programmes

The advanced age and health vulnerabilities of valvular heart disease patients, their procedure-focused clinical trajectories, the complexities of the referral patterns, and the involvement of multiple medical specialities combine to form a 'perfect storm' for potentially failing to attend to the important end of life requirements of patients presenting with severe aortic stenosis. When there is not a treatment option with a likelihood of significant benefit of improved quantity and quality of life, programmes ought to provide an alternative care plan for patients for whom a valve intervention has been deemed clinically futile.

A palliative approach is a way of caring for those with life-limiting illnesses that focuses on improving patients' and families' quality of life. This holistic, needs-based perspective aims to assess and improve symptom management, communication, advanced care planning, and psychosocial and spiritual needs regardless of prognosis. The focus is on meeting a person's and his/her family's full range of needs at all stages of a life-limiting illness.²⁹ The integration of a palliative approach can be a parallel process to the pursuit of curative care so that if and when an intervention is not an option, the patient, family, and healthcare team can change the focus of discussions to match the changing health trajectory.³⁰

Integrating best practices

There can be barriers to adopting a palliative approach in valvular heart disease programmes: clinicians may perceive that discussions about end of life may remove hope, cause increased confusion, or be incongruent with previous discussions. The complexity of treatment decisions, prognostic uncertainty, lack of knowledge about palliative care, and confidence to initiate or pursue discussions about end of life further contribute to a lack of clarity of the responsibility of the multidisciplinary team.

To overcome these barriers, the following steps are recommended to identify patients who would benefit from a palliative approach:

- Ask yourself: 'Would I be surprised if this patient died in the next 6–12 months?'
- Look for one or more general clinical indicators (e.g. limited self-care, in chair or bed >50% of the day, multiple hospitalizations in the past 6 months, and/or the requirement for extensive home or residential care).
- Look for two or more cardiac disease indicators (e.g. New York Heart Association functional class III or

IV, renal impairment, cardiac cachexia, two or more episodes needing intravenous furosemide, and/or inotropes in the past 6 months).

- Asking simple questions such as ‘Tell me what you understand about your illness’, ‘Tell me what you expect by having the valve procedure’, or ‘What is most important to you?’ can help inform patients’ goals of care and help improve outcomes and patients’ experiences.³¹

The decision of appropriate treatment (medical/surgical treatment or a palliative approach) should always be reached through a process of shared decision-making with the patients and by including perspectives of the family. As older age and high comorbidity burden increase the risk of interventions and, thus, might have a negative impact on life expectancy and quality of life, an appropriate risk assessment is needed, especially in the elderly patient.

The complexity of valvular heart disease—irrespective of aetiology and treatment options—highlights the central importance of nurses’ role in optimizing patients’ capacity for self-care during their health trajectories. Promotion of physical, mental, and social health status hinges on education tailored to the unique needs of patients and their families (see also Chapter 13), awareness of potential complications and risk for deterioration (see also Chapter 5), and partnerships to support adherence to treatment are nurse-led strategies that can improve outcomes and patient experiences. These components of care are illustrated in ► **Table 8.2** which outlines two case studies focused on aortic stenosis and infective endocarditis.

After a heart valve procedure: follow-up

Facilitating safe transition home

The early period after returning home from the hospital can be particularly challenging for patients and their families. The evidence concerning patient experiences solely after heart valve surgery is scant, but in the few studies that do exist, patients report experiencing tiredness and deconditioning, worry about symptoms, and concerns about returning to their usual way of life.^{20,32–34} In general, altered bodily awareness, symptom burden, and the increased risk of complications in the early postoperative period may postpone the overall recovery process.³²

Similarly, the risk of readmission should be considered before discharge, as emerging evidence shows high readmission rates after both surgical procedures and TAVI, especially in the early period after discharge.³⁵ Thus, discharge planning should include an assessment of the readmission risk, including data on clinical symptoms, possible effusions, and frailty status.³⁶ In combination, this information can inform an individualized, early follow-up including symptom management in the early postoperative period, patient education, and awareness-raising concerning mental health—and is therefore suggested.^{20,32,36}

Patients recovering from infective endocarditis will often have been physically inactive for weeks or months due to diagnostic delay, their symptom burden, long-term hospitalization, and possible postsurgical restrictions. Though the area of research seems largely unexplored, patients report slow physical and mental recovery.^{37,38} Qualitative findings describe patient experiences of physical weakness and extreme fatigue, but also identify emotional instability, including anxiety and depression as major themes.³⁹ Although the rate of recurrence of endocarditis is fairly low (2–6%), high readmission rates of 65% within the first year have been reported and up to 35% of previously employed patients have been reported not returning to work within 1 year post discharge.^{3,38,40} This indicates that the burden of the disease, both for the patient and the healthcare system, potentially continues to be substantial following a successful treatment. For patients having undergone heart valve surgery, possible complications include those similar to other valve surgery patients.

Surveillance and monitoring

As with the clinical assessment before treatment, monitoring and surveillance in the period after discharge should ideally be performed in multidisciplinary heart valve clinics. The monitoring should include observations aimed at detecting deterioration of the valve and the overall condition of the patient.⁴⁵ Nurses play an essential role in the follow-up and symptom monitoring during follow-up.

Surveillance after completion of medical therapy for endocarditis includes patients’ self-monitoring as well as follow-up visits according to local guidelines.³⁴ Investigations at follow-up include a physical examination, bloodwork and cultures, and possibly transthoracic echocardiogram. Patients should be educated to observe for signs of recurrent infection and of heart failure indicative of valve dysfunction. Other health issues may persist

Table 8.2 Clinical case studies on aortic stenosis and infective endocarditis

	Aortic stenosis	Infective endocarditis
1. Patient population and medical history	Margaret is an 84-year-old widow who lives alone in the same town as her daughter and grandchildren. Margaret lost her husband the previous year, and has found it difficult to live alone. Her previous medical history includes a history of hypertension, smoking, dyslipidaemia, previous hip replacement, myocardial infarction, and coronary artery bypass 12 years ago. For the past 6 months, she has felt increasingly short of breath and easily fatigued	John is a 43-year-old carpenter who is married and the father of two young boys. John has previously been in good health and has rarely sought medical care. Over the past 2 months, he has felt increasingly unwell and tired, has experienced intermittent fevers, and lost nearly 10 kg. His wife encourages him to see their family physician, who treats him with a short course of antibiotics for a likely diagnosis of mild pneumonia
2. Clinical presentation	Margaret's family doctor is concerned about her worsening symptoms. She can only walk 2 blocks without stopping and has difficulties climbing stairs. He refers her for an echocardiogram which reveals a significantly reduced valve area of 0.8 cm ² and a high transvalvular gradient of 42 mmHg. Her left ventricular function is preserved, but she has mild mitral insufficiency	John's condition deteriorates and one night he wakes up feeling very short of breath and anxious. He is pale, his skin is clammy, and his ankles are swollen. John's wife drives him to the emergency department. On admission, his temperature is 38.5°C, blood pressure 130/80 mmHg, pulse regular at 110 beats per minute. A chest X-ray shows signs of congestion, and a systolic heart murmur is audible. After undergoing an echocardiogram, the cardiologist tells John that she is worried he might have bacterial endocarditis
3. Evaluation pathway	The Heart Team meets to review Margaret's presentation. The surgeon states that Margaret has significant risks for open surgery, including previous sternotomy and newly diagnosed moderate renal impairment. The heart valve clinic nurse reports that Margaret is independent with her activities of daily living, is moderately frail, but experiences good quality of life. She is motivated to be treated and hopes that her symptoms will improve. Her coronary angiogram and CT scan are unremarkable. The Heart Team recommends TAVI as the preferred option for Margaret	The transoesophageal echocardiogram reveals mitral valve endocarditis with vegetations on the anterior leaflet. Blood cultures are positive for <i>Staphylococcus aureus</i> , and further confirm John's diagnosis. The cardiologist consults with an infectious disease specialist to review the findings and develop a treatment plan
4. Treatment	Margaret is admitted on the day of her procedure, and undergoes TAVI with percutaneous vascular access through the femoral artery. The procedure is done with local anaesthesia and light sedation	John requires a 4-week regimen of in-hospital intravenous antibiotics and telemetry monitoring to control the infection. His hospitalization is complicated by poor sleep, loss of appetite, low mood, and stress associated with family and financial concerns. Upon clearance from the infectious disease consultant, John undergoes surgical mitral valve repair

(continued)

Table 8.2 Continued

	Aortic stenosis	Infective endocarditis
5. In-hospital nursing care and priorities	Immediately following the procedure, the cardiac nurse monitors Margaret to ensure vascular haemostasis, haemodynamic stability, and absence of new conduction delay. To prevent any deconditioning, the nurse assists Margaret to ambulate 4 hours after her procedure, and to resume normal hydration, nutrition, and elimination as soon as possible. The next day, she is transferred to the cardiology ward where she is encouraged to walk and to take care of herself. With the absence of complications and a discharge plan in place, Margaret is ready to return home 2 days after her procedure	In the cardiac surgery intensive care unit, the nurse follows the local postoperative nursing care standard. The priorities of care include monitoring for any complications, ensuring appropriate cardiac output, and providing supportive care. John is rapidly extubated, and transferred to the cardiac ward the day after his surgery. Nurses teach him about sternal precautions, and the importance of breathing exercises and mobilization. Although he is thankful that his surgery was uncomplicated, his mood remains low and his sleep is easily disrupted. John's recovery is lengthened by a further 2-week course of intravenous antibiotics before he is cleared for discharge
6. Discharge planning and follow-up	As planned prior to the procedure, Margaret's daughter stays with her mother for 3 nights to help her recover. Margaret follows the recommendations to have 2–3 short walks every day, rest, and eat nutritious foods. She sees her family doctor 1 week after discharge, and has a follow-up echocardiogram 1 month after her TAVI. She is pleased to notice that her shortness of breath has improved significantly, and feels a bit stronger every day	John is relieved to return home after so many weeks. He has lost weight and still feels tired. His healthcare team has told him that, although he is cured, it will take up to 6 months for him to return to his normal function. John and his wife are fearful about his health, and still have many questions. John plans to rest, spend time with his family, and start the cardiac rehabilitation programme as soon as possible

after the end of treatment and should be addressed in follow-up care, including nutritional issues, pain management, and mental health problems which could be managed in a nurse-led clinic.

Post-procedure echocardiography

Echocardiography is recommended in existing guidelines as a vital part of the management of the patient after heart valve procedures with specific time points of follow-up after discharge varying, depending on the type of surgery, choice of the prosthesis, and pertinent guidelines.¹⁵ The echocardiography should focus on functioning of the prosthesis, stenosis, regurgitation, paravalvular leakage, and ejection fraction. Furthermore, echocardiography should include assessment of pericardial effusion which commonly occurs within the first month after open heart valve surgery.

Considerations for antithrombotic management

Following surgery, oral anticoagulation is recommended as a lifelong treatment for all patients with mechanical valves (see also Chapter 12). The anticoagulation treatment (warfarin) includes clinical consultations based on individual assessment, close monitoring of international normalized ratio (INR), patient education, and possible self-monitoring among patients capable of this¹⁵ ► **Box 8.2**.

Among patients with bioprostheses or mitral repair, temporary anticoagulation may be recommended depending on the site and type of surgery. Long-term anticoagulation is driven by other considerations, including atrial fibrillation, heart failure, or impaired left ventricular function. The anticoagulation after both surgical treatment and TAVI remains the subject of current studies and recommendations should be checked in the most contemporary guidelines.

Box 8.2 Cardiovascular nurse management of patients on warfarin following valve replacement

Patients who have a surgical mechanical valve replacement are recommended a lifelong treatment with oral anticoagulation, warfarin. In addition, temporary treatment with warfarin should be considered after surgical implantation of a mitral or tricuspid bioprosthesis.¹⁵ Although based on low-level evidence, in patients receiving surgical aortic bioprostheses, low-dose aspirin is favoured as an alternative to postoperative anticoagulant.¹⁵

Treatment with warfarin requires close monitoring in order to achieve therapeutic levels and reduce the risk of bleeding (see also Chapter 12). The INR should be maintained within a therapeutic range near a median value. The specific values should be assessed according to recent guidelines.¹⁵ Accordingly, the INR target level should be adapted to patient risk factors and the thrombogenicity of the valve prosthesis.

Thromboembolism and anticoagulant-related bleedings are known complications following prosthetic valve procedures, which is why the monitoring remains essential. If the INR falls too low, patients may not have sufficient protection from developing thromboembolism. On the other hand, if the INR is too high, the patient will be at increased risk of bleeding. Also, the high variability of the INR is associated with reduced survival following valve surgery. The risk of major bleeding increases when the INR exceeds 4.5, and an INR greater than 6.0 requires a rapid medical reversal of the anticoagulation.

Oral anticoagulation should be started within the first postoperative days and to ensure sufficient treatment, intravenous unfractionated heparin is commonly added to the treatment until a therapeutic level of INR has been obtained. Thus, regular monitoring is required and much more frequently in the early initiation period. Once the INR is stabilized in the therapeutic range, monitoring can be reduced, but often, the patients are discharged with monitoring twice a week.

Therefore, to ensure patient adherence, patient education is a priority. The patient education should include the following:

1. How warfarin works.
2. The need for self-monitoring for signs of bleeding (e.g. gums, urine, stools, nosebleeds, vomiting blood, and unusual headache).
3. When and how to contact a health professional.
4. Preventing bleeding (e.g. use a soft toothbrush, electric shaver, avoiding falls, and taking care with knives in the kitchen).
5. Interaction of warfarin with alcohol, foods, and medications.

Portable patient self-testing devices and patient self-management systems are available for patients to use at home to test blood and adjust the warfarin dose to keep the INR within the therapeutic range. Allowing patients to self-manage has been shown to significantly reduce mortality and thromboembolic events in addition to increasing patient adherence.^{41,42}

In many countries, monitoring INR or teaching patients and/or informal caregivers to do so is performed in nurse-led anticoagulation/warfarin clinics. The specialized nurses in these clinics carry out dose adjustment and patient education for self-monitoring and management and prevention of complications. However, a survey conducted on delegates at the ESC Nurses' Spring meeting in 2014 found that nurses working in cardiovascular care had knowledge deficits relating to anticoagulation with warfarin and dietary and medicinal interactions.⁴³ In addition, less than half reported that they offered patient self-testing devices and patient self-management systems to their patients, despite their availability.

Endocarditis prophylaxis

Prevention of infections in the prosthetic valve is important, as the risk of developing infective endocarditis is increased after surgery. The evidence regarding endocarditis prophylaxis is sparse and the topic remains contentious among clinicians; most commonly, endocarditis prophylaxis includes a single-dose antibiotic treatment when patients undergo dental procedures, especially bleeding procedures. Impeccable dental hygiene in general is recommended.^{3,15} Furthermore, whenever patients experience fever of unknown origin, clinicians

should be aware and consider screening for endocarditis prophylaxis.

Patient education and information during follow-up

Patient education during recovery and follow-up may include information on expected physical recovery, sick leave, sexuality and intimacy issues, social functioning, engaging in sports, observation and care of scars, possible insurance issues, patient organizations, and the use of peer support (► Table 8.3).

Table 8.3 Patient education during recovery and follow-up

Topic	What to inform patients
Wound care	Patients should inspect the wound every day within the first weeks after surgery to prevent infections Signs to be aware of include redness, heat, swelling, and pain Stitches should be removed after 7–10 days after surgery (local variations might occur) Patients might feel itchy, numb, or tingly around the incisions for the first months
Pain	Patients should be encouraged to perform exercises during the postoperative period—often physiotherapists will guide patients on this during admission—and rehabilitation Most patients experience muscular pain within the first period after surgery If patients experience chest pain/angina, local guidelines on whom to contact should be followed
Sternal precautions	Patients are encouraged to follow sternal precautions (see earlier in this chapter) to help prevent infections and reduce pain
Nutrition	Immediately after the surgery and within the first month after, a diet rich in proteins and calories is recommended. This reduces the catabolic phase and stimulates the anabolic phase (the healing and recovery phase) After the healing period, a heart-friendly diet is recommended among patients undergoing combined valvular and bypass surgery Patients often experience reduced appetite and weight loss within the first month after surgery, but the patients should be encouraged to eat sufficiently
Sleep	Patients often have trouble sleeping and feel more tired and have reduced energy
Exercise	Patients are commonly offered rehabilitation or specific physical exercises by a physiotherapist. In addition, patients should be encouraged to go for daily walks Outdoor bicycling is not recommended in the period of the sternal precautions
Shortness of breath	During the first period after surgery, shortness of breath can occur Beware of patients with low ejection fraction (and/or a diagnosis of heart failure) and patients with known reduced lung capacity
Cognition	It is normal to have mild trouble with short-term memory or to feel confused in the early period after surgery
Mental health	Many patients experience impaired mental health/quality of life. Similarly, mood changes in the early period after surgery are normal As part of the rehabilitation following surgery, patients should be screened for symptoms of anxiety and depression and local guidelines on how to react should be followed
Driving (car)	Driving is not recommended within the 1–2 months after surgery due to sternal precautions (beware of local variation)
Constipation	Constipation due to immobilization and use of pain killers is normal, and patients should be informed about how to prevent this
Sexual activity	Patients can resume sexual activity after discharge, but should be told that sexual activity should be performed with awareness of the sternal bone and sternal precautions. Some medicines and mental health after surgery might influence the sexual response for both men and women
Relatives	Relatives are encouraged to participate in all consultations and to be involved during admission It is important to recognize the need for support to relatives

Mental health

Patients may suffer from symptoms of anxiety and depression in the period after discharge, which may affect adherence to treatment and discharge guidelines, and delay recovery and return to everyday life. Evidence regarding the effect of specific screening tools is lacking; among patients with symptoms of anxiety and depression, a collaboration with/or referral to a general practitioner is recommended. The risk of impaired mental health is increased among both patients treated with valvular diseases in general, and among patients suffering from infective endocarditis (see also Chapter 11).

Physical and cardiac rehabilitation

Although the evidence on the effect of physical rehabilitation following isolated heart valve surgery is sparse,⁴⁴ it is still recommended. Rehabilitation should include exercise prescription and training similar to what is recommended among patients undergoing coronary artery bypass grafting.⁴⁵ The consideration of unique clinical issues—including the potential occurrence of pleural and/or pericardial effusions, impaired left ventricular function, and arrhythmias—is pivotal to safe cardiac rehabilitation in the setting of valvular heart disease. Cardiac rehabilitation is recommended after the termination of the period of sternal restrictions (6–8 weeks after surgery) (see also Chapter 11).

Currently, there is a gap in research focused on investigating cardiac rehabilitation in patients treated for infective endocarditis. In planning follow-up care and assessing adverse outcomes, clinicians and policymakers, therefore, have little information about referral rates, participation rates, or content and efficacy of any programmes offered. There is, however, mounting evidence that recovery after infective endocarditis is slow and often inadequate. Therefore, the need for providing more effective follow-up care seems evident.

Follow-up: patient-reported outcomes and experiences

The way clinicians, researchers, policymakers, and the general public think about health, healthcare, and the role of patients as partners is changing. Increasingly, multiple stakeholders recognize the importance of physical, mental, and social patient-reported health status,

the adverse consequences of illness from patients' perspectives, and that patients are the most important experts of their health and illness⁴⁵ (see also Chapter 2). The ESC has strongly endorsed the importance of measuring patient-reported perspectives in practice and research to improve quality of care.⁴⁶ This is particularly salient in the management of complex valvular heart disease where the potential risks and benefits can vary greatly; the reporting of mortality and morbidity does not suffice to fully capture patients' experiences of care. To this end, we provide a short introduction to the measurement of health-related quality of life and other patient-centred quality indicators.

Patient-reported outcome and experience measurements (PROMs and PREMs) are umbrella terms used to capture information obtained directly from patients about various aspects of their health and healthcare, including symptoms, functioning, well-being, quality of life, perceptions about treatment, and satisfaction with care received and with their professional communication with clinicians. A PROM is a precise, reliable, valid, and reproducible measure of aspects of patients' health status using questionnaires or other scales. Patient-related outcome data come directly from the patient, without the interpretation of the patient's responses by a physician, nurse, or anyone else.

The purpose of measuring patients' perspectives of their care is to augment conventional indicators of treatment decision and outcome evaluation and to strengthen a patient-centred approach to care. PROMs and PREMs can improve the quality of patient care and the optimization of resource utilization.

The selection of patient-reported instruments should reflect the goals of measurement. The process of PROM and PREM development includes the identification and synthesis of the conceptually driven domains to be measured, followed by validation testing to confirm the robustness of the measures. This rigour is essential to support claims that can be made about outcomes. Instruments can be defined as scientifically valid if the outcomes are conceptually defined and operationalized in questionnaires and if the questionnaires can meet established standards of reliability, validity, responsiveness, and sensitivity and withstand the scrutiny of psychometric evaluation.⁴⁵ Equally important, however, is the clinical relevance of the measure. PROMs capture disease-specific (e.g. heart failure) and/or generic (e.g. overall quality of life) domains. PREMs measure patients' perception of their experience with healthcare (► Fig. 8.4).

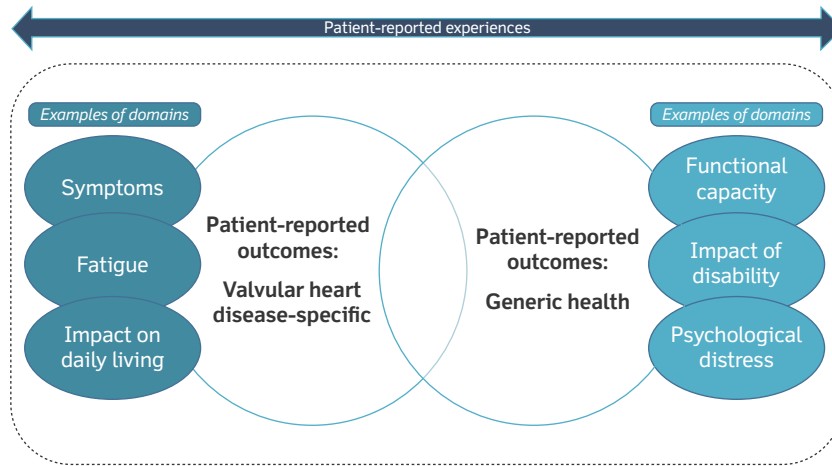


Fig. 8.4 Generic and disease-specific patient-reported outcomes.

Conclusion

Cardiovascular nurses require a comprehensive understanding of the complexity of managing valvular heart disease in a diverse and clinically demanding population. The implications of changes in haemodynamics, the trajectory of heart failure, and the variation in clinical presentation across age groups and pathologies create unique challenges to optimize outcomes and support patients and their family. The rapid advances in technology, procedural approaches, and cardiac imaging make this clinical area particularly exciting for cardiovascular nurses to demonstrate their leadership and unique competencies, and contribute significantly to improving the lives of people living with valvular heart disease.

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9 Care of the patient with inherited cardiac conditions and congenital heart diseases

JODIE INGLES, TOOTIE BUESER, PASCAL MCKEOWN, PHILIP MOONS,
AND DONNA FITZSIMONS

CHAPTER CONTENTS

Introduction 242

Genetic principles and cardiac genetic testing 242

- Basic principles of genetics 242
- Comprehensive three-generation family history 243
- Cardiac genetic testing 244
- Genetics of sudden cardiac death in the young 246
- Genetics of congenital heart diseases 246
- Challenges of cardiac genetic testing 246
- Role of genetic counselling 247

Inherited cardiovascular conditions—epidemiology, presentation, investigations, and management 248

- Inherited cardiomyopathies 248
- Inherited arrhythmias 254
- Sudden cardiac death in the young (<40 years) 259

Inherited connective tissue disorders 260

- Marfan syndrome 260
- Vascular Ehlers–Danlos syndrome 261
- Familial thoracic aortic aneurysm and dissection 261

Nursing care in inherited cardiac conditions 262

- Psychological and emotional challenges of a diagnosis of an inherited cardiac condition 262

Specialized multidisciplinary clinics 262

The role of the cardiac genetics nurse 262

Principles of general nursing care in inherited cardiac conditions 262

Nursing considerations in the aspects of care in inherited cardiac conditions 264

Congenital heart diseases 266

- Categorization of heart defects 267
- Congenital heart defects of great complexity 267
- Congenital heart defects of moderate complexity 271
- Congenital heart defects of mild complexity 272
- From womb to tomb: continuity of care over the lifespan 273

Nursing care in congenital heart diseases 275

- Psychological, physical, and social impact 275
- Specialized facilities and healthcare professionals 275
- Key elements in the care for adults with congenital heart disease 276

This chapter is focused on inherited cardiac conditions in terms of their diagnosis, management, and holistic nursing care. The purpose is to provide an overview of the genetic basis of these conditions and an understanding of the care required for people with inherited cardiac conditions and the congenital heart diseases most commonly seen in clinical practice.

KEY MESSAGES

- The inherited basis of certain cardiac conditions is a rapidly expanding area of knowledge development and future innovations in care pathways are anticipated.
- The population of patients with congenital heart disease is growing, which results in an increased demand for efficient diagnosis and evidence informed nursing care.
- While treatment options have improved in many cases, the impact of inherited cardiac conditions and congenital heart diseases is multifaceted and lifelong.
- Caring for patients with these conditions requires a distinct patient- and family-centred approach to care from all professionals in the multidisciplinary team.

Introduction

A significant proportion of cardiovascular diseases have an underlying genetic basis, as a result of chromosomal abnormalities, disease-causing changes in single genes, and the interaction of minor genetic changes (polymorphisms) with environmental factors. It is estimated that the burden of inherited cardiovascular conditions is greater than cancer.¹

There is a huge drive for personalized medicine in cardiovascular care as advances in molecular genetics and therapeutics develop. Furthermore, advances in cardiovascular imaging and diagnostic techniques, as well as increased knowledge about inherited conditions, have resulted in more patients and family members identified from this patient group. It is, therefore, of great importance that cardiovascular nurses and allied health professionals have a basic grounding in genetic principles as they will soon encounter more patients with these conditions in both specialist and general settings, and will be expected to facilitate the delivery of personalized medicine in the future.

Further, cardiovascular nurses and allied health professionals will increasingly encounter patients with

congenital heart disease (CHD). Given the dramatic improvement of life expectancy in childhood, more than 90% of children with CHD will reach adulthood. However, in the fourth and fifth decades of life, many patients present with long-term complications of the structural defect. Cardiovascular nurses need to understand the features of the different heart defects and be attuned to the changing needs of the patient and family across the lifespan, including the provision of palliative and supportive care as appropriate.

Genetic principles and cardiac genetic testing

Understanding the genetic basis of diseases can have significant benefit. There are many cardiovascular diseases that are known to be caused by genetic variants, affecting all aspects of the heart. Some may be inherited as Mendelian traits, where there is a direct and sizeable risk to relatives. Usually these can be discovered by genetic testing to identify and quantify the risk involved. Other diseases including coronary artery disease² and atrial fibrillation,³ have a more complex underlying aetiology, being due to a combination of genetic and environmental factors. Genetic risk of complex diseases can be derived from the presence of hundreds to thousands of genetic variants, and the cumulative risk of disease for an individual can be expressed as a polygenic risk score. At present, polygenic risk scores are not often used in mainstream cardiology, although this is likely to evolve in coming years as our knowledge increases.

Basic principles of genetics

Our bodies are made up of millions of cells which contain all the genetic information that determines many of our attributes and health. We have approximately 22,000 genes and these encode proteins that perform specific tasks in our body. Inherited diseases are those caused primarily due to a change in the DNA code in a gene, impacting the function of a specific protein it encodes. We have two copies of every gene, one which is inherited from our mother and the other from our father. The sex chromosomes include XX (female) and XY (male). The DNA sequence is a series of nucleotides, including adenine (A), guanine (G), cytosine (C), and thymine (T). Nucleotides are read in groups of three, and the order will determine the resulting amino acid. Therefore, a single change, like a spelling mistake, will result in a different amino acid being

substituted into the protein sequence. This is known as a missense change. These changes can result in errors in the protein structure and/or function. Other changes can result in a loss of function, for example, a small insertion or deletion of a nucleotide(s) which causes a shift in the reading frame and eventually a premature truncation. Where the change is so drastic that the protein may become truncated or radically altered, the cells are capable of 'mopping up' the dysfunctional protein (known as nonsense-mediated decay) and the result is overall lower levels of normal protein (known as haploinsufficiency). Changes to the DNA sequence are called variants. Not all variants cause disease, and in fact rare variation in our genetic make-up is common. This becomes a challenge when trying to determine whether a specific genetic change is causative of disease or not.

Comprehensive three-generation family history

A comprehensive three-generation family history is a key aspect of the clinical assessment of families with known or suspected inherited cardiac conditions (ICCs). Communicating effectively at this stage can be useful to develop rapport and gain a better understanding of the social circumstances in the family, for example, who is in contact, where relatives reside, and how family communication is likely to proceed. Importantly, it may also shed

light on the inheritance pattern in the family, allowing inheritance risk information to be passed on to at-risk family members.

The family history is a valuable tool (► Fig. 9.1). In drawing this, circles denote females, and squares males. Typically, those with clinical evidence of disease are represented as black filled-in symbols, while unfilled symbols are unknown or unaffected clinical status. As there are two copies of most alleles, the notation $+/-$ represents an individual with one affected allele, as would be sufficient to cause autosomal dominant disease (► Fig. 9.1). Alternatively, recessive inheritance requires both alleles to be affected, therefore those expressing clinical disease will be $+/+$ while their carrier parents will be $+/-$. Other inheritance patterns are explained in more detail later in the chapter. Family members who are deceased will be shown with a diagonal line through their symbol, and typically at least three-generations should be recorded.

Inherited diseases can follow different modes of inheritance, and in many cases this information can be gleaned from the family history (► Fig. 9.1). These include:

- Autosomal dominant: one gene copy is affected resulting in disease, known as a heterozygous change. There is a one in two risk of passing on the disease to offspring.
- Autosomal recessive: both gene copies are affected resulting in disease. This can be the same variant

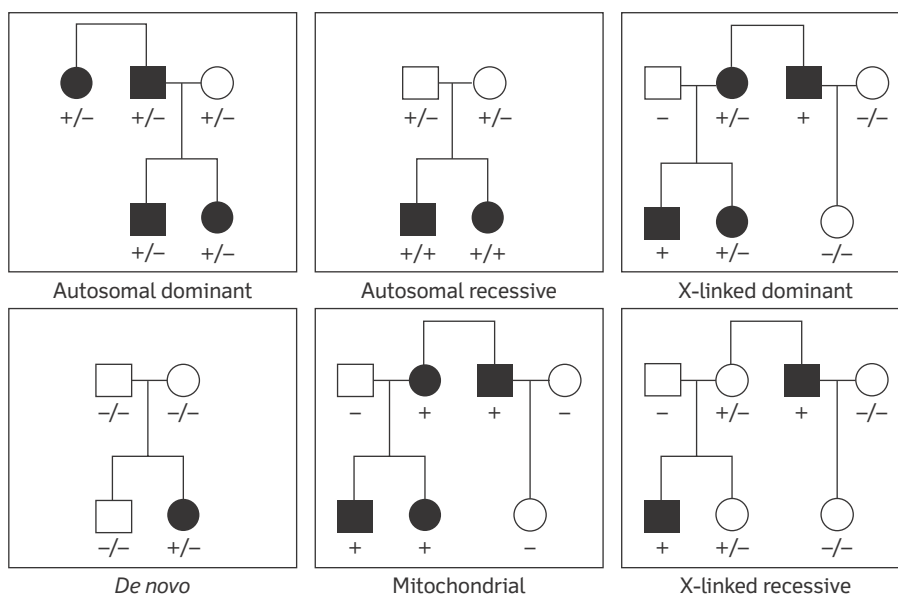


Fig. 9.1 Inheritance patterns that can be identified from the family history.

(homozygous) or different variants in the same gene (compound heterozygous). This often implies that both parents are carriers, that is, they have only one gene copy affected and no disease. In some cultures, where consanguinity is commonplace, genetic diseases due to homozygous gene variants should be suspected.

- **X-linked:** a gene on the X-chromosome is affected. Since males (XY) do not have another functional gene copy, they often have disease. Females (XX) are considered carriers, though in some cases can express disease. For dominant X-linked conditions, disease in the females can be severe. For many X-linked conditions, however, females are typically more mildly affected, if at all. Affected males cannot pass on the disease, and carrier females have a one in two risk of passing it on to their children.
- ***De novo*:** some variants arise at conception, meaning both parents are demonstrated to be gene negative in a setting where paternity is confirmed. *De novo* variants that cause disease often affect children, and reassuringly to families there is no recurrence risk to additional pregnancies or children. In rare cases, a *de novo* variant can appear to arise due to gonadal mosaicism, where some of the gonadal cells of a parent carry the genetic change. This situation is important to recognize as it means there is an inheritance risk to further children.
- **Mitochondrial:** genes that encode mitochondrial proteins can either be encoded by mitochondrial DNA or nuclear DNA. Nuclear DNA variants will follow inheritance patterns described previously. Mitochondrial DNA exists separate to nuclear DNA and is passed from the mother to offspring at conception. All children of an affected mother will inherit the affected mitochondrial DNA, though at varying levels (heteroplasmy). Importantly, males cannot pass on mitochondrial DNA variants.

Some common terms used in genetics are shown in ► **Table 9.1**.

Cardiac genetic testing

ICCs have a combined prevalence of up to 1 in 200–500 in the community. These encompass the inherited cardiomyopathies,⁵ arrhythmia syndromes, and aortopathies,⁶ among others, and are defined by their clinical and genetic heterogeneity. Most are autosomal dominantly inherited, meaning there is a one in two risk to first-degree relatives, and indeed a positive family history with multiple affected

relatives is not an uncommon presentation. Historically, specialized centres drew in large kindreds with demonstrated familial disease that enabled their initial diagnoses. Indeed, these are the family descriptions that paved the way for our earliest understanding of the disease genes. Cardiac genetic testing is now a routine addition to management in many cases, largely driven by the evolution of next-generation sequencing technologies, making testing faster, more comprehensive, and widely available.

Genetic testing for ICCs has become widely available, and aims to identify the underlying genetic cause of the disease. In some cases, this can have benefit in clarifying the diagnosis in the affected individual, but for the most part, the true value lies in the ability to clarify disease risk for at-risk family members. Genetic testing for Mendelian genetic diseases is a two-step process. First, the disease-causing gene variant must be identified. Given many families have their own unique genetic cause of disease, this can be a challenge. Typically, a DNA sample is taken from the proband (i.e. the index case) and a large panel of genes associated with a specific phenotype are sequenced. In this setting, the potential outcomes can include (1) a genetic cause of disease is identified, (2) a genetic cause of disease is suspected but it cannot be reliably ascertained at this point in time, or (3) a genetic cause of disease is not identified (► **Table 9.2**).

If a variant is identified that is deemed to be causative, then cascade genetic testing can be offered to family members. This is a technically simpler test, evaluating the presence or absence of the causative variant in their DNA sample. If asymptomatic relatives are shown to be gene positive then they may at some point in future develop disease and should continue clinical screening with a cardiologist, and their own children have a one in two risk of disease. Those who are gene negative can be released from all future clinical screening, and likewise their children are no longer at risk. This is a powerful tool for use in families, and indeed the ability to release family members from lifetime periodic clinical surveillance is the basis for genetic testing being a very cost-effective addition to family management among those with hypertrophic cardiomyopathy (HCM)^{7,8} and dilated cardiomyopathy (DCM).⁹

Cascade genetic testing can give at-risk family members options and greater certainty regarding their risk, but there can be additional considerations when children are concerned. Given many ICCs develop from teenage years and above, there is an argument that there is little urgency to determine a child's genetic status. In many cases, it may be prudent to offer cascade genetic testing

Table 9.1 Glossary of genetic terms

Variant	An alteration of the DNA sequence from the reference sequence
Gene	A part of the DNA sequence that encodes a specific protein
Protein	Proteins are comprised of amino acids and perform a multitude of tasks in our cells and body. These include structural, biochemical, transport, metabolic, cell signalling, and adhesion roles
Variant classification	Variants occur commonly. Some variants can be the underlying cause of genetic diseases. Distinguishing which are disease causing and which are not requires use of variant classification criteria. If there is robust evidence that the variant causes disease, it will be considered 'likely pathogenic' or 'pathogenic'. If there is enough evidence that it is not causative, then it will be considered 'likely benign' or 'benign'. Where there is insufficient or conflicting evidence, the variant will be termed a 'variant of uncertain significance' (VUS) and it should not be used for cascade screening in the family
Genetic testing	Genetic testing is the process of sequencing genes to determine if DNA variants exist. It is usually a two-step process (proband and cascade genetic testing)
Proband genetic testing	The first step in many cases requires finding the genetic variant causing disease in a member of the family who is definitely affected with disease
Cascade genetic testing	If a disease-causing variant is identified, at-risk relatives may be offered cascade genetic testing which tests for the presence or absence of the variant in the family
Phenotype	The clinical features due to a specific genetic variant. In many cases this is referring to a specific disease state
Disease penetrance	Whether or not the phenotype develops in those who have the genetic variant
Variable expression	The variability in clinical features present among those affected individuals who carry the same genetic variant

Source data from Ingles J, Macciocca I, Morales A, et al. Genetic Testing in Inherited Heart Diseases. *Heart Lung Circ* 2020; 29: 505–511.

once the child has reached an age where they can participate in the decision-making process. This is part of the pretest genetic counselling discussion when considering cascade genetic testing in children. However, ultimately, it will be the decision of the family, especially for risk of inherited arrhythmia syndromes where disease onset may be younger and where it is clinically challenging to diagnose.¹⁰

Currently the pick-up rate (diagnostic yield of cardiac genetic testing) can range from 10% to 70%, depending on the disease in question, the characteristics of the patient, and the gene panel sequenced.¹¹ Where genetic variants are not identified, it should be clarified to the family that it is believed that they may still have a familial disease, but that the current knowledge or available technologies are not sufficient to identify it. This can be frustrating for the patient, their family, and the treating clinician, and illustrates the critical role of research. With

greater stringency in how gene variants are determined to be causative of disease, robust research methods that provide a high level of evidence for causation are needed.

Uncertain genetic results can be challenging in many ways. For the patient, comprehension of uncertain genetic findings can be difficult, causing confusion and being a barrier for further communication in the family.^{12–14} For the clinician, it can be hard to know how to resolve whether the variant is the cause or not. In some cases, there can be further clarification of the role of the variant in disease. For example, in a family where there are multiple affected relatives, seeking permission to obtain DNA to determine if they do/do not carry the genetic variant. By segregating the variant to other affected relatives, we can increase the confidence that the variant is the cause of disease. For other families, research laboratories may choose to perform functional studies (e.g. using cells or animal models) to determine whether the variant causes disease.

Table 9.2 Outcomes of genetic testing in the proband (index case)

Meaning	Genetic result	Impact to the family
Pathogenic variant (class 5)	Cause of disease is identified	Can be used for cascade genetic testing in the family
Likely pathogenic variant (class 4)		
Variant of uncertain significance (class 3)	Cause of disease is suspected but cannot be reliably ascertained	Cannot be used in the family for cascade genetic testing, at-risk relatives should continue clinical surveillance
Likely benign variant (class 2)	Only variants not considered to be causing disease, or no variants, are identified	Cascade genetic testing not available to the family, at-risk relatives should continue clinical surveillance
Benign variant (class 1)		
No variants identified		

Genetics of sudden cardiac death in the young

Sudden cardiac death (SCD) is a tragic outcome of many ICCs, and in some cases, it is the presenting symptom of disease. Where a cause of death remains elusive, that is, sudden unexplained death or sudden arrhythmic death, an inherited cause is strongly suspected. For the surviving relatives, there are clinical, genetic, and psychological challenges, and thus distinct advantages to family-based approaches to care. Clarification regarding the cause of death is a key consideration, allowing clinicians to devise a more tailored clinical surveillance plan and family members to gain some closure. While clinical investigation of family members after a sudden unexplained death can reveal a diagnosis in 10–20% of families,¹⁵ the molecular autopsy (i.e. genetic testing of postmortem DNA) can provide important insights. By identifying an underlying genetic cause, we can (1) provide a cause of death for the decedent, and (2) offer a useful tool to allow cascade genetic testing of asymptomatic family members.^{16,17}

While the clinical and genetic aspects of care following a SCD have to date been a focus, the psychological care needs often garner less attention. There is a high risk of poor psychological outcomes, including post-traumatic stress symptoms and prolonged grief, with almost one in two first-degree relatives reporting clinically significant symptoms, on average 6 years after the death.^{18,19} From a nursing perspective it is important that we recognize and advance our knowledge base in this area in order to optimize care to individuals and families.

Genetics of congenital heart diseases (CHD)

Genetic testing for CHDs has not been as widely adopted as other cardiac genetic testing. This is largely due to the

complex inheritance of CHD, meaning very large numbers of genes need to be included on gene panels and often there can be a digenic inheritance pattern (i.e. multiple segregating variants). In large expert centres, genetic testing for CHD is performed in a research setting, often requiring multidisciplinary input to interpret the genetic findings. With the increasing availability of next-generation sequencing, however, there is a growing use of genetic testing in this setting. It is estimated that single-gene disorders can be identified in 3–5%, chromosomal abnormalities in 8–10%, and large structural variants in 3–25% of cases. The large majority, however, are considered multifactorial, due to a combination of environment and many genetic factors.

Nonetheless, genetic testing and counselling is recommended. Understanding the underlying genetic causes of CHD is important for the following reasons: to confirm diagnosis, to guide management, to prognosticate, to appraise the recurrence risk, and to assess the genetic risks in family members.²⁰ ► Fig. 9.2 gives a graphical illustration of the genetic counselling and testing process in CHD.

Challenges of cardiac genetic testing

While our understanding of the clinical and genetic aspects of these diseases has evolved in recent decades, challenges remain around clinical and genetic diagnosis. The phenotype may be subtle or difficult to detect using current cardiac investigations, while broad genetic testing will often implicate numerous rare variants with unknown impact. Rare variants are cumulatively common and at present there is little ability to determine their impact, with most being unlikely to cause disease. The dangers of misclassifying these as causative are well documented, often relating to issues with certain ethnicities being underrepresented in general population databases,²¹ inconsistent variant classification,²² and poorly defined

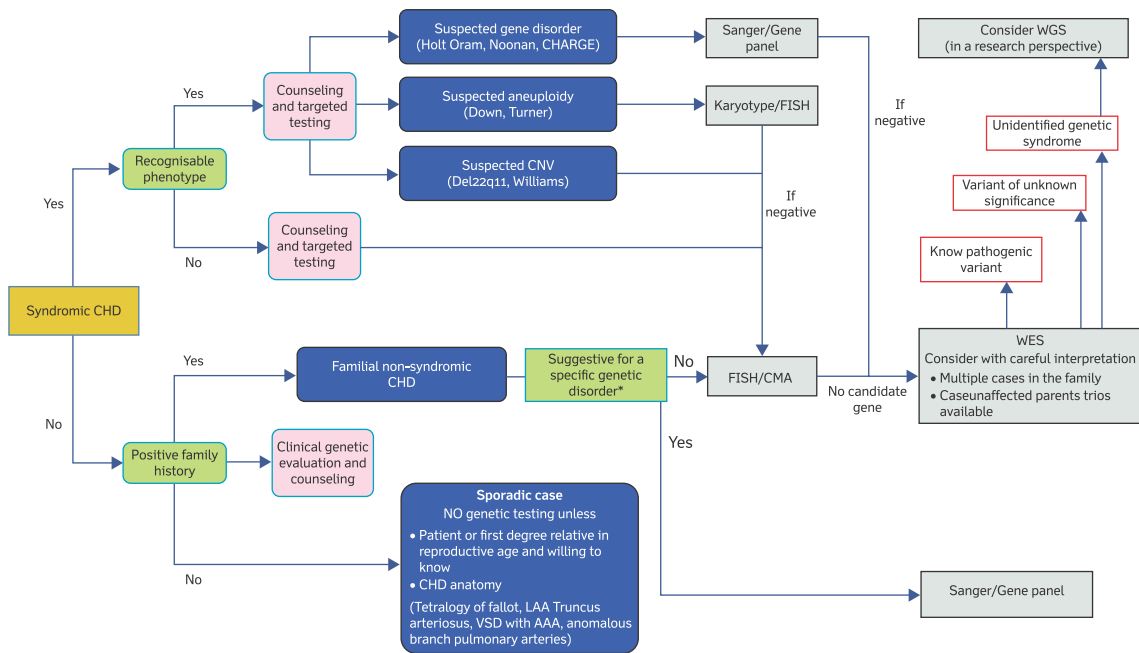


Fig. 9.2 Graphical illustration of the genetic counselling and testing process in congenital heart disease. AAA, ascending aortic aneurysm; AV, atrioventricular; CMA, chromosomal microarray; CNV, copy number variant; ELN, elastin; FISH, fluorescence *in situ* hybridisation; IAA, interrupted aortic arch; VSD, ventricular septal defect; WES, whole exome sequencing; WGS, whole genome sequencing; *e.g. *ELN* for familial supravalvular aortic stenosis; *TFAP2B* for familial patent ductus arteriosus, *NKX2.5* for familial atrial/ventricular septal defect with AV block.

De Backer J, Bondue A, Budts W, et al. Genetic counselling and testing in adults with congenital heart disease: A consensus document of the ESC Working Group of Grown-Up Congenital Heart Disease, the ESC Working Group on Aorta and Peripheral Vascular Disease and the European Society of Human Genetics. *Eur J Prev Cardiol.* 2020 Sep;27(13):1423–1435. doi: 10.1177/2047487319854552 with permission from SAGE.

association of a gene with a specific phenotype.^{23,24} For the individual patient, putting together the pieces of the puzzle to understand the underlying genetic basis of disease is, therefore, difficult. In the setting of a positive family history, however, where the prior probability of a single gene causing disease is greater, the task may become easier and less prone to error. Likewise, interpretation of the phenotype in the context of a family means mild or incompletely penetrant traits, which may have been disregarded in isolation, can be more fully appreciated. The advantages of a well-constructed family history are far reaching in this setting, both for the management of patients and their relatives.

Role of genetic counselling

Genetic counselling is the process of providing information and emotional support to those with, or at risk of, genetic diseases.²⁵ It aims to assist patients and their families to understand and adapt to the medical, psychosocial,

and familial aspects of genetic disease.²⁶ Genetic counselling, as a process, may be performed by appropriately trained health professionals, including genetic counselors or genetic nurses.

Genetic counselling goes beyond provision of information, and an important focus is the psychosocial support offered, including empathic listening, crisis intervention, managing family dynamics, coping models, grief, and adjustment to disease diagnoses.²⁷ Awareness of the psychosocial considerations in the family, as well as a strong rapport with the patient, can help facilitate effective communication.²⁸ Additional support for some patients in communicating risk information to family members may be warranted. One recent study of patients with long QT syndrome (LQTS) showed that those with worse anxiety reported greater difficulty disseminating this information to relatives.²⁹ Consideration of the need for a clinical psychologist in the management of families with ICCs may also be warranted, and a referral pathway should be established. For families who have experienced a young SCD,

this should be encouraged in all cases, given the known high prevalence of prolonged grief and post-traumatic stress symptoms.¹⁸

Inherited cardiovascular conditions (ICCs)—epidemiology, presentation, investigations, and management

ICCs is an overarching term for a range of conditions which affect the heart muscle (cardiomyopathies), electrical system (primary arrhythmia syndromes/channelopathies), and connective tissue disorders with major cardiovascular manifestations. Some of these conditions also have extracardiac manifestations, including abnormalities in the skeletal muscle, skin, and the neurological system. Specialized multidisciplinary teams integrate expertise to deal holistically with the complex needs of patients and families presenting with these conditions. These clinics provide individualized care with relevant members of staff covering the medical, genetic, psychological, and ethical issues.

Inherited cardiomyopathies

The cardiomyopathies are an important, heterogeneous group of heart muscle diseases that are associated with

significant morbidity and mortality. Collectively, they are defined as a disorder of the myocardium where there is an abnormality in the structure and function of the heart muscle in the absence of coronary artery disease, hypertension, valvular disease, and CHD which could explain the observed myocardial abnormality.³⁰ ➤ **Fig. 9.3** illustrates the classification of cardiomyopathies according to specific morphological and functional phenotypes which are then subclassified into familial and non-familial forms (➤ Table 9.3).

Hypertrophic cardiomyopathy

Epidemiology, pathology, and aetiology

HCM is a condition which affects approximately 1 in 500 of the general population. It is characterized by the development of a hypertrophied, non-dilated left ventricle (LV) in the absence of other predisposing conditions (such as aortic stenosis or hypertension). At a pathological level, the hallmark of the condition is myocardial disarray, or loss of the normal parallel alignment of the heart muscle cells.

The development of the hypertrophy is characteristically age related—in family settings, it is relatively uncommon for young children to manifest the disease before the age of 10 years and, while most genetically predisposed individuals develop hypertrophy during adolescence, there is increasing recognition of the development of late-onset disease. The hypertrophy is often asymmetrical, affecting the interventricular septum, but it is important to recognize that the hypertrophy can affect any part of the

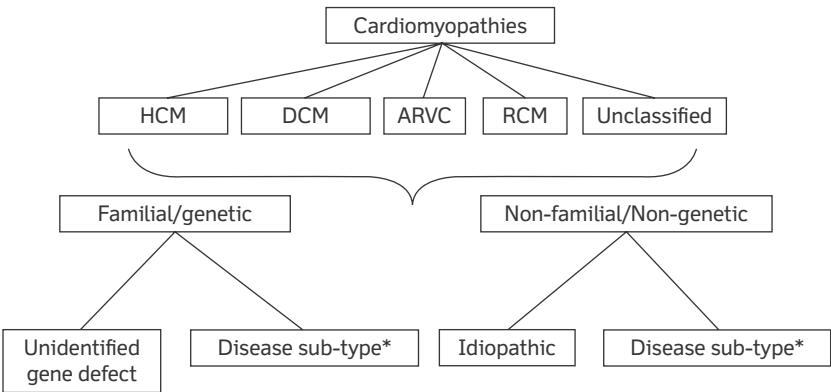


Fig. 9.3 Summary of proposed classification of cardiomyopathies. ARVC, arrhythmogenic right ventricular cardiomyopathy; DCM, dilated cardiomyopathy; HCM, hypertrophic cardiomyopathy; RCM, restrictive cardiomyopathy. (The asterisk refers to table 1 in reference³⁰.)

Elliott P, Andersson B, Arbustini E, et al. Classification of the cardiomyopathies: a position statement from the European Society Of Cardiology Working Group on Myocardial and Pericardial Diseases. Eur Heart J. 2008 Jan;29(2):270–6. doi: 10.1093/eurheartj/ehm342. Reprinted by permission of Oxford University Press on behalf of the European Society of Cardiology.

Table 9.3 Types of inherited cardiomyopathies

Condition and prevalence	Presentation	Investigations	Management
Hypertrophic cardiomyopathy (HCM) LV thickness ≥ 15 mm in one or more LV segment. 1:500 in general population	Often silent initially Dyspnoea Palpitations Syncope Chest pain	ECG Echocardiography (ECHO) Cardiac MRI HCM risk calculator Genetic testing	Reduction of proarrhythmic risk using: Drugs—beta-blockers, verapamil and disopyramide ICD Surgical techniques Exercise advice and avoidance of competitive sport Symptom management
Dilated cardiomyopathy (DCM) LV dilation and systolic dysfunction without CAD 1:250 general population Familial in 30%	Variable presentation Dyspnoea Palpitations Syncope/SCD Thromboembolism	ECG ECHO Chest X-ray Cardiac MRI Genetic testing	Symptom management and prevent complications—heart failure, SCD, and thromboembolism
Arrhythmogenic right ventricular cardiomyopathy (ARVC) 1:2500–5000 in general population	Usually presents in mid 30s Symptoms of heart failure or arrhythmia	ECG and signal-averaged ECG Cardiac MRI Angiography Genetic testing	Reduction of proarrhythmic risk using: Drugs—beta-blockers SCD risk stratification and ICD if indicated Tailored exercise advice
Restrictive cardiomyopathy (RCM) High ventricular pressure due to stiffness in myocardium Normal or reduced systolic and diastolic volume	Various causes: Idiopathic, familial, or associated with conditions such as amyloidosis, Fabry disease, and haemochromatosis Signs of heart failure or arrhythmia	ECG ECHO Cardiac MRI Angiography Endomyocardial biopsy	Treatment predicated by underlying cause Careful fluid management Drugs—diuretics, beta-blockers, calcium channel blockers Risk stratification and management—ICD and LV assist device where indicated
Left ventricular non-compaction (LVNC) Spongy myocardium usually restricted to LV apex	Idiopathic or associated with other congenital conditions, e.g. VSD or Ebstein anomaly	ECG ECHO Cardiac MRI	Prevention and treatment of heart failure, arrhythmia, and embolic events Genetic testing

myocardium. Up to one-third of patients have resting left ventricular outflow tract obstruction (LVOTO). However, in other patients without resting obstruction, it may be induced during exercise or if there are other haemodynamic strains, such as tachycardia, blood loss, or inadvertent use of inotropes. Atrial arrhythmias are common, and affected individuals have a high risk of thromboembolism. Progression to a 'burn-out' phase, which is characterized by progressive LV dilation, wall thinning, and systolic impairment, can occur in up to 15% of adults with HCM. More commonly, HCM is an autosomal dominant condition associated with pathogenic variants in sarcomere genes *MYBPC3*, *MYH7*, *TNNT2*, *TNNI3*, *TPM1*, *ACTC*, *MYL2*, and *MYL3*, which are implicated in 40% of cases.

It is important to recognize that there are many other conditions that can cause LV hypertrophy and appear to clinically mimic HCM, especially in the very young, as there are treatment implications, as well as implications for the risk of other family members. These include X-linked lysosomal disorders, such as Fabry disease caused by pathogenic variants in the alpha-galactosidase A (*GLA*) gene which typically presents in males over the age of 36 with concentric LV hypertrophy, and Danon disease where the dominant features include cardiomyopathy, skeletal myopathy, and developmental delay resulting from pathogenic variants in the lysosome-associated membrane protein-2 (*LAMP2*) gene. Other glycogen storage diseases which can include LV hypertrophy include Pompe disease (autosomal recessive) and a syndrome caused by pathogenic variants in the gamma-2 subunit adenosine monophosphate-activated protein kinase (*PRKAG2*) gene (autosomal dominant) which often includes conduction abnormalities and Wolff-Parkinson-White syndrome. LV hypertrophy is also a feature in primary mitochondrial disorders, Friedreich's ataxia, and syndromic conditions such as Noonan syndrome. The diagnosis of these conditions requires a high index of clinical suspicion and the use of appropriate diagnostic tools.

Furthermore, an important differential diagnosis in young healthy individuals is 'athlete's heart' which can show physiological hypertrophy. Various factors may be used to distinguish HCM from athlete's heart; these include extent of hypertrophy, LV cavity size, extent of left atrial enlargement, presence of LVOTO, changes in tissue Doppler parameters, peak VO_2 consumption, levels of N-terminal-pro-B-type natriuretic peptide, regression on cessation of exercise, and genetic testing.

Clinical presentation

An initial diagnosis of HCM is often made following an incidental finding of a heart murmur or an abnormal

electrocardiogram (ECG) or in the context of family screening. Individuals with HCM generally have few or any symptoms. When present, these typically include dyspnoea, palpitations, and chest pain, which is commonly exertional but can also occur at rest following heavy meals. Syncope is a relatively common symptom which can be caused by multiple mechanisms such as LVOTO, abnormal vascular responses, and atrial and ventricular arrhythmias. Unexplained or exertional syncope is associated with increased risk of sudden death in the young. Extreme presentations include SCD and infants with symptoms of heart failure.

Investigations

Ninety-five per cent of individuals with HCM have an abnormal 12-lead ECG. Common features include a variable combination of pathological Q waves most often in the inferolateral leads, LV hypertrophy, and ST- and T-wave abnormalities. These should be interpreted in conjunction with findings on echocardiography and/or cardiac magnetic resonance imaging (MRI). In an adult, HCM is defined by a wall thickness of at least 15 mm in one or more LV myocardial segments—as measured by any imaging technique—that is not explained solely by loading conditions. In children, the diagnosis requires an LV wall thickness more than two standard deviations greater than the predicted mean. In first-degree relatives of patients with unequivocal disease, the presence of otherwise unexplained increased LV wall thickness greater than 13 mm in one or more LV myocardial segments, as measured by any cardiac imaging technique, will suffice. First-degree relatives of patients with HCM should be invited for cardiac screening commencing from the age of 10 years or even earlier and should continue at regular intervals due to the possibility of late-onset disease despite a normal initial screen. This also applies to genetic carriers, who remain phenotypically unaffected.

Management

Making an accurate diagnosis for HCM and the exclusion of conditions which mimic HCM ensures patients receive an appropriate management plan. Lifelong follow-up is required for monitoring disease progression, symptoms, and assessments for risk of SCD. Symptoms resulting from LVOTO may be initially managed with the addition of the antiarrhythmic, disopyramide, to beta-blockers or verapamil. Disopyramide is usually well tolerated but initiation at low doses is recommended, especially in the elderly. Prolongation of the QT interval may occur so patients will need regular ECG monitoring and other medications that prolong the QT interval should be avoided. Patients who

are unable to tolerate medications or whose LVOTO-related symptoms do not respond to medical therapy may be offered septal reduction therapy. The traditional treatment is a septal myectomy which involves the removal of a portion of the heart muscle from the interventricular septum. A more recent option is alcohol septal ablation wherein 95% alcohol is injected to produce an area of localized necrosis within the basal septum. In patients without LVOTO, chest pain and dyspnoea are likely to be caused by LV diastolic impairment and microvascular ischaemia and these patients are, therefore, treated with beta-blockers or calcium antagonists. Other medications such as angiotensin-converting enzyme inhibitors or nitrates may be beneficial in selected patients with systolic dysfunction but should be avoided in patients who have inducible LVOTO as they can make symptoms worse. Patients who are in the end stage of the disease should receive standard heart failure therapy, including palliative care.

The overall risk for SCD in patients with HCM is around 1% per year. Nevertheless, high-risk patients should be identified and considered for a primary prevention ICD. The use of the HCM Risk-SCD calculator will facilitate this, considering age, cardiac imaging parameters, symptoms of syncope, and family history. Patients with HCM who present having survived an out-of-hospital cardiac arrest or have sustained ventricular tachycardia (VT) will typically have an ICD for secondary prevention. Advice against participation in competitive sport and intense physical activity should be given to high-risk patients for SCD and/or those with LVOTO.

Atrial fibrillation in HCM should be treated promptly as per European Society of Cardiology Guidelines as there is a high risk of thromboembolism in patients with HCM conveying a low threshold for commencing oral anticoagulants. The CHA₂DS₂-VASc score to calculate stroke risk is not recommended.

Dilated cardiomyopathy

Epidemiology, pathology, and aetiology

DCM is characterized by 'the presence of LV dilatation and systolic dysfunction in the absence of abnormal loading conditions or significant coronary artery disease'.³⁰ Right ventricular (RV) dilatation is often also present. The current data on the epidemiology of DCM estimates that it occurs in 1 out of 250 people in the population.³¹ It is estimated that 25–35% of DCM cases are familial. Autosomal dominant, autosomal recessive, X-linked, and mitochondrial inheritance patterns have been reported, with a range of genes implicated, including cytoskeletal, sarcomere, and nuclear envelope proteins. Familial disease

should also be suspected when there is a family history of sudden death, conduction system disease, or an associated skeletal myopathy. Acquired causes of DCM include autoimmune and systemic disorders, and inflammatory diseases, such as myocarditis; as well as past exposure to alcohol, drugs, or chemotherapeutic agents; metabolic/endocrine disorders; and other neuromuscular diseases.

Clinical presentation

Patients with DCM have signs and symptoms that are highly variable and depend on the degree of LV dysfunction. They may present with heart failure, arrhythmias, thromboembolic events, or SCD. Typical symptoms include reduced exercise tolerance, dyspnoea on exertion, palpitations, pre-syncope, and syncope.³² Where family screening is being undertaken, several asymptomatic relatives may be identified to have isolated LV dilatation or asymptomatic LV dysfunction.

Investigations

The ECG in patients with DCM may be normal, but typically exhibits sinus tachycardia and non-specific ST-segment and T-wave changes. Evidence for atrial enlargement and ventricular hypertrophy is common as well as the presence of AF and ventricular arrhythmias. Atrioventricular (AV) block may also be present and raises the possibility for pathogenic variants in the lamin A/C gene (*LMNA*).³³ Chest X-ray is often abnormal in DCM reflecting LV and left atrial dilatation. Echocardiography is diagnostic for DCM in the presence of LV fractional shortening less than 25% and/or LV ejection fraction less than 45% with LV end-diastolic diameter greater than 117% of the predicted value corrected for age and body surface area. Cardiac MRI provides additional details beyond ventricular size and function, as it permits tissue characterization, including evidence of inflammatory processes and scarring. The absence of any other known cause of myocardial disease should be established and a diagnosis of idiopathic DCM is only assigned after all other possible explanations have been excluded.

Comprehensive or targeted genetic testing is recommended for patients with DCM, with truncating variants in *TTN* being the most common cause, but other genes including *RBM20*, *FLNC*, *DSP*, *BAG3*, and *PLN* also being potentially implicated. For patients with significant conduction disease, there should be a high level of suspicion of a causative variant in *LMNA*. Establishing a familial pattern of DCM helps confirm the diagnosis, thereby facilitating cascade screening within the family.¹¹ All first-degree relatives of a patient with familial or idiopathic DCM should have cardiac evaluation, including ECG and imaging.

Management

The management of DCM is targeted towards improvement of symptoms and the prevention of complications such as heart failure, SCD, and thromboembolism.³² Treatment pathways are similar to those for established LV dysfunction/heart failure and include use of angiotensin-converting enzyme inhibitors (or angiotensin receptor antagonists), beta-blockers, mineralocorticoid antagonists, and I_f channel inhibitors. Device-based therapy, both pacemaker and ICD, may be indicated, according to established guidelines. Mechanical support with LV assist devices and heart transplantation may also be indicated in certain patients.

Arrhythmogenic right ventricular cardiomyopathy

Epidemiology, pathology, and aetiology

Arrhythmogenic right ventricular cardiomyopathy (ARVC) has an estimated prevalence of 1 in 2500–5000.³⁴ It is characterized by progressive fibro-fatty replacement of the myocardium, leading to both electrophysiological and contraction abnormalities. The pathological changes are found most commonly in the triangle of dysplasia (RV inflow, outflow, and apex) and are increasingly recognized in the LV. More recently, the triangle of dysplasia has been refined to include the RV basal inferior wall, the RV anterior wall, and the posterolateral LV wall.³⁵ Indeed, in the later stages, biventricular involvement resembling DCM is observed.

As greater understanding of the phenotype spectrum of the disease develops, the term arrhythmogenic cardiomyopathy has been suggested. This incorporates right-sided disease such as ARVC, and biventricular and left-sided disease which are known manifestations of these diseases.³⁶

Autosomal dominant inheritance is the most common pattern of inheritance in ARVC, although autosomal recessive inheritance is also seen in the case of Naxos disease and Carvajal syndrome (often with hair and skin changes, such as woolly hair and palmoplantar keratoderma).³⁷ The genes involved mainly encode desmosomal genes *DSC2*, *DSG2*, *DSP*, *JUP*, *PKP2*, *PLN*, and *TMEM43*.

There is limited information on the natural history of the disease, although four stages are generally recognized:

- Concealed: early, generally asymptomatic phase; in very rare cases there may be ventricular arrhythmias preceding overt structural disease.
- Overt electrical disorder: unstable phase with symptomatic arrhythmias, generally left bundle branch block, and, thus, suggestive of RV origin.
- RV failure: phase of progressive deterioration in RV contractile function.

- Biventricular pump failure: phase of progressive biventricular dilatation.

Clinical presentation

It is rare for the condition to become manifest before the age of 12 years. Indeed, the median age of presentation is in the mid-thirties. Patients may present with a wide variety of symptoms related to arrhythmias and heart failure or as a sudden death. Affected asymptomatic relatives may be identified as part of family screening. There is some evidence to suggest that the rate of progression may be accelerated if patients participate in significant levels of exercise.

Investigations

Diagnosis of this condition is challenging and requires a detailed family history as well as multiple investigations, including imaging with echocardiography/cardiac MRI/angiography to define structure and function; 12-lead ECG, signal-averaged ECG, ambulatory ECG monitoring and exercise stress testing to look for resting T-wave abnormalities, delayed conduction on right-sided leads, and epsilon waves; late potentials on signal-averaged ECG; arrhythmias; and endomyocardial biopsies to detect histopathological changes. The original Task Force criteria for the diagnosis of ARVC were proposed in 1994 and modified in 2010; major and minor criteria are documented.^{38,39} The main differential diagnoses include idiopathic right VT, myocarditis, sarcoidosis, RV infarction, and DCM.

Comprehensive or targeted genetic testing of desmosomal genes can be useful in patients with arrhythmogenic cardiomyopathy³⁶ and can help with cascade screening in family members.⁴¹ The unpredictability of onset and symptoms complicates the evaluation of relatives and most will face lifelong comprehensive periodic cardiac screening in a specialist centre, particularly in the absence of a definitive pathogenic variant.

Management

The management of ARVC is focused on lifelong monitoring and treatment of symptoms, SCD risk stratification, and prevention of progression of the disease. Extreme physical exertion and participation in competitive sports or endurance training is not recommended due to the risk of disease progression and SCD. Beta-blockers are the mainstay for medical management. ICD implantation is considered according to risk for SCD⁴⁰:

- High risk: patients who have experienced a cardiac arrest due to ventricular fibrillation or sustained VT and those with severe RV/LV dysfunction.

- Intermediate risk: includes those patients with unexplained syncope, non-sustained VT and/or moderate RV/LV dysfunction.
- Low risk: includes those with no risk factors and those who are gene carriers but do not currently show any phenotype.

Although an ICD may be lifesaving, it may also be associated with short-, medium-, and long-term complications that may require multidisciplinary involvement.⁴¹

Restrictive cardiomyopathy

Restrictive cardiomyopathy (RCM) is a less well-defined cardiomyopathy in which the pattern of ventricular filling caused by increased stiffness of the myocardium results in high ventricular pressures with small increases in volume in the presence of normal or reduced diastolic volumes, normal or reduced systolic volumes, and normal wall thickness. In many ways, it is a description of the pathophysiological state, which may represent various pathologies or cardiomyopathies rather than a distinct cardiomyopathy. This is the least common of all the cardiomyopathies.

RCM may be idiopathic, familial (related to pathogenic variants in the sarcomere genes), or associated with various systemic disorders, such as haemochromatosis, amyloidosis, Fabry disease, carcinoid syndrome, other metabolic disorders, hypereosinophilic syndromes, endomyocardial fibrosis, or previous radiation.

Clinical presentation

Adults with RCM have variable presentations but more commonly have signs and symptoms of heart failure and arrhythmias. There is usually an elevated jugular venous pressure. Disease progression is rapid in children with over 50% dying within 2 years of diagnosis.⁴¹

Investigations

In RCM, the ECG is typically abnormal with evidence of biatrial hypertrophy and non-specific ST-segment and T-wave changes. Cardiac imaging by echocardiography or cardiac MRI typically shows biatrial enlargement with evidence of diastolic dysfunction. Cardiac catheterization may be required to distinguish it from constrictive pericarditis which has a similar presentation. Endomyocardial biopsy may be helpful in selected cases.

Management

Treatment of RCM should consider the underlying cause, if known, such as chemotherapy for those with amyloidosis.⁴² Careful fluid management is an essential aspect in the treatment of patients with RCM. Diuretics are used to

ameliorate symptoms and signs of pulmonary or venous congestion, but caution is required as they may reduce preload, thus decreasing blood pressure and cause dizziness. Beta-blockers and calcium channel blockers to increase filling time should be carefully introduced as patients may be intolerant, as is the case with angiotensin-converting enzyme inhibitors for which there is limited evidence of any benefit. Patients may have complex arrhythmias, including atrial fibrillation which will require anticoagulation, ICDs may be needed for the management of ventricular tachyarrhythmias. In severe cases, LV assist device therapy is now seen as a bridge to cardiac transplantation or as definitive therapy in RCM.⁴³ In familial RCM, screening and/or cascade testing of first-degree relatives should be advised accordingly, depending on the inheritance pattern associated with genetic aetiology.

Left ventricular non-compaction

Left ventricular non-compaction (LVNC) is characterized by the presence of spongy myocardium, thought to be as a result of an arrest in normal cardiac development, and predominantly involves the apical portion of the LV chamber (biventricular involvement has been described but is uncommon). The overall prevalence has been estimated as somewhere between 0.05% to 0.24% of the population and LVNC appears to be more common in males. LVNC can occur as an isolated condition or associated with other congenital heart anomalies (e.g. ventricular septal defect (VSD), Ebstein anomaly, bicuspid AV, alpha-dystrobrevin/*NKX2.5* gene mutations). Inheritance patterns vary depending on the genes implicated, which include sarcomeric, mitochondrial, and X-linked genes (e.g. *taffazin* (*TAZ*)).

Clinical presentation

LVNC may be identified incidentally or when patients present with one or a combination of these clinical manifestations: heart failure, arrhythmias, or embolic events.

Investigations

Consensus on the diagnostic criteria for LVNC remains elusive. However, Jenni et al. (2001) proposed criteria based on an end-systolic ratio of non-compacted to compacted layers greater than 2 as seen on echocardiography.⁴⁴ Cardiac MRI has now been used more often as it allows for proper visualization of the apex in some cases.

Management

The management of LVNC is focused on the prevention and treatment of heart failure, arrhythmias, and embolic events.⁴⁵ The frequency of VT, risk for sudden death, and

systemic embolism may warrant yearly ambulatory ECG monitoring. All first-degree relatives of patients with LVNC should be offered cardiac evaluation and cascade testing, where a causative pathogenic variant has been found in the proband.¹¹

Inherited arrhythmias

Inherited arrhythmias are a group of disorders where there is an inherited susceptibility to heart rhythm defects due to pathogenic variants in genes mainly encoding the Na⁺ and K⁺ channels, and other arrhythmogenic mechanisms such as those linked to Ca²⁺ transport; typically in the context of a structurally normal heart.⁴⁶ This section will focus on the most common such as LQTS, Brugada syndrome (BS), and catecholaminergic polymorphic ventricular tachycardia (CPVT) (► **Table 9.4**), and the investigation of sudden arrhythmic death syndrome.

Long QT syndrome

Epidemiology, pathology, and aetiology

LQTS is a disease of myocardial ion channels causing delayed repolarization which can cause torsades de pointes and ventricular fibrillation and may lead to syncope and SCD. The exact prevalence of LQTS is uncertain; however, it is likely to be approximately 1:2000.⁴⁷

While there are an increasing number of LQTS subtypes, the commonest are LQT1, LQT2, and LQT3. Of these LQT1 accounts for 30–35% of cases and is typically due to pathogenic variants in the *KCNQ1* gene. Patients with LQT1 present at a younger age with 86% experiencing a cardiac event by the age of 20 years, usually in the context of exercise, including swimming. Jervell and Lange Nielsen reported a rare, autosomal recessive form with deafness in the late 1950s. In the early 1960s, Romano and Ward reported autosomal dominant families without deafness. LQT2 and LQT3 are both autosomal dominant

Table 9.4 Types of inherited arrhythmias

Condition and prevalence	Presentation	Investigations	Management
<i>Long QT syndrome (LQTS)</i> Delayed repolarization caused by ion channel dysfunction	Variable from asymptomatic to syncope, epilepsy-type symptoms, or SCD	ECG History—precipitating factors, swimming, acoustic stimuli, stress Genetic testing to LQTS and CPVT Risk stratification Schwartz score, ICD where indicated Cascade screening	Beta-blockade Lifestyle modification—avoid competitive sports, swimming, and acoustic stimuli 'Drugs to Avoid' list to both LQTS and Brugada ICD in selected cases Left cardiac sympathetic denervation in selected cases
<i>Brugada syndrome (BS)</i> Complex genetic disorder	Variable from asymptomatic to syncope, epilepsy-type symptoms, SCD, nocturnal agonal breathing Arrhythmia more common at rest or sleeping	ECG Provocation test eg ajmaline Cascade screening	Avoidance of personal triggers Lifestyle modification ICD in selected cases
<i>Catecholaminergic polymorphic ventricular tachycardia (CPVT)</i> Bidirectional, polymorphic VT Prevalence 1:10,000	Palpitations or syncope during exercise in young, seizure-like symptoms, SCD	ECG Exercise stress testing Loop recorder Cascade screening	Avoidance of personal triggers Lifestyle modification Drug treatment ICD in selected cases left cardiac sympathetic denervation in selected cases

conditions and the onset of symptoms tends to be later in life compared to LQT1. LQT2 accounts for 25–30% of LQTS cases and is due to pathogenic variants in the *KCNH2* gene. Symptoms may be provoked by being startled by acoustic stimuli. In LQT3, cardiac events usually occur at rest or sleep and LQT3 is caused by pathogenic variants in *SCN5A*, which encodes the sodium ion channel. At least 12 genes have been implicated in LQTS encompassing the various subtypes.

Clinical presentation

Symptom patterns vary in LQTS, and patients can present asymptotically with an incidental ECG finding, or epilepsy-type symptoms or indeed sudden death. Symptoms of transient loss of consciousness are typically caused by torsade de pointes and may be misdiagnosed as seizures.

It is important to note any precipitating situations, such as exercise and swimming, sudden acoustic stimuli or stress, and rest or sleep. A relevant family history of LQTS, SCD, recurrent syncope, epilepsy, and deafness should raise the suspicion of LQTS in individuals presenting with palpitations, dizziness, or syncope and an abnormal ECG.

Investigations

The QT interval reflects both depolarization and repolarization. As the QT interval varies with heart rate, several correction approaches have been advocated to ensure accurate measurement as this has important implications for diagnosis and management. The commonly used method is the Bazett formula. The Schwartz score has been used as a standard to diagnose LQTS based on ECG and clinical characteristics (► Table 9.5), and has now been incorporated in the updated consensus statement on the diagnosis and management of patients with inherited primary arrhythmia syndromes⁶ (► Box 9.1).

Apart from the resting ECG, an exercise ECG is usually performed. In LQT1, the QTc interval on exercise does not shorten as much with increased heart rate compared to healthy individuals and this may be more pronounced in the immediate recovery phase (measurement should continue at least up to 4 minutes into recovery).

A 24-hour Holter recording can be helpful in recording T-wave changes not apparent at rest. Diurnal variation may be present, particularly in LQT3, with marked QTc prolongation seen overnight. Other arrhythmias such as ventricular ectopics, torsades de pointes, and non-sustained ventricular fibrillation may also be observed.

Management

Lifestyle modification is an important aspect of management in LQTS. Avoidance of competitive sport is advised,

Table 9.5 Risk score for long QT syndrome (Schwartz score)

Criteria	Points
Electrocardiographic findings^a	
A. QTc ^b	
≥480 ms	3
460–479 ms	2
450–459 ms (in males)	1
B. QTc ^b 4 th minute of recovery from exercise stress test ≥480 ms	1
C. Torsade de pointes ^c	2
D. T wave alternans	1
E. Notched T wave in 3 leads	1
F. Low heart rate for age	0.5
Clinical history	
A. Syncope ^c	
With stress	2
Without stress	1
B. Congenital deafness	0.5
Family history	
A. Family members with definite LQTS ^e	1
B. Unexplained sudden cardiac death below age 30 among immediate family members ^e	0.5

^a In the absence of medications or disorders known to affect these electrocardiographic features.

^b QTc calculated by Bazett's formula where QTc = QT/√RR.

^c Mutually exclusive.

^d Resting heart rate below the 2nd percentile for age.

^e The same family member cannot be counted in A and B.

SCORE: ≤1 point: low probability of LQTD.

1.5 to 3 points: intermediate probability of LQTS.

≥3.5 points high probability.

Reproduced from Schwartz PJ, Crotti L. QTc behavior during exercise and genetic testing for the long-QT syndrome. *Circulation*. 2011 Nov 15;124(20):2181–4. doi: 10.1161/CIRCULATIONAHA.111.062182 with permission from Wolters Kluwer.

but an individualized approach should be undertaken. In LQT1, swimming should be avoided or under supervision as this is known to trigger an event in approximately 33% of patients. In LQT2, where triggers include

Box 9.1 Diagnostic criteria for long QT syndrome

1. LQTS is diagnosed:
 - a. In the presence of an LQTS risk score of 3.5 or higher in the absence of a secondary cause for QT prolongation *and/or*
 - b. In the presence of an unequivocally pathogenic mutation in one of the LQTS genes *or*
 - c. In the presence of a QT interval corrected for heart rate using Bazett's formula (QTc) of 500 ms or greater in repeated 12-lead ECG and in the absence of a secondary cause for QT prolongation.
2. LQTS can be diagnosed in the presence of a QTc between 480 and 499 ms in repeated 12-lead ECGs in a patient with unexplained syncope in the absence of a secondary cause for QT prolongation and in the absence of a pathogenic mutation.

Priori SG, Wilde AA, Horie M, et al; Heart Rhythm Society; European Heart Rhythm Association; Asia Pacific Heart Rhythm Society. Executive summary: HRS/EHRA/APHS expert consensus statement on the diagnosis and management of patients with inherited primary arrhythmia syndromes. *Europace*. 2013 Oct;15(10):1389–406. doi: 10.1093/europace/eut272. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

acoustic stimuli especially during sleep, telephones and alarm clocks should be removed from the bedroom. Drugs that prolong the QTc interval and those that deplete magnesium and potassium should be avoided (<https://crediblemeds.org/>).

Beta-blockers remain the mainstay of drug treatment with a very strong evidence base for LQT1 and LQT2. In some patients with LQT3, the sodium channel blocker mexiletine can be useful.

ICD implantation for secondary prevention is recommended for patients with LQTS who are survivors of cardiac arrest. A primary prevention ICD should be considered in the following patients:

- Patients with LQTS-related syncope while on beta-blockers.
- Patients with QTc greater than 500 ms and signs of electrical instability.
- Patients with high-risk genetic profiles (carriers of two variants, including Jervell and Lange-Nielsen syndrome).

In pregnancy, women with LQTS have an increased risk during the 9-month postpartum period (especially women

with the LQT2 genotype) and should, therefore, have regular follow-up.

In patients who are unable to tolerate beta-blockers or remain high risk for sudden death with beta-blocker treatment, left cardiac sympathetic denervation is an option.⁴⁸ The procedure can be done surgically through a left supraclavicular incision or as a minimally invasive procedure in experienced centres. This procedure is frequently used in very-high-risk infants and children in whom ICD therapy may be relatively contraindicated due to the physical size of the patient.

All first-degree relatives of patients with LQTS should be offered cardiac screening. However, the exclusion of LQTS solely on clinical grounds has been difficult, and up to 6% of family members with normal QT intervals may ultimately have syncope or cardiac arrest.⁴⁹ If a causative gene defect has been found in the proband, it is recommended that family members are offered genetic counselling and predictive genetic testing. Nursing and psychosocial aspects of care are discussed on p. 274.

Brugada syndrome (BS)

Epidemiology, pathology, and aetiology

The prevalence of BS is uncertain but is reported to be 1:10,000 worldwide but can be as high as 0.5–1:1000 in Southeast Asia where it appears to be the most common cause of death in young men under the age of 50 years.⁵⁰ The syndrome typically presents in adulthood with a mean age of sudden death at 41 ± 15 years. BS is eight to ten times more prevalent in males than in females.

The genetic aspects of BS are complex and not yet fully understood, with some families demonstrating autosomal dominant inheritance of variants in *SCN5A*, and more recent evidence supporting a polygenic basis of disease.⁵¹ BS leads to a reduction of Na^+ current and the ensuing conduction defects such as ventricular fibrillation in typically structurally normal hearts.

Clinical presentation

Patients with BS are frequently asymptomatic but they can present with palpitations, dizziness, syncope, chest discomfort, nocturnal agonal respiration, or cardiac arrest. Arrhythmias usually occur at rest or during sleep; or while in a febrile or vagotonic state but are rarely associated with exercise.

Investigations

The diagnosis of BS relies on the characteristic classical type 1 coved ST-segment elevation pattern (► Fig. 9.4)



Fig. 9.4 Brugada ECG patterns.

present in the precordial ECG leads. The ECG should be performed with the right precordial leads (V1 and V2) positioned in the second and third intercostal spaces (high lead position) as well as the fourth intercostal space. The ECG changes may be present spontaneously or after administration of a sodium channel blocking drug, such as ajmaline or flecainide.

A diagnosis of BS is made in the presence of:

- ST-segment elevation with type 1 morphology of 2 mm or greater in one or among the right precordial leads V1, V2 in the standard or higher intercostal positions occurring either spontaneously or after drug provocation testing; or
- The induction of a type 1 ECG morphology after a drug provocation test in individuals with type 2 or type 3 ST-segment elevation in one or more leads among the right precordial leads V1, V2 in the standard or higher intercostal positions. Phenocopies that lead to Brugada-like ECG changes need to be ruled out. These include RV ischaemia, acute pulmonary embolism, pericarditis, myocardial infarction, and mechanical compression of the RV.

Management

Avoidance of triggers that lead to arrhythmias are key aspects of management in BS. This includes rapid treatment of fever and hypokalaemia, avoidance of high-carbohydrate meals close to bedtime, heavy drinking and very hot baths.⁵² Patients should be advised against drugs that induce a type 1 ECG pattern—these include some antiarrhythmics, anaesthetic agents, cocaine, antidepressants, and antipsychotics (<https://www.brugadadrugs.org/avoid/>).

Risk stratification in BS is currently challenging but there is a consensus that those who survived a cardiac arrest should have an ICD implanted as recurrence remains high. The presence of a spontaneous type 1 ECG pattern or a history of syncope is considered high risk. Males tend to have a higher incidence of arrhythmias. There is still ongoing debate about the role of electrophysiological studies in risk stratification in BS.

Pharmacological therapy (isoproterenol or quinidine) may be of help in an arrhythmic storm situation, although there is currently no definitive evidence base for its use for prevention of SCD.

Genetic testing in BS makes little contribution to diagnosis, prognosis, and therapeutic management, in sharp contrast to LQTS and is, therefore, not routinely recommended. It is emerging that the familial pattern in BS may not be as simple as originally reported and that an oligogenic model may be more likely.¹¹ A clear exception is families where there is demonstrated familial inheritance of disease, and in these cases sequencing of *SCN5A* should be considered. Regardless of suspected inheritance risks, first-degree relatives should be offered clinical screening with a baseline ECG and drug provocation as appropriate.

Catecholaminergic polymorphic ventricular tachycardia (CPVT)

Epidemiology, pathology, and aetiology

CPVT is a rare condition characterized by bidirectional and polymorphic VT which is adrenergically mediated. The estimated prevalence of CPVT is approximately 1:10,000.⁵⁰

Two types of CPVT have been noted which are linked to genes involved in calcium handling in the cells. CPVT1 is an autosomal dominant form which mainly involves pathogenic variants in the gene encoding the cardiac ryanodine receptor gene (*RYR2*). The rarer form, CPVT2, is the autosomal recessive form and is caused by pathogenic variants in the cardiac calsequestrin gene (*CASQ2*). Altogether, these account for 60% of the genetic causes of CPVT, suggesting that other genes are involved in this condition.

Clinical presentation

The first clinical manifestation in the form of palpitations or syncope usually presents in the first or second decade of life, typically occurring during exercise or heightened emotional stress. CPVT is a common cause of sudden unexplained cardiac death. Seizure-like activities may be seen during a syncopal episode which may be attributed to a neurological cause in the first instance, causing delays in the diagnosis of CPVT.

Investigations

The resting ECG is normal. However, ventricular arrhythmias generally occur during exercise stress testing. A classical pattern of monomorphic followed by polymorphic or bidirectional VT is noted with increasing arrhythmia burden as exercise progresses (► Fig. 9.5).⁵³ Holter monitors and implantable loop recorders can also be helpful investigations with regard to making a diagnosis. An echocardiogram will confirm a structurally normal heart. The diagnostic criteria for CPVT can be found in ► Box 9.2.⁶

A drug challenge with epinephrine or isoproterenol may be useful in eliciting arrhythmias in patients who cannot exercise.

Management

Avoidance of triggers is an important management aspect in CPVT and is focused on advice regarding exercise, particularly the limitation or avoidance of competitive

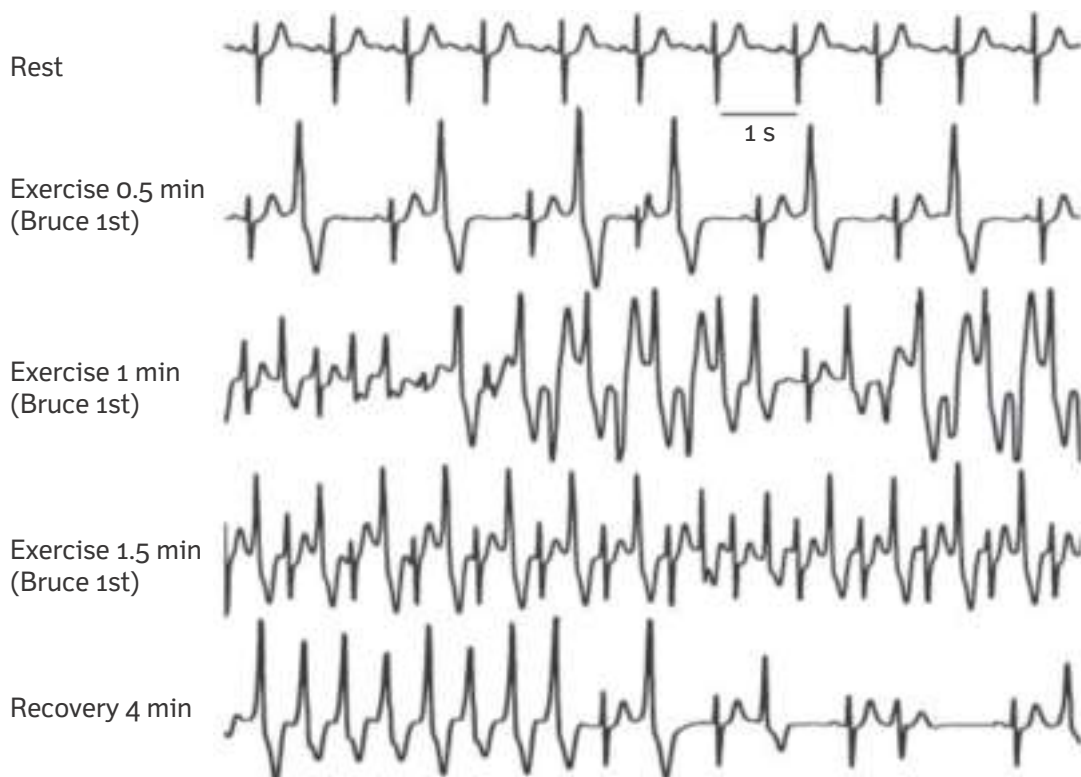


Fig. 9.5 ECG pattern in CPVT during exercise testing.

Reproduced from Liu N, Ruan Y, Priori SG. Catecholaminergic polymorphic ventricular tachycardia. *Prog Cardiovasc Dis*. 2008 Jul–Aug;51(1):23–30. doi: 10.1016/j.pcad.2007.10.005 with permission from Elsevier.

Box 9.2 Diagnostic criteria for catecholaminergic polymorphic ventricular tachycardia

1. CPVT is diagnosed in the presence of a structurally normal heart, normal ECG, and unexplained exercise or catecholamine-induced bidirectional VT or polymorphic ventricular premature beats or VT in an individual less than 40 years of age.
2. CPVT is diagnosed in patients (index case or family member) who have a pathogenic mutation.
3. CPVT is diagnosed in family members of a CPVT index case with a normal heart who manifest exercise-induced premature ventricular contractions or bidirectional/polymorphic VT.
4. CPVT can be diagnosed in the presence of a structurally normal heart and coronary arteries, normal ECG, and unexplained exercise or catecholamine-induced bidirectional VT or polymorphic ventricular premature beats or VT in an individual greater than 40 years of age.

Priori SG, Wilde AA, Horie M, et al; Heart Rhythm Society; European Heart Rhythm Association; Asia Pacific Heart Rhythm Society. Executive summary: HRS/EHRA/APHRS expert consensus statement on the diagnosis and management of patients with inherited primary arrhythmia syndromes. *Europace*. 2013 Oct;15(10):1389–406. doi: 10.1093/europace/eut272. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

sport and strenuous exercise, as well as stress-related environments.

Beta-blockers are used for patients who have a clinical diagnosis of CPVT and may be useful for asymptomatic gene carriers. Nadolol or propranolol are most widely prescribed and it is important to be aware that the maximal tolerated dose of beta-blockers should be prescribed to optimize control of arrhythmias. Exercise testing should be performed on a regular basis to monitor effectiveness of beta-blockers. Flecainide may be added to beta-blockers for further control of arrhythmias.

A diagnosis in childhood and the persistence of complex arrhythmias during the exercise stress test on a full dose of beta-blockers are independent predictors for arrhythmic events.¹¹ An ICD is recommended alongside beta-blockers for secondary prevention in patients who have survived a cardiac arrest and should be considered for primary prevention for those who have recurrent syncope or sustained VT despite beta-blocker therapy. The programming of the ICD should incorporate long delays before shock delivery, because painful shocks can increase the sympathetic tone and trigger further arrhythmias, leading to a malignant cycle of ICD shocks and even death.

Left cardiac sympathetic denervation may be recommended in the management of patients with CPVT intolerant to beta-blockers or those who continue to be symptomatic while on beta-blockers, as well as for those with recurrent VT storms.⁴⁸

First-degree relatives are recommended to have clinical screening with an ECG, exercise stress test, and Holter monitor. They should also be offered genetic counselling and predictive genetic testing (if a causative gene has been identified) as there are lifestyle and treatment implications even for asymptomatic carriers.

Sudden cardiac death in the young (<40 years)

SCD is of major public health importance and prevention is key (REF) ESC 2016 Guidelines on Prevention of VA & SCD. However, most of these sudden deaths occur in older individuals and are secondary to coronary heart disease. The sudden, unexpected cardiac death of a young individual has profound effects not only for the family and friends but also for society in general. Accurate figures are not available but it has been estimated that the incidence of sudden death in young individuals is about 1–2:100,000 per year. Common causes include various types of cardiomyopathies and channelopathies, as well as atherosclerotic coronary artery disease, aortic dissection, and anomalous coronary arteries. However, in up to 40% of cases, no structural abnormality can be detected at autopsy and, where there is a negative toxicology result, this is termed sudden arrhythmic death syndrome.

In the event of SCD, it is very important to try to establish an accurate cause of death. Therefore, it is recommended that a thorough personal and family history and circumstance of the sudden death are collected. Expert cardiac pathology should be undertaken to rule out microscopic features of structural heart disease as well as collection of blood or suitable tissue for genetic evaluation/molecular autopsy. A molecular autopsy may be helpful in confirming a genetic cause of the SCD/make a diagnosis in up to 35% of cases. Establishing a pathogenic variant will enable cascade testing to the rest of the surviving family members.

Many conditions associated with SCD have a clear inherited basis, including many cases without a clear diagnosis established at postmortem. Therefore, clinical investigation, and, where indicated, genetic testing of surviving family members is warranted and should take place in a clinic with appropriately trained multidisciplinary staff. ► Fig. 9.6 illustrates the clinical investigation pathway of surviving family members.¹⁶

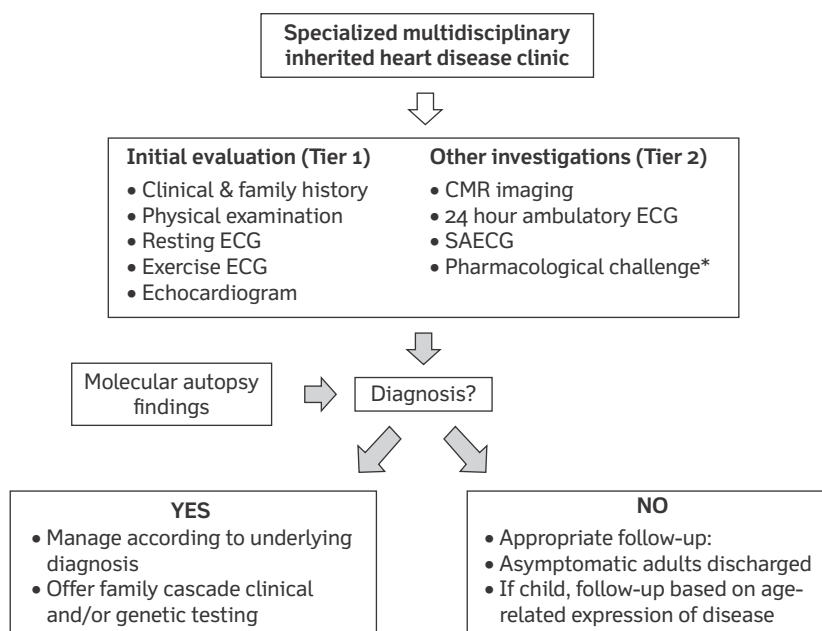


Fig. 9.6 Pathway for investigating SCD relatives.

Semsarian C, Ingles J, Wilde AA. Sudden cardiac death in the young: the molecular autopsy and a practical approach to surviving relatives. *Eur Heart J*. 2015 Jun 1;36(21):1290–6. doi: 10.1093/eurheartj/ehv063. Reprinted by permission of Oxford University Press on behalf of the European Society of Cardiology.

Inherited connective tissue disorders

The spectrum of signs and symptoms in inherited connective tissue disorders is extensive and may involve multiple body systems. Generally, patients will have progressive disease with mild to severe dermatological, joint, eye, and cardiovascular features. This section focuses on the cardiovascular manifestations and management in the most common inherited connective tissue disorders. Management of family members in inherited connective tissue disorders share a common approach where clinical screening of first-degree relatives is recommended and, in the presence of a pathogenic genetic variant in the proband, genetic counselling and cascade testing should be offered.

Marfan syndrome

Epidemiology, pathology, and aetiology

The minimal birth incidence of Marfan syndrome is 1:9800 with a prevalence of around 1:5000. Marfan syndrome is an autosomal dominant condition caused by pathogenic

variants in the fibrillin-1 gene which has an important role in the stability of the extracellular matrix. These genetic defects bring about the characteristic features of Marfan syndrome found in the aorta, eye, and musculoskeletal system.

Loeys–Dietz syndrome appears to overlap with Marfan syndrome but has the additional features of arterial tortuosity and aneurysms, hypertelorism, and a bifid uvula. Genetic variants have been reported in the genes encoding the type 1 or type 2 transforming growth factor (TGF)-beta receptors.⁵⁴

Diagnosis

The musculoskeletal features of Marfan syndrome are the most obvious on clinical examination, including long limbs, chest wall abnormalities, arachnodactyly (spider fingers), joint hypermobility, and stretch marks. Ophthalmic features include ectopia lentis, myopia, and retinal detachment. A diagnosis of Marfan syndrome is made if patients carry specific combinations of aortic, ophthalmic, skeletal, and genetic findings using the revised Ghent criteria⁵⁵ (<https://www.marfan.org/dx/revised-ghent-nosology>).

Due to multisystem involvement in Marfan syndrome, several diagnostic tools are needed and include cardiac and aortic imaging (transthoracic echocardiography and

MRI) to measure the aortic diameter at the sinuses of Valsalva and along the length of the aorta. Musculoskeletal evaluation may include pelvic X-ray and lumbar MRI scans.

Cardiovascular complications and management

Cardiovascular features of Marfan syndrome include mitral valve prolapse and regurgitation, LV dilatation and heart failure, and pulmonary artery dilatation, but the main cause of mortality and morbidity is aortic root dilatation leading to aortic dissection. Beta-blocker therapy should be considered at any age in those with a dilated aorta. However, prophylactic treatment may be more effective in those with an aortic diameter less than 4 cm.

Patients at high risk of aortic dissection include those with an aortic diameter greater than 5 cm, aortic dilatation extending beyond the sinus of Valsalva, a rapid rate of dilatation ($>5\%$ /year, or 1.5 mm/year in adults), and a family history of aortic dissection. Prophylactic aortic root surgery should be considered when the aortic diameter is greater than 5 cm at the sinus of Valsalva.

Pregnant women with Marfan syndrome are at an increased risk of aortic dissection if the aortic diameter is greater than 4 cm. Frequent cardiovascular monitoring is, therefore, warranted throughout pregnancy and the postpartum period.

Annual evaluation should be offered to patients with Marfan syndrome and will include a clinical history, examination, and cardiac and aortic imaging. Children should have more frequent surveillance with serial echocardiography every 6–12 months, depending on the aortic diameter and rate of increase.⁵⁶

Vascular Ehlers–Danlos syndrome

Epidemiology, pathology, and aetiology

There are at least ten subtypes of Ehlers–Danlos syndrome (EDS) with overlapping features of skin laxity, easy bruising, delayed healing, joint hypermobility, and cardiovascular manifestations. The focus of this section is EDS IV which is associated with moderate to severe cardiovascular manifestations, including sudden death and stroke due to arterial rupture.

The pathology in EDS IV reveals vascular changes in the form of aneurysms, microscopic evidence of connective tissue changes, and abnormal type 3 collagen profile on biochemistry. EDS IV is caused by pathogenic variants in the collagen type 3 gene (*COL3A1*).

Cardiovascular complications and management

The clinical picture in EDS IV may be normal and skin thinning can be observed. Cardiovascular complications are a major concern in EDS IV and can be catastrophic and frequently fatal with arterial rupture and dissection commonly occurring. EDS IV may produce sudden arterial failure without evidence of gradual deterioration. Thus, the management of arterial complications in EDS IV is immediate and should not be delayed. Vascular surgery is potentially dangerous due to difficulty in establishing haemostasis in friable aneurysmal or dissected vessels.

Approaches in the event of a dissection include the conservative control of bleeding in smaller aneurysms and small arteries, coil embolization, the use of angiographic arteriography to aid in aneurysm resections, and grafting and endovascular repair.

Familial thoracic aortic aneurysm and dissection (FTAAD)

Epidemiology, pathology, and aetiology

Approximately 20% of thoracic aortic aneurysms and dissections relate to a genetic predisposition. Most are autosomal dominant with incomplete penetrance and variable clinical presentation. The genes involved in this group of conditions include *TGFBR1*, *TGFBR2*, *MYH11*, and *ACTA2*.

The mean age of presentation in familial thoracic aortic aneurysm and dissection (FTAAD) is younger than that of individuals with sporadic disease but older than those with Marfan syndrome.

Cardiovascular complications and management

The initial manifestations of FTAAD are either dilatation of the ascending aorta or dissection of the ascending aorta or both. Death usually results from aortic rupture. The onset and rate of progression of aortic dilatation is highly variable even within families but, tragically, the first presentation of FTAAD may be sudden unexplained death and a diagnosis is made at postmortem examination.⁵⁷

Aortic dissection is rare in childhood but aortic dilatation may be present. In adults, the risk of aortic rupture is significant when the maximal aortic dimension reaches about 5.5 cm. Appropriate management with medical therapy and prophylactic repair of aneurysmal dilatation

renders a similar life expectancy to that of the general population in those with FTAAD.

Family screening should improve the prognosis of those with a family history compared to those presenting with symptoms due to earlier surveillance. In at-risk family members, echocardiography should be performed at frequent intervals (every 1–3 years) from a young age (6–7 years) to monitor the status of the ascending aorta, with full imaging of the entire aorta every 4–5 years. Lifestyle advice should include avoidance of isometric exercises and competitive sport that has a risk for significant blows to the chest as this could accelerate aortic root dilatation. In pregnancy, serial monitoring of the aorta is warranted according to the prepregnancy assessment of the aorta.

Nursing care in inherited cardiac conditions

Psychological and emotional challenges of a diagnosis of an inherited cardiac condition

Patients diagnosed with an inherited condition have the dual challenge of dealing with their own health issues as well as the implications for the health of their family. It is common to experience a sense of guilt as the person ‘who caused the condition’.⁵⁸ Furthermore, this stress and worry is compounded by the risk of sudden death at a young age.⁵⁹ In many cases, a diagnosis is brought about by a combination of a catastrophic family history of sudden death, significant morbidity, or a personal history of a cardiac arrest. These factors are known antecedents of significant psychological distress and, therefore, nursing care should be provided in the context of this background.^{19,60} Patients with ICCs have varying signs and symptoms due to variable disease penetrance.⁶¹ However, even if they are asymptomatic or have very few symptoms, they may be subjected to radical lifestyle changes to reduce the risk of sudden death.^{62,63} The role of the nurse, alongside other clinicians, in supporting these adjustments can have a profound impact on the long-term coping of these patients and their families (see ► **Fig. 9.7** for a summary of some of these issues).

Specialized multidisciplinary clinics

International practice guidelines for the care of patients and families affected by inherited and congenital cardiac conditions have stipulated that clinical care for this

population should be delivered within specialized multidisciplinary clinics due to the complex, long-term needs of these patient groups.^{63–65} These clinics are typically comprised of a core team of cardiologists, clinical geneticists, specialist nurses, and genetic counsellors with experience and expertise in ICCs. The service has a full array of diagnostic capabilities in terms of cardiac imaging, arrhythmia interpretation, and genetic technologies. The core team works in collaboration with other disciplines, such as pathology, surgery, metabolic medicine, behavioural health, and many more, to bring about optimal outcomes for patients.⁶⁵ A nursing priority is, therefore, to facilitate early access to these specialized services and co-ordination of care.

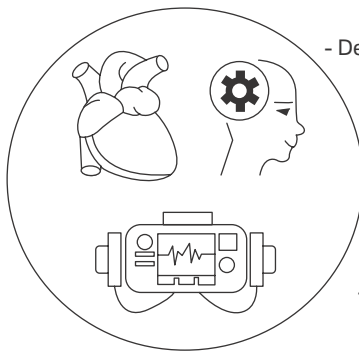
The role of the cardiac genetics nurse

A cardiac genetics nurse is a core member of the ICC multidisciplinary team and is usually an experienced cardiovascular nurse with knowledge in heart failure, arrhythmias, and vascular disorders in both the inpatient and outpatient setting, who has undertaken additional academic and practical training in clinical genetics.^{65–67} A main function of the role is to be the first point of care and contact for the patient and their families for access to the specialist service and also to coordinate the other associated specialties involved in their care.⁶⁷ Cardiac genetics nurses have the expertise to undertake a comprehensive family history, provide genetic and cardiac-related information and support, initiate tests and collate results for an multidisciplinary team evaluation, and facilitate family screening. They are responsible for addressing follow-up questions, providing health guidance, and ensuring timely and continued consultations long term. Where genetic services are mainstreamed, they also provide genetic counselling and facilitate diagnostic genetic testing.⁶⁶

Principles of general nursing care in inherited cardiac conditions

While these specialist nursing roles exist, there are nursing responsibilities that every nurse in the cardiovascular specialty should be aware of and, at the centre of this, is the provision of holistic, person- and family-centred nursing care which aims to:

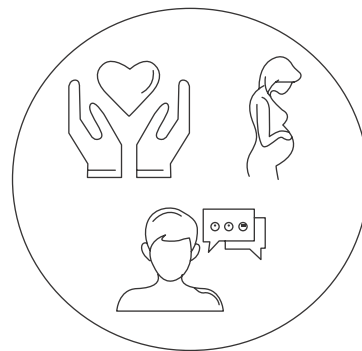
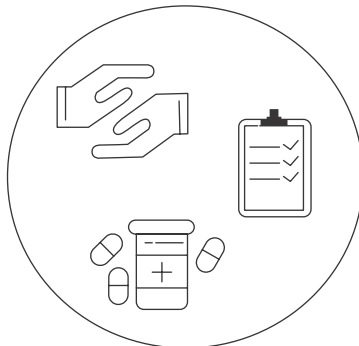
- In the acute, in-hospital phase, conduct a comprehensive assessment and the application of nursing interventions; and facilitate timely medical interventions to achieve homeostasis.
- Provide coordinated care within the multidisciplinary team for access to prompt expert consultations (i.e.

Holistic, ongoing assessment

- Detailed medical & family history
- Appropriate tests & referrals, i.e. ECG, ECHO, loop recordings, cardiac MRI
- Effective risk communication
- Cascade screening where appropriate
- Full psychosocial assessment
- Evaluation of lifestyle impact

Patient-and family-centred care

- Specialist referral & follow-up
- Genetic counselling
- Transition programmes for children moving to adult services
- Counselling regarding fertility
- Contraception and pregnancy
- Integrated palliative and supportive care
- Advance care planning

**Shared decision-making**

- Treatment choices
- Engagement with lifestyle modification
- Strategies to enhance self-management and medication adherence
- Discussion of reproductive options in the light of genetic testing results
- Planned follow-up and symptom assessment

Fig. 9.7 Issues surrounding the care of patients with inherited cardiac conditions.

cardiology, clinical genetics) and comprehensive diagnostic, genetic, and risk assessment work-up, as well as access to long-term follow-up.

- Ensure that patients and their families have comprehensive and clear health information to enable them to make balanced decisions about their clinical management, lifestyle, and genetic implications.
- Reinforce measures to prevent significant morbidity and SCD.
- Provide psychological support, tailored to the individual's needs and experience of the condition, personal coping skills, and family dynamics.
- Signpost to relevant patient support groups and resources.

- Ultimately, increase patient self-efficacy, harness their social and family networks, and develop their coping skills to enable adjustment, and optimal short- and long-term outcomes.

Nursing Assessment in inherited cardiac conditions

The diagnostic journey

An initial diagnosis or the beginning of the diagnostic work-up for an ICC may take place in the acute or out-patient setting. This period is usually marked by shock and disbelief as patients take in the events prior to the diagnosis, which could be as serious as a cardiac arrest.⁶⁸ It is important at this stage to establish an empathic therapeutic relationship with the patient and assess any additional psychological support needs signaling requirement for prompt referral.

Patients will undergo several diagnostic and risk stratification tests according to the guidance for each ICC. These can range from something as simple as an ECG or as invasive as cardiac catheterization. Preparing the patient by explaining the purpose of each test and ensuring prompt feedback of the results is essential to helping patients understand their diagnosis and provide reassurance when possible.⁶⁸ Uncertainty regarding signs and symptoms has been recognized as a source of emotional distress in this patient group⁶⁹ and can be ameliorated once the source is identified and a plan for treatment initiated.

Genetic studies will often be done as part of the diagnostic work-up and, therefore, access to genetic counseling will be crucial at this stage. The purpose and benefits of this were discussed at the start of this chapter (see ‘Genetic principles and cardiac genetic testing’ Pg 244).

Clinical management

Signs and symptoms

Many patients with ICCs may remain symptom free for most of their life. However, regular monitoring through serial investigations/regular follow-ups is essential to respond to any changes in their risk profile. Nursing responsibilities in this aspect include health education around signs and symptoms that herald the deterioration in cardiac function or dangerous ventricular arrhythmias summarized in ► **Table 9.6**.

Medications

When medications are initiated, a thorough discussion of the purpose, uptitration schedule, monitoring, and side

Table 9.6 Potential health problem and associated signs and symptoms in inherited cardiac conditions

Potential health problem	Signs and symptoms
Decrease in myocardial function	Dyspnoea Easy fatigability Oedema/fluid retention Chest pain
Ventricular arrhythmias	Palpitations Dizzy spells Syncope or near-syncope Seizures or seizure-like episodes *Fever in Brugada syndrome may induce ventricular arrhythmias and requires rapid treatment

effects, including possible effects on sexual performance, should be provided. Possible interactions should also be explored if patients have an existing medication regimen or are taking any supplements or herbal agents. Atrial fibrillation is also a common arrhythmia in HCM⁶⁹ and, therefore, requires the associated health education around the methods for cardioversion and anticoagulation which are discussed in detail in Chapter 7. Beta-blockers are the mainstay for patients with LQTS and CPVT to suppress ventricular arrhythmias and prevent SCD. Ensuring therapeutic levels through exercise testing should be facilitated.⁶ Nursing input to support medication adherence is crucial, especially in the young, as it has been noted that this has been suboptimal in the LQT1 and LQT2 population despite a strong evidence base for its therapeutic benefits.⁷⁰

A main aspect in the care of patients with inherited arrhythmias, particularly in LQTS and BS, is the avoidance of certain medications. In LQTS, these are medications that prolong the QTc interval and cause the depletion of potassium and magnesium.⁷¹ In BS, the drugs to avoid are those associated with inducing a type 1 Brugada ECG pattern, such as antiarrhythmics, psychotropic drugs, certain anaesthetics, and other substances including cocaine, acetylcholine, ergonovine, and alcohol in excess.⁷² Patients should, therefore, be advised regarding experimentation with recreational drugs and heavy drinking. They should also have access to the latest ‘drugs to avoid’ lists found online (for LQTS: <https://crediblemeds.org/>; for BS: <https://www.brugadadrugs.org/>).

Devices

ICDs are used for primary prevention in high-risk groups and secondary prevention of SCD in ICCs and a decision

should be made after a balanced discussion with the patient regarding the benefits and possible complications. Across cardiovascular diseases, ICDs are associated with depression and anxiety, particularly in the period post implantation and in those who received inappropriate or frequent shocks.⁷³ In an international study of patients with HCM, overall psychological well-being was not impacted by the ICD implantation. However, there was a heightened anxiety in anticipation of a future shock.⁷⁴ Furthermore, in a study focused on ICC patients with ICDs, the vulnerable groups were identified as those with a female sex, a history of syncope episodes, other medical comorbidities, and complications with their ICD.⁷⁵ While the nursing care of patients undergoing ICD implantation should be delivered as per the guidance detailed in Chapter 7, it is worth noting that patients with ICCs may need extra support.

Lifestyle advice

Exercise and sport

Physical activity and exercise are essential for cardiovascular health and yet may be restricted in ICCs, as they are triggers for ventricular arrhythmias, particularly in LQT1 (unsupervised swimming should be avoided), CPVT, and HCM, and in the case of ARVC, lead to disease progression.¹ Studies have shown, particularly in ICC patients where participation in sport is part of their identity and main social group, that feelings of isolation, loneliness, and frustration are common when they are excluded for medical reasons.⁷⁶ Stricter guidelines exist for the participation of individuals with ICCs in competitive sport but, for general fitness and leisure, a person-centred approach is more appropriate as suited to the patient's risk profile for SCD.⁶² An important nursing role is advocating for this tailored exercise advice and supporting patients as they adjust to these recommendations.

Other considerations

In patients with LQT2, acoustic stimuli, especially during sleep, should be avoided. Telephones and alarm clocks should not be present in sleeping areas.⁶⁹

Sexual activity

Patients should be given the opportunity to discuss their concerns regarding sexual activity, not only because of the anxiety and depression they may experience due to the diagnosis, but also the physical activity itself which they may fear as precipitating symptoms.

Employment

Most patients diagnosed with an ICC can retain their usual employment. However, there will be cases where a

decrease in physical functioning will make it impossible to carry on with heavy manual work, particularly in inherited cardiomyopathies.⁶³ Furthermore, certain occupations such as pilots, armed forces personnel, and heavy goods drivers have strict eligibility criteria which could exclude the patient depending on their physical status and clinical management. The loss of professional identity and role as a breadwinner can have a profound psychological impact on patients, not to mention the financial implications.⁷⁷ Input from social services, where relevant, should be considered as part of the initial nursing assessment.

Diet, weight, and smoking

Patients should be supported to maintain a healthy body mass index and diet. General advice on the health risks of smoking should be provided as well as referrals to a smoking cessation programme, as required. Patients with HCM and LVOTO should maintain hydration and may find smaller, more frequent meals more tolerable as large meals increase the propensity for chest pain.⁶³ Maintenance of good hydration to maintain electrolyte balance is also important in inherited arrhythmias. Therefore, there should be prompt treatment of diarrhoea and vomiting.⁶

Immunizations

In the absence of any contraindications, immunization schedules should be maintained. Patients should be encouraged to have yearly influenza vaccinations.⁶³

Insurance

Patients diagnosed with ICCs may have difficulty getting life insurance and may see an increase in their travel insurance premiums, which can be a cause of anxiety and further limit their lifestyle choices.⁷⁸ Guidelines vary among different countries and local information should be shared with the patient.

Care of the family

The family at risk for inherited cardiac conditions

The inherited nature of these conditions automatically conveys a risk for first-degree relatives of the person first diagnosed with an ICC (the proband). Facilitation of screening and/or genetic testing for first-degree relatives is usually undertaken by members of the specialist ICC team. However, general nursing care should involve highlighting this risk to the patient and, if required, a referral to the specialist team should be made. Care should be taken to protect patient confidentiality, as in most countries the legal framework for conveying this risk information often stipulates that this risk information is communicated by the proband supported by the clinicians,

and not communicated directly to relatives by the clinicians.¹ In most cases, patients and their families will work together to disseminate this information. However, not all will seek screening and/or pursue predictive genetic testing and this and/or a lack of communication can be a source of conflict within families.^{60,79}

Engaging the family in the care of patients with long-term conditions is particularly helpful in supporting self-management and fostering increased social support.⁸⁰ However, the realization of their own risk may add further distress to family members already struggling with the proband's predicament.¹ Psychological support should, therefore, also be offered to the family members.

Psychological care in the context of sudden cardiac death

The psychological impact of ICCs in a relative is even more profound in the context of sudden death. The sudden, unexpected loss of an apparently healthy young relative is a major traumatic event for the bereaved.⁸¹ Such situations are not uncommon in ICCs, as this group of conditions underlie at least half of SCDs in the under 45 age group.⁸² This loss can interfere dramatically with established family routines and habits that have previously provided a sense of safety and purpose for the family unit.⁸³ Grief is a normal emotional response to the loss of a loved one. However, in sudden death in the context of ICCs, up to 44% of family members may experience prolonged grief and post-traumatic stress.¹⁸ Mothers, in particular, are more likely to report symptoms of anxiety and depression.¹⁹ Prompt assessment of needs and an appropriate referral to a clinical psychologist or other clinical professional skilled in psychological evaluation and treatment should be prioritized for bereaved relatives.

Strategies that have been known to help families include open lines of communication between patients and nurses and other clinicians over time as bereavement tends to continue despite a decrease of the acute shock, disbelief, and erratic emotional reactions which tends to occur early after the death of a family member. Health professionals can, and should, provide clear and accurate information about the cause of death and answer questions, while also recognizing that this information may need to be repeated several times.⁸³ Unanswered questions contribute to a lack of understanding related to causes and circumstances of a family member's death, which in turn appear to limit survivors' ability to make sense of their loss. Allowing family members to share stories of loss is also an important component of clinical care and peer support could be helpful in this respect.⁸⁴

Support groups

There are patient support groups that are specific to ICCs. They aim to provide day-to-day experiential advice to patients with ICC and their families and patient-friendly health information. Support is provided in a variety of ways—via telephone, online, or group meetings and most have comprehensive websites. Support groups also focus on advocacy for the needs of patients and families in terms of clinical services and research priorities, and for increased awareness of ICCs.⁸⁵ Nurses should signpost patients and families to the appropriate support groups local to the patient.

Congenital heart diseases

CHD is a collection of gross structural abnormalities of the heart or intrathoracic great vessels that have actual or potential functional significance. CHD comprises a wide spectrum of simple, moderate, and complex severity lesions.⁸⁶ Globally, the birth prevalence of CHD is estimated to be 8.2:1000 newborns.⁸⁷ The highest birth prevalence is observed in Asia.⁸⁸ Since the first cardiosurgical operations on CHD 80 years ago, there have been spectacular medical, surgical, and technological evolutions, which yielded an increased life expectancy. To date, more than 90% of children born with CHD in Western countries can reach adulthood.^{89,90} A slightly increasing birth prevalence over time, combined with improved survival rates, has resulted in a substantial growth of the population of people with CHD. In Western societies, adults with CHD have outnumbered the children with CHD. The number of adult patients with CHD in the population has been estimated to be about 3000 patients per million inhabitants.⁹¹ There is even a growing group of older people with CHD, which is estimated to account for 11% of all adults with CHD by 2030.⁹²

Irrespective of the surgical or medical treatment, these patients cannot be considered to be cured. Indeed, many patients have residual defects and they are vulnerable to developing complications over the course of life. In order to optimize longevity and long-term functioning, lifelong cardiac follow-up is indispensable. Therefore, a workforce of physicians, nurses, and allied professionals who are trained and equipped to provide such specialist care is required. Moreover, all cardiac care providers need to have a basic understanding of the particular features and unique needs of this growing population of people with CHD.⁹³

Categorization of heart defects

Congenital heart defects can be categorized into simple, moderate, and complex severity lesions (► **Box 9.3**).⁸⁶ The birth prevalence of the respective heart defects is highly variable. Some defects are relatively common, whereas others can be considered as a rare disease. The treatment armamentarium and the prognosis vary for the different heart defects. Patients with a heart defect of great complexity are advised to have follow-up visits every 6–12 months at a specialist centre.⁹⁴ Patients with moderate-complexity lesions should receive check-ups every 1–2 years, preferably undertaken at specialist centres or in a shared care setting if the CHD course is uncomplicated.⁹⁵ In case of simple heart defects, patients need medical check-ups every 3–5 years, either in a non-specialized

setting or at shared care facilities.^{94,95} This indicates that almost all patients with CHD require lifelong surveillance. In the following sections, different types of important or common heart defects are discussed.

Congenital heart defects of great complexity

Single-ventricle physiology

The term single-ventricle physiology refers to a group of cardiac defects that share the common feature that only one of the two ventricles is of adequate functional size. Anomalies that are described as single-ventricle defects include tricuspid atresia (► **Fig. 9.8a**), mitral atresia, double-inlet LV, atrioventricular septal defect (AVSD)

Box 9.3 Categorization of heart defects according to the level of complexity

Mild

- Isolated congenital aortic valve disease.
- Isolated congenital mitral valve disease (except parachute valve, cleft leaflet).
- Mild isolated pulmonic stenosis.
- Isolated small (no relevant shunt) ASD, VSD, or PDA.
- Repaired secundum ASD, sinus venosus defect, VSD or PDA without residua, chamber enlargement, or elevated pulmonary artery pressure.

Moderate

(Repaired or unrepaired where not specified; alphabetic order.)

- Anomalous pulmonary venous connection (partial or total).
- Anomalous coronary artery arising from the pulmonary artery.
- Anomalous aortic origin of a coronary artery from the opposite sinus.
- Aortic stenosis—subvalvular or supra-ventricular.
- AVSD (partial or complete, including primum ASD).
- ASD (secundum), moderate or large unrepaired.
- Coarctation of the aorta.
- Double-chambered right ventricle.
- Ebstein anomaly.
- PDA, moderate or large unrepaired.
- Peripheral pulmonary stenosis.
- Pulmonic stenosis (infundibular, valvular, supra-ventricular), moderate or severe.

- Sinus of Valsalva aneurysm/fistula.
- Sinus venosus defect.
- Tetralogy of Fallot—repaired.
- VSD with associated abnormalities (excluding pulmonary vascular disease!) and/or moderate or greater shunt.

Complex

(Repaired or unrepaired where not specified.)

- Any congenital heart disease (repaired or unrepaired) associated with pulmonary vascular disease (including Eisenmenger).
- Any cyanotic congenital heart disease (unrepaired or palliated).
- Double-outlet ventricle.
- Fontan circulation.
- Interrupted aortic arch.
- Pulmonary atresia (all forms).
- Transposition of the great arteries (all forms).
- Univentricular heart (including double inlet left/right ventricle, tricuspid/mitral atresia, hypoplastic left heart, any other anatomic abnormality with a functionally single ventricle).
- Truncus arteriosus.
- Other complex abnormalities of atrioventricular and ventriculoarterial connection (i.e. crisscross heart, isomerism, heterotaxy syndromes, ventricular inversion).

Panel A: Tricuspid atresia	Panel B: Transposition of the great arteries	Panel C: Congenitally corrected transposition of the great arteries
Panel D: Truncus arteriosus	Panel E: Tetralogy of Fallot	Panel F: Coarctation of the aorta
Panel G: Ebstein's anomaly	Panel H: Atrioventricular septal defect	

Fig. 9.8 Continued

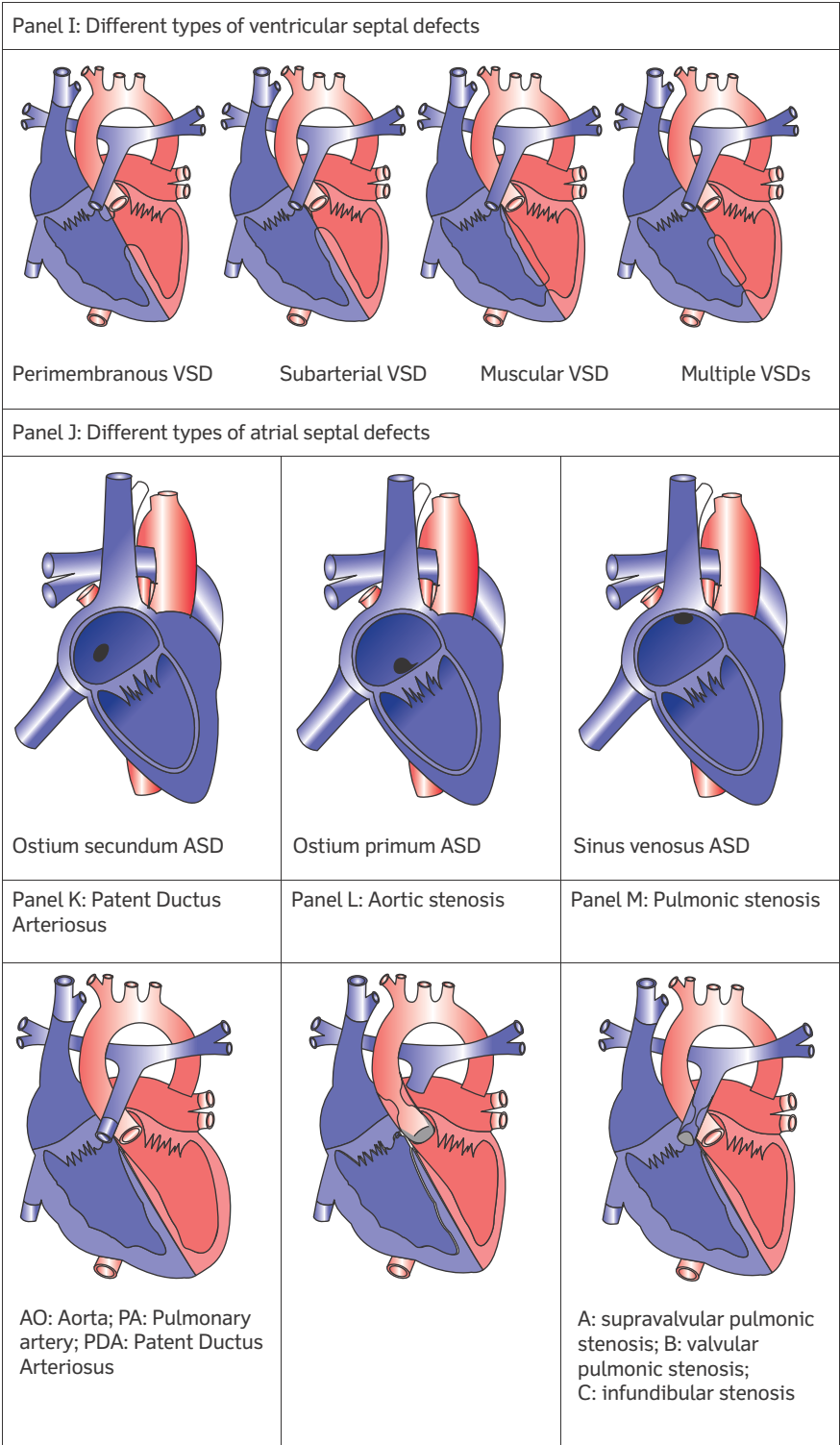


Fig. 9.8 Graphical representations of different congenital heart defects.

with a dominant LV or RV, hypoplastic left heart syndrome, and univentricular heart. Taken together, single-ventricle physiologies occur in about 6% of all congenital heart defects.⁸⁷ Hypoplastic left heart syndrome is the most common form, accounting for 2.5% of all CHD.⁸⁷

Most patients with a single-ventricle physiology die in infancy or early childhood unless palliative surgery is performed. Biventricular repair is usually not possible. Today, all surgical approaches are either staged or palliative in nature. Norwood operations are performed in patients with hypoplastic left heart syndrome, and Fontan operations are performed on other types of single-ventricle physiology. These procedures can only be performed in well-selected patients.⁹⁶

Life expectancy after palliation for single-ventricle physiology is considerably lower than that of other congenital heart defects. In historical cohorts, only 50% of patients with univentricular heart and 10% of patients with hypoplastic left heart survived into adulthood.⁹⁰ Due to the recent advances in surgical techniques, the survival rates will be better in contemporary patient groups.

Transposition of the great arteries

In transposition of the great arteries (TGA), also referred to as complete transposition of the great arteries or dextro-transposition of the great arteries (d-TGA), the aorta arises from the RV and is located anterior to the pulmonary artery; with the pulmonary artery arising from the LV (Fig. 9.8b). Blood returning to the heart from the systemic circulation is ejected from the RV into the aorta, sending unoxygenated blood back into the systemic circulation. This means that the systemic circulation and the pulmonic circulation form two parallel circuits, instead of one serial circuit. TGA occurs in about 4% of all CHDs.⁸⁷ There is a male preponderance in patients with TGA, with a sex ratio of 1.5.

Natural survival is extremely rare, and survival into adulthood is dependent on the early use of palliative shunting procedures (atrioseptectomy, atrioseptostomy), a pulmonary artery banding to regulate pulmonary flow, and later, the arterial switch procedure. In the arterial switch operation, the aorta and pulmonary artery are switched and the coronaries are reimplanted in the neo-aortic root. This operation has been performed since the late 1980s. Hence, the first patients who underwent this procedure are now in their third decade of life. Before the arterial switch operation, patients underwent an atrial rerouting procedure (e.g. the Mustard or Senning operation). Both of these procedures divert caval blood to the mitral valve and pulmonary venous blood to the tricuspid valve.

When directly compared, the outcomes of patients undergoing arterial switch operation is better than those of patients after atrial rerouting.⁹⁷ Indeed, 20-year transplant-free survival following atrial rerouting was 76% versus 82% after arterial switch operation.⁹⁷ Long-term follow-up studies have demonstrated that more than three-quarters of the patients who underwent a Mustard or Senning operation could survive into the fifth decade of life.⁹⁸ The long-term complications, such as arrhythmias, baffle obstruction, progressive failure of the systemic ventricle, and tricuspid regurgitation, are significant because of the demand placed on the RV to support the systemic circulation.

Congenitally corrected transposition of the great arteries

Congenitally corrected transposition of the great arteries (CCTGA), also known as levo-transposition of the great arteries (l-TGA), is a particular form of transposed great arteries. The aorta arises from the morphological RV and the pulmonary trunk from the morphological LV (Fig. 9.8c). However, the transposition is 'corrected' by the fact that the ventricles are inverted, with the morphological RV on the left and the morphological LV on the right. As a consequence, the circuit is physiologically correct, but the morphological RV serves as the systemic ventricle. Since the AV valves follow the ventricles, the left-sided AV valve is the anatomical tricuspid valve, whereas the right-sided valve is the anatomical mitral valve. Also, the coronary arteries are mirroring the normal situation. CCTGA occurs in less than 0.5% of all CHD.^{99,100}

Most patients with CCTGA are managed conservatively. Indeed, surgical intervention is only indicated to repair associated anomalies such as VSD or pulmonary stenosis, which if left unrepaired can result in cyanosis or heart failure. Such operations are considered to be a 'physiological repair'. While patients are growing older, the function of the tricuspid valve may deteriorate and, consequently, dysfunction of the systemic ventricle emerges. To avoid or delay such complications, a selected group of patients may benefit from the double switch operation.¹⁰¹ This is a combination of an atrial rerouting and an arterial switch operation, as described previously. A double switch operation is referred to as an 'anatomical repair' and makes the morphological LV the systemic ventricle.

Outcome data in CCTGA is limited. The largest cohort so far showed that there is a 20-year survival rate of 75% in patients with CCTGA.¹⁰¹ Outcomes largely depend on the development of tricuspid regurgitation and systemic ventricular dysfunction.

Truncus arteriosus

Typical for a truncus arteriosus is that the primitive trunk failed to divide into two great arteries and, thus, a single great vessel emerges from the base of the heart through a single semilunar valve, straddling both ventricles over a large VSD (Fig. 9.8d). The truncus, which is the aorta, receives blood from both ventricles and gives rise to both pulmonary and systemic circulations, as well as coronary arteries. Hence, truncus arteriosus is a cyanotic heart defect with common mixing, and occurs in about 1% of all CHD.⁸⁷

The Rastelli operation is the treatment of choice for truncus arteriosus. In this operation, the VSD is closed, the pulmonary arteries are disconnected from the common truncus, and a valved conduit is placed from the RV to the pulmonary arteries. Multiple reoperations to replace the conduit are common.

Before the availability of surgical corrections, 80% of children with truncus arteriosus died within the first year of life.¹⁰² After corrective surgery, three-quarters of patients survive for 30 years.¹⁰³

Congenital heart defects of moderate complexity

Tetralogy of Fallot

Tetralogy of Fallot (TOF) is a tetrad comprising a non-restrictive VSD, severe pulmonary stenosis causing obstruction to pulmonary blood flow, RV hypertrophy, and various degrees of overriding of the aorta (Fig. 9.8e). The degree of pulmonary obstruction is a primary determinant of clinical presentation. TOF accounts for approximately 5% of all CHD.⁸⁷ In about 15% of the patients with TOF, a deletion of chromosome 22q11 is observed.⁹⁶ TOF is treated surgically. Initially, the TOF correction was performed in two stages. In the first stage, a shunt is made between the subclavian artery and the pulmonary artery, in order to increase the pulmonary blood flow and reduce cyanosis while waiting for complete repair corrective surgery. In the second stage, the VSD is closed with a patch and the RV outflow tract is widened by removing some of the thickened muscle and/or by inserting a patch in the outflow tract. In this second stage, the shunt that was made in the first stage is closed. Nowadays, primary repair is performed in most patients.¹⁰⁴ Reoperations of the RV outflow tract for either regurgitation or restenosis are common. Mortality in patients with repaired TOF is low. Indeed, 25-year survival following repair is 94.5%.¹⁰⁵ However, mortality is increasing in the fourth and fifth

decade of life and high morbidity is observed when patients are growing older.¹⁰⁶

Coarctation of the aorta

Coarctation of the aorta is a deformity of the aortic isthmus, characterized by narrowing either proximal or distal to the left subclavian artery, where the ductus arteriosus joins the descending aorta (Fig. 9.8f). Occasionally, the coarctation occurs above the origin of the right subclavian. This narrowing results in obstruction of aortic blood flow within the lumen, resulting in upper extremity hypertension and decreased blood pressure in the lower extremities. Coarctation is strongly associated with other heart defects, such as bicuspid aortic valve, VSD, patent ductus arteriosus (PDA), and valve abnormalities. Coarctation of the aorta represents 3–5% of all congenital cardiac anomalies^{87,100} and occurs with greater frequency in males than females.⁹⁹

Surgical repair in infancy or childhood was the treatment of choice for many years. Such operations either resected the narrowed part or inserted a patch to widen the course of the aorta. Nowadays, the first treatment of choice in native coarctation of the aorta is also treated by balloon dilatation whether or not combined with stenting.⁹⁶ It is recommended that all patients with coarctation, regardless of absent clinical symptoms, undergo treatment, since untreated patients have a lower life expectancy due to congestive heart failure, cerebral haemorrhage, infective endocarditis, or dissection of the aorta.¹⁰⁷ Re-coarctation or aneurysms at the site of operation are common, and therefore require medical surveillance. Re-coarctation is presumed when there is a difference in blood pressure of more than 30 mmHg between the upper and lower extremities. Contemporary survival rates in patients treated for coarctation of the aorta is 99% at 30 years and 88% at 50 years of age.¹⁰⁸

Ebstein's anomaly

Ebstein's anomaly involves the tricuspid valve and is characterized by a downward displacement of portions of the tricuspid valve into the RV (Fig. 9.8g). The portion of the normal RV that underlies the tricuspid valve becomes mechanically a part of the right atrium (atrialized RV). As a result, the right atrium is exceptionally large, the RV is small, and the tricuspid valve is incompetent. In patients with Ebstein's anomaly, 80% have either an atrial septal defect (ASD) or patent foramen ovale, often resulting in a right-to-left shunt. Therefore, Ebstein's anomaly is typically considered to be a cyanotic heart defect. Ebstein's

anomaly occurs in about 0.5% of all congenital heart defects. In general, the management of Ebstein's anomaly is conservative. Only when symptoms emerge, when ventricular function deteriorates and when cyanosis occurs (saturation less than 90%), is surgical intervention indicated. During such surgical procedures, the tricuspid valve is repaired, the interatrial communication is closed, and/or a pacemaker is placed. Tricuspid valve repair may include valvuloplasty, whether or not using an annuloplasty ring, or tricuspid valve replacement.

Ebstein's anomaly is compatible with a relatively long and active life.¹⁰⁹ Patients with Ebstein's anomaly may live beyond age 50 years. The largest current long-term outcome study showed that the mean age of initial operation was 24 years (range 8 days–79 years), and that the actuarial survival at 20 years post operation was 71.2%.¹¹⁰

Atrioventricular septal defect

AVSD, also called AV canal septal defects or endocardial cushion defects, are essentially a combination of both an ASD (ostium primum: see later) and a VSD (Fig. 9.8h). In patients with complete AVSDs, the endocardial cushions do not develop, resulting in a common AV valve, a primum ASD, and a VSD. Incomplete or partial AV canal defects typically consist of a primum ASD with a cleft mitral valve without VSD. Although AVSD can occur in those with normal chromosomes, it is much more frequently found in patients with Down syndrome. AVSD account for about 4% of all CHD.^{87,100} Thirty-five per cent of patients with AVSD have Down syndrome.⁹⁶

Patients with AVSD have invariably undergone some surgical intervention in infancy or childhood for incomplete or complete AVSD repair. Unrepaired complete AVSD results in Eisenmenger syndrome.⁹⁶ Incomplete repair includes an ASD patch closure and a mitral cleft suture. Complete repair includes not only ASD and VSD patch closure, but also mitral and tricuspid valve repair with valve reconstruction using available tissue from the common AV valve leaflets. Catheter closure of AVSD is not feasible.⁹⁶

Long-term survival in patients who underwent surgery for AVSD is good, with 25-year survival rates of 88%.¹¹¹

Congenital heart defects of mild complexity

Ventricular septal defect

VSDs are characterized by an abnormal opening between the LV and RV. There are three main categories of VSD: perimembranous (65%), muscular (30%), and

malalignment/subarterial (5%) VSDs (Fig. 9.8i). In the perimembranous and muscular regions, spontaneous closure occurs in 50% of the patients. Furthermore, VSDs are categorized as restrictive or unrestrictive. Restrictive VSDs are small, resulting in a high gradient of pressure between RV and LV, and non-restrictive VSDs are large in which the pressure in the RV and LV is equal. Unrestricted defects are typically repaired in childhood, but restrictive VSDs can be newly found in the adult. VSDs are the most common heart defects, representing about 35% of all CHD.⁸⁷ Isolated small perimembranous VSDs do not require closure, as long as patients do not have problems with recurrent endocarditis. VSD closure can be done surgically or transcatheter with closing devices. Transcatheter closure is indicated in muscular VSDs that are located centrally in the interventricular septum, and in patients with increased risk for surgery, multiple previous cardiac surgical interventions, and VSDs that are poorly accessible for surgical closure.⁹⁶ Transcatheter procedures avoid arrhythmic and valvular complications from surgery.

The long-term survival of patients with isolated VSD is equal to that of the general population.⁸⁹ Nonetheless, when taking all VSDs together, the 30- and 40-year survival is 85% and 78%, respectively, which is lower than the general population.¹¹² Once patients survive the peri-operative period, survival is similar to that of the general population again.¹¹² However, these patients are not free from complications and morbidity. Therefore, lifelong medical follow-up is also required for patients with this considerably mild heart defect.

Atrial septal defect

ASDs are abnormal communications between the left and right atria. There are different types of ASD, differentiated by their occurrence within the septum (Fig. 9.8j). *Ostium secundum* ASD, the most common type, occurs in the central region of the fossa ovalis. *Ostium primum* ASD, which occurs low in the atrial septum, has an associated cleft anterior mitral valve with varying degree of mitral insufficiency (see earlier: AVSD). *Sinus venosus* ASD occurs in the upper part of the atrial septum near the entry of the superior vena cava and may be associated with the partial anomalous right pulmonary venous connection. Owing to the trivial or absent physical signs, ASD may go undetected until the fourth or fifth decade. ASDs comprise 15% of all CHD,⁸⁷ and there is a female predominance.⁹⁹ In small ostium secundum ASDs (<6 mm), spontaneous closure occurs in one-third of the patients.¹¹³ In patients with a persistent ASD, the defect is recommended to be closed if the pulmonary-to-systemic blood flow ratio (Qp/

Qs) is 1.5:1 or greater. Overall, closure is performed in about two-thirds of the patients with persistent ASD.¹⁴⁴ Transcatheter closure has become the first choice for ostium secundum ASD.⁹⁶

Long-term survival in patients with ASD is very good and close to that of the general population. However, morbidity, even in small ASDs, is substantial. Patients who have undergone a surgical closure remain prone to developing arrhythmias, such as atrial fibrillation.¹⁴⁵ Long-term complications that occurred in patients following percutaneous closure of the ASD were device thrombosis, cardiac erosion, and atrial arrhythmias.¹⁴⁶ In small unrepaired ASDs, patients present with a higher prevalence of chronic comorbidities, particularly lung diseases.¹⁴⁴ The presence of long-term complications in this apparently mild condition stresses the need for lifelong follow-up, even in patients with small isolated ASDs.

Patent ductus arteriosus

The ductus arteriosus is a vascular connection, which during fetal life directs blood flow from the pulmonary artery to the aorta, bypassing the lungs. Functional closure of the ductus occurs within hours or days after birth. In some cases, it takes 6 months to several years to close. If the ductus remains patent, the direction of blood flow is reversed to left-to-right, because of high systemic pressure at the left side of the heart (Fig. 9.8k). A PDA, which can escape recognition until adulthood, accounts for about 10% of all cases of CHD⁸⁷ and predominates in females.⁹⁹ Initially, the treatment was surgical by ligating the PDA. Contemporary treatments entail a transcatheter closure, by using a plug. PDA is the only CHD that can be considered as 'cured' after closure.

Congenital aortic stenosis

A congenital stenosis of the aorta is characterized by an obstruction of the LV outflow (Fig. 9.8l). Three types of congenital aortic stenosis can be identified: valvular, subvalvular, and supra-ventricular. Valvular aortic stenosis represents 75% of all congenital aortic stenosis.⁹⁶ Supra-ventricular aortic stenosis is uncommon and refers to a stenosis of the ascending aorta. Three types of supra-ventricular stenosis have been described: hourglass, hypoplastic, and membranous. In about 20% of the patients, the valvular aortic stenosis is associated with other heart defects, mainly with coarctation of the aorta or PDA. Congenital aortic stenosis represents about 2.5% of all CHD.⁸⁷ When bicuspid valves are included, the prevalence is much higher, because bicuspid valves occur in 1–2% of the general population.⁹⁶

Patients with non-calcified valves can be treated with balloon valvuloplasty. In patients with calcified valves, the treatment of choice is valve replacement.⁹⁶ Transcatheter aortic valve implantation currently has no place in the treatment of congenital aortic stenosis.⁹⁶ When patients develop symptoms, urgent surgery is required.⁹⁶ In supra-ventricular and subvalvular aortic stenosis, surgery is the primary treatment.⁹⁶ Long-term survival is good in patients who have undergone intervention in childhood or adolescence and in patients who are symptom free. The 25-year survival of patients treated for aortic stenosis is about 90%.¹⁴⁷ However, the 25-year freedom of intervention is only 40%.¹⁴⁷ Patients treated for supra-ventricular aortic stenosis had a 10-year survival of 80–95%.¹⁴⁸

Pulmonary valve stenosis

Pulmonary valve stenosis can occur at the valvular, subvalvular (infundibular or subinfundibular), or supra-ventricular level (stenosis of the pulmonary artery and its branches) (Fig. 9.8m). In 90% of the cases, pulmonary stenosis is at valvular level. Supra-ventricular pulmonary stenosis results from the narrowing of the pulmonary trunk, its bifurcation, or its peripheral branches. Pulmonary stenosis may occur as an isolated defect or in combination with other congenital cardiac defects, including VSD, ASD, or as part of the TOF. Isolated pulmonary stenosis represents 6% of all CHD.⁸⁷ Balloon valvuloplasty is indicated in critical pulmonary stenosis, or if the RV systolic pressures are 50 mmHg or higher. If balloon valvuloplasty is not successful in critical stenosis, surgery with muscle resection or patch repair is required. Surgery is also recommended for patients with subinfundibular or infundibular stenosis.⁹⁶

Life expectancy depends on the severity of the stenosis. Patients with mild pulmonary stenosis or patients who have undergone balloon valvuloplasty have an excellent survival, similar to that of the general population. They must, however, be periodically evaluated for mild residual pulmonary stenosis, or for pulmonary regurgitation which can occur as a result of the valvuloplasty. Patients following surgical correction for valvular pulmonary stenosis have a survival rate of 90% up to 40 years after the operation.¹⁴⁹

From womb to tomb: continuity of care over the lifespan

It is obvious that patients with CHD cannot be considered as cured. Residua and sequelae indicate the need for lifelong follow-up by healthcare teams with expertise in CHD (► Fig. 9.9). During childhood, patients

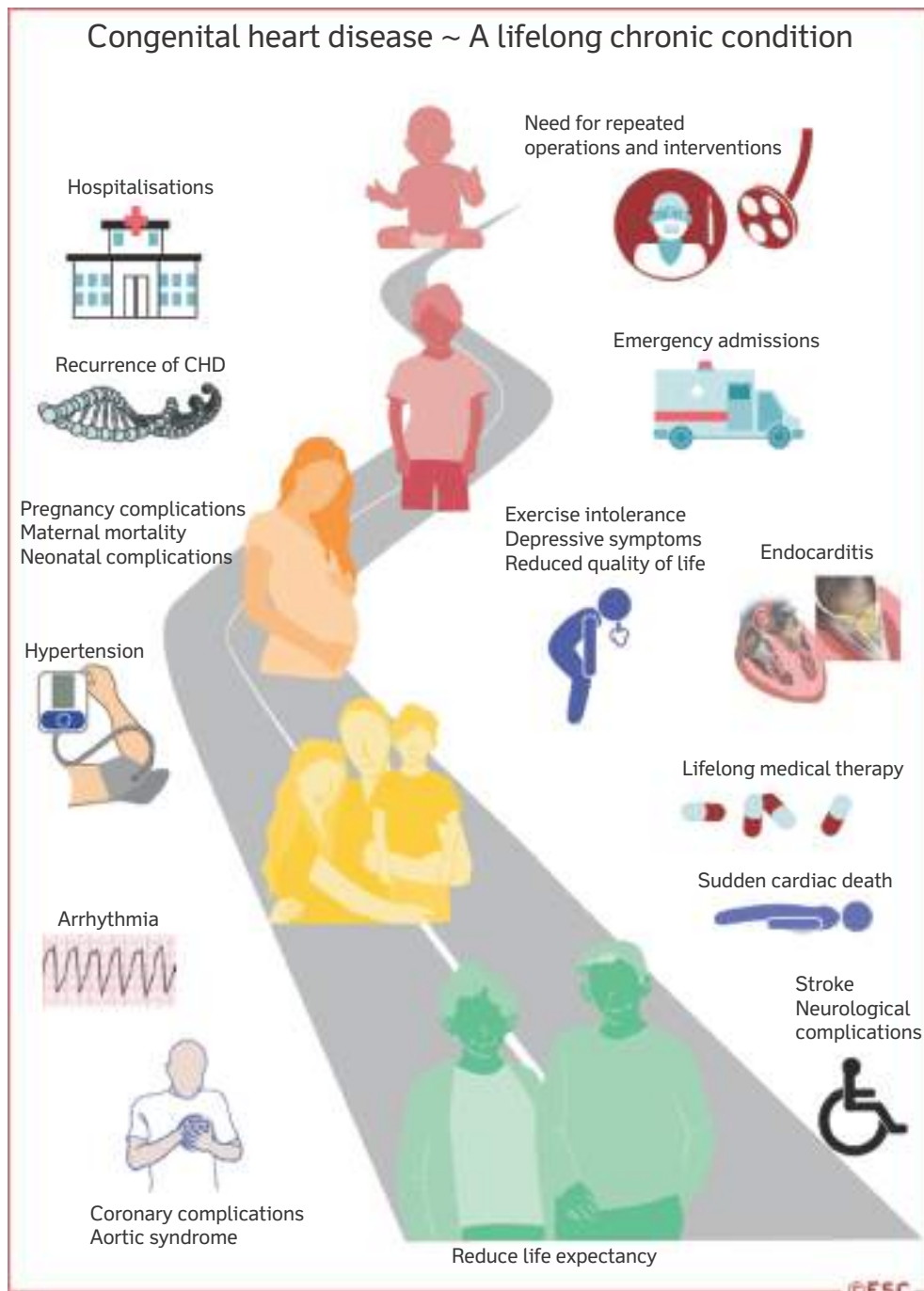


Fig. 9.9 Congenital heart disease (CHD) is a lifelong chronic condition. SCD, sudden cardiac death.

Baumgartner H, De Backer J, Babu-Narayan SV, et al; ESC Scientific Document Group. 2020 ESC Guidelines for the management of adult congenital heart disease. Eur Heart J. 2021 Feb 11;42(6):563–645. doi: 10.1093/eurheartj/ehaa554. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

are typically followed up at paediatric cardiology. When they are growing up, patients ought to be seamlessly transferred from paediatrics to adult-oriented healthcare. Nonetheless, empirical evidence showed that a substantial number of patients have gaps in their care. Care gaps rates range from 7% to 76%,¹²⁰ with a median proportion of 42%. The phase of adolescence seems to be a very vulnerable period for care gaps. However, care gaps occur throughout the entire life spectrum.¹²¹ Clinicians should identify patients at risk for discontinuity of care and need to implement intervention plans that keep patients in care.¹²⁰

The growing number of patients is an impetus for the increasing number of specialized centres for adults with CHD.¹²² Minimal requirements for such centres have been proposed.⁶⁴ However, only a limited number of centres fulfil the proposed criteria.¹²² The professions that are lacking most are allied professions, such as masters-prepared nurses, psychologists, and social workers. Given the complexity of CHD and the high prevalence of psychosocial problems, such professionals are indispensable in the interdisciplinary teams.

Although survival has improved dramatically over the past decades, premature death is still prevalent in patients with CHD. In line with this, increasing attention is given to end of life issues. It was found that the last year of life of patients with CHD is more expensive and more burdensome than that of patients with cancer.¹²³ Furthermore, 53% of patients indicated that they would like to die at home; 1% stated that their healthcare providers talked to them about end of life planning, although 62% of the patients preferred an early end of life discussion.¹²⁴ Current clinical practice is mismatched with the preferences of the patients. Therefore, more attention has to be given to end of life discussions and care for patients with CHD.

Nursing care in congenital heart diseases

Psychological, physical, and social impact

There must be careful consideration of the unique care needs of patients with CHD. Patients may experience a psychological, physical, and social impact of the condition, which requires dedicated nursing care. Historically, the 'feeling of being different' is a recurrent theme in the studies of the lived experience of patients with CHD, particularly in those with the most severe forms.^{125–127} They

not only perceive themselves as different but also feel that they are perceived as different by others. This tends to emerge in the adolescent phase where differences due to visible signs and symptoms and physical activity restrictions become a focus. These often persist through young adulthood, where this 'difference' relates more to limitations in career choices or personal relationships.¹²⁸ Coping with this sense of being different is highly individualized and is influenced by the patient's personality and attitudes. For example, those who feel that they are able to affect their environment (internal locus of control) will often use active strategies to cope with their situation. Parental overprotection also appears to be a factor in creating difficulties in integration of the illness in daily life. Parents who offer a realistic view on living with the heart defect early on may ultimately facilitate better coping. Healthcare providers can also impact this 'feeling of difference' as lack of information, particularly in the peri-operative period, leads to feelings of insecurity, fear of the unknown, and disappointments regarding the patients' outcomes.¹²⁸

Patients with CHD may have residual problems and sequelae from conservative medical management, as well as the initial surgical or interventional procedures.⁹⁶ These include risks for complications such as bacterial endocarditis, arrhythmias, and heart failure. Therefore, they require regular medical follow-up and are often instructed to adhere to lifelong health behaviours, such as adherence to preventive measures for endocarditis, medications, and the avoidance of heavy physical activity.

A topic that is particularly of concern for people with CHD are reproductive issues.⁹⁶ Patients need to be counselled about the most appropriate contraceptive methods for them, the risk for complications in case of pregnancy, the need for follow-up during pregnancy, and the recurrence risk. Also advanced care planning needs to be discussed in this counselling. For instance, the couple need to discuss if the partner is able and wants to raise the children alone, in case of severe adverse events in the patient.

A significant proportion of patients with CHD also experience difficulties with employability and gaining life insurance which is a further source of insecurity and could result in declined social integration.¹²⁹

Specialized facilities and healthcare professionals

To meet the specific needs of the growing CHD patient population and to minimize the negative impacts of the condition, specialized clinics providing lifelong care to

adult patients with CHD are now established internationally.⁹⁶ These specialized clinics consist of a team of health professionals—CHD cardiologists, cardiac surgeons, obstetricians, specialist nurses, psychologists, and cardiac physiologists—who are trained and educated in this field.¹²²

The nurse specialist tends to have a pivotal role in the collaborative care needed to deliver the best outcomes for the patient and has a key role in transition from paediatric to adult cardiology, identifying patient needs, educating patients and their families, initial screening for psychological problems, and onward referral to a social worker, psychologist, legal adviser, or other professionals.¹³⁰

Specific attention ought to be given to transitional care. When patients are transitioning from a child towards an adult, they need to develop the skills to become the manager of their condition. Comprehensive transitional care is recommended. Therefore, the CHD team needs to include staff with expertise in adolescent health.

Key elements in the care for adults with congenital heart disease

Recommendations relevant for nurses to provide holistic care for patients with CHD include⁹³:

1. A formal transition programme should be instituted when patients with CHD are moving on from paediatric to adult cardiology. This ensures that patients will have a seamless follow-up in a specialist clinic, with adequate support in all aspects of their care.
2. Individualized patient education regarding a patient's diagnosis and specific health behaviours must be provided to maximize good outcomes. This should include education around their specific lesion, procedures or interventions planned or already undertaken, medications, exercise modifications, signs and symptoms of deterioration, need for regular clinic follow-up, and reproductive risk and contraception.
3. Tools for screening of psychosocial problems should be available for rapid identification of concerns and referral to the appropriate health professional. Psychosocial concerns that have been identified in this population include anxiety, depressive symptoms, lack of self-esteem, issues with family functioning, and social integration.
4. Specific issues have been identified which require prompt and appropriate counselling input in patients

with CHD. Vocational counselling and advice regarding employability and insurance difficulties should be provided, which are timed at key periods to tie in when making choices regarding education and training.

5. Women will require careful and timely counselling regarding pregnancy and choice of contraception. While CHD is not always genetic, it is important to discuss the recurrence risk in an offspring prospectively with all patients and, therefore, adequate genetic counselling should be provided.

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10 Care of the patient with heart failure

TINY JAARSMA, ANNA STROMBERG, EKATERINI LAMBRINO, ANDREAS PROTOPAPAS, LOREENA HILL, ANA LJUBAS, AND DAVID R. THOMPSON

CHAPTER CONTENTS

Introduction 284

Pathophysiology and epidemiology 284

Clinical presentations 285

Aetiology 285

Symptoms and signs 287

Medical investigations for heart failure
diagnosis 287

Nursing assessment 287

Comprehensive management and nursing care 292

Heart failure management programmes 292

Self-care 293

Case studies 294

Complications 294

Arrhythmias 294

Valvular heart disease 294

Thromboembolism 294

Organ damage 294

Pulmonary complications 297

Cardiac cachexia 297

Drug side effects 297

Anxiety and depression 297

Impaired health-related quality of life 297

Care of patients with devices 298

Types of devices 298

Long-term management 299

This chapter covers the care of patients with heart failure. It looks at heart failure management programmes and the importance of self-care in this patient population.

KEY MESSAGES

- Heart failure is a major and growing health problem that imposes a significant human and economic burden on individuals, families, and society.
- This condition is associated with high mortality, morbidity, and hospital readmission rates.
- It impairs health-related quality of life and well-being of patients, families, and carers.
- Management depends on a detailed, systematic clinical assessment.
- Treatments include both pharmacological agents and devices.
- Patients with heart failure and their families need education and support to help them understand and cope with treatments and their complications and have an active role in the care plan design based on their needs and preferences, make adjustments to their lifestyle, adhere to the therapy, and take responsibility for their self-care management.

Introduction

Heart failure (HF) is a progressive and complex syndrome as a consequence of structural or functional cardiac diseases, including coronary heart disease, high blood pressure, valvular disease, and cardiomyopathies.¹ It progresses rapidly with an escalating ageing population and causes considerable morbidity, mortality, and rehospitalization, resulting in a tremendous burden on the global healthcare system but also at personal, family and societal levels.² Health professionals need to determine the best therapy by integrating the patient's and family's characteristics and needs, clinical signs, and diagnostic tests.¹

Nurses, including nurse specialists, are important in HF care,³ and nurse-led HF management programmes reduce HF-related and all-cause readmissions.⁴ The aim of this chapter is to present an overview of HF, including its pathophysiology, epidemiology, clinical presentations, clinical features, management, including self-care, complications, and devices, and describe the important role of nurses throughout the trajectory of HF.

Pathophysiology and epidemiology

HF is a complex and fatal clinical condition characterized by a prototype of symptoms (dyspnoea, orthopnoea, lower limb swelling) and signs (elevated jugular venous pressure, pulmonary congestion) often caused by a structural and/or functional cardiac abnormality resulting in reduced cardiac output and/or elevated intracardiac pressures. It encompasses patients with normal left ventricular ejection fraction (LVEF), typically considered as HF with a preserved ejection fraction (HFpEF) of 50% or greater; an LVEF in the mid-range of 40–49% is considered as HFmrEF; and an LVEF less than 40% as HF with a reduced ejection fraction (HFrEF)¹ (► **Table 10.1**).

Approximately 1–2% of the population in high- and middle-income countries have HF although this depends on what definitions are applied. Prevalence increases with age to 10% or higher among people more than 70 years of age. In the population over 65 years old presenting to their general practitioner with breathlessness on exertion, a significant minority will have undiagnosed HFpEF.⁵ Patients with HFpEF are generally older, female, and are more likely to have a history of hypertension and atrial fibrillation than a previous myocardial infarction. However, in all patients with HF, there will often be a history of many pathologies which can include myocardial infarction, both inherited and acquired cardiomyopathies, valvular heart

disease, alcohol abuse, and some infectious diseases (e.g. Chagas disease and rheumatic fever). Aetiology varies widely according to geographic region,⁶ although coronary heart disease and hypertension are the most common primary causes of HF globally. Improvements in treatment over the last few decades have improved survival and reduced hospitalization, in particular, for HFrEF. Between 17% and 45% of deaths from HF occur within 1 year of diagnosis,⁶ mainly due to cardiovascular causes. Deaths from non-cardiovascular causes occur more in patients with HFpEF.¹ Most of our understanding of HF comes from studies conducted in high-income countries, although most HF, like cardiovascular disease in general, occurs in low- and middle-income countries.

Advances in health sciences have increased the life expectancy of individuals with HF, changing at the same time the demographic and clinical characteristics contributing to an increase in the proportion of patients diagnosed with HF.^{7,8} A strong correlation has been found between advanced age and increased incidence of HF, of which hypertension appears to be a major precursor.⁹ Consequently, the combination of advanced age, elderly patients, and coronary heart disease is expected to increase the prevalence of HFrEF in patients across European countries¹⁰ (see also Chapter 14).

Approximately half of HF patients were reported as experiencing all-cause hospitalization at 1-year follow-up, with non-cardiovascular disease hospitalizations associated with a risk of subsequent mortality similar to cardiovascular disease hospitalizations.¹¹ Often acute events and rehospitalizations are due to non-cardiac reasons such as complications of other diseases or polypharmacy, behavioural reasons such as non-adherence to the therapy, and

Table 10.1 Classifications of heart failure (see the ESC HF Guidelines¹ for more information)

HF with a preserved ejection fraction (HFpEF)	Symptoms ± signs, normal LVEF ≥50%, elevated natriuretic peptides, evidence of structural, and/or functional abnormality
HF with a mid-range ejection fraction (HFmrEF)	Symptoms ± signs, LVEF in the mid-range 40–49%, elevated natriuretic peptides evidence of structural, and/or functional abnormality
HF with a reduced ejection fraction (HFrEF)	Symptoms ± signs, LVEF <40%

socioeconomic determinants, with many people with HF reporting a variety of emotional and physical symptoms that substantially impair their health-related quality of life, mobility, and daily living.^{8,12} The incidence and prevalence of HF increase significantly with age and HF is the most common reason for hospitalization in older adults.^{7,13} As the HF profile changes towards a more elderly cohort, there is a subsequent rise in the number of comorbidities (see also Chapter 14) and need for multiple medications (polypharmacy) (see also Chapter 14) along with the challenge of diagnostic difficulty and complex management.^{5,7,13} Furthermore, older people with HF have additional symptoms and needs: cognitive impairment, dementia, anorexia, muscle wasting, cachexia (see definition later in this chapter), frailty (described in Chapter 8), and depression (described in Chapter 11). Respiratory disorders, depression, obesity, and arthritis in older people can present with similar symptoms as those with HF (e.g. dyspnoea and fatigue).

Clinical presentations

Aetiology

Risk factors for HF are likely to vary depending on the quality of healthcare and the geographical area.¹ Other causes of HF are shown in ► **Table 10.2**.

The decreased cardiac output activates compensatory mechanisms such as increased activation of the sympathetic nervous system, the renin–angiotensin–aldosterone system (RAAS), and other neurohormonal mechanisms, in an attempt to maintain cardiovascular homeostasis and increased cardiac output.¹⁴ In clinical practice, pharmacological treatment of HF is targeted at neurohormonal activation based on pathophysiological mechanisms.¹⁵

The Frank–Starling mechanism

In the early stages of HF, the Frank–Starling mechanism plays an important role in increasing cardiac output. In HF, for the same preload, the heart muscle is unable to increase the stroke volume and cardiac output (► **Fig. 10.1**). Thus, HF treatment aims to decrease preload and afterload using diuretics and vasodilators¹⁵ (see also Chapter 4).

Neurohormonal activation

Sympathetic nervous system

Increased sympathetic tone by baroreceptors leads to increased heart rate in order to maintain cardiac output. Stimulation of the sympathetic nervous system causes

Table 10.2 Aetiologies of heart failure

Heart diseases	Coronary artery disease
	● Myocardial infarction
	● Ischaemia
	Hypertension
	Valvular heart disease/ rheumatic
	Cardiomyopathy
	Arrhythmia
Toxic damage	Congenital
	Pericardial diseases
	Alcohol, cocaine
	Heavy metals (e.g. iron, cobalt)
	Medications (e.g. immunomodulating, antidepressant, antiarrhythmics, non-steroidal anti-inflammatory, anaesthetic agents, and chemotherapeutic)
Immune–infections and metabolic diseases	Autoimmune diseases
	Chagas disease, viruses, fungi, bacteria
	Amyloidosis, haemochromatosis
	Thyroid diseases, thyrotoxicosis
	Nutritional deficiencies
Other	Iatrogenic fluid overload, renal failure
	Sepsis
	Severe anaemia

Source data from Ponikowski P, Voors AA, Anker SD, Bueno H, Cleland JGF, Coats AJS, et al. 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution. Eur J Heart Fail. 2016;37(27):2129–200.

peripheral vasoconstriction and increased afterload due to release of catecholamines in the circulation. As a negative effect, tachycardia causes increased myocardial oxygen demand and shortens ventricular filling time.

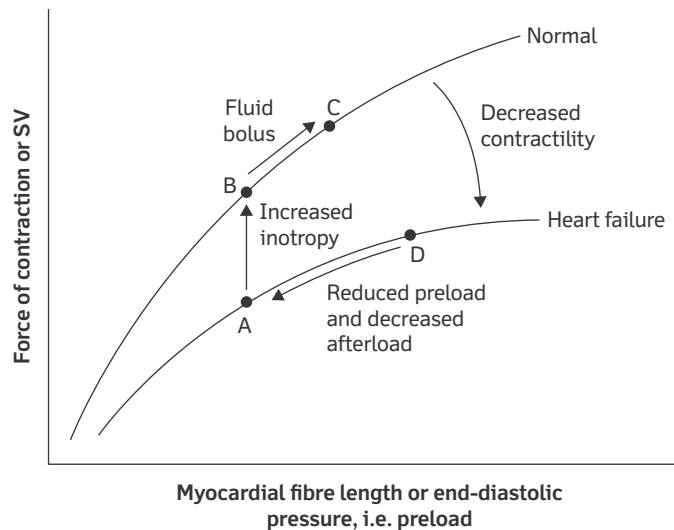


Fig. 10.1 Starling curves effect of filling and increased inotropy. Y-axis: force of contraction can be represented by cardiac output, stroke volume (SV), or stroke work. X-axis: myocardial fibre length can be represented by end-diastolic volume or end-diastolic pressure. A→B represents increased contractility from inotropic therapy. B→C represents a fluid bolus. D→A represents preload or afterload reduction by vasodilators and/or diuretics.

Reproduced from Barry P, Morris K, Ali T. Applied physiology and bedside assessment. In: Paediatric Intensive Care. Oxford UK: Oxford University Press, 2010 with permission from Oxford University Press.

Renin–angiotensin–aldosterone system

Activation of the RAAS aims to increase the intravascular volume and preload of the left ventricle via the Frank–Starling mechanism in order to improve cardiac output and maintain blood pressure and renal flow at a normal level. Renin converts angiotensinogen, which is produced in the liver, into angiotensin I. Angiotensin I is then converted, by the angiotensin converting enzyme, to angiotensin II. Angiotensin II is an active factor of the RAAS and causes vasoconstriction, activation of the sympathetic nervous system, myocyte hypertrophy, and aldosterone release. In addition, the RAAS is also responsible for releasing other neurohormones. Consequently, aldosterone release causes sodium and water retention and potassium excretion (► Fig. 10.2).

Ventricular remodelling

Ventricular remodelling is the response of the myocardium to insult in conditions such as ischaemia, inflammation, and mechanical pressure (changes in haemodynamic load), with changes in the geometry (volume and mass) and the structure of the left ventricle (mass and shape).¹⁶ Changing the shape of the left ventricle contributes to increased wall stress and dilation of the mitral valve ring causing functional

or ischaemic mitral valve failure. The process of ventricular remodelling is characterized by a neurohormonal response and activation of RAAS secretion of catecholamines, cortisol, and oxidative stress.¹⁷ Ventricular remodelling can lead to electrical and mechanical complications, such as ventricular arrhythmia and ventricular dyssynchrony, and further reduced cardiac output.¹⁶

Other hormonal responses

Release of natriuretic peptides

As a compensatory mechanism, the main action of natriuretic peptides is to promote diuresis, natriuresis, and vasodilation in order to reduce the extracellular volume and control of cardiovascular homeostasis. Release of these peptides is due to increased mechanical tension in the walls of the atria and ventricles.¹⁸

Release of antidiuretic hormone.

Vasopressin regulates osmotic pressure and circulating blood volume. Baroreceptors detect a decrease in mean arterial pressure due to the failing heart and this leads to elevated vasopressin release. As a result, vasoconstriction and water retention occur in an effort to increase mean arterial pressure.

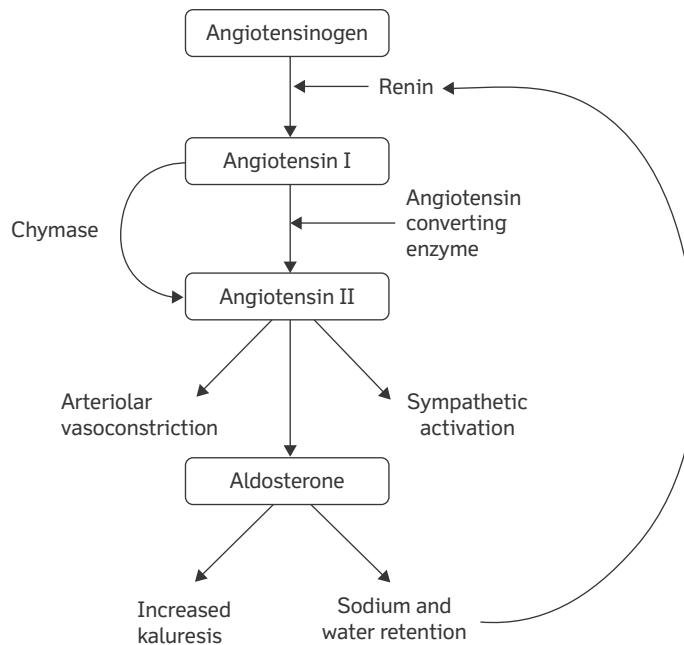


Fig. 10.2 The renin–angiotensin–aldosterone system.

Reproduced from Gardner R, McDonagh T, Walker, N. Definition of heart failure, basic epidemiology, and pathophysiology. In: Heart Failure. Oxford, UK: Oxford University Press, 2014 with permission from Oxford University Press.

Symptoms and signs

The symptoms and signs of HF (► **Table 10.3**) are determined by a careful, systematic, detailed clinical assessment that requires skill, experience, and time.¹⁹

Symptom classification

The New York Heart Association (NYHA) functional classification (► **Table 10.4**) is used to determine the severity of HF which has been particularly useful in clinical practice and is used in most clinical studies, describing patient functionality in four stages based on symptoms and ability to exercise.²⁰

Medical investigations for heart failure diagnosis

Assessment pathway

Essential initial investigations include natriuretic peptides, electrocardiogram (ECG), and echocardiogram. Patients with normal plasma concentrations are unlikely to have HF. An ECG is useful in ruling out HF as it is

unlikely for patients with HF to have a completely normal ECG. However, the most useful test to confirm the presence of HF is an echocardiogram.

Algorithms for the diagnosis of HF in both acute and non-acute settings are presented in ► **Fig. 10.3** and ► **Fig. 10.4**. These are as described in the European Society of Cardiology (ESC) Guidelines for the management of HF.¹ More information on cardiogenic shock is available in Chapter 5 where track and trigger systems to identify and monitor deterioration are covered.

Nursing assessment

History

Taking a detailed history is essential for further nursing care plans. History should include information about previous medical history and any other comorbidities, NYHA classification, implanted devices, sexual and exercise activity, and sleep disorders. Nurses need to consider the common factors that cause hospitalization as a consequence of decompensated HF, for example compliance with evidence-based medications, diet, fluid and sodium restriction, self-care strategies such as daily weighting,

Table 10.3 Symptoms and signs of heart failure

Symptoms	Signs
Typical	More specific
Breathlessness	Elevated jugular venous pressure
Orthopnoea	Hepatojugular reflux
Paroxysmal nocturnal dyspnoea	Third heart sound (gallop rhythm)
Fatigue, tiredness, increased time to recover after exercise	Laterally displaced apex
Reduced exercise tolerance	
Ankle swelling	
Less typical	Less specific
Nocturnal cough	Weight gain (>2 kg/week)
Wheezing	Weight loss (in advanced HF)
Bloated feeling	Tissue wasting (cachexia)
Loss of appetite	Cardiac murmur
Confusion (especially in the elderly)	Peripheral oedema (ankle, sacral, scrotal)
Depression	Pulmonary crepitations
Palpitations	Pleural effusion
Dizziness	Tachycardia
Syncope	Irregular pulse
Bendopnoea	Tachypnoea
	Cheyne–Stokes respiration
	Hepatomegaly
	Ascites
	Cold extremities
	Oliguria
	Narrow pulse pressure

McDonagh TA, Metra M, Adamo M, Gardner RS, Baumbach A, Böhm M, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC) With the special contribution of the Heart Failure Association (HFA) of the ESC. Eur Heart J. 2021, ehab368 © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

‘over the counter’ medication, and social and psychological aspects.

Physical examination

Inspection, palpation, percussion, and auscultation are the four basic methods of physical examination with which nurses should be familiar (see Chapter 5 for more detail). Despite advances in technology, performing a physical examination is an important skill not only for the

Table 10.4 NYHA functional classification of heart failure

Class I	No limitation of physical activity. Ordinary physical activity does not cause undue breathlessness, fatigue, or palpitations
Class II	Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in undue breathlessness, fatigue, or palpitations
Class III	Marked limitation of physical activity. Comfortable at rest, but less than ordinary activity results in undue breathlessness, fatigue, or palpitations
Class IV	Unable to carry on any physical activity without discomfort. Symptoms at rest can be present. If any physical activity is undertaken, discomfort is increased

McDonagh TA, Metra M, Adamo M, Gardner RS, Baumbach A, Böhm M, et al. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: Developed by the Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC) With the special contribution of the Heart Failure Association (HFA) of the ESC. Eur Heart J. 2021, ehab368 © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

diagnosis of HF, but also the optimization and follow-up strategies and therapeutic plans.¹⁹ Specifically, a physical examination reveals valuable information about the patient’s clinical status such as volume overload, congestion, perfusion, and adherence to the therapy.^{20,21}

Respiratory manifestations

Common symptoms in HF are breathlessness, orthopnoea, paroxysmal nocturnal dyspnoea and reduced exercise tolerance. Less typical symptoms are nocturnal cough, wheezing, bloated feeling. Dyspnoea or breathlessness is associated with high pressures in the left ventricle and in the pulmonary capillary. Depending on the severity of the patient’s condition, dyspnoea occurs in three clinical forms:

Exertional dyspnoea

During physical activity, the patient complains of shortness of breath and is forced to stop the activity and rest. For example, dyspnoea can occur when climbing stairs or while running. In advanced stages of HF, dyspnoea may appear with minimal effort such as in speech.

Orthopnoea and paroxysmal nocturnal dyspnoea

Orthopnoea is defined as dyspnoea appearing in the supine position and relieved when the patient adds more

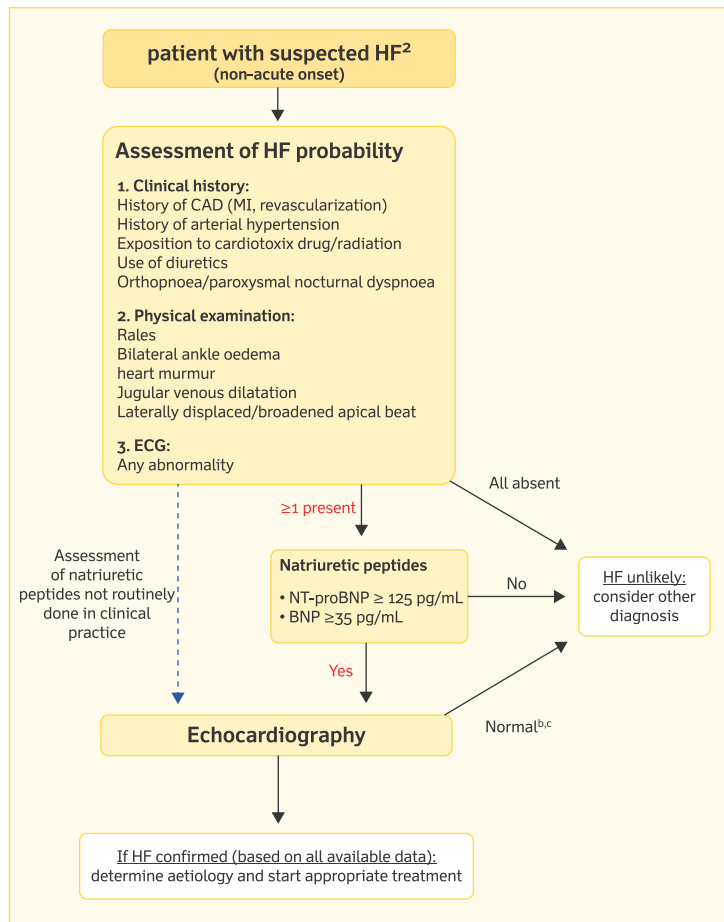


Fig. 10.3 The diagnostic algorithm for heart failure. BNP = B-type natriuretic peptide; ECG = electrocardiogram; HFmrEF = heart failure with mildly reduced ejection fraction; HFpEF = heart failure with preserved ejection fraction; HFrEF = heart failure with reduced ejection fraction; LVEF = left ventricular ejection fraction; NT-proBNP = N-terminal pro-B type natriuretic peptide. McDonagh TA, Metra M, Adamo M, et al; Authors/Task Force Members; Document Reviewers. 2021 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC. Eur Heart J. 2021 Aug 27; 00, 1_128. doi:10.1093/eurheartj/ehab368. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

pillows or sits up, whereas paroxysmal nocturnal dyspnoea occurs at night. The patient wakes up suddenly after a few hours of bedtime and is frightened, anxious, and has shortness of breath, being forced to sit or stand in order to relieve his/her symptoms. This kind of dyspnoea is caused by congestion of the lungs due to redistribution of blood volume.

Pulmonary oedema

Pulmonary oedema constitutes the most dramatic clinical feature of HF and may occur suddenly or progressively. It

is a life-threatening situation and the patient can develop severe respiratory distress with use of accessory muscles, orthopnoea, tachypnoea, cough, low oxygen saturation (hypoxaemia), and signs of pulmonary congestion. In severe situations, the cough may be accompanied by frothy bloody sputum, excessive sweating, anxiety, and pale skin. On pulmonary auscultation, initially crackles are heard over the lung bases at the end of inspiration but soon these occupy all the pulmonary fields. This is caused by an increase in pulmonary capillary hydrostatic pressure which forces fluid into the alveoli.

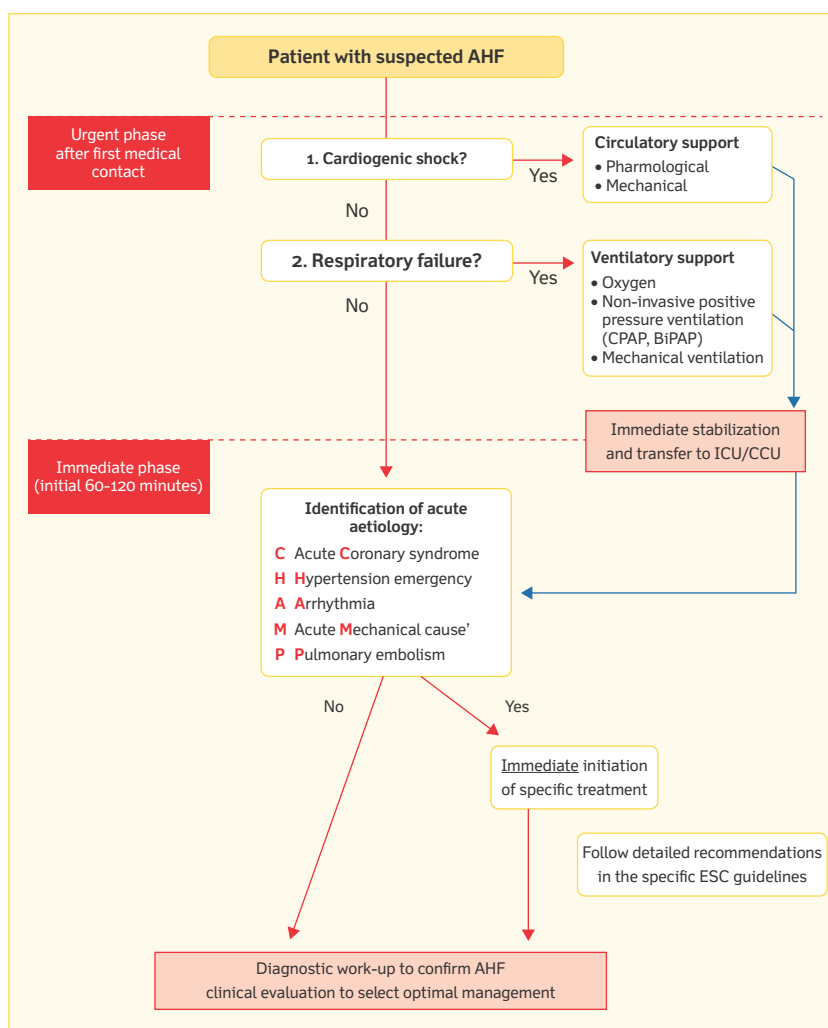


Fig. 10.4 Diagnosing heart failure of acute onset. AHF, acute heart failure; BiPAP, bilevel positive airway pressure; CCU, coronary care unit; CPAP, continuous positive airway pressure; ESC, European Society of Cardiology; ICU, intensive care unit. * Acute mechanical cause: myocardial rupture complicating acute coronary syndrome (free wall rupture, ventricular septal defect, acute mitral regurgitation), chest trauma or cardiac intervention, acute native or prosthetic valve incompetence secondary to endocarditis, aortic dissection, or thrombosis.

Ponikowski P, Voors AA, Anker SD, et al; Authors/Task Force Members; Document Reviewers. 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC. *Eur J Heart Fail.* 2016 Aug;18(8):891–975. doi: 10.1002/ehf.592. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

Volume status

Symptoms and signs of HF vary widely, with some signs resulting from fluid retention and volume overload, while common symptoms include dyspnoea and fatigue. The volume status can be assessed by estimating the jugular

venous pressure, testing the hepatojugular reflux, auscultation of the lungs and heart, evaluating the presence of oedema (► Fig. 10.5a), and measuring weight.

Jugular venous distention is a sign of volume overload and is common in decompensated HF. In order to examine



Fig. 10.5 Signs of congestion in heart failure: (a) peripheral oedema; (b) raised jugular venous pressure.

Reproduced from Dargie HJ, McDonagh TA. Diagnosing heart failure. In: Oxford Textbook of Heart Failure. Oxford, UK, Oxford University Press, 2011 with permission from Oxford University Press.

it, the patient should be placed at 45 degrees from the supine position and the right internal jugular vein evaluated. It indicates increased pressure in the right atrium, elevated pulmonary capillary wedge pressure, and left atrial pressure (► Fig. 10.5b). Jugular pressure may be normal at rest but increased when steadily compressing the patient's abdomen for 10 seconds. This test is called the hepatojugular reflux and is positive when the jugular venous pressure is raised more than 3 cmH₂O and maintained for a few seconds (10–15 seconds) after removal of the pressure. A positive hepatojugular reflux reflects elevated ventricular filling pressures. Hepatomegaly is also a common sign in right HF.

Another finding which commonly occurs in patients with HF is oedema. Oedema can be present as a pitting oedema of the lower extremities (► Fig. 10.5a); oedema in the abdomen is called ascites. Due to the oedema, the patient's body weight may increase. A daily record of the patient's body weight, at the same time every day, is necessary in order to detect early decompensated HF. For example, unexpected weight gain of more than 2 kg in 3 days is a sign of alarm. Daily measurement of fluid intake and output helps determine efficacy of diuretic therapy and volume status.

Sometimes, a pleural effusion can be present, typically indicated by dullness on percussion of the lung and no sounds heard during auscultation. Cardiac auscultation is useful for evaluating volume status. As a sign of left ventricular failure, the third heart sound can be heard and is associated with increased left ventricular end-diastolic pressure.

Vital signs

Examining vital signs is crucial to determine abnormalities (see Chapter 5). Increased sympathetic activity results in decreased peripheral perfusion due to vasoconstriction with cold extremities, increased capillary refill time, and even high blood pressure. On the other hand, hypotension (systolic blood pressure <90 mmHg) can be caused as a side effect of medication such as angiotensin-converting enzyme (ACE) inhibitors (or angiotensin II receptor blockers), beta-blockers, and diuretics due to hypovolaemia. Hypotension is also a sign of hypoperfusion. However, it is important to measure blood pressure in a supine and standing position in order to assess volume status and to exclude hypotension that is not caused by a reduced preload possibly due to aggressive diuretic or ACE inhibitor treatment.

The pulse pressure (the difference between systolic blood pressure and diastolic blood pressure) reflects stroke volume and vascular stiffness. Patients with HF who have a narrow pulse pressure have worse prognosis.

Examining the pulse rate provides information on efficacy of treatment or indicates a worsening situation. For example, a rapid rhythmic pulse (such as sinus tachycardia) in a patient with HF may be due to fever, anaemia, or hyperthyroidism. It is also a sign of decompensated HF due to increased sympathetic activity. Conversely, bradycardia can be caused by side effects of medicines such as beta-blockers, digoxin, and antiarrhythmics. However, a slow heart rate can also occur due to other causes such as heart block. Palpation of the pulse will identify if it is rhythmic or arrhythmic, supported and evidenced by an ECG. The latter (e.g. atrial fibrillation, see Chapter 7) may be caused by infection, valvular disease (see Chapter 8), thyroid disease, or decompensated HF. In the case of atrial fibrillation, precordial auscultation is recommended instead of measuring peripheral pulse by palpation.¹

Left-sided HF is characterized by the symptoms and signs of pulmonary congestion due to ineffective pumping of the left ventricle, whereas right-sided HF is characterized by those of systemic venous congestion (► Table 10.5).

Laboratory tests

Laboratory tests also provide significant clinical information for the diagnosis and treatment of HF. Due to the pathophysiology and medications, electrolyte imbalance (e.g. hyponatraemia, hypo/hyperkalaemia, and hypomagnesaemia) and renal failure are common in HF.²¹ See the ESC Guidelines on HF for more information on laboratory tests.¹

Comprehensive management and nursing care

Heart failure management programmes

Clinical guidelines recommend that patients with HF, especially after hospitalization, are enrolled in multidisciplinary HF management programmes to reduce the risk of HF hospitalization and mortality and improve quality of life.^{22,23} Different organizational forms can be used to include a combination of components that guarantee optimal HF care. HF management programmes can vary in their components and apply different service models, such as a clinic-based approach (in primary, secondary, or

Table 10.5 Summary of symptoms and signs of congestion

Left sided	Right sided
Orthopnoea	Jugular venous dilation
Paroxysmal nocturnal dyspnoea	Bilateral peripheral oedema
Bilateral pulmonary crackles, wheezing	Hepatomegaly
Bilateral peripheral oedema	Hepatojugular reflux
Hypoxia	Ascites
Cough	Symptoms of gut congestion (e.g. abdominal pain, nausea, vomiting, reduced appetite)

tertiary care), a home-based programme, case management, or a hybrid-based model.²⁴

However, it is not a matter of who provides the best care for the HF patient, but rather how we can provide patients with integrated interdisciplinary care where healthcare professionals collaborate with each other in providing person-centred care that fits the individual patient’s situation as well as each local healthcare system (see Chapter 14). The following characteristics and components are recommended:

Characteristics

- Use a patient/person-centred approach.
- Employ a multidisciplinary/interdisciplinary approach (e.g. nurse, cardiologist, primary care physician, pharmacist, physiotherapist, dietician, psychologist, social worker, and surgeon) (see also Chapter 3).
- Target high-risk symptomatic patients and have a proactive approach for prevention.
- Have competent and professionally educated staff.
- Encourage patient/carer engagement in the condition and its management.

Components

- Optimized medical and device treatment.
- Adequate patient education, with special emphasis on self-care including patient involvement in symptom monitoring.
- Provision of psychosocial support to patients and family caregivers with respect to sociocultural characteristics and needs.

- Follow-up after discharge (regular clinic and/or home-based visits; possibly telephone support or telemonitoring).
- Easy access to healthcare (through in-person follow-up and by telephone contact) and facilitated access to care during episodes of decompensation.
- Assessment of (and appropriate intervention in response to) an unexplained change in weight, nutritional status, functional status, quality of life, sleep problems, psychosocial problems, or other findings (e.g. laboratory values).
- Access to advanced treatment options, supportive care, and palliative care.

As with any complex intervention, HF management programmes should be tailored to individual patient (and partner, family, caregiver) needs, choices, and preferences. The nurse will need to discuss through communication with the patient, family, and other members of the team the most desirable and appropriate outcomes for the patient along the HF trajectory. These are likely to be related to health-related quality of life and well-being, but also to issues such as satisfaction with and experiences of their care.^{25,26}

Self-care

Self-care is essential in the long-term management of chronic illnesses such as HF. Self-care is defined as the process of maintaining health through health-promoting practices and managing illness and can be performed in both healthy and ill states.²⁷ Self-care can be seen as an overarching concept built from the three key concepts: self-care maintenance (e.g. taking medication as prescribed), self-care monitoring (e.g. regular weighing), and self-care management (e.g. changing diuretic dose). For patients with HF, it might be necessary to regulate and adapt self-care during the course of the disease, for example, in times of deterioration, if comorbidities occur, or in case of specific advanced treatment.^{27–30} Self-care has proven to be very important to influence both medical and person-centred outcomes in patients with HF. Those who report more effective self-care have better quality of life, lower mortality, and lower readmission rates than those who report poor self-care.^{24,31,32} However, despite the obvious relationship of good self-care with positive health outcomes, many patients find it difficult to adhere to self-care advice. This lack of adherence might be related to the complexity of self-care, lack of perceived need for self-care, the long-term character of the behavioural changes

needed, or a lack of motivation, to mention a few (see also Chapter 11).

A challenge faced by healthcare professionals (nurses) is in understanding the complex process of self-care and to develop appropriate, theory-driven interventions that support patients and their caregivers to maintain their health and manage their chronic illness. The middle-range theory of self-care of chronic illness²⁷ and the situation-specific theory of HF self-care³¹ can assist healthcare professionals (nurses) in their assessment of patients with HF and identify individual factors that hinder their engagement in self-care.

Self-care behaviour in heart failure patients

Self-care maintenance

Self-care maintenance refers to those behaviours performed to improve well-being, preserve health, or maintain physical and emotional stability. These behaviours can be related to lifestyle or the medical regimen, and they may be imposed by healthcare professionals or chosen by the patients in order to meet their own goals. Important self-care maintenance behaviours for HF patients are listed here¹ (see also Chapter 11 and Chapter 12):

- Taking medication (including careful use of non-prescription medication).
- Being physically active.
- Cessation of smoking (and drug use).
- Eating a healthy diet.
- Updating immunization.
- Restricting alcohol.
- Balancing activity and rest (sleep and rest).
- Adapting leisure and travel (if relevant).

Self-care monitoring

Self-care monitoring is the process of observing oneself for changes in symptoms and signs (when they occur). In HF patients, this includes monitoring weight changes, or changes in symptoms. Active monitoring for symptoms is needed for awareness and interpretation of bodily changes as symptoms.^{30,33}

Important self-care monitoring behaviours for HF patients are:

- Fluid accumulation (weight gain, leg/ankle oedema, shortness of breath, impendence).
- Activity.

- Increasing fatigue.
- Sleep problems.
- Appetite.
- Other symptoms (dizziness, nausea).

Self-care management

Self-care management is defined as the response to symptoms and signs. It is important that patients and their caregivers receive individualized advice on what the most optimal self-care management is for them.³⁰

Important self-care management behaviours for HF patients can include:

- Adapting diet or fluid prescription in accordance with their symptoms.
- Adapting their exercise levels in case of fatigue.
- Taking extra diuretics if there are symptoms of fluid retention, such as sudden weight gain and dyspnoea.
- Consulting a healthcare provider.

Case studies

► **Table 10.6** includes two case studies in HF care which demonstrate the principles of care outlined in this chapter.

Complications

As HF progresses, complications are likely to occur (► **Box 10.1**). The most common are muscle atrophy, anaemia, arrhythmias, valvular heart disease, and kidney, liver, and lung damage. Complications may result from adverse reactions to medications (e.g. headache, hypotension, nausea, and vomiting); however, the most serious complication is sudden cardiac death.

Arrhythmias

Atrial fibrillation is the most common arrhythmia in HF (see also Chapter 7). Atrial and ventricular contractions are not synchronized and that causes blood stasis which can lead to thrombus formation and thromboembolism. Symptoms of atrial fibrillation include dyspnoea in minimal physical activity, fatigue, palpitations, anxiety caused by irregular heart rhythm, and episodes of lightheadedness and syncope caused by brain hypoperfusion. Furthermore, patients can feel frustrated and anxious by a lack of knowledge and understanding of the disease,

complications, and therapy. The main goals of treatment are rhythm or rate control and the patient's comfort and feelings of trust and staying calm. Sudden cardiac death is a major cause of mortality in a growing population of HF patients.³⁴ Malignant heart disorders such as ventricular tachycardia and ventricular fibrillation are the most common cause of sudden cardiac death. The incidence of malignant arrhythmias is higher in patients with HF than in the general population, therefore implantable cardioverter defibrillators (ICDs) are an option in such patients for prevention of sudden cardiac death. No test can predict sudden cardiac death, but timely assessment of a high-risk patient, optimal drug therapy, and preventive implantation of ICDs can surely help prevent a lethal outcome.

Valvular heart disease

Valvar heart disease in HF is the result of heart enlargement and morphological changes in valve structure (see also Chapter 8). All valves can be affected. The result of valve disease is a worsening in haemodynamics. Fluid accumulates in the lungs and affects gas exchange. It can also result in acute pulmonary oedema. The main symptoms are dyspnoea and orthopnoea.

Thromboembolism

Emboic events are also a complication of HF. When the heart isn't working effectively, blood clots are more likely to form in the blood vessels or in the heart (especially in case of atrial fibrillation). A stroke occurs when a clot(s) lodges in a blood vessel in the brain and cuts off the necessary blood flow and tissue perfusion. Ischaemic stroke symptoms include numbness on one side of the body, confusion, trouble speaking, and loss of balance or coordination. If the patient does not receive medical care in a timely manner, there can be permanent neurological damage. A pulmonary embolism is a blockade of a blood vessel in the lungs. Symptoms include shortness of breath, chest pain on breathing, and tachycardia. Depending on the size of the blocked vessel, it can be an acute or chronic complication.

Organ damage

HF affects other organs too, predominantly the liver and kidneys.²¹ As heart function declines, kidney blood flow and glomerular filtration decreases. Sodium filtration also decreases which results in fluid retention. With reduced

Table 10.6 Case studies: heart failure

	Heart failure (1)	Heart failure (2)
1. Patient population and medical history	Elizabeth is an independent 64-year-old lady. She lives alone and has good family and friend support. She enjoyed an alcoholic drink on social occasions, but over the last 12 months her intake has increased to 4–6 units every night. Her medical history included chronic obstructive pulmonary disease, compliant with inhalers, and ex-smoker. Over the past 3 weeks Elizabeth felt more breathless when carrying out her household chores. She also noticed swelling in her ankles and lower legs	John is a 49-year-old gentleman who presented with anterolateral myocardial infarction, treated with primary percutaneous coronary intervention and stenting 5 years ago. He has a manual job, smokes 40 cigarettes per day, and has a positive family history of coronary artery disease. Echocardiogram post myocardial infarction demonstrated moderate left ventricular dysfunction. He was initiated on guideline-directed medications, and provided with information and support to make necessary lifestyle changes, including smoking cessation. He was followed up by the HF nurses in secondary care
2. Clinical presentation	Elizabeth became concerned when she could not lie comfortably in bed. Instead, she would awaken three or four times during the night, feeling so breathless she had to sit on the side of the bed. Her inhaler for chronic obstructive pulmonary disease helped slightly. She decided to attend the accident and emergency (A&E) department. A B-type natriuretic peptide was markedly elevated at 4800 ng/L and an urgent echocardiogram demonstrated a severely impaired left ventricle	Over the past year, John has noted a deterioration in his exercise tolerance. He now would become breathless on walking upstairs or when feeling anxious. He denied any chest pain, dizziness, or palpitations. His general practitioner performed N-terminal pro-B-type natriuretic peptide blood test which was elevated at 510 ng/L. A cardiac magnetic resonance imaging scan was arranged which showed severe left ventricular impairment (ejection fraction 30%)
3. Evaluation pathway	Elizabeth was reviewed by the cardiology team in A&E and admitted directly to the ward for close monitoring. An ECG showed sinus rhythm with broad QRS duration (152 ms). A cardiac magnetic resonance imaging scan demonstrated severely dilated and impaired left ventricle in keeping with non-ischemic cardiomyopathy	The HF team reviewed John and discussed referral to an electrophysiologist for device implantation. As John's ECG was sinus rhythm with no prolongation of QRS, the option was an ICD. Medications were also amended, with perindopril changed to sacubitril/valsartan. Six months later John was reviewed by the electrophysiologist. An echocardiogram showed an improvement in left ventricular impairment; however, ICD implantation remained warranted

(continued)

Table 10.6 Continued

	Heart failure (1)	Heart failure (2)
4. Treatment	Elizabeth was fluid restricted to 1200 mL and strict recording of her urinary output. Intravenous diuretic therapy was commenced, which Elizabeth found difficult as she became embarrassed due to occasional incontinence. A SRC was inserted, at her request for the first 4 days. Elizabeth was weighed every morning and over the course of the initial days lost 2 kg. She became less breathless and subsequently more mobile around the ward. When her condition stabilized, Elizabeth was commenced on an ACE inhibitor and beta-blocker, both guideline-directed medications. Her kidney function was checked daily. After 10 days she was ready for discharge. Elizabeth was feeling much better, but decided a close friend would stay with her at home to assist with daily household chores, such as shopping. On discharge, the treatment plan was for further titration of EB medication and consideration of device therapy	John is admitted for primary prevention ICD implantation. The device was implanted using local anesthetic into the pectoral muscle in the left upper chest region. Steristrips were applied and the wound covered with a dressing
5. In-hospital nursing care and priorities	During her hospital stay Elizabeth was reviewed by the HF nurse. Information on her condition as well as the subsequent need for lifestyle changes (including cessation of alcohol) was provided. Her medication regimen was discussed and the need for adherence. This verbal advise was supplemented with a booklet which had a table to record daily weights as well as the contact details of the HF nurse, should Elizabeth notice her signs or symptoms deteriorate. Contact details of her local cardiac patient support organization were also provided	John is transferred back to the ward after his procedure. An ECG and chest X-ray are carried out. John is monitored in the cardiac ward overnight to ensure no arrhythmia or bleeding from the wound site. He is reviewed by the electrophysiologist and the cardiac scientist in the morning. The cardiac scientist checks his device and provides important lifestyle advice, as required following device implantation. This information is reinforced by the HF nurse and an important review date at the ICD clinic arranged. Contact details of the local support group for cardiac device patients are also given, which will provide John and his wife with ongoing psychoeducational support. John is discharged following receipt of this information and device checks
6. Discharge planning and follow-up	Elizabeth was reviewed by the HF nurse 2 weeks later. Her blood pressure and pulse were recorded and kidney function checked. Elizabeth was making good progress, describing breathless only when she exerted such as climbing stairs (NYHA II) and had no dizziness. Weight was stable and she had not taken any alcohol. Her medications were therefore increased and a date confirmed to be reviewed by the electrophysiologist for consideration of CRT-D implantation	John lives with his wife. He returned home with the plan to be reviewed by the ICD clinic in 1 month. He also has the contact details of the ICD clinic and the HF nurse should he experience any problems. He is aware of the driving and travel restrictions, which have an impact on his work. He was reviewed by his general practitioner 1 week after discharge and reviewed at the ICD clinic after 1 month. No arrhythmias were noted and he has had a phased return to less manual work

SRC, self retaining catheter; EB, evidence based.

Box 10.1 Complications of heart failure

- Arrhythmias:
 - Atrial fibrillation.
 - Ventricular arrhythmias (ventricular tachycardia, ventricular fibrillation).
 - Bradyarrhythmias.
 - Sudden cardiac death.
- Thromboembolism:
 - Stroke.
 - Peripheral embolism.
 - Deep venous thrombosis.
 - Pulmonary embolism.
- Gastrointestinal:
 - Hepatic congestion and hepatic dysfunction.
 - Malabsorption.
- Musculoskeletal:
 - Cardiac cachexia.
- Respiratory:
 - Pulmonary congestion.
 - Respiratory muscle weakness.
 - Pulmonary hypertension.
- Renal:
 - Fluid retention.
 - Kidney failure.
- Haematological:
 - Anaemia.
- Electrolyte disbalance:
 - Hypokalaemia.
 - Hyperkalaemia.
 - Hyponatraemia.
- Drugs side effects:
 - Hypotension.
 - Electrolyte disbalance.
- Anxiety and depression.
- Impaired health-related quality of life.

function of the right ventricle, the liver can become congested affecting its function and leading to ascites. Furthermore, congestion in the intestines can cause malabsorption. In monitoring patients with liver and kidney complications, it is important to provide education on diet and nutrition (see also Chapter 11 and Chapter 13).

It is essential that patients adhere to a low-sodium diet.

Pulmonary complications

Patients with HF who have prolonged or severe pulmonary congestion can develop lung complications, especially pneumonia and pulmonary embolus. Because their breathing is already compromised by the HF itself, these

pulmonary complications can be particularly dangerous in a patient with HF. In addition, patients who have repeated episodes of acute pulmonary oedema may simply reach the point where an acute episode causes death before they can get medical care.

Cardiac cachexia

Cardiac cachexia is a condition in which a patient loses a significant amount of body fat, muscle, and bone. It is common in advanced HF patients. Once it begins, it cannot be reversed simply by eating more. Weight loss is the main symptom of cardiac cachexia; however, it is associated with increased fatigue and generalized weakness.³⁵ It is possibly caused by fluid retention in the intestines which prevents absorption of nutrients, liver failure which causes hypoalbuminemia, and chronic inflammation which can cause muscle breakdown.

Drug side effects

Diuretics are often used in the management of HF. Diuretics can cause hypotension, hypokalaemia, and dehydration. Hyperkalaemia can be a side effect of ACE inhibitors and angiotensin II receptor blockers. More information on drug treatments used in HF can be found in the ESC Guidelines on HF.¹

Anxiety and depression

Suffering from chronic illness is a risk factor for depression or anxiety (see also Chapter 11). The rate of depression in the general population with HF is 25%, and in a population with advanced HF is higher than 50%.³⁶ Patients need to successively adapt to changing physical and psychosocial situations, and not adapting well enough leads to depression or anxiety. Symptoms of depression in HF are not specific and include persistent sadness, hopelessness, and lack of affect. Nurses and clinicians should offer emotional support, and education about HF and its symptoms and signs.

Impaired health-related quality of life

HF and its related complications and possible comorbidities present a condition which implies many unpleasant symptoms for the patient. The quality of life in HF patients is more significantly impaired than is the case with some other chronic diseases.³⁷ Dyspnoea, sleep disorders, oedema, nausea, and fatigue are some of the symptoms which affect not only the physical aspect of a person's life, but its psychosocial and economic dimensions as well.

Lifestyle changes caused by the illness, physical limitations in daily activities, losing a job, increased costs, reversed social roles in the family, or uncertainty regarding the course of illness, all present a burden to the patient and their caregivers. All of the above-mentioned aspects impair the patient's quality of life. Such a state, as well as social isolation and depression, reduce the patient's cooperation in the disease treatment, which has a direct influence on their chances of survival. The early introduction of palliative care may help in relieving the symptoms and reducing suffering. A multidisciplinary approach, the development of self-care programmes, patient education, and social support all have a positive impact on the quality of life and they reduce the frequency of rehospitalization.

Care of patients with devices

Device therapy is a cornerstone in the management of HF patient¹ (see also Chapter 7). Nevertheless, over one-quarter of patients with an implanted cardiac device feel insufficiently informed of potential complications and future implications of living with the device.³⁸ Patients and families should receive tailored information and psychological support to understand the risks and benefits, therefore ensuring informed consent, promotion of self-care, and enabling future control in daily life^{39,40} (see also Chapter 13).

Many of the implanted devices used in HF management are solely appropriate for patients with HFrEF, for example, ICDs, cardiac resynchronization therapy (CRT), and ventricular assist devices (VADs).¹⁴¹

Types of devices

Implantable cardioverter defibrillator

An ICD is a small electromagnetic device inserted into the pectoral muscle to pace the heart if it beats too slow, to pace if it beats too quickly (known as antitachycardia pacing), and discharge a shock when a life-threatening arrhythmia occurs. HF patients may be given the option of a subcutaneous ICD, which just discharges a 'shock'. For symptomatic patients with HFrEF (ejection fraction $\leq 35\%$), an ICD is implanted for primary prevention. For patients with HFpEF, there are no data to support the use of an ICD.¹⁴² The decision to implant a device should be taken carefully, with involvement of the family for patients of advanced age or debilitating comorbidities.^{42,43}

Many patients with an ICD experience psychological distress following the receipt of shock therapy and the

realization of the device's impact on daily living (i.e. driving restrictions, work, and leisure activities). Younger age, depression, and type D personality have been found to be associated with an increased vulnerability for post-traumatic stress and anxiety symptoms.⁴⁴ To date, there is limited evidence on the effectiveness of non-pharmacological therapies, therefore most patients receive the prescription of an antidepressant.

Combined with biventricular pacing, an ICD can reduce hospitalization rates, decrease mortality,^{45,46} and improve HF symptoms and quality of life.⁴⁷

Cardiac resynchronization therapy

The CRT device works by pacing the two ventricles in a synchronized motion to improve the contractibility of the heart, thus improving cardiac output. The device can include an ICD (CRT-D) or be a pacemaker only (CRT-P). For a CRT-D to be implanted, the patients must fulfil criteria for both a CRT device and the ICD device.¹

Clear communication and information regarding the prognostic benefit of an implanted device is vital to enable informed choice. Despite its proven effectiveness, the 'non-response' rate remains approximately 30%⁴⁸ (see also Chapter 14).

Ventricular assist device

The VAD, developed as a mechanical circulatory support for haemodynamically unstable HF patients awaiting cardiac transplantation, is surgically implanted, acting as an artificial pump to assist the dysfunctional ventricle.⁴⁹ It comprises a blood pump, system monitor, system controller, and a driveline wire which protrudes out of the body and connects to the battery power source.

Most VADs implanted are left ventricular assist devices (LVADs), the type of device depends on the ventricle that is failing to function efficiently, for example, the right ventricle (RVAD) or both ventricles (biventricular assist device: BiVAD). Since the decline in heart donors for transplantation, VADs are being used more as 'destination therapy', with improved patient survival rates (80%) and quality of life.^{50,51} However, VADs are not without complications, such as infection, bleeding and pump thrombosis, and mechanical pump failure.⁵²

Successful outcome of the implantation procedure relies on thorough patient and family education before hospital discharge, including regular monitoring, VAD maintenance, and the safe performance of activities of daily living.⁵³ Patient safety is a priority; therefore, the patient and family must learn techniques including dressing the driveline site, monitoring and management

of anticoagulation therapy, and care of the batteries in current use and 'on charge' for future use.

Following discharge, patients will be regularly reviewed by their HF multidisciplinary team with input from the VAD centre regarding drug therapy, blood profiles, and lifestyle, with referral to cardiac rehabilitation to assess and improve exercise tolerance and potentially reduce the risk of hospitalization and mortality.⁵⁴

Long-term management

All patients with an ICD are regularly reviewed, face to face or via telemonitoring,⁵⁵ usually at the hospital where the device was implanted. During a face-to-face meeting, the device can be reprogrammed to prevent, for example, unnecessary shocks, optimization of resynchronized pacing, or alteration of the threshold for antitachycardia pacing, in order to improve outcomes. The patient and family must be informed of the importance to attend routine reviews, what to do in 'emergency' or out-of-hours' situations, and given a contact number for advice and support. In services where remote monitoring is available, nurses must inform, educate, and introduce patients and family to the facility.

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11 Cardiovascular prevention and rehabilitation

CATRIONA JENNINGS, KATHY BERRA, LAURA L. HAYMAN, IRENE GIBSON, JENNIFER JONES, ALISON ATREY, DAVID R. THOMPSON, CHANTAL F. SKI, MARY KERINS, TARA CONBOY, LIS NEUBECK, ROBYN GALLAGHER, AND SUE KOOB

CHAPTER CONTENTS

Introduction 304

The global imperative: why nurses need to be involved in cardiovascular prevention and rehabilitation 304

Cardiovascular prevention and rehabilitation 304

Primordial and primary prevention of cardiovascular disease: supporting evidence, challenges, and opportunities for nurses and nursing 311

Conclusion 313

Concept of total cardiovascular risk and total risk management 314

How to estimate total cardiovascular disease risk 315

Components of prevention and rehabilitation in clinical practice 316

Lifestyle and risk factor management.

Supporting patients and families to make healthy lifestyle changes 316

Tobacco and smoking cessation management 318

Adopting healthy eating habits and achieving and maintaining optimal weight and shape 322

Physical activity and exercise 329

Biological risk factor management 334

Addressing psychosocial aspects, illness perceptions, and health-related quality of life 341

Conclusion 344

Settings and delivery modes for cardiovascular prevention and rehabilitation 344

Hospital setting 344

Primary care setting 348

Community setting 350

Technology to support prevention and rehabilitation initiatives 351

Role of professional societies, associations, and foundations in cardiovascular prevention and rehabilitation 354

KEY MESSAGES

- There is a global imperative for the prevention of cardiovascular disease which includes primordial, primary, and secondary prevention.
- Prevention requires a multifactor risk reduction approach because of the multifaceted aetiology of cardiovascular disease.
- Components of cardiovascular disease prevention include behavioural strategies to encourage the

adoption of healthy lifestyle habits, the use of medications to manage biological risk factors, and strategies to manage psychological conditions such as anxiety and depression.

- Risk estimation allows the detection of those at highest risk, so they can be identified for management as a priority.
- Nurses have an important role to play in the implementation of prevention programmes which, when led by this professional group working in interdisciplinary models with physicians and allied health professionals, have been shown to be successful in reducing total mortality.
- Integrating digital technology can address barriers to participation in programmes and improve adherence. Healthcare providers need to be familiar with these modes of delivery and equipped on what to recommend.
- Professional societies, associations, and heart foundations play an important role in supporting healthcare professionals, patients, and caregivers to maximize the effectiveness of prevention initiatives.

Introduction

In this chapter we will look at the priorities for cardiovascular prevention and rehabilitation (CVPR). This perspective reflects an integrated approach to prevention and rehabilitation. In 1993, the World Health Organization (WHO) provided a definition for cardiac rehabilitation as follows¹:

The sum of activities required to influence favourably the underlying cause of the disease, as well as to provide the best possible physical, mental and social conditions, so that the patients may, by their own efforts, preserve or resume when lost as normal a place as possible in the community.

This definition alludes to the need for efforts to manage risk factors, that is, underlying causes of cardiovascular disease (CVD) which have an impact on preventing the development of CVD. More recently, calls to action have been published, firstly in 2011 under the auspices of the Preventive Cardiovascular Nurses' Association (PCNA) and the Council on Cardiovascular Nursing and Allied Professions (now known as the Association of Cardiovascular Nursing and Allied Professions (ACNAP)).² This supplement was directed specifically at nurses working in cardiovascular care. Secondly, an international charter was published³ under the auspices of the Canadian Institutes for Health Research which calls for the harmonization of efforts to promote CVPR and to provide an international consensus on its core components.

The global imperative: why nurses need to be involved in cardiovascular prevention and rehabilitation

Cardiovascular prevention and rehabilitation

CVPR programmes, a common setting for secondary prevention (► Table 11.1), demonstrate that providing multifactor risk reduction (MFRR) for patients with atherosclerotic heart disease reduces both morbidity and mortality from vascular diseases including stroke and myocardial infarction and some cancers.⁴ Following cancer prevention guidelines reduces the risk of cancer, CVD, and all-cause mortality.

CVPR programmes achieve this through managing well-known cardiovascular risk factors such as blood pressure, lipids, diabetes, obesity, poor diet, physical inactivity, tobacco use, depression, and numerous other health-related conditions.⁵ As part of the emphasis on cardiovascular risk reduction, these programmes have been successful in developing healthcare professionals as primary and secondary prevention specialists. Although these programmes have proven to be successful, data show that they only reach a minority of all eligible patients. The fifth EUROASPIRE survey of preventive care in coronary patients reported that only one-third of patients post cardiac event attended a CVPR programme. In fact, less than half (46%) were advised, but if advised, two-thirds (69%) attended.⁶ Numerous barriers exist that prevent individuals from participating in cardiovascular risk reduction programmes (► Table 11.2). Thus, there is much to be done in order to improve access these programmes.

Table 11.1 Definitions of terms used in prevention

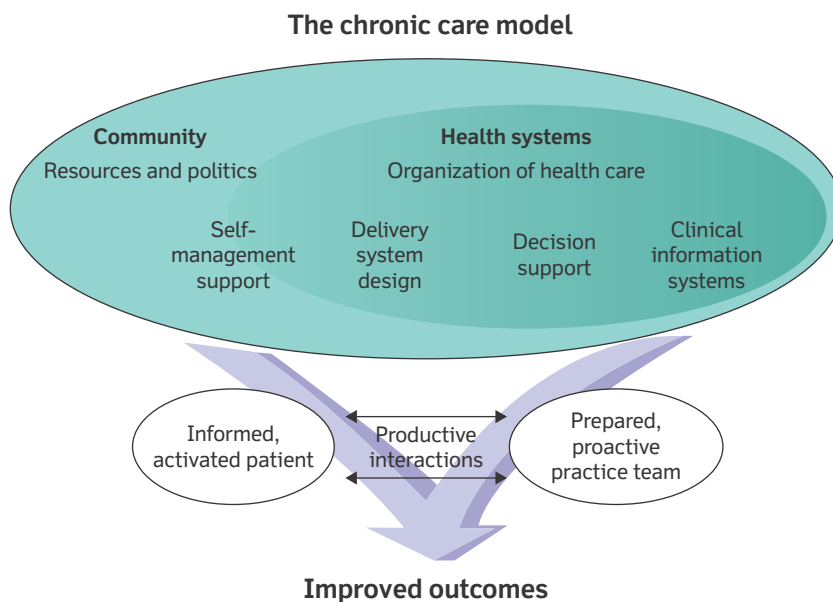
Primordial prevention	Prevention of the development of cardiovascular risk factors in the first place
Primary prevention	Modifying adverse health behaviours and cardiovascular risk factors to reduce the risk of incident CVD
Secondary prevention	Managing cardiovascular risk factors to prevent recurrence of CVD events

Table 11.2 Barriers to participation in cardiovascular risk reduction programmes

Cost	Programmes are not reimbursed sufficiently in many countries and do not cover all groups who should be eligible
Availability	In many countries, programmes are not available
Lack of transportation	Programmes may be located far from where people who need it live and transport is not reimbursed
Complex comorbidities	For example, depression and other mental illnesses, arthritis, and chronic pulmonary disease (see also Chapter 14)
Lack of referral from physicians and other healthcare providers	Programmes are often not seen as an integral part of cardiovascular care and physicians, among others, may not refer their patients or emphasize the importance of attending
Literacy	Ability to understand verbal communication and written information particularly about health and illness management (see also Chapter 13)
Cultural beliefs	Values and perceptions that may be represented in health behaviours and practices (see also Chapter 14)

Wagner's Chronic Care Model (► Fig. 11.1)⁷ captures key components for delivering a successful cardiovascular risk reduction programme. Wagner defines the importance of healthcare systems interfacing with communities to provide self-management and decision-making support⁸ (<https://www.kingsfund.org.uk/audio-video/>

edward-wagner-chronic-care-model-and-integrated-care). This outreach is augmented by clinical information systems and healthcare delivery systems. The interface of community with healthcare systems must be patient centred (see also Chapter 2), timely and efficient, and supported by evidence-based guidelines. Careful cooperation

**Fig. 11.1** Wagner's Chronic Care Model.

between the community and healthcare systems supports the development of informed and activated patients and families and creates a proactive healthcare team of physicians, nurses, and allied health professionals.

The evidence for multifactor risk reduction

The INTERSTROKE and INTERHEART studies clearly demonstrated that patients suffering from a stroke or an acute myocardial infarction share common cardiovascular risk factors. For stroke risk, these include hypertension, smoking, waist-to-hip ratio (abdominal obesity), physical inactivity, and the ratio of apolipoprotein B to A1. For acute myocardial infarction, similar shared risk factors such as hypertension, smoking, waist-to-hip ratio, and the ratio of apolipoprotein B to A1 were also found. Other important risk cardiovascular factors such as poor diet, diabetes, alcohol intake, psychosocial stress, and depression were predictive of stroke and acute myocardial infarction.^{9,10}

Two systematic reviews and meta-analyses of prevention and rehabilitation trials, published in 2016,^{11,12} the first reviewing trials of exercise-based cardiac rehabilitation programmes and the second reviewing trials of CVPR programmes, both showed no effect on total mortality (► Table 11.3). However, a significant effect was seen on cardiovascular mortality in both reviews. Importantly, van Halewijn's et al's review⁹ showed in two subanalyses—the

first comparing programmes that addressed six or more cardiovascular risk factors with those addressing less, and the second comparing programmes which included medication prescription and monitoring with those that did not—a significant effect on total mortality, demonstrating that a MFRR approach is an effective strategy for prevention and rehabilitation. Focusing on exercise alone is less effective.

► Table 11.4^{13–23} and ► Table 11.5^{14,17,18,20,24–28} show the evolution of the research into MFRR since the 1990s and implementation of this research into clinical practice. Our challenge is to build on this important clinical research and develop similar programmes to offer integrated primary and secondary CVD risk reduction across all ages, ethnicities, and both sexes. Salisbury nicely described how CVPR programmes are an excellent place to create healthy communities.²⁹ Cardiac rehabilitation programmes are directed by well-educated healthcare professionals and also have resources such as psychosocial counselling, nutrition, and physical activity expertise. Their knowledge regarding the promotion of self-management including shared decision-making and patient-centred care (see also Chapter 2) creates an environment conducive to successful behaviour change. They wisely pointed out that patients want convenience when accessing MFRR programmes. Patients look for individualized care plans, they need the support of healthcare providers including continuity of relationships, and seek healthcare providers

Table 11.3 Systematic reviews of prevention and rehabilitation trials

Randomized controlled trials (RCTs)	Year trials conducted	N of trials	N of patient	Effect on total mortality	Effect on cardiovascular mortality
RCTs of exercise-based cardiac rehabilitation ¹¹	1975–2013	47	12,455	RR 0.96, 95% CI 0.88–1.04	
RCTs of exercise-based cardiac rehabilitation ¹¹	1975–2013	27	7469		RR 0.74, 95% CI 0.64–0.86
RCTs of prevention and rehabilitation ¹²	2010–2015	18	7691	RR 1.00, 95% CI 0.88–1.14	
RCTs of prevention and rehabilitation ¹²	2010–2015	4	1046		RR 0.42, 95% CI 0.21–0.88
RCTs of prevention and rehabilitation—subanalysis of programmes addressing 6 or more risk factors ¹²	2010–2015	6	2470	0.63, 95% CI 0.43–0.93	
RCTs of prevention and rehabilitation—subanalysis of programmes including medication prescription and monitoring ¹²	2010–2015	3	1035	0.35, 95% CI 0.18–0.70	

CI, confidence interval; RR, relative risk.

Table 11.4 Evolution of the research into delivery of multifactor risk reduction programmes

Study name, design (year) and country	Patient population and number	Intervention	Follow-up	Important results
SCRIP RCT ¹³ (1994) US	Known coronary heart disease 300	Intensive nurse-led case management of multiple cardiovascular risk factors	4 years	1. Reduction in acute myocardial infarction and total cardiac events—rate ratio 0.61 (CI 0.03–0.9) 2. Significant reduction in need for PCI and coronary artery bypass grafting 3. Angiographic evidence of improved atherosclerotic plaque burden compared to usual care
MULTIFIT RCT ¹⁴ (1994) US	Post acute myocardial infarction 585	Nurse-led case management of multiple risk factors	1 year	1. Smoking cessation rates: 70% vs 53% ($P = 0.03$) 2. LDL-C 2.77 ± 0.69 mmol/L vs 3.41 ± 0.90 mmol/L (107 ± 30 mg/dL vs 132 ± 30 mg/dL) ($P = 0.001$) 3. Functional capacity 9.3 ± 2.4 METS vs 8.4 ± 2.5 METS ($P = 0.001$)
Grampian RCT ¹⁵ (1998) UK	Known coronary heart disease 1343	Nurse-led lifestyle and risk factor consultations in general practice with regular follow-up over 1 year	1, 4, and 10 years	1. At 4 years, cumulative death rates: 14.5% and 18.9%, respectively ($P = 0.038$). 2. At 10 years, survival analysis: proportional hazard ratios were 0.88 (0.74–1.04) for total mortality and 0.96 (0.79–1.18) for coronary death or non-fatal myocardial infarction
CHAMP Quasi experimental design ¹⁶ (2001) US	Post acute myocardial infarction 558	Multidisciplinary team approach to ensure hospitalized patients with known coronary disease are discharged with guideline-based therapies	1 year	Significant reduction in total mortality between pre (7%) and post (3.3%) CHAMP groups
COACH RCT ^{17,18} (2003, 2004) Australia	Known coronary heart disease 792	4 coaching sessions (total 2 hours) from dietitians and nurses to achieve lifestyle and risk factor goals over 6 months	4 years	Despite superior lifestyle and risk factor management in COACH patients, no difference seen in survival but significantly reduced number of hospital admissions (16% any cause) and bed days (15% cardiac; 20% any cause)
COURAGE RCT ¹⁹ (2007) US and Canada	Known coronary heart disease 2287	Comparison of optimal medical therapy + PCI with optimal medical therapy alone	Mean 4.7 years	No difference in primary composite death rates between the groups—demonstrated importance of adhering to practice guidelines on medical therapy and deferring PCI in stable coronary heart disease

Continued

Table 11.4 *Continued*

EUROACTION ²⁰ (2008) Europe	Incident coronary heart disease in hospital, and high multifactorial risk in general practice 5396	Intensive nurse-led, family-centred, interdisciplinary programme to manage multiple lifestyle (smoking, diet, and physical activity) and risk factors (weight, blood pressure, lipids, and diabetes) in hospital for coronary heart disease patients and in general practice for high multifactorial risk patients	1 year	In incident coronary heart disease patients in hospital: 1. Fruit and vegetables intake (≥ 400 g per day) 72% vs 35% $P = 0.004$ 2. Moderate intensity physical activity (≥ 30 min, ≥ 4 times per week) 54% vs 20% $P = 0.002$ 3. Blood pressure ($< 140/90$ mmHg; $< 130/85$ mmHg in patients with diabetes) 65% vs 55% $P = 0.04$
COACH—community outreach and cardiovascular health RCT ²¹ (2011) US	Known coronary heart disease, hypercholesterolaemia, hypertension, diabetes type 2 (African American or Caucasian) 525	Nurse practitioners and community health workers led aggressive pharmacological management and tailored educational and behavioural counselling for lifestyle modification and problem-solving to address barriers to adherence and control	1 year	Significant improvements in: 1. LDL-C (difference, 15.9 mg/dL) 2. Triglycerides (difference, 16.3 mg/dL) 3. Systolic blood pressure (difference, 6.2 mmHg) 4. HbA1c (difference, 0.5%) 5. Perceptions of the quality of their care (difference, 1.2 points)
RESPONSE ^{22,23} (2013, 2017) The Netherlands	Post acute myocardial infarction	Nurse-led consultations for 6 months to manage lifestyle and risk factors in hospital and community setting	1 year	1. 17.4% reduction in estimated 10-year cardiovascular mortality 2. 7–9 risk factors at goal in 35% vs 24.7% $P = 0.003$

Table 11.5 Translating MFRR evidence into working models of care

The model of care	Country and health system where implemented	Evidence supporting model of care
The Stanford Chronic Care Management System: home care for patients with chronic conditions (e.g. heart failure, coronary heart disease) The Stanford Cardiac Rehabilitation Programme—MULTIFIT—care management programme for chronic diseases	US Stanford University and the Kaiser Permanente Health Care System 2015: Moving Analytics, Inc. given an exclusive licence to use MULTIFIT—includes remote care management programmes for coronary heart disease, heart failure, diabetes, hypertension, and acute coronary syndrome. http://www.stanfordchroniccaresystem.com/about.html	14
MyAction for Our Hearts (see also 'Integrated models of community-based cardiovascular disease care')	UK National Health Service and CROI Heart Charity in Galway in collaboration with Ireland Health Service Executive MyAction Pilot, Bromley, Southeast London, UK NHS Cardiovascular Health and Rehabilitation Service, Imperial College Healthcare NHS Trust, London UK Our Hearts Our Minds, Western Health and Social Care Trust, Eniskillen, Northern Ireland CROI Heart and Stroke Centre, Galway, Western Ireland	20,24–27
Heart to Heart Project	The Stanford and San Mateo County Heart to Heart Project, US http://med.stanford.edu/ppop/heart.html	28
COACH Program https://www.thecoachprogram.com/telemedicine/	Throughout the public health system in Australia	17,18

with skills in behavioural change techniques, medical therapies, and communication skills.

The important role of nurses

Nurses have an important role to play in the implementation of MFRR programmes. Many of the studies mentioned previously included programmes that were coordinated and led by nurses. A systematic review and meta-analysis from 2016³⁹ of 12 trials of secondary prevention of CVD conducted between 1994 and 2008 including 4886 patients showed significant reductions in total mortality (0.78, 95% confidence interval (CI) 0.65–0.95) and improvements in both adherence to lipid-lowering therapy (1.57, 95% CI 1.14–2.17) and antiplatelet therapy (1.42, 95% CI 1.01–1.98).

Nurses are equipped to lead these programmes for a number of reasons. They are accustomed to working closely with the medical profession and to implementing medical decisions about care. They follow professional recommendations and protocols well and are trained to

understand symptoms and monitor patients' signs, such as blood pressure. They are also trained to safely administer medicines and are familiar with medications, doses, potential medication interactions, and side effects. In some countries, legislation now permits nurses and other health professionals, for example, nurse practitioners and pharmacists, to have prescribing rights. While this has been driven by economic circumstances, diminishing numbers of physicians and unavailability of health services in rural areas has been challenging. Enabling nurse practitioners and pharmacists has proven to be safe and successful with patients, physicians, and nurses who report a higher quality of care and greater flexibility and convenience for patients and their families (see also Chapter 12).

However, as importantly, nurses bring a holistic and health-promoting approach to care. Nurse training and bachelor degree programmes incorporate the medical, biological, social, and behavioural sciences as well as health psychology. In addition, nurses are taught to use counseling and teaching skills. This prepares them for a holistic

approach to care as opposed to the disease-oriented approach. Rather, they see their patients in the context of their physical, psychological, and spiritual needs, their family, and their social environment. The promotion of health, nurture, and caring are central to the profession of nursing and an integral part of their expertise. It is this model of care which they adopt rather than the medical model.

Nurses are formally taught management theory, because, in their professional role, they are required to coordinate interdisciplinary care delivered by nursing teams and other disciplines. This includes physiotherapists, pharmacists, and occupational therapists, who provide important care for their patients. They learn to become managers from an early stage in their career when they are put in charge of overseeing groups of hospitalized patients. They learn to cope with patients' emotional and medical problems because they are the professional who spend the most time with patients. They have time to listen, perhaps during the administration of basic care. They have to cope with patients' anger, their fears, and their denial. They have to deal with death and dying and loss. They are the frontline to deal with families, relatives, and friends.

Having the knowledge, skills, and experience equips nurses with skills which they can apply to the management of preventive and rehabilitative care. Nurses must know their capabilities, access adequate training for extended roles, accept their limitations, and know when it is appropriate to refer to other disciplines or to seek the advice of physicians. For example, in the UK, nurses are governed by the Nursing and Midwifery Council and its code of professional conduct (<https://www.nmc.org.uk/standards/code/>), and they have access to university modules and in-service training to further their knowledge and give them extra skills. Provision of this kind varies between countries.

In taking on this management role, nurses work closely with physicians who provide the medical leadership to ensure that prevention and rehabilitation programmes are an integral part of the care plan. Nursing responsibilities in hospitals and clinical practice settings includes the management of cardiovascular patients. Physicians are responsible for encouraging patients to participate in prevention and rehabilitation programmes. Close collaboration between nurses and physicians is required to ensure that risk factor management and medications therapies are optimal. With physician support, patients are more likely to participate in programmes and achieve their healthcare goals. Both nursing and medical professionals are important to successful healthcare. As nurses assume more responsibility for medical decision-making and achieve advanced skills (physical assessment, nurse prescribing),

implementation of medical decisions becomes much more collaborative (see also Chapter 3). Nurse-coordinated care is applied differently based on individual country health cultures. It is dependent upon the professional standing and provision for expanding roles (see also Chapter 3) and physician/nurse ratios by country.

Nurses do not work in isolation from other professionals. Working in collaboration, not only with physicians but with an interdisciplinary approach, is essential. A transdisciplinary approach may be preferable to a multidisciplinary approach where single disciplines work in silos with no reference to each other to coordinate preventive care which requires a broad spectrum of expertise. The transdisciplinary team recommended to deliver a CVPR service ideally includes a specialist nurse, dietitian, physiotherapist or exercise specialist, psychologist, pharmacist, occupational therapist, vocational counsellor, social worker, and supported by a cardiologist.³¹

Examples of research evaluations of practice models which were subsequently implemented in clinical practice can be seen in ► **Table 11.5**. Further on in this chapter we describe the components of prevention and rehabilitation and the settings in which they can be delivered.

Family

In order to be successful with implementing primary and secondary prevention of CVD, we need to focus on barriers that prevent patients from achieving MFR. A key component of this is the family, including both younger and older generations. Lloyd-Jones and others found a strong association between a family history of premature heart disease and adult-onset coronary artery disease.³² The association is strong when there is a parent and a sibling with premature disease. Also, children whose parents develop early CVD tend to be more obese, have worse lipid profiles, are more likely to be hypertensive, have glucose abnormalities, and other physiological measurements associated with cardiac and other vascular diseases.³³ Children in high-risk families have a higher risk of developing CVD risk factors and CVD due to genetic susceptibility, lifestyle behaviours, and commonly shared environmental factors. Importantly, they also showed that family history does not necessarily predict improved CVD reduction behaviours.

The Multi Ethnic Study of Atherosclerosis (MESA), showed that for Caucasians, African Americans, Hispanics, and American Chinese, the prevalence of a family history of CVD predicted a higher Framingham Risk Score for those under 10% and for those between 10% and 20% measured risk.³⁴ A history of CVD in the family indicates

a higher risk for family members. Results of a very recent study designed to examine the association between parental cardiovascular health (CVH) and time to onset of CVD in offspring found that maternal CVH was a more robust predictor of an offspring's CVD-free survival than paternal CVH.³⁵ In this analysis of data generated from the Framingham Heart Study, offspring of mothers with ideal cardiovascular health (ICVH) lived 9 more years free of CVD than offspring of mothers with poor cardiovascular health ($P < 0.001$). Maternal poor CVH was associated with a twice as high hazard rate of early-onset CVD compared with maternal ICVH (adj. hazard rate = 2.09, 95% CI 1.50–2.92). Collectively, results underscore the importance of family in CVD prevention and suggest the need for clinical and policy interventions that break the intergenerational cycle of CVD-related morbidity and mortality. It has also been shown that parental lifestyle influences childhood behaviours. Steinberger and colleagues³³ evaluated television watching plus an overweight parent in children. They found that the children with more than 1 hour of TV watching per day or an overweight parent had a higher likelihood of developing CVD risk factors during their lives. They also found that families who consumed a Mediterranean diet, one high in fruits, vegetables, wholegrains, and fish plus healthy oils, had a beneficial effect on the cardiovascular risk factors in adults and their children. Families are critically important for successful primary and secondary CVD prevention programmes.

Ageing

The world's population is ageing and data show clearly that older adults benefit from CVD prevention programmes. The global median age, as reported by 'Our World in Data', was 21.5 years in 1970 and 30 years in 2019 (<https://ourworldindata.org/age-structure>). This report showed that 8% are older than 65 years, with half of the world's population working between 25 and 65 years of age. Focusing preventive measures across all ages is a clear direction for prevention programmes and research.

It is known that chronic diseases in males and females increase by age. Uijen and colleagues studied men and women across the age span of 24 to 75 years of age.³⁶ They identified the presence of one or more chronic diseases (hypertension, diabetes mellitus, ischaemic heart disease, chronic obstructive pulmonary disease, osteoarthritis of the knee or hip) by age groups. The presence of three or more risk factors for those over 75 years of age was approximately 85%, between the ages of 65 to 74 years was approximately 70%, and between the ages of 45 and

64 years was approximately 42%. Thus, comprehensive MFR is necessary across the lifespan.

Technology

Innovation and technology have been shown to benefit both primary and secondary prevention services and are becoming essential in clinical care. The Internet provides access to important health information and is the most commonly used source for health-related topics. In addition, increasingly more people are using their smartphones and other technology to access healthcare information. In 2016, Google processed greater than 1 trillion searches per year or about 90 billion searches per month regarding healthcare. The Internet has been shown to be successful in delivering behaviourally guided weight loss programmes and programmes for heart failure management and cardiovascular risk factor modification.^{37–39} Burke and colleagues looked at consumer use of mobile health for CVD prevention and provided an overview in a scientific statement from the American Heart Association (AHA).⁴⁰ They encouraged embracing the challenge to produce new evidence on the effectiveness of technology and how this evidence can be adopted into clinical practice and help support primary and secondary CVD prevention. Later on in this chapter, examples of innovation in technology for delivering prevention and rehabilitation interventions are described and discussed.

Primordial and primary prevention of cardiovascular disease: supporting evidence, challenges, and opportunities for nurses and nursing



What is primordial and primary prevention?

While there is substantial evidence for the effectiveness of nurse case-managed secondary CVD prevention

programmes globally in both clinical and community-based settings, there is considerably less research focused on the important role of nurses and nursing in primordial prevention. Primary prevention focuses on modifying adverse health behaviours and risk factors to reduce the risk of incident CVD (► **Table 11.1**). The global prevalence and trends in the intra-individual clustering of risk factors (obesity, hypertension, dyslipidaemia) and adverse health behaviours points to the importance of primary prevention efforts.⁴¹ Primordial prevention, prevention of the development of risk factors in the first place, includes both individual/clinical approaches while emphasizing macrolevel strategies such as environmental and policy initiatives that enable development and maintenance of healthy behaviours.⁴² The AHA has prompted considerable global attention on primordial and primary prevention and the promotion of ICVH across the lifespan.⁴³

Addressing lifestyle and risk factors early in life

Most children are born with ICVH as operationalized by AHA metrics that include four health behaviours (smoking status, body-mass index (BMI), physical activity, and healthy diet score) and three health factors (total cholesterol, blood pressure, and fasting plasma glucose). Substantial data generated from clinical and epidemiological studies indicate that atherosclerotic processes begin early in life and are influenced over time by potentially modifiable behaviours, health factors, and environmental exposures.^{44,45} Data also indicate that individuals who maintain optimal levels of established risk factors for CVD through adult life have dramatically lower lifetime CVD risk and longer survival than their adult counterparts who developed one or more risk factors earlier in life.⁴⁶

Evidence generated from several paediatric cohort studies highlight the benefits of primordial prevention beginning early in life. The Special Turku Coronary Risk Factor Intervention Project for Children (STRIP), randomized families of 6-month-old infants (who were recruited from clinics in Turku) to a dietary intervention ($n = 540$) or control ($n = 522$).⁴⁷

The dietary intervention was designed to guide participants towards a diet beneficial for cardiovascular health and focused on replacing saturated fats with unsaturated fats. Individualized dietary counselling transitioned from parent to child at approximately 7 years of age, continued at least biannually until 20 years of age, and also focused on reduction of salt intake and increase in whole-grain products, fruit, and vegetables. At follow-up in adolescence, those in the control group who received usual paediatric primary care had increased risk of low ICVH ($\leq$

3 metrics) compared with intervention adolescents; the number of ICVH metrics was inversely associated with aortic intima-media thickness ($P < 0.0001$) while the risk of high intima-media thickness (>85 th percentile) was substantially higher in adolescents with a low number of ICVH metrics compared with those with a higher score (risk ratio = 1.78, 95% CI 1.31–2.43). In another analyses of STRIP data, conducted when participants were 20 years of age, the long-term relative risk of metabolic syndrome was significantly lower in the intervention group (relative risk 0.59, 95% CI, 0.40–0.88; $P < 0.009$).⁴⁸ Taken together, the results from this landmark study support the importance of clinical, individual, and family-focused life course approaches to primordial prevention of CVD and provided evidence to inform guidelines for promoting cardiovascular health early in life.⁴⁹

The importance of psychosocial factors and health inequalities

Adding to the evidence supporting life course approaches to primordial prevention are findings from the Cardiovascular Risk in Young Finns Study, a multicentre study that included participants ($n = 1089$) who were 3–18 years of age at baseline.⁵⁰ A major aim was to examine the cumulative effect of psychosocial exposures and factors (socioeconomic and emotional environments, life events, self-regulation, health behaviours, social adjustment) in youth on AHA-defined ICVH in adulthood. Results indicated that a favourable socioeconomic environment and participants' self-regulatory behaviour were the strongest predictors of ICVH 27 years later in adulthood. Of note, individuals exhibiting favourable levels in all psychosocial factors in youth had the healthiest profiles in adulthood. In contrast, highlighting the association of adverse environmental exposures and experiences in early life and cardiometabolic health in adulthood are results from several studies summarized in a statement from the AHA. This statement supported the need for both individual and population-based primordial prevention.⁵¹ Central to population-based prevention and to reducing disparities in cardiovascular health are macrolevel strategies targeting contexts in which healthy lifestyles develop and are maintained.

Relevant contexts include family, schools, worksites, and communities (including the built environment and quality and quantity of available foods). As suggested in socioecological models of health and behaviour, local, national, and global policies that influence these contexts are of critical importance. For example, local and national school policies impact the food and physical activity environments of schools, recognized venues for

population-based primordial and primary prevention for children and youth.⁵² The MESA study provides evidence reaffirming associations between neighbourhood characteristics (socioeconomic status, availability of healthy foods, and outlets for physical activity) and level of cardiovascular health.⁵³ Harper and colleagues⁵⁴ suggest that the interactions among early-life socioeconomic environments/contexts and risk factor trajectories influence both the development and maintenance of health behaviours and their 'cumulative biologic' sequelae as part of a major life course process linking socioeconomic position in early life to CVD in adulthood.

Which public health measures are the most important?

Collectively, the accumulated evidence supports life-course clinical and population-based approaches and strategies in order to realize optimal cardiovascular health for diverse populations. A 2019 global impact assessment analysis argues convincingly for three public health interventions that have potential to save approximately 100 million lives globally within 25 years.⁵⁵ Specifically, the high-impact interventions targeted are improving treatment of high blood pressure to 70%, reducing sodium intake by 30%, and eliminating the intake of artificial trans fatty acids. Of note, programmes and policies targeting these interventions have been shown to be effective but will require multipronged approaches with tailoring to region/country-specific needs and resources. Increasing coverage for the identification of hypertension and treatment will require availability of and access to medications, blood pressure monitors, dose-specific treatment protocols, expansion of primary healthcare coverage, and healthcare information systems that facilitate tracking and monitoring of rates of treatment and control. Policies that target primary sources of sodium in each country will be required to reduce sodium intake by 30%. Since it is well established that packaged food and food eaten away from the home are major contributors to sodium intake worldwide, evidence-based policy options focused on industry targets, front-of-pack labelling, and institutional food standards in schools, government offices, and other institutions are recommended. In low- and middle-income countries, homemade food is the major source of sodium intake indicating a need for public education and media campaigns to reduce intake. Similarly, policies and regulatory mechanisms will facilitate the elimination of trans fat worldwide. Of note, approximately 23 countries have such regulations (as of 2018) and the WHO has offered specific

recommendations including promoting replacement with healthier oils, and creating awareness among industry, policymakers, and consumers.⁵⁶

How can nurses help?

The potential for primordial prevention to promote optimal cardiovascular health on a global level has been demonstrated. While multilevel efforts will be essential in realizing the World Heart Federation and AHA goals for cardiovascular health, nurses are the largest healthcare discipline managing CVD risk factors globally and are well positioned in healthcare and community settings to implement evidence-based, country/region-specific prevention guidelines.

Recognizing the importance of policies necessary to create healthy food and physical environments, access to affordable, quality healthcare, and as advocates for the health of the public worldwide, nurses must participate in targeted activities designed to allocate resources and increase capacity for promoting primordial as well as primary prevention.

Conclusion

In summary, it is time to embrace the multifactor, multi-level challenges and opportunities for improved CVD prevention. Focusing on guideline-based multifactor care management for multiple comorbidities, along with the emerging importance of technology, will help us to better manage community-based patients living at home with CVD, stroke, and for those with high-risk comorbidities. Medical therapies and interventions must be easily available, accessible, affordable, and financially supported to improve utilization. Optimizing prevention across the life course includes primordial, primary, and secondary interventions. As such, prevention begins early in life, extends beyond the individual level, and includes contexts/environments where healthy behaviours and lifestyles are developed and the policies that impact those environments. Successful prevention is also family focused and addresses the unique needs of the family across the lifespan. Telemedicine, computers, handheld devices, and wearable and other technologies are important advancements for home and community-based care. Computer-based support is essential including social media, email, Internet, text messaging, and the use of iPhone reminders. By expanding our reach, developing our tools for prevention, and coordinating care across all ages and communities, we can provide the much-needed services of primordial, primary, and secondary prevention around the world.

Concept of total cardiovascular risk and total risk management

In the previous section, we defined primordial, primary, and secondary prevention of CVD. While primordial prevention of CVD is very important, this chapter focuses principally on primary and secondary prevention. In order to define the patient population eligible for primary and secondary prevention, the European Society of Cardiology (ESC) has categorized risk into four levels⁵⁷ and described methods to assess the level of risk in individuals (► **Table 11.6**). This allows us to focus efforts on the right people (see also Chapter 1).

Risk assessment plays a central role in CVPR and is a key component of CVD prevention guidelines in most countries across the globe. Yet, despite the use of this risk estimation in clinical practice across Europe, implementation of MFRR is suboptimal.⁵⁸ A large majority of individuals at high CVD risk are not achieving the recommended blood pressure, lipid, diabetes, and lifestyle goals.⁵⁹ This calls for wider utilization of risk assessment tools, which are specific to different patient groups, are efficient to use, accurate, and support a more personalized approach to communicating risk.⁶⁰ Adding a MFRR score into the electronic medical record can support clinicians in identifying and initiating MFRR counselling and

treatment.^{17,61} Assessment of total cardiovascular risk in individuals should be multifactorial, which represents a paradigm shift from the traditional approach of treating single risk factors in isolation. This is because the total risk of developing CVD (the probability of having an event over a given period of time) is determined by the combined effect of cardiovascular risk factors present, including age, sex/gender, smoking status, blood pressure, and total cholesterol⁶² or body mass index (BMI). For example, an individual with several mildly raised risk factors may be at a higher total risk of CVD than someone with just one elevated risk factor; this is demonstrated in ► **Table 11.7**.⁵⁷ Evidence from randomized controlled trials shows that assessment based on total risk leads to more optimal prevention with a strong association between the level of the patient's pre-intervention total CVD risk and the degree of treatment benefit.⁶¹

Risk estimation tools are useful for clinicians in identifying individuals at high multifactorial risk for CVD and directing the intensity of the prevention intervention accordingly. Estimating CVD risk forms the basis for initiating a conversation with the patient about risk reduction strategies, leading to shared decision-making regarding lifestyle goals, medical risk factor management, and the initiation and adjustment of preventive

Table 11.6 Risk categories

Very high-risk	Subjects with any of the following. ● Documented CVD, clinical or unequivocal on imaging. Documented clinical CVD includes previous AMI, ACS, coronary revascularization and other arterial revascularization procedures, stroke and TIA, aortic aneurysm and PAD. Unequivocally documented CVD on imaging includes significant plaque on coronary angiography or carotid ultrasound. It does NOT include some increase in continuous imaging parameters such as intima-media thickness of the carotid artery. ● DM with target organ damage such as proteinuria or with a major risk factor such as smoking or marked hypercholesterolaemia or marked hypertension. ● Severe CKD (GFR <30 mL/min/1.73 m²). ● A calculated SCORE ≥10%.
High-risk	Subjects with: ● Markedly elevated single risk factors, in particular cholesterol >8 mmol/L (>310 mg/dL) (e.g. in familial hypercholesterolaemia) or BP ≥180/110 mmHg. ● Most other people with DM (with the exception of young people with type I DM and without major risk factors that may be at low or moderate risk). ● Moderate CKD (GFR 30–59 mL/min/1.73 m²). ● A calculated SCORE ≥5% and <10%.
Moderate risk	SCORE is ≥1% and <5% at 10 years. Many middle aged subjects belong to this category.
Low-risk	SCORE <1%

ACS = acute coronary syndrome; AMI = acute myocardial infarction; BP = blood pressure; CKD = chronic kidney disease; DM = diabetes mellitus; GFR = Glomerular filtration rate; PAD = peripheral artery disease; SCORE = systematic coronary risk estimation; TIA = transient ischaemic attack.

Table 11.7 Impact of combinations of risk factors on SCORE 10-year risk of fatal cardiovascular disease

Sex	Age (years)	Cholesterol (mmol/L)	SBP (mmHg)	Smoker	Risk (10-year risk of fatal CVD)
F	60	7	120	No	2%
F	60	7	140	Yes	5%
M	60	6	160	No	9%
M	60	5	180	Yes	21%

SBP, systolic blood pressure.

medication (avoiding undertreatment of high-risk patients and overtreatment of low-risk patients) as appropriate.

How to estimate total cardiovascular disease risk

Adopting a total risk approach to CVD prevention ensures that individuals at highest CVD risk gain the most from preventive measures. There are several tools that can be used to estimate cardiovascular risk and all have their own unique features which should be considered prior to use.⁶⁰ European guidelines recommend estimating risk in apparently healthy individuals using the Systematic Coronary Risk Evaluation (SCORE) tool.⁵⁷ SCORE predicts the likelihood of fatal CVD events, with the threshold for very high risk being defined as a risk of death of 10% or greater. The level of 10-year CVD risk whether low (<1%), moderate (≥1% to 5%), high (≥5% to <10%), or very high (≥10%) should guide the intensity of the preventive action. To learn more about utilizing the SCORE risk estimation tool in clinical practice and the various categories of risk, please visit the ESC website (<https://www.escardio.org>).⁶³ Risk can also be estimated using charts where access to the electronic tool is unavailable (<https://www.escardio.org/Education/Practice-Tools/CVD-prevention-toolbox/SCORE-Risk-Charts>). While SCORE has many advantages in terms of its intuitive nature and objective assessment of risk, it is only suitable for apparently healthy individuals between 40 and 65 years of age. It is not suitable for patients over 65 years of age as it will overestimate risk and is not intended for use in patients with established CVD as these patients are automatically considered high risk. The use of SCORE in young people with multiple risk factors poses a challenge

as a low absolute risk may conceal a high relative risk, which would require intensive lifestyle modification. To overcome this, the relative risk chart is recommended for use,⁵⁷ demonstrating to young people that through making the recommended lifestyle changes, risk can be significantly reduced. Risk age is another effective tool for communicating with young people with a low absolute risk. The risk age of a person with multiple CVD risk factors is the age of a person with the same level of risk, but with risk factors within recommended levels.⁵⁷

To address CVD risk across all patient categories, ensuring optimization of patient outcomes, there are increasing calls for different risk algorithms for different population groups.⁶⁰ For example the Second Manifestation of Arterial Disease (SMART) risk score (<https://www.escardio.org/Education/ESC-Prevention-of-CVD-Programme/Risk-assessment/SMART-Risk-Score>) is suitable for estimating risk in patients with previous CVD. It recognizes that not all CVD patients are alike and that there can be variation in 10-year risk. In addition, given the very high-risk status of these patients, tools such as SMART can provide ongoing motivation regarding adherence to a healthy lifestyle and medication adherence.

Risk estimation tools provide objective estimates of CVD risk and their use should be complementary to clinical decision-making, while promoting patient empowerment and self-management. The utilization of health behaviour change techniques is an essential component to communicating CVD risk effectively and engaging the patient in the shared decision-making process. With many high-risk patients remaining undiagnosed and untreated,⁵⁹ all opportunities whether systematic or opportunistic to identify patients at increased CVD risk must be promoted.

Components of prevention and rehabilitation in clinical practice

Lifestyle and risk factor management

As described earlier in this chapter, nurses play an important role in an interdisciplinary approach in preventive and rehabilitation programmes. They have the important clinical skills for monitoring and managing lifestyle and risk factors across the age span. The ESC Guidelines in collaboration with experts from the disciplines of dietetics, physical activity, exercise, medicine, psychology, and social care provide nurses with knowledge and tools to become effective CVD prevention specialists. In this section, we will cover the principles of this practice and cross-reference to other resources as appropriate. The settings in which this care can be delivered will be covered in 'Settings and delivery modes for cardiovascular prevention and rehabilitation'.

Adverse lifestyle habits—smoking, poor diet, and sedentary behaviour—are associated with obesity, raised blood pressure, abnormal lipid profiles, and glucose dysregulation. All of these factors are linked to premature mortality from CVD (see also Chapter 1). Therefore, priorities for intervention should include support to stop smoking, to adopt a healthy diet, to increase physical activity and exercise, and to manage body weight using behavioural approaches and taking psychosocial factors into account. In addition, medication will be required in most cases to manage blood pressure, lipids, and diabetes. Nurses are well positioned within the healthcare system to support patients with adherence to these therapies.

All of these risk factors should be managed to the goals outlined in the evidence-based guidelines. The ESC has multiple resources to facilitate this management. Health professionals can access evidence-based clinical practice guidelines on the ESC website (<https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines>). The following guidelines are relevant to preventive care:

- 2021 ESC Guidelines on cardiovascular disease prevention in clinical practice. Developed by the Task Force for CVD prevention in clinical practice with representatives of the European Society of Cardiology and 12 medical societies. With the special contribution of the European Association of Preventive Cardiology (EAPC).⁵⁷
- '2018 ESC/ESH Guidelines for the management of arterial hypertension: the Task Force for the management of arterial hypertension of the European Society

of Cardiology (ESC) and the European Society of Hypertension (ESH).'⁶⁴

- '2019 ESC/EAS Guidelines for the management of dyslipidaemias: lipid modification to reduce cardiovascular risk: the Task Force for the management of dyslipidaemias of the European Society of Cardiology (ESC) and European Atherosclerosis Society (EAS).'⁶⁵
- '2019 ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD: the Task Force for diabetes, pre-diabetes, and cardiovascular diseases of the European Society of Cardiology (ESC) and the European Association for the Study of Diabetes (EASD).'⁶⁶

The ESC Guidelines webpage also includes a number of tools to facilitate implementation of guidelines in clinical practice, including summary cards and pocket guidelines. There is also a pocket guidelines app (<https://www.escardio.org/Guidelines/Clinical-Practice-Guidelines/Guidelines-derivative-products/ESC-Mobile-Pocket-Guidelines>) which can be downloaded to a smart device. ACNAP has a toolkit (<https://www.escardio.org/Sub-specialty-communities/Association-of-Cardiovascular-Nursing-&-Allied-Professions/Education/be-guidelines-smart>) which provides materials to empower nurses to participate in guidelines implementation. The ESC Association of Preventive Cardiology website ([https://www.escardio.org/Sub-specialty-communities/European-Association-of-Preventive-Cardiology-\(EAPC\)/Education](https://www.escardio.org/Sub-specialty-communities/European-Association-of-Preventive-Cardiology-(EAPC)/Education)) has an education section and prevention toolbox.

Supporting patients and families to make healthy lifestyle changes

In order to successfully support healthy lifestyle changes in our patients, there are a number of factors to take into account. These include the different ways in which people define and view their health,⁶⁷ beliefs and perceptions patients may have about their condition, the social and environmental context in which people are living, psychological comorbidities, and the level of support from family, carers, friends, and colleagues. Health behaviours are influenced by all of these factors. For example, cultural beliefs and habits in relation to food, legislation pertaining to tobacco and unhealthy foods, the cost of healthy foods, provision of exercise facilities in the built environment, social support, stressful work environments, and psychological factors such as anxiety and depression. Nurses and other health professionals need to have an understanding of these complexities in order to prepare themselves for supporting

Box 11.1 The environmental context and behavioural change

Example: people make lifestyle choices in the context of their environment. An understanding of the environmental context allows more empathy when addressing behavioural change, for example, quitting smoking. This context may include the following:

1. Social pressure—the rest of the family smokes; friends, carer(s), and others in the leisure environment smoke.
2. Social isolation—there is no one to reinforce the messages the patient receives from the nurse, no ‘buddy’ to accompany them in this task, no one to encourage them and give them confidence.
3. Psychological need—smoking may be perceived as being one of the only comforts the patient has in life, a way of coping with stress at work and in general.
4. Social conditioning—smoking may be seen as the social norm. Anecdotal accounts of longevity associated with smoking may be recounted.
5. Socioeconomic status—smoking is more prevalent in manual compared to non-manual workers and those with a lower educational attainment.
6. The government receives substantial revenue from cigarette taxes and is therefore reluctant to take drastic measures such as banning cigarette advertising to reduce the prevalence of smoking.

individuals and families to change their lifestyle. ► **Box 11.1** demonstrates how the environment may influence people in relation to making behavioural changes.

Other influencing factors for healthy change include the balance of power between professionals and patients. Patients and family members should feel empowered to make healthy choices and not coerced to do so. A helping partnership empowers patients to take control of their illness, set their own priorities for change, and to engage in self-care and self-management. Sharing information, sharing agenda setting, and planning jointly, all encourage patients to participate in shared decision-making. Motivation and intention to initiate behaviour changes requires professional follow-up and support. Effective communication and counselling skills are essential to encourage the initiation of these changes.

Theories and approaches to health behaviour change

Over the years, several empirical theories have been described in the literature to explain health behaviour

change such as the Health Belief model,⁶⁸ the theory of self-efficacy,⁶⁹ and the transtheoretical model.⁷⁰ More recently, Michie and colleagues have developed a taxonomy of behaviour change strategies used in clinical practice⁷¹ and elaborated the COM-B model (► **Fig. 11.2**) for behaviour change⁷¹ which categorizes the ability for individuals to make changes according to their capability (available knowledge, skills, and capacity to engage in desired behaviour), opportunity (factors external to an individual that allow or prompt them to engage in a behaviour), and their motivation (all brain processes that lead an individual to decide to behave in a certain way). ► **Fig. 11.3**⁷² outlines the complexity of the change process and characterizes interventions and how they relate to policy and behaviour.

A pragmatic approach to helping people change behaviours, which was first used for addiction treatment, is motivational interviewing.⁷³ This strategy is based on a number of principles:

- Encouraging patients to take an active role in therapy.
- Enhancing internal motivation.
- Encouraging patients to explore and resolve ambivalence.
- Exchanging information rather than ‘telling’ to find solutions.
- Developing a collaborative relationship between professional and patient.
- Drawing on patient’s resources and motivation.
- Allowing autonomy and avoiding being authoritative.
- Resisting the ‘righting’ reflex.
- Supporting self-efficacy.

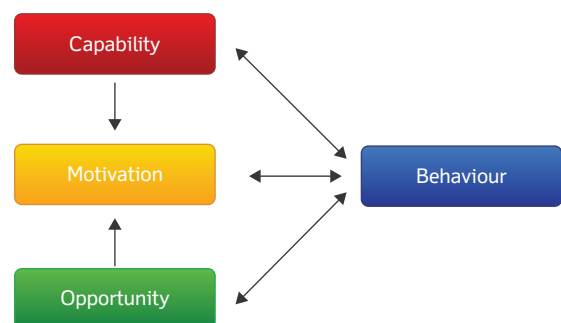


Fig. 11.2 The COM-B Model.

<http://www.behaviourchangewheel.com/about-wheel>.

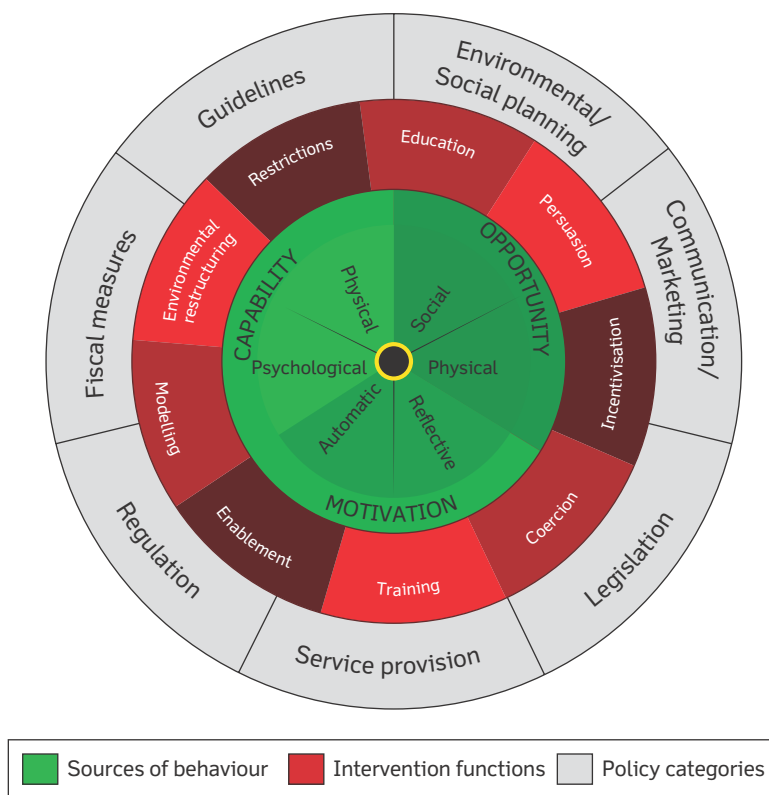


Fig. 11.3 The Behaviour Change Wheel.

- Using a counselling approach which includes expressing empathy and active listening techniques (► Box 11.2).

The important contribution of family members and other caregivers should also be stressed in relation to making behaviour change more successful.

Box 11.2 Using OARS principles when counselling patients

Open-ended questions: 'Since you had your heart attack there are a number of things that are concerning you. What would you like to talk about first?'

Affirmation: 'It takes a lot of strength and determination to stay away from smoking like you have done over the last week.'

Reflective listening: 'I can see that you are quite concerned you may have another heart attack.'

Summarizing: 'So we have talked about ... and you have decided that you would like to ...'

Use of behavioural approaches includes the negotiation of realistic goals using 'SMART' principles. Goals should be specific, measurable, achievable, realistic, and timely and graded so that they represent what will be achieved in both the longer and shorter ('1 day at a time' goals) terms. Follow-up and progress monitoring towards reaching goals, managing lapses and problems, and developing a contingency plan to prevent relapse is essential.

Tobacco and smoking cessation management

All patients and families should be supported to become tobacco free. The risks associated with continued tobacco use and the benefits of quitting are clear.⁷⁴⁻⁷⁶ The best way to achieve and maintain abstinence in cardiac patients and their families is to integrate tobacco cessation support into CVPR programmes. In order to do this, nurses and other members of the interdisciplinary team require training in skills to support patients and families in a quit attempt. In the UK, there is a national centre for smoking cessation and training which provides online training internationally

Box 11.3 The 5As

- *Always* ask your patients about smoking.
- Advise those who are smoking to quit.
- Assess nicotine dependence in smokers and motivation to quit.
- Agree on a treatment plan which encompasses counselling and pharmacology in those motivated to quit.
- Arrange follow-up.

(<https://elearning.ncsct.co.uk/>). The '5As' (► **Box 11.3**) provide a reminder of the steps to be taken by all health professionals practising in any setting preparing themselves to provide tobacco cessation support.

The basis for a successful quit attempt is a comprehensive assessment which incorporates the following:

- Smoking status and biomarker validation.
- Measurement of nicotine dependence.
- Readiness to quit and when (e.g. in a month or in 6 months).
- Motivation—importance and confidence. Identify ambivalence.
- Past quit attempts.
- Psychological comorbidities (e.g. depression).
- Others in the household who smoke.

Assessing smoking status

Smoking status can be assessed using the following questions:

1. Have you ever smoked?
2. How many years have you smoked?
3. How long ago did you stop smoking?
4. Do you smoke now?

Self-reported smoking status is more reliable if validated with a biomarker. An expired breath carbon monoxide monitor provides a pragmatic way to measure this in a clinical setting because it is inexpensive, provides an immediate result, and has the benefit of visual demonstration of the harms of tobacco to patients.

Assessing dependence on tobacco

The nicotine contained in tobacco is extremely addictive, which is why the early stage of a quit attempt is challenging. Once dependent on tobacco, being deprived of a

cigarette induces 'nicotine hunger' in a smoker which manifests in several symptoms of withdrawal including irritability, aggression, depression, restlessness, anxiety, poor concentration, light-headedness, insomnia, and urges to smoke. Most of these symptoms will disappear within 1 month of quitting, although urges to smoke can persist or re-emerge some time after a quit attempt has been made. However, it is reassuring to be able to tell patients that they are not likely to feel the discomfort of physical withdrawal a month beyond their quit date.

Smokers with a high dependency on nicotine will benefit most from pharmacological and counselling support during their quit attempt. Many cardiac and high CVD risk patients who are smokers will fall into this category as they have been smoking several cigarettes per day for many years. Validated available measures of nicotine dependence include the Heavy Smoking Index⁷⁷ (► **Table 11.8**) and the Fagerström Test for Nicotine Dependence.⁷⁸ The most important indicators of dependence are time of the first cigarette of the day and number of cigarettes smoked per day. A higher score on both measures is an indicator of higher dependence.

Table 11.8 Heavy Smoking Index to measure dependence on nicotine

Heavy Smoking Index

How many cigarettes do you smoke each day?

- 31 plus (1.5 pack plus) = 3 points
- 21 – 30 (1 – 1 and half packs) = 2 points
- 11 – 20 (half – 1 pack) = 1 point
- 1 – 10 (half pack or less) = 0 points

How soon after waking do you smoke your first cigarette?

- Within 5 minutes = 3 points
- From 6 – 30 minutes = 2 points
- From 30 minutes – 1 hour = 1 point
- More than one (1) hour = 0 points

Heavy Smoking Index Score (add points from 1 & 2 above)

0 – 1 = Light Smoker	2 – 3 = Moderate Smoker	4 – 6 = Heavy Smoker

Box 11.4 Using scaling questions to measure motivation and build self-efficacy

Build self-efficacy:

- 'On a scale of 1–10, how important is it for you to quit?'
- 'Using the same scale, how confident are you that you can quit?'
- 'So why are you a ... on the scale and not 10?'
- 'What would it take to move you from ... to 10?'

Assessing readiness to quit and motivation

Many smokers want to quit but are often ambivalent and lacking confidence and about how and when they will stop. An important role for the professionals is to build self-efficacy by providing information on pharmacotherapy and exploring the pros and cons of quitting with their patients.

► **Box 11.4** shows one of the tools you can use to do this.

Assessing past quit attempts

Many patients believe that a failed attempt in the past to stop smoking means they cannot succeed in a future attempt. It is important to explore these past attempts in order to understand possible reasons which may include, for example, suboptimal use of pharmacotherapy. This exploration also provides an opportunity to reframe perceptions. A past quit attempt which lasted for a few years can be seen as a success to build on rather than a failure which cannot be redeemed.

Assessing psychological comorbidities

Dependence on nicotine may be a way for some smokers to lift their mood given the antidepressant properties of nicotine. However, in the long term, mental health is improved with smoking cessation.⁷⁹ Therefore, it is important not to deter quit attempts due to this concern.

Assessing smoking in the family

Smokers attempting to quit will be facing significant barriers if there are other members of the household, close friends, or carers who smoke. It is important to assess the level of available social support and engage spouses, partners, and others in supporting patients attempting to quit. Quitting smoking at the workplace where smoking is permitted makes quitting difficult. Public policies and workplace policies prohibiting smoking are essential. Quit attempts can be all the more successful if they are

embarked on with others. Quitting smoking with a spouse or significant other who smokes contributes greatly to success.

Key components of behavioural support

Some patients may have quit at the time of their cardiovascular event but will need support to sustain their quit attempt in the form of pharmacotherapy and counselling, and others will be embarking on a quit attempt when they join a CVPR programme. This setting has the opportunity of providing smoking cessation support over the duration of the programme where a quit attempt can be initiated, monitored, and followed up in participants. Support delivered at this important time has the advantage of preventing relapse so often associated with the early stages of a quit attempt. While this should include support from all members of the interdisciplinary programme team, it should be coordinated by a particular member of the team. Nurses are ideal to take on this task.

Behavioural support should be provided alongside pharmacotherapy. The key components of this support⁸⁰ are outlined as follows and can be carried out using a group based or individual one-to-one approach:

1. Ask patients to identify and record their personal reasons for quitting—they will be able to revisit these in moments of weakness and reinvigorate their quit attempt.
2. Ensure that patients are realistic about the challenges they face in making the quit attempt, the importance of using pharmacotherapy, and identify ways of coping with withdrawal.
3. Set a quit date and reinforce the importance of not having one puff of a cigarette. Encourage patients to prepare for the attempt by disposing of ashtrays, cigarettes, letting friends and family know that they are quitting and asking for their support, and so on.
4. Remind patients of the seriousness of their decision to quit and how important it is to remain abstinent especially during the challenging first week.
5. Record the baseline breath carbon monoxide reading and chart the decline to normal after the quit date. Record a carbon monoxide reading each time the patient visits the programme to check adherence. This will provide an opportunity to discuss lapses and avoid long-term relapse.
6. Ask patients to identify 'triggers' for lapsing and discuss ways to manage them.

Box 11.5 How to manage lapses and get back on track

- Where the patient fails to stick to their quit date—set a new date or a reduction plan (see ‘Medication to support quit attempts’).
- Reinforce the need to stay in contact even if a lapse occurs.
- Remind the patient to look at their original reasons for quitting to rejuvenate commitment.

7. Remind patients that withdrawal from nicotine is unlikely to last more than a month.
8. Discuss medication choices and explain how to take it. Monitor tolerance and adherence.
9. Use remote support strategies like texting, telephone helpline, and emailing if urgent support with lapses is required. See ► **Box 11.5** for how to help with lapses.

Medication to support quit attempts

In this section, the most effective medications to support stop smoking attempts will be covered, that is, varenicline (Champix®) and nicotine replacement therapy (NRT). More details and information on other medications used in smoking cessation can be found in *The ESC Textbook of Preventive Cardiology*⁸¹ and *The ESC Handbook of Preventive Cardiology*.⁸² Using medication to support a quit attempt is essential and especially in cardiovascular patients. Medications are mostly prescribed to support abrupt quit attempts, that is, where a patient quits completely on a set quit date. However, medication can also be used to help a patient to reduce tobacco in the run up to a quit date. In addition, medication has been shown to be useful in supporting temporary abstinence (e.g. on long-haul flights and in other settings where abstinence is required for a temporary period), and to provide harm reduction in those who are unable to quit completely.

Varenicline (Champix®)**What is it?**

This medication comes in tablet form and contains a partial receptor agonist, which provides relief from withdrawal and reduces the desire to smoke.

How is it prescribed and taken?

Varenicline is taken over a 12-week course. Initially it is uptitrated over a 1-week period from a dose of 0.5 mg daily (days 1–3), followed by a dose of 0.5 mg twice daily (days

4–7), to a maintenance dose of 1 mg twice daily from day 8 onwards.

Does it have any side effects?

It can cause nausea in around one-third of patients; however, this is usually mild and often tolerated. Some patients report vivid dreams. None of these side effects are dangerous.

Is it safe for patients with heart disease or risk factors?

This medication has been shown to be safe in both the general and cardiac populations.^{83–85} Despite early reports of neuropsychiatric and other adverse events, subsequently research has confirmed its safety in both acute and chronic cardiovascular settings.⁸⁶

What is the best way to use it?

Varenicline is effective when used on its own as described previously. In addition, it can be used in combination with nicotine products. Some success has been reported and some studies are still ongoing.⁸⁷

How effective is it?

This medication has been demonstrated to have the most efficacy for smoking cessation.⁸³ The minimum treatment period is 12 weeks but this can be extended depending on how long after starting treatment the patient quits.⁸⁸

Nicotine replacement therapy**What is it?**

This medication comes in various forms including transdermal patches, gum, inhalators, lozenges, and nasal spray. While it contains nicotine, it does not contain all the other harmful constituents present in cigarettes. The nicotine is absorbed through the skin and oral, buccal, or nasal mucosa. It replaces some of the nicotine which a smoker would normally get through their cigarettes and thus provides relief from withdrawal and reduces the urge to smoke.

How is it prescribed and taken?

NRT is most commonly used over a 12-week course. It is most effective when the long-acting patch is used in combination with a short-acting product such as the gum or inhalator.

Does it have any side effects?

Some skin irritation can be experienced with the patch although this is less likely to occur when the site is rotated. This is also true of the mouth and nose.

Is it safe for patients with heart disease or risk factors?

This medication has been shown to be safe in both the general and cardiac populations.⁸⁶

What is the best way to use it?

As described previously, long- and short-acting NRT are best used together. In addition, NRT can be used in combination with varenicline. Some success has been reported and some studies are still ongoing.⁸⁷

How effective is it?

When long- and short-acting NRT are used in combination, they are about as effective as varenicline.⁸³ The minimum treatment period is 12 weeks but this can be extended up to 9 months and beyond if necessary.

Using varenicline and nicotine replacement therapy to reduce smoking with a view to an eventual quit attempt

There is evidence to show that using NRT and varenicline to reduce smoking with an eventual quit in mind is effective. The UK charity Action on Smoking and Health (ASH) describes a 'Cut down to stop' (<https://ash.org.uk/home/>) programme which spreads reduction and quitting over a duration of up to 6 months or more.⁸⁹

Issues with weight gain and smoking cessation

Weight gain is common after a successful stop-smoking attempt with an average of 4–5 kg body weight gain over a year.⁹⁰ Patients who start off their quit attempt overweight or obese gain the most weight; however, while weight gain has an adverse effect on the cardiovascular risk profile, smoking cessation should be prioritized over weight loss as excess weight carries less risk. In addition, weight management can be delayed until a quit attempt has been sustained in the long term. During a programme of CVPR, patients should be offered a tailored programme of healthy diet advice and support to safely increase physical activity and this may mitigate against weight gain.⁹¹

Suggested resources

- *The ESC Handbook of Preventive Cardiology* (chapter 10).⁸²
- *The ESC Textbook Preventive Cardiology* (chapter 10).⁸¹

Adopting healthy eating habits and achieving and maintaining optimal weight and shape

In order to reduce cardiovascular risk, all patients and families require advice and support to adopt a cardioprotective diet and to achieve and maintain a healthy weight and shape. CVD has multiple modifiable risk factors many of which can be improved by adapting a healthier diet and shape. Patients often have more than one comorbidity so understanding how dietary advice can be integrated with the overall care given within a CVPR programme is essential. Support to achieve dietary and body weight goals should be an integral part of a programme. The whole interdisciplinary team therefore requires extended dietary knowledge and understanding. Ideally the team should include a dietitian; however, other team members can play an important role in dietary and weight management supported with the necessary education and training in the required skills.

A healthy diet associated with the lowest risk for cardiovascular disease

There is extensive evidence that diet influences CVD. This is either directly or through its beneficial effect on CVD risk factors. This evidence is available from both population-based studies and RCTs. However, there is often conflicting information due to methodological problems including small sample sizes, short study durations, and the difficulties in identifying the effect of a single dietary factor independent of other changes. As diet is made up of whole foods and not individual nutrients, it is hard to attribute the health effects of a food when it has many nutrient components. This is especially so if reducing one component results in the increase of another. The observed effect would be dependent on the quality of the replacement.

In more recent years, nutritional research has placed greater focus on dietary patterns and foods rather than nutrients. The most commonly referenced dietary patterns are the Dietary Approaches to Stop Hypertension (DASH)⁹² diet and the Mediterranean diet from the Prevención con Dieta Mediterránea (PREDIMED) trial.⁹³ The essential difference between these two diets is the additional focus on extra virgin olive oil or nuts in the latter study. The two trials diets in PREDIMED showed a 30% reduction in incidence of major cardiovascular events compared to those on a low-fat diet.

The Mediterranean diet has a focus on unprocessed, plentiful wholegrain products, vegetables, fruit, fish, and unsaturated fats but is also low in saturated fat. It also advises on a pattern of eating a large variety of whole foods that are fresh and local when possible. This is more important than promoting a single nutrient intake.

Within a CVPR programme, there are the additional challenges of comorbidities and often multiple risk factors which are concurrently being addressed. Working as a team, with the patient and their carers, is essential to establish realistic short- and long-term goals.

Assessing dietary intake

To provide a tailored dietary and/or weight management programme requires a detailed dietary assessment in combination with all other aspects of a CVD assessment.

The two principal methods of assessing dietary intake include what patients recall eating and what they record they have eaten. A quick and useful tool to collect recall information from patients is to use the interview-led validated 9- or 14-point Mediterranean diet score tool.⁹⁴ The 14-item version, known as the Mediterranean Diet Adherence Screener (MEDAS-14), was originally validated for use in the Spanish PREDIMED study⁹⁵ but has since been validated in many other European countries including UK, Germany, and Italy.^{96–99} ► Table 11.9 shows the components of the diet that are assessed when using this tool and how it is scored. An increase of 2 points in

this score has been shown to be associated with a 9% reduction in cardiovascular risk.¹⁰⁰ In addition to using this tool, patients can be asked to record what they have eaten in a 3- or 7-day food diary. Keeping a food diary helps patients to become more aware of the content, quantity, and pattern of their eating (► Table 11.10). The following hints can make the process of keeping a diary easier:

- Record everything that you eat, however small.
- Take the diary everywhere you go.
- Record what you have eaten immediately after eating it so you don't forget.
- Record how you feel when you eat something.
- Record any physical activity you do.

Assessing dietary intake using recall and recording will generate discussion with the patient on how diet can be modified and improved. More information on dietary assessment methods can be found in *The ESC Handbook of Preventive Cardiology*.⁸²

Behavioural strategies to improve dietary patterns

Professionals can use counselling and motivational interviewing techniques (e.g. 'OARS'— Open-ended questions, Affirmation, Reflective listening, Summarizing) to support patients to make healthy dietary changes, including negotiating 'SMART' goals, monitoring

Table 11.9 The 14-point Mediterranean diet score

Mediterranean diet score tool question	Yes/no
Is olive oil the main culinary fat used?	
Are 4 tbs olive oil used each day?	
Are 2 servings (of 200g each) of vegetables eaten each day?	
Are 3 servings (of 80g each) of fruit eaten each day?	
Is <1 serving (100–150 g) red meat, hamburgers, other meat products eaten each day?	
Is <1 serving (12g) of butter, margarine, cream eaten each day?	
Is <1 serving (330 mL) of sweet or sugar sweetened carbonated beverages consumed each day?	
Are 3 glasses (of 125 mL) of wine consumed each week?	
Are 3 servings (of 150 g) of legumes consumed each week?	
Are 3 servings (of 100–150 g) of fish or (200 g) of seafood eaten each week?	
Are <3 servings of commercial sweets/pastries eaten each week?	
Is 1 serving (50 g) of nuts consumed each week?	
Is chicken, turkey or rabbit routinely eaten instead of veal, pork, hamburger, or sausages?	
Are pasta, vegetable or rice dishes flavoured with garlic, tomato, leek, or onion eaten 2 times per week?	
TOTAL SCORE (total number of 'yes' answers)	

Table 11.10 An example of a food diary

DAY: DATE:			
Time of day	What you ate	How much you ate	Thoughts, Feelings & Physical Activity
Early Morning:	Coffee with Skimmed milk	1 cup 1 tbsp	
Breakfast:	Wholemeal bread (large loaf) Salted butter Hard Cheese Egg -boiled	2 medium slices 2 tsp 2 matchbox size pieces 1 medium egg	
During Morning:	Coffee with skimmed milk Apple (eaten with skin)	1 mug 1 tbsp 1 medium	Used stairs rather than lift when shopping
Midday:	Sandwiches: wholemeal bread (brand) large loaf, sliced Butter Ham (no fat) Tomato Banana Diet Cola	4 slices 4 level tsp 2 thin slices 1 large 1 large 1 can (330ml)	Sunny day, felt happy
During Afternoon:	Water Roasted salted peanuts	1 glass 25g packet	Craved something salty
Evening Meal:	Chicken & mushroom casserole (home-made with skimmed milk in the sauce) Rice (steamed) Broccoli, boiled Plain yoghurt with honey Medium orange Half mineral water/half natural orange juice Coffee with skimmed milk	4 heaped tbsp 1 apple sized 3 tbsp 3 tablespoons and 2 teaspoons 1 medium 1 glass 1 cup 1 tbsp	
During Evening:			
Bedtime Snack:	Milk Chocolate.	8 squares	

progress, and exploring strategies to overcome challenges and barriers (see also 'Supporting patients and families to make healthy lifestyle changes'). Some useful educational topics are included in ► **Box 11.6**.

Regarding behavioural changes, creating a supportive network is very important. Professionals can help by providing advice and contact to existing support groups. They can also ensure the involvement of family, friends, and carers. Technology in the form of websites and smartphone apps may also be useful (see 'Technology to support prevention and rehabilitation initiatives').

Box 11.6 Educational topics to support dietary change

- Healthy cooking tips.
- Making healthy choices when shopping and when eating away from home.
- Understanding how to read food labels.
- How to budget when buying healthy foods.
- Understanding portion sizes and how a healthy plate of food looks to ensure a balanced diet (Fig. 11.7).
- Buying local fruit and vegetables in season.

Translating ESC dietary guidelines into understandable messages for patients and families

When advising on the adoption of a healthy diet, professionals should be aware of ways to translate the

evidence-based guidelines into language that is meaningful to the lay public. Guidelines are often written in a way that is hard for untrained personnel to interpret. ►

Table 11.11 shows the ESC prevention guidelines in the left column with some practical advice in the right column.

Table 11.11 Translating guidelines into messages for patients and families to use for patients. An example of this is the table shown below. (REF)

ESC guideline	Practical advice example
● Adopt a more plant and less animal based food pattern	Try to have 1-2 vegetarian meals in a week to support environmental sustainability as well as CV health.
● Saturated fat should account for less than 10% of total energy intake, through replacement by polyunsaturated fatty acids, monounsaturated fatty acids and carbohydrates from wholegrains	Foods including saturated fat include butter, full fat milk, cream, meaty pies and fatty meat for example. Mono-unsaturated fat includes olive oil, rapeseed oil, groundnut oil. Polyunsaturated fat includes sunflower oil or corn oil. Be careful to monitor overall fat intake, especially if attempting to lose weight
● Red meat should be reduced to a maximum of 350-500g a week, in particular processed meat should be minimized.	Replace red meat options with white meat or fish. Choose fresh or frozen cuts of meats that are not processed (e.g. burgers, sausages, cured, breaded, battered). Try to have meat free days
● Limit trans-unsaturated fatty acids as much as possible with preferably none from processed foods.	Trans fatty acids include margarine, shop bought cakes, biscuits and other convenience foods.
● 30-45 g of fibre per day, preferably from wholegrain products	Increasing intake of dietary fibre can be achieved by eating more fruit and vegetables, porridge oats, pulses (lentils, kidney beans, chickpeas, baked beans, peanuts), wholemeal bread, wholemeal breakfast cereals (shredded wheat) and potato skins.
● ≥ 200 g of fruit per day (2-3 servings)	A portion equals for example: 4 heaped tablespoons of French beans or cooked greens, a 5 cm piece of cucumber, two whole canned plum tomatoes, two dried figs, an orange or apple, two handfuls of raspberries, a heaped tablespoon of sultanas, two small tangerines. Be realistic about increasing targets gradually (see figure [] for more information on portion size)
● ≥ 200 g of vegetables per day (2-3 servings)	
● Fish is recommended once or twice a week, in particular fatty fish.	Examples of fatty fish are sardines, pilchards, mackerel, tuna, salmon or trout.
● 30g unsalted nuts per day	Choose raw nuts with no added flavouring. Monitor amount eaten.
● Consumption of alcoholic beverages should be limited to a maximum of 100g per week.	A glass or unit (approx. 10g of alcohol) of alcohol is equal to 25 mls of spirits, a 125 mls glass of 9% wine and 250 mls of standard beer.
● Less than 5 g of salt per day	Use other flavourings instead, such as herbs, spices, lemon juice, garlic, pepper, vinegar and chilli. Avoid convenience meals, stock cubes and salty snacks because they contain a lot of salt and sugar.
● Sugar-sweetened beverages such as soft drinks and fruit juices must be discouraged	Replace with water, water flavoured with a squeeze of lime, coffee/tea without sweeteners. Fruit juices are high in sugar as the fibre has been broken down and many portions are required to produce one glass.

Representing guidelines as real foods will make them easier to use for patients.

Encouraging patients to eat from the major food groups is important to ensure a balanced diet. The advice outlined in ► **Table 11.11** breaks the guidelines into practical foods groups with examples of foods and recommended intake frequency. More detail on food groups is available in *The ESC Handbook of Preventive Cardiology*.⁸²

When giving dietary advice, it is also important for the healthcare provider to be respectful to any cultural, religious, or socioeconomic restrictions. In addition, it is important to incorporate the environmental issues related to food and food manufacturing. As the Mediterranean diet has such a high focus on diverse plant foods, it not only addresses environmental drive to help the planet, but it also will help to improve the gut biome.

There is currently no evidence to support the use of supplements or fortified foods unless deficiencies are identified or if the patient's diet is severely restricted. If this is the case, they would need an individual session with a dietician for additional assessments.

Food choices to lower low-density lipoprotein cholesterol and improve the overall lipoprotein profile

See ► **Table 11.12**.

Achieving and maintaining optimal weight and shape

Overweight and obesity are associated with increases in cardiovascular death and all-cause mortality. All-cause mortality is lowest in those with a BMI of 20–25

Table 11.12 Food choices to modify the blood lipid profile

	To be preferred	To be used in moderation	To be chosen occasionally in limited amounts
Cereals	Wholegrains	Refined bread, rice, and pasta, biscuits, corn flakes	Pastries, muffins, pies, croissants
Vegetables	Raw and cooked vegetables	Potatoes	Vegetables prepared in butter or cream
Legumes	Lentils, beans, fava beans, peas, chickpeas, soybean		
Fruit	Fresh or frozen fruit	Dried fruit, jelly, jam, canned fruit, sorbets, ice lollies/popsicles, fruit juice	
Sweets and sweeteners	Non-caloric sweeteners	Sucrose, honey, chocolate, sweets/candies	Cakes, ice creams, fructose, soft drinks
Meat and fish	Lean and oily fish, poultry without skin	Lean cuts of beef, lamb, pork, and veal, seafood, shellfish	Sausages, salami, bacon, spare ribs, hot dogs, organ meats
Dairy food and eggs	Skimmed milk and yoghurt	Low-fat milk, low-fat cheese and other milk products, eggs	Regular cheese, cream, whole milk, and yoghurt
Cooking fat and dressings	Vinegar, mustard, fat-free dressings	Olive oil, non-tropical vegetable oils, soft margarines, salad dressing, mayonnaise, ketchup	Trans fats and hard margarines (better to avoid them), palm and coconut oils, butter, lard, bacon fat
Nuts/seeds		All, unsalted (except coconut)	Coconut
Cooking procedures	Grilling, boiling, steaming	Stir-frying, roasting	Frying

kg/m².¹⁰¹ While this is true in those less than 60 years of age, it may not be so in the elderly, where a higher body weight is healthier. Having a healthy weight and shape is also associated with superior cardiovascular risk factor control.

Obesity is the result of an imbalance in energy intake and expenditure; however, this occurs because of complex behavioural and societal factors. Effective weight management requires a three-pronged approach encompassing dietary management, physical activity, and behavioural strategies. Even losing as little as 10% of body weight can be of benefit to an obese person. Calorie reduction depends on eating less, replacing unhealthy with healthy food options, and changing the balance of food eaten throughout the day (► Fig. 11.4).

The European prevention guidelines⁵⁷ recommend that people with healthy weight, that is, a BMI between 20–25 kg/m², maintain their weight and that overweight and obese people achieve a healthy weight (or aim for a reduction in weight) in order to reduce cardiovascular risk. The WHO has further refined this goal taking ethnicity into account (► Table 11.13).¹⁰²

Anthropometric measurements used in assessment of overweight and obesity

Measuring obesity is an important part of a cardiovascular assessment. Body fat can be measured in different ways, each with pros and cons. The most common is the BMI which classifies weight according to height. It is calculated

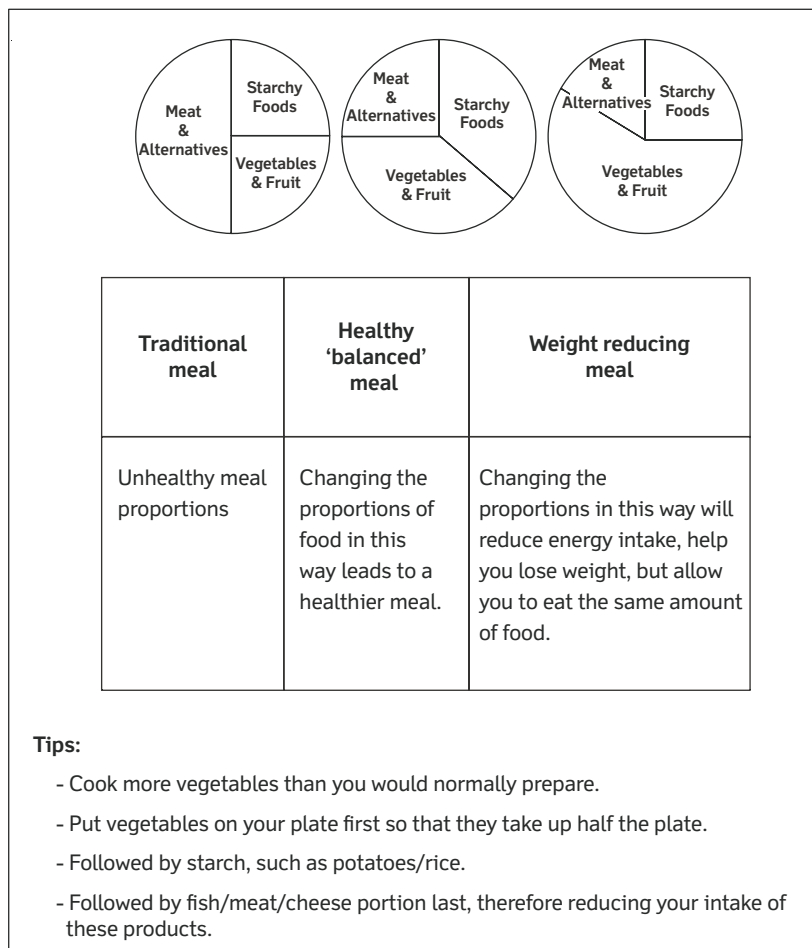


Fig. 11.4 Balancing nutrition: food plates.

Table 11.13 WHO BMI recommendations

White European population (kg/m ²)	Asian population (kg/m ²)	Description
<18.5	<18.5	Underweight
18.5–24.9	18.5–23	Increasing but acceptable risk
25–29.9	23–27.5	Increased risk
≥30	>27.5	High risk

using the following formula: weight (kg)/(height (m))². It is inexpensive, simple to calculate, and strongly correlates with body fat levels as measured by the most accurate methods. It is also supported by many studies showing a correlation between increased BMI and higher risk of chronic disease. Other methods that are common in clinical practice for measuring body fat are waist circumference (see following subsection), waist-to-hip ratio, skinfold thicknesses, and bioelectrical impedance. Other methods such as magnetic resonance imaging or dual-energy X-ray absorptiometry are expensive and more complex to measure and so are not suitable for everyday community practice.

Measuring body weight and height

- Shoes should be removed along with heavy overclothes and any heavy items from the patient's pockets like keys or loose change.
- Height should be measured without shoes and with the heels together, with the so-called Frankfurt plane of the head in a horizontal position.
- The patient should breathe in deeply and reach up to their maximum height.
- The feet should be flat on the ground.

Waist circumference provides a measure of central obesity which is important in assessing cardiovascular risk. Although waist circumference and waist-to-hip ratio provide the same information, the latter requires two measurements so the risk of error is increased resulting in the former being used more frequently. Body fat stored in the abdomen carries a higher risk than subcutaneous fat. For every 5 cm increase in waist circumference over 4 years, there is an increased risk of total and cardiovascular mortality.¹⁰³ The European thresholds for advising on weight

Table 11.14 International Diabetes Federation guidance on waist circumference

European	Men >94 cm (37 inches) Women ≥80 cm (31.5 cm)
South Asian	Men >90 cm (35 inches) Women ≥80 cm (31.5 cm)
Chinese	Men >90 cm (35 inches) Women ≥80 cm (31.5 cm)
Japanese	Men >90 cm (35 inches) Women ≥80 cm (31.5 cm)
Ethnic South and Central America	Use European data until more specific ones are available
Sub-Saharan Africa	Use European data until more specific ones are available
Easter Mediterranean, Middle East, and Arab populations	Use European data until more specific ones are available

reduction are a waist circumference of at least 102 cm in men and at least 88 cm in women. In addition, a waist circumference of at least 94 cm in men and at least 80 cm in women represents the threshold at which no further weight should be gained. The International Diabetes Federation (IDF) has refined these thresholds by ethnicity (► **Table 11.14**).¹⁰⁴

Measuring waist circumference

- Sit in front of the patient and ensure they are standing straight with both feet together, arms relaxed down by their side (supporting themselves on a piece of furniture if they cannot balance) and looking straight ahead.
- Measure next to the skin or over one piece of light clothing.
- Palpate the lowest rib and iliac crest (► **Fig. 11.5**) and measure the midpoint between the two points.
- Pass the tape around the patient ensuring it is horizontal and not twisted from the midpoint.
- The tape must be taut but not tight. Encourage the patient to breathe normally, taking the measurement at the end of expiration.

Interventions to support weight loss

Achieving the BMI goal of 20–25 kg/m² is often unrealistic. Even a 10% reduction of total body weight has been shown to have health benefits relating to total mortality,¹⁰¹ diabetes-related deaths/morbidity, reduction of blood pressure, and reduction of cholesterol.

It is important to identify the root causes of weight gain as well as physical, mental, and psychosocial barriers when working with patients who have identified weight loss as a goal during their time on the CVPR programme. Reducing weight is a long-term process. When planning an individual's interventions, the patient's longer-term support should be identified early. Nutrition and exercise are the cornerstone to any weight loss intervention but adjunctive therapies outside the scope of the CVPR team maybe appropriate (additional psychological behavioural, pharmacotherapy, and surgical interventions).

Negative energy balance is required to lose weight, achieving this can be done in multiple ways. One way is by working with patients and their families to reduce portion sizes of foods or change the proportion of food groups in their diet alongside increasing their lifestyle activity levels (► Fig. 11.4 and ► Table 11.15).

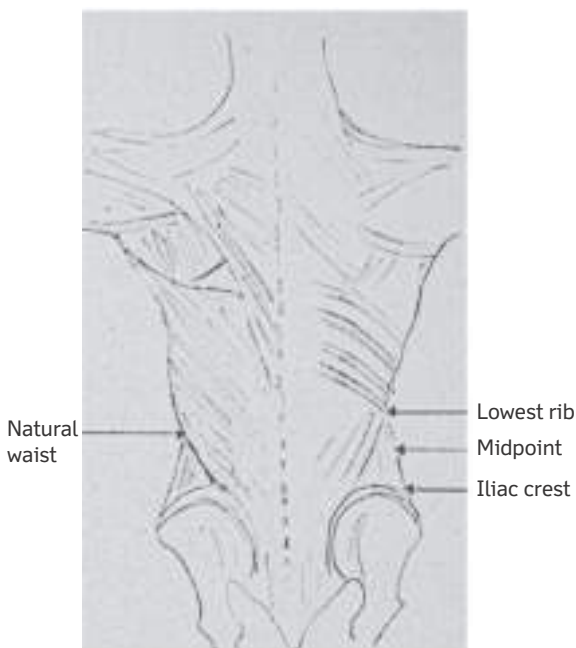


Fig. 11.5 Where to measure waist circumference.

As many patients with CVD have comorbidities, having the support from nutritionally qualified healthcare providers (preferably a dietician) is essential to do this effectively and safely. While a Mediterranean diet has been shown to reduce CVD risk, if an alternative pattern is more suitable to enable particular patients to achieve the necessary weight loss and would be of benefit in improving CVD risk factors, it should be considered. There is increasing evidence of the effectiveness of low-carbohydrate diets^{105,106} and very low-calorie diets.¹⁰⁷ This is particularly so in patients with type 2 and pre-diabetes. In these groups, successful weight loss can even result in a reversal of the diabetes. These diets must be carefully planned and monitored closely to ensure they remain nutritious. Without this planning, these diets can be very poor quality. Incorporating this type of intervention within a CVPR programme would only be sensible if the team had access to a qualified dietician.

Measuring servings of food

See ► Table 11.15.

Suggested resources

- *The ESC Handbook of Preventive Cardiology* (chapter 11).⁸²
- *The ESC Textbook of Preventive Cardiology* (chapters 11 and 13).⁸¹

Physical activity and exercise

It is important for nurses working in cardiovascular care and particularly in prevention and rehabilitation services to have an understanding of the cardiovascular risks associated with a sedentary lifestyle and the benefits of supporting patients to become physically active for their health and recovery.

Physical inactivity is the fourth leading risk factor for global mortality and accounts for 12.2% of the global burden of acute myocardial infarction and 6% of deaths that occur worldwide (► Fig. 11.6).¹⁰⁸ In the WHO European region, it accounts for 1 million deaths per year, which is around 10% of total deaths. It also accounts for 8.3 million disability-adjusted life years which is around 5% of the total. More than half of this WHO region's population is not active enough to meet health recommendations. This translates into enormous costs for the region. For a population of 10 million people, where half the population is insufficiently active, the overall cost is estimated to be €910 million annually.

Since the turn of the century, evidence has been mounting to show that more active adults, including older adults,

Table 11.15 Measuring portion size

Food groups	Standard serving	Visual equivalent
Bread, cereal, rice, pasta, and potato	One cup of pasta	Tennis ball
	30 g cereal	A fist
	1 medium potato	A computer mouse
Fruits	1 medium apple or orange	Tennis ball
	1 tablespoon raisins	½ cupped hand
	½ avocado	
Vegetables	2 spears of broccoli	1 cupped hand
	8 Brussel sprouts	
	3 tbsp frozen mixed veg	
Milk, yogurt, and cheese	200 mL semi-skimmed milk	Average glass
	30 g of hard cheese	1 matchbox
	125 g of yogurt	Average pot
Meat, poultry, and fish	100 g meat/chicken or fish	Deck of cards
Dry beans, eggs, and nuts	3 heaped tsps cooked beans	Light bulb
	28 g nuts	Cupped hand
	Large teaspoon peanut butter	Ping pong ball
	2 whole eggs	
Fats, oils, and sweets	1 tsp of salad dressing	½ thumb
	1 tsp of butter /margarine or oil	½ forefinger
	½ cup ice cream	Tennis ball

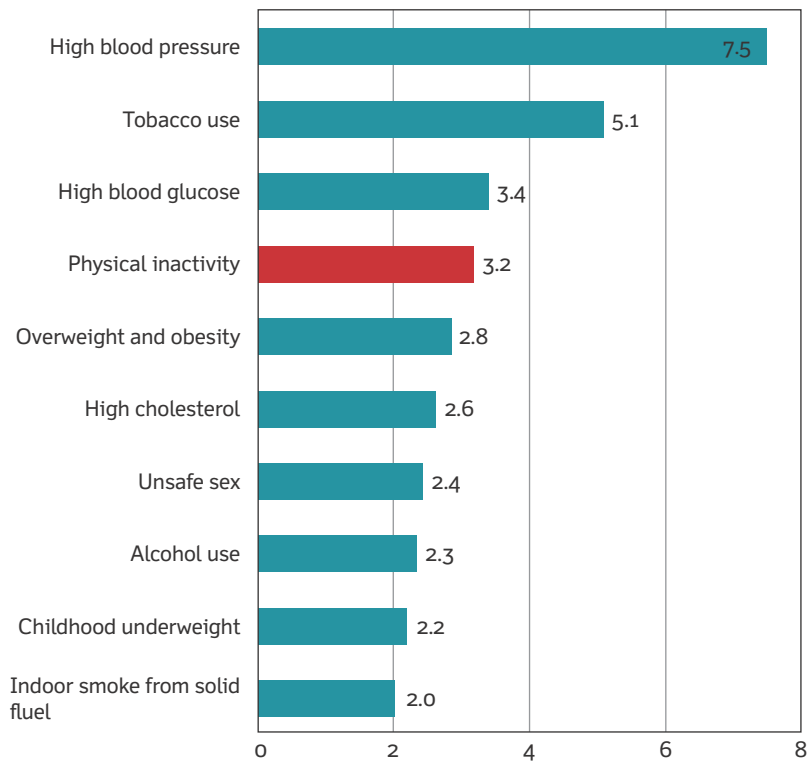
consistently have a lower risk for cardiovascular and all-cause mortality compared to inactive adults. These studies include evidence from across Europe and the US including the Framingham Heart Study, the Canada Health Survey, the Swedish Annual Level of Living Survey, the Puerto Rico Heart Health Program, and the Nordic Research Project on Aging, among several others.^{109–115} The benefits¹¹⁶ include not only all-cause and cardiovascular mortality, but also improved cardiovascular risk factor profiles (blood pressure, lipids, and blood glucose), reduction of some cancers, improved cognition, less dementia, improved physical function, less frailty and risk of falls, improved bone health, and improved psychological health.

Identifying people who are sedentary and working with them to increase physical activity levels and meet evidence-based guidelines can lead to reduced mortality. Estimates have shown that even if one in five people who are physically inactive become active this could translate into more than 100,000 deaths averted, equal to one life saved every 5 minutes¹¹⁷ (► **Table 11.16**).

Looking in more depth at the benefits of increasing activity for the cardiovascular risk profile, it has become

clear that while physical inactivity is an independent risk factor for CVD, it also interacts with several other risk factors, including poor lipid profiles, high blood pressure, diabetes, obesity, and mental health. Thus, in addressing physical inactivity, there are important benefits for the cardiovascular risk profile as a whole. In this way, increasing physical activity becomes a powerful cardioprotective therapy. In ► **Fig. 11.7**, the cardioprotective effects of aerobic endurance training can be seen in relation to atherosclerosis, thrombosis, ischaemia, and arrhythmias as well as the psychological benefits which are important for cardiovascular health.¹¹⁸

Specifically, in relation to weight loss and lowering low-density lipoprotein cholesterol (LDL-C), the minimum guideline of 150 minutes of moderate intensity exercise per week is beneficial to numerous other risk factors. As an example, physical activity supports weight loss in conjunction with low-density lipoprotein (LDL) lowering. For many risk factors, evidence suggests more is better and as such, achieving levels between 250 and 300 minutes per week of moderate aerobic physical activity intensity exercise is encouraged where possible.

Top ten leading risk factors for global mortality (millions of deaths), 2004**Fig. 11.6** Physical inactivity as a leading global risk factor.**Table 11.16** Reducing deaths by reducing inactivity.

Estimated reductions in European disorder prevalence and deaths associated with given declines in inactivity, 2012

Percentage decline in physical inactivity	5%	10%	20%
Potential decline in breast cancer cases	8,200	16,300	32,600
Potential decline in colorectal cancer cases	5,600	11,200	22,400
Potential decline in type II diabetes cases	115,000	231,000	462,000
Potential decline in CHD cases	8,400	16,700	33,400
Potential deaths averted	25,600	51,100	102,200

Data Source; Lee et al., (2012), WHO, OECD, Eurostat, IDA, EUCAN, Cebr analysis
 Inactivity Time Bomb – Now We Move Report
<https://inactivity-time-bomb.nowwemove.com/>

Anti atherosclerotic	Psychological	Anti thrombotic	Anti ischaemic	Anti arrhythmic
Improved lipids	↓ Depression	↓ Platelet adhesiveness	↓ Myo cardial O ₂ demand	↑ Vagal tone
↓ Blood pressure	↓ Stress	↑ Fibrinolysis	↑ Coronary blood flow	↑ Heart rate variability
↓ Adiposity	↑ Social support	↓ Fibrinogen	↓ Endothelial dysfunction	↓ Adrenergic activity
↑ Insulin sensitivity		↓ Blood viscosity	↑ Endothelial progenitor cells (EPCS)	
↓ Inflammation			↑ Circulating angiogenic cells	
			↑ Nitric oxide	

Fig. 11.7 Cardioprotective effects of exercise training.

Regular aerobic exercise can increase high-density lipoprotein cholesterol (HDL-C) by 3–10% (up to 0.16 mmol/L), especially at a more vigorous intensity. It can also reduce triglycerides by around 11% (up to 0.34 mmol/L). In conjunction with a reduction in saturated fat intake, it can slow down the reduction in protective HDL-C.^{119–122}

A recent systematic review and meta-analysis¹²³ of RCTs investigating the effects of different types of exercise training on blood pressure lowering found that both aerobic and resistance (endurance, dynamic resistance, and isometric resistance training) all help to lower both systolic and diastolic blood pressure. As far back as 1995, the insulin resistance atherosclerosis prospective observational study¹²⁴ of 1467 patients with glucose tolerance ranging between normal and mild non-insulin-dependent diabetes mellitus showed that regular exercise can

improve insulin sensitivity and lower fasting insulin levels (► **Fig. 11.8**).

This multifactorial effect that physical activity has on the cardiovascular risk profile has been likened to that of the polypill¹²⁵ and strengthens the case for including it as an important part of a CVD prevention intervention.

Threshold for benefit

Importantly, most recent evidence shows that there is no lowest threshold for benefit with the most benefit being in those who are the most sedentary becoming a little more active (► **Fig. 11.9**). Reducing sedentary behaviour is now as important as getting people to become active. In such cases, the health benefits can be immediate. In individuals who exercise regularly but are otherwise sedentary, cardiovascular risk is much higher than in regular

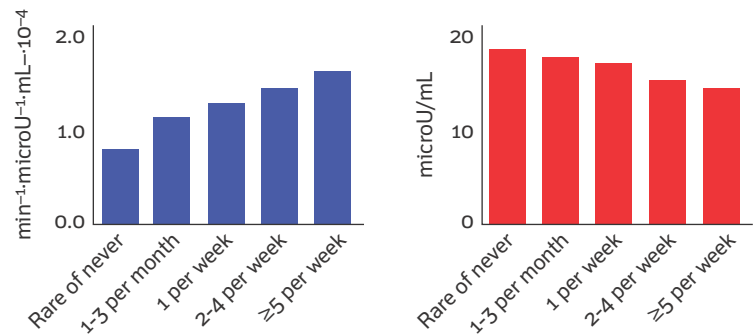


Fig. 11.8 Effects of exercise on insulin.

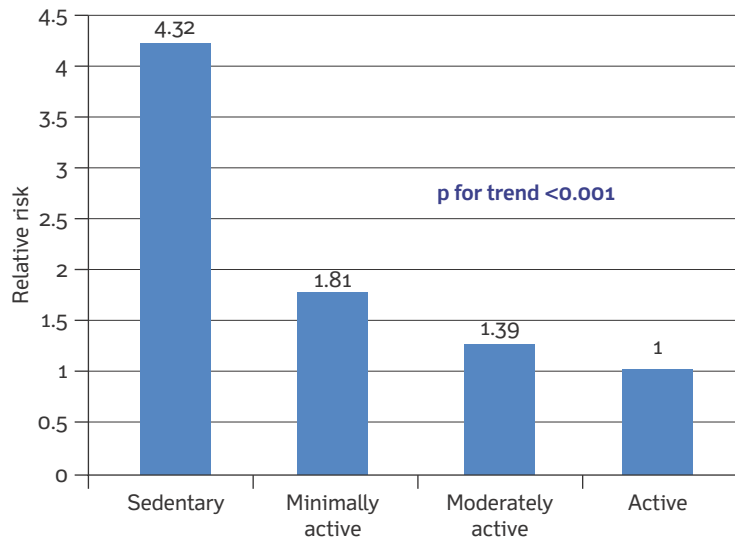


Fig. 11.9 Relative risks for classification of activity at the time of a treadmill test among veterans.

exercisers who limit the amount of time they are sedentary.^{127,128} These studies demonstrated that any amount of activity helps. However, most benefits are associated with 150–300 minutes of moderate physical activity per week⁵⁷ (► **Box 11.7**).

The amount of time in the day spent sitting is related to survival. Katzmarzyk and colleagues, in a 14-year follow-up of 17,013 individuals,¹²⁸ showed that compared with those who were sedentary almost none of the time, in those who were sedentary almost all of the time, survival was lower (► **Fig. 11.10**).

Box 11.7 Recommendations for your patients

150 minutes of moderate intensity activity (or 75 minutes of vigorous) (or equivalent combination) per week.

Example: in the last week a patient reports they have walked briskly (moderate intensity) for 30 minutes, twice. They also went jogging (vigorous intensity) for 25 minutes, twice?

Is this patient achieving the guidelines?

The answer is YES!

30 minutes × 2 of moderate intensity activity = 60 minutes.

25 minutes × 2 of vigorous activity translates into 100 minutes of moderate intensity activity.

Total = 160 minutes of moderate intensity activity.

For every 2 hours of sitting time per day replaced with standing time there will be an 11% lower triglyceride level, 6% lower total to HDL-C ratio, and 0.06 mmol/L higher HDL. Replacing sitting time with stepping had even more significant benefits. More than 4 hours of screen time per day significantly lowers HDL-C levels. Those in the highest screen time category also had significantly higher triglyceride levels.^{129,130}

Making every contact count

When interacting with patients, health professionals have the opportunity to make every contact count. In doing so they need to draw on behavioural approaches to assess activity levels, identify barriers and intervene (see more about behavioural approaches elsewhere in this chapter). According to a recent 'call to action', the first recommendation to all health professionals is to treat physical activity as a 'vital sign' and assess it at every meeting with patients.¹³¹ Two questions are proposed (► **Table 11.17**). A score can be calculated from the responses to these questions which informs the health professional of how many minutes per week the respondent says they are active. In addition, this call to action includes an adaptation of the 5As model used in smoking cessation brief interventions (see ► **Box 11.3** earlier in this chapter) and for providing support to increase physical activity (► **Fig. 11.11**). This builds on asking about physical activity at every visit and prompts the professional to give advice, assess motivation, negotiate a treatment plan, and organize follow-up.

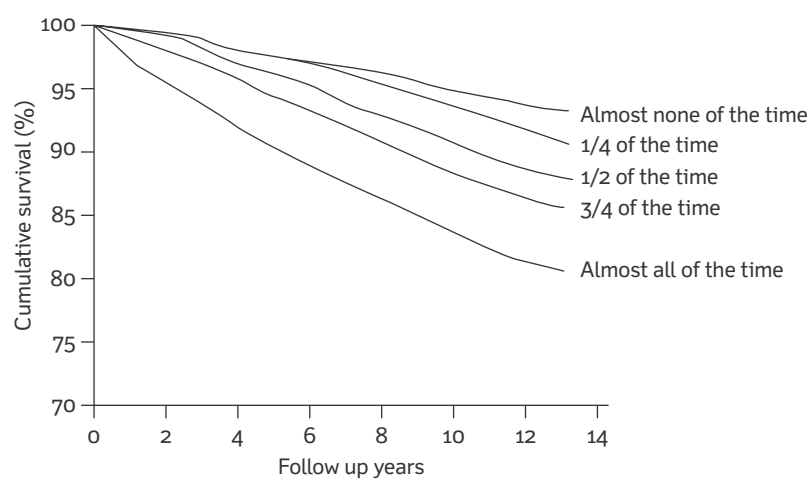


Fig. 11.10 Differences in survival according to proportion of the day spent sitting.

The treatment plan includes providing an exercise prescription as part of the intervention which works towards accumulating 150 minutes of activity per week. It also encourages patients to measure and record their physical activity on paper, using a wearable device or their smartphone,¹³² referring to a specialist as appropriate who may be a physician or nurse with expertise, a physiotherapist, an exercise physiologist, or a certified fitness instructor. Follow-up allows both professional and patient to chart progress, set goals, solve problems, and identify and draw on social support.

In summary, physical activity prescription is effective. Healthcare providers have an important opportunity to make physical activity an integral component of the prevention and treatment of chronic disease. All healthcare providers should include physical activity assessment and prescription as part of routine care for patients.

Recommendations from physicians influence patient engagement and improve the likelihood of adoption. Any amount of physical activity has benefit and importantly, a strong emphasis should be placed on reducing sedentary time.

Finally, if health professionals are going to be effective in helping their patients to become more active, they need to consider their own behaviour and lead by example, remembering that even the smallest increases in activity levels can have benefit.

Suggested resources

- The ESC Handbook of Preventive Cardiology (chapter 12).⁸²
- The ESC Textbook of Preventive Cardiology (chapters 12 and 13).⁸¹

Table 11.17 Measuring and calculating physical activity and exercise participation as a vital sign.

.....	
The Physical Activity Vital Sign	_ days
1. On average, how many days per week do you engage in moderate to strenuous exercise (like a brisk walk)?	
.....	
2. On average, how many minutes do you engage in exercise at this Level?	_ minutes
.....	
Total minutes per week of physical activity (multiply #1 by #2)	_ minutes per week

Biological risk factor management

Biological risk factors include raised blood pressure, abnormal lipid profile and dysglycaemia, and diabetes mellitus. As outlined already in this chapter, a multiple risk factor management approach is required to manage CVD prevention because the total risk of developing CVD or its recurrence is determined by the combined effect of cardiovascular risk factors present, including age, sex/gender, smoking status, blood pressure, and total cholesterol or BMI.

Nurses play an important role in the management of cardiovascular risk factors in collaboration with physicians and other allied professional colleagues. In addition

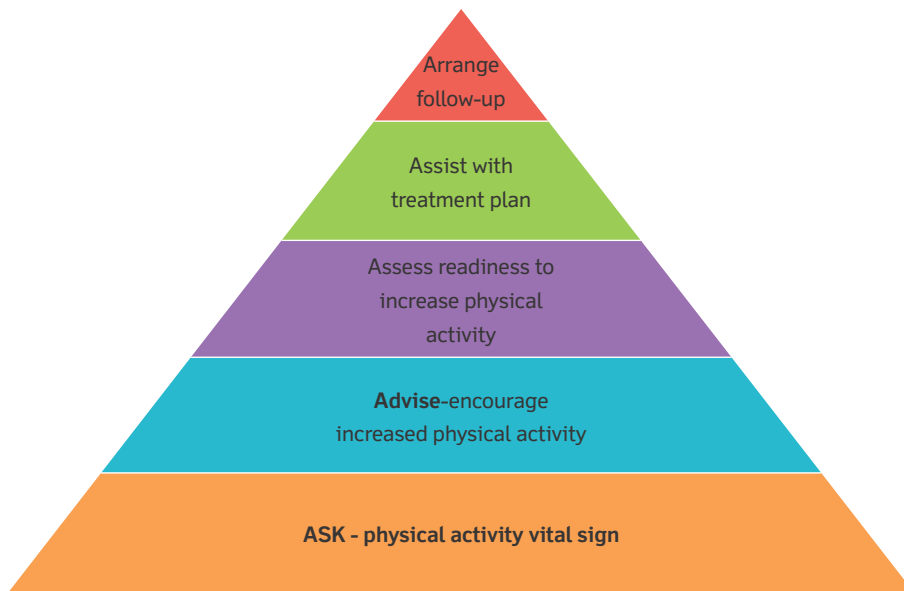


Fig. 11.11 5As used to guide physical activity brief intervention.

to providing education for self-management and using behavioural strategies to achieve lifestyle goals, they are ideally placed to monitor treatment and progress. Increasingly, with the advent of non-medical prescribing (see more in Chapter 12), they play a role in initiating and titrating treatment. Importantly, they work with allied professional experts to evaluate and manage adherence to both lifestyle and medical treatments.

Blood pressure

Classification of blood pressure

Blood pressure should be classified as either optimal, normal, high normal, or grade 1, 2, or 3 hypertension when measured in the clinical setting (office measurement). The most recent ESC Guidelines⁶⁴ defines this as shown in

► **Table 11.18.** Diagnosis of hypertension should be based

Table 11.18 Classification of office blood pressure based on office measurements

Category	Systolic (mmHg)		Diastolic (mmHg)
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
High normal	130–139	and/or	85–89
Grade 1 hypertension	140–159	and/or	90–99
Grade 2 hypertension	160–179	and/or	100–109
Grade 3 hypertension	≥180	and/or	≥110
Isolated systolic hypertension ^a	≥140	and	<90

BP, blood pressure; SBP, systolic blood pressure.

BP category is defined according to seated clinic BP and by the highest level of BP, whether systolic or diastolic.

^a Isolated systolic hypertension is graded 1, 2, or 3 according to SBP values in the ranges indicated.

The same classification is used for all ages from 16 years.

Table 11.19 Definitions of hypertension according to office, ambulatory, and home blood pressure levels

Category	SBP (mmHg)		DBP (mmHg)
Office BP ^a	≥140	and/or	≥90
Ambulatory BP			
Daytime (or awake) mean	≥135	and/or	≥85
Night-time (or asleep) mean	≥120	and/or	≥70
24 h mean	≥130	and/or	≥80
Home BP mean	≥135	and/or	≥85

BP, blood pressure; DBP, diastolic blood pressure; SBP, systolic blood pressure.
^a Refers to conventional office BP rather than unattended office BP.

on repeated office measurements conducted during more than one clinic visit. Alternatively, diagnosis should be based on ambulatory blood pressure monitoring (ABPM) or on home blood pressure monitoring (HBPM) where this is feasible. In particular, ABPM and HBPM, especially HBPM, provide opportunities to confirm a diagnosis of hypertension, detect white-coat and masked hypertension, and to monitor blood pressure control.

Where measurements are taken outside the clinical environment (ABPM and HBPM), the definition of hypertension should be based on different parameters (► Table 11.19).

Measuring blood pressure

As blood pressure varies enormously depending on the day and time it is measured, it is necessary to take several measurements in each individual on separate occasions. The decision to start treatment with medication should be based on two measurements taken on two to three separate occasions.

In order to take and record an accurate and reliable blood pressure reading in the clinic setting, technique is important (► Fig. 11.12). The following guidelines should be followed:

- 1. The patient should be seated quietly for 5 minutes before measurement.

- 2. Three readings should be recorded 1–2 minutes apart. The measurements should be repeated if there is a difference of greater than 10 mmHg between the first two readings. The blood pressure recorded should be an average of the last two readings.
- 3. Additional measurements may be required in patients with unstable values due to arrhythmias (e.g. patients with atrial fibrillation). In these patients, it is preferable to use auscultatory methods rather than an automated device.
- 4. Use a standard size bladder cuff, 22–42 cm, for most patients.
- 5. The cuff should be positioned at the level of the heart with the arm and back supported so as to avoid muscle contraction.
- 6. If using auscultatory measurement methods, use phase I and V (sudden reduction/disappearance) Korotkoff sounds to identify systolic and diastolic blood pressure respectively.
- 7. Take measurements on both arms for the first visit to detect between arm differences. Use the measurement from the arm with the higher value as reference.
- 8. Take a measurement 1 and 3 minutes after standing up from a seated position in all patients for the first visit measurement in order to exclude orthostatic hypertension. Lying and standing measurements should also be considered in the following patients: older patients, patients with diabetes, and patients with other conditions where orthostatic hypertension may frequently occur.
- 9. Record heart rate and use palpation where arrhythmia is likely to be present.

Measurements taken in a home (HBPM) or ambulatory (ABPM) setting will likely vary from those taken in a clinic setting. While both HBPM and ABPM can be useful in diagnosing whitecoat hypertension, they have their advantages and disadvantages (► Table 11.20).

Interventions to lower blood pressure

Blood pressure treatment goals can be seen in ► Table 11.21. Interventions to lower blood pressure include those based on providing support with healthy lifestyle changes (► Box 11.8) and those based on drug therapy. More information on providing support for healthy lifestyle habits can be found elsewhere in this chapter. More information on drugs used in the management of blood pressure can be found in Chapter 12.

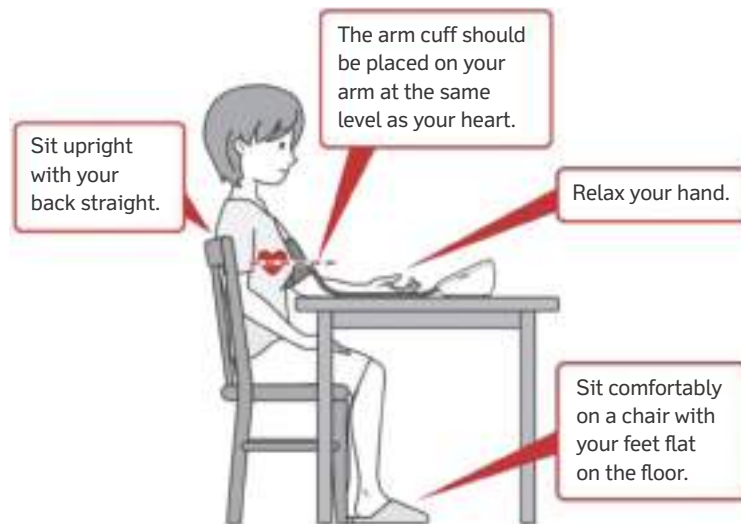


Fig. 11.12 Maintaining the correct posture for measurement: upper arm blood pressure monitor (regular cuff wrapping type). <https://www.healthcare.omron.co.jp/zeroevents/english/bloodpressuremonitor/howtouse.html>.

Initiating drug therapy in patients who are not already at high or very high risk due to established CVD, renal disease, or diabetes, a markedly elevated single risk factor (e.g. cholesterol), or hypertensive left ventricular hypertrophy should be based not only according to blood pressure classification, but also on a total cardiovascular risk assessment using the ESC SCORE risk estimation tool (<https://www.heartscore.org/>). Classification of cardiovascular risk and risk estimation is explained elsewhere in this chapter (see 'Concept of total cardiovascular risk and total risk management'). Drug treatment may be considered for high normal blood pressure (i.e. 130–139 mmHg systolic blood pressure/85–89 mmHg diastolic blood pressure) when cardiovascular risk is high due to established heart disease.

heartscore.org/). Classification of cardiovascular risk and risk estimation is explained elsewhere in this chapter (see 'Concept of total cardiovascular risk and total risk management'). Drug treatment may be considered for high normal blood pressure (i.e. 130–139 mmHg systolic blood pressure/85–89 mmHg diastolic blood pressure) when cardiovascular risk is high due to established heart disease.

Table 11.20 Comparison of ambulatory blood pressure monitoring and home blood pressure monitoring

ABPM	HBPM
Advantages	Advantages
● Can identify white-coat and masked hypertension ● Stronger prognostic evidence ● Night-time readings ● Measurement in real-life settings ● Additional prognostic BP phenotypes ● Abundant information from a single measurement session, including short-term BP variability	● Can identify white-coat and masked hypertension ● Cheap and widely available ● Measurement in a home setting, which may be more relaxed than the doctor's office ● Patient engagement in BP measurement ● Easily repeated and used over longer periods to assess day-to-day BP variability
Disadvantages	Disadvantages
● Expensive and sometimes limited availability ● Can be uncomfortable	● Only static BP is available ● Potential for measurement error ● No nocturnal readings^a

ABPM, ambulatory blood pressure monitoring; BP, blood pressure; HBPM, home blood pressure monitoring.

^a Techniques are being developed to enable nocturnal BP measurement with home BP devices.

Table 11.21 Blood pressure treatment goals (based on office measurements)

Blood pressure targets	
<140/80 mmHg	In all patients
<130/80 mmHg	In most patients if treatment is tolerated
SBP <120–129 mmHg	In most patients <65 years receiving drug treatment
SBP 130–139 mmHg	In patients ≥65 years receiving drug treatment

SBP, systolic blood pressure.

When considering treatment of older patients, the biological rather than the chronological age should be taken into account with consideration being given to frailty, independence, and tolerability of treatment. Grade 1 hypertension (140–159 mmHg) can be treated with blood pressure-lowering drugs and lifestyle interventions in patients older than 65 years if fit and provided they are well tolerated, but not in patients over the age of 80 years.

Medication to manage blood pressure

Most patients requiring medication can be considered for a single-pill treatment strategy, that is, a drug that contains two or more different treatments in one tablet. A two-drug combination can be used to initiate treatment. Simplified treatment algorithms include the use of an angiotensin-converting enzyme inhibitor or angiotensin

receptor blocker combined with a calcium channel blocker or a thiazide/thiazide-like diuretic as core treatment strategy with beta-blockers used for specific indications. More information about drug regimens and combinations for the treatment of hypertension can be found in the ESC Guidelines^{57,64} (see also Chapter 12).

Blood lipids

Classification

Management of the lipid profile should be guided by the level of total cardiovascular risk (see ‘Concept of total cardiovascular risk and total risk management’).

► **Table 11.22** shows the goals for LDL-C according to the level of risk.

Measuring lipids

In patients who are found to be at high cardiovascular risk, a full lipid profile should be measured to guide management. The lipid profile is expressed using a number of different parameters including total cholesterol, LDL-C, HDL-C, and triglycerides (TG). LDL-C is not directly measured from the blood, but is usually calculated according to the Friedewald formula:

$$\text{LDL-C} = \text{total cholesterol} - \text{HDL-C} - (\text{TG} / 2.2)$$

This calculation should be based on a fasting lipid profile (after 12 hours). If fasting triglycerides are more than 4 mmol/L, the calculation will not be valid. Following an acute coronary syndrome, lipid levels should be assessed within the first 24 hours as after this, during the following 6–8 weeks, they will lower and reduce the accuracy of the baseline reading. Alcohol can raise triglyceride levels and, over a longer period can raise HDL-C levels.

Interventions to manage the lipid profile

Lipid treatment goals can be seen in ► **Table 11.22**. Interventions to manage lipids include those based on providing support with healthy lifestyle changes and those based on drug therapy.

Lifestyle interventions to achieve lipid goals include making healthy food choices (see ‘Adopting healthy eating habits and achieving and maintaining optimal weight and shape’ and ► **Table 11.12**). In addition, quitting smoking has a small effect on raising HDL-C. Increasing habitual physical activity has a large effect on raising HDL-C, a small effect on reducing total cholesterol and LDL-C, and a moderate effect on reducing triglycerides. Reducing excessive body weight has a moderate effect on reducing total cholesterol and LDL-C, a small effect on reducing triglycerides,

Box 11.8 Lifestyle interventions to lower blood pressure

- Restrict salt to less than 5 g per day.
- Restrict alcohol:
 - Less than 14 units per week for men.
 - Less than 8 units per week for women.
- Increase consumption of fruit and vegetable, fish, nuts, unsaturated fatty acids (olive oil), and low-fat dairy and reduce consumption of red meat.
- Control body weight to avoid obesity and aim for healthy weight and shape (see section ‘Adopting healthy eating habits and achieving and maintaining optimal weight and shape’).
- Take regular aerobic exercise (see ‘Physical activity and exercise’).
- No tobacco exposure.

Table 11.22 Lipid goals

LDL-C targets	
At very high cardiovascular risk ^a	An LDL-C reduction of $\geq 50\%$ from baseline and LDL-C goal of <1.4 mmol/L (<55 mg/dL) ^b
At high cardiovascular risk ^a LDL-C <1.8 mmol/L (<70 mg/dL)	An LDL-C reduction of $\geq 50\%$ from baseline and LDL-C goal of <1.8 mmol/L (<70 mg/dL)
At moderate cardiovascular risk ^a	LDL-C <2.6 mmol/L (<100 mg/dL)
At low cardiovascular risk ^a	LDL-C <3 mmol/L (<116 mg/dL)

LDL-C, low-density lipoprotein cholesterol.

^a See text for definitions of level of risk.

^b In patients with CVD who experience a second event within 2 years and LDL-C goal of <1 mmol/L (40 mg/dL) may be considered

and a moderate effect on increasing HDL-C. A summary of this evidence is provided in the ESC Guidelines on lipid.^{57,65}

The main drugs used in the management of lipids include statins, a combination of statins and ezetimibe and PCSK9 inhibitors. (see also Chapter 12). ► **Table 11.23** summarizes the indications for use of these drugs.

The decision to start lipid-lowering medication depends not only on the lipid levels but also on total CVD risk. In all cases, it is important to look at and manage all risk factors. Risk estimation (see 'Concept of total cardiovascular risk and total risk management') should be used to guide the treatment of asymptomatic adults aged over 40 years without CVD, diabetes mellitus, chronic kidney

disease, familial hypercholesterolaemia, or LDL-C greater than 4.9 mmol/L (>190 mg/dL).

Blood glucose and diabetes

Classification and diagnosis

Like blood pressure and lipids, glucose has a continuous relationship with cardiovascular risk. This risk is worsened by the presence of other lifestyle risk factors such as smoking, poor diet, and physical inactivity. People with diabetes are classified either at very high risk or high risk of developing CVD depending on the presence of other cardiovascular risk factors (see 'Concept of total cardiovascular risk and total risk management')⁶⁶ and in those with coronary disease, around two-thirds will have either frank diabetes or dysglycaemia (impaired glucose tolerance or impaired fasting glucose).¹³³

It is therefore very important to screen for diabetes in these patients. Type 2 diabetes is much more common than type 1 although the risk of developing CVD is elevated in both. The ESC Guidelines^{57,66} recommend using either fasting plasma glucose or haemoglobin A1c (HbA1c) for diagnosis, and an oral glucose tolerance test (OGTT) for the diagnosis of impaired glucose tolerance. While these guidelines recommend the use of an OGTT for diagnosis in individuals with established CVD only if fasting plasma glucose and HbA1c are inconclusive, ideally, and where possible, screening should include both an OGTT and fasting HbA1c levels. An OGTT was found in the EUROASPIRE IV survey of patients with coronary artery disease to identify the largest number of patients with undetected diabetes.¹³³

An OGTT requires that the patient has fasted for 8–12 hours. A fasting glucose sample is then performed followed by the administration of an oral glucose load with 75 g of anhydrous glucose. A second blood sample should be analysed for glucose 2 hours later. During this time, the patient should not eat or drink anything else. This test allows classification of blood glucose as either impaired fasting glycaemia, impaired glucose tolerance, or diabetes mellitus. The WHO criteria for the diagnosis of dysglycaemia based on the OGTT can be seen in ► **Table 11.24**.¹³⁴

HbA1c has been recognized by the WHO as a diagnostic test for diabetes since 2011.¹³⁵ Prior to this, HbA1c was used more to monitor the control of existing diabetes. It reflects the average level of glucose to which the red blood cells have been exposed over a period of between 4 weeks to 6 months. A diagnosis is made if the HbA1c is greater than 48 mmol/mol or 6.5% on two occasions. However, if a diagnosis had already been made using other tests like the OGTT, a value of less than this would not exclude diabetes.

Table 11.23 Drug therapies used to treat lipids

Statins	High intensity up to highest tolerated dose to achieve goal appropriate for level of risk
Ezetimibe + statin	If above does not achieve goal
PCSK9 inhibitors	For secondary prevention patients and familial hypercholesterolaemia patients at very high risk, add in PCSK9 inhibitors

Table 11.24 WHO criteria for the diagnosis of dysglycaemia based on the OGTT

Diabetes	Fasting plasma glucose ≥7 mmol/L
	OR 2-hour plasma glucose ≥11.1 mmol/L
Impaired glucose tolerance (IGT)	Fasting plasma glucose <7 mmol/L
	AND 2-hour plasma glucose* ≥7.8 and < 11.1 mmol/L
Impaired fasting glucose (IFG)	Fasting plasma glucose 6.1 to 6.9 mmol/L
	AND (if measured) 2-hour plasma glucose* <7.8 mmol/L

*The 2-hour plasma glucose is measured after the ingestion of 75 g of oral anhydrous glucose.

OGTT which includes post-prandial glucose testing, should definitely be recommended for patients who have a fasting glucose value at target but an HbA1c above target because post-prandial glucose values (impaired glucose tolerance) are associated with greater cardiovascular risk, independent of fasting plasma glucose.⁶⁶

Interventions to manage dysglycaemia and diabetes

Interventions to manage dysglycaemia and diabetes include those based on providing support with healthy lifestyle changes and those based on drug therapy. ► **Table 11.25** shows the most recent ESC recommended targets for risk factor control in patients with diabetes. Control of blood pressure and lipids to target is as important as the control of glycaemia and in these patients will lead to a substantial impact on cardiovascular risk. Combined reduction in HbA1c, systolic blood pressure, and lipids decreases cardiovascular events by 75%.⁶⁶ Multifactorial treatment is still underused. Therefore, in the context of CVPR, it is important first to look for and

Table 11.25 Risk factor goals for patients with diabetes

Glycaemic targets	
HbA1c <7% (<53 mmol/mol), i.e. near normal	To reduce risk of microvascular complications
Tighter glucose control to be initiated early on in the course of DM	Leads to reduction in cardiovascular outcomes in younger people over 20-year timescale
Individualized targets according to duration of DM, comorbidities and age:	
HbA1c <8% (64 mmol/mol) for the elderly	
Blood pressure	
SBP 130 mmHg for most	
SBP <120 mmHg if tolerated	
SBP 130–139 mmHg older patients	
Lipids^a (see also ‘Concept of total cardiovascular risk and total risk management’)	
● At very high cardiovascular risk ^a LDL-C <1.4 mmol/L (<55 mg/dL)	And at least 50% reduction
● At high cardiovascular risk ^a LDL-C <1.8 mmol/L (<70 mg/dL)	And at least 50% reduction
● At moderate cardiovascular risk ^a LDL-C <2.6 mmol/L (<100 mg/dL)	

DM, diabetes mellitus; HbA1c, glycated haemoglobin; SBP, systolic blood pressure; LDL-C, low-density lipoprotein cholesterol.

^a <Footnote to be confirmed>

Box 11.9 Lifestyle goals

- No exposure to tobacco, support for quit smoking attempts (see 'Tobacco and smoking cessation management').
- A Mediterranean diet supplemented with olive oil and/or nuts reduces the incidence of major cardiovascular events (see 'Adopting healthy eating habits and achieving and maintaining optimal weight and shape').
- Lower excessive body weight (see 'Adopting healthy eating habits and achieving and maintaining optimal weight and shape').
- Moderate to vigorous physical activity of at least 150 minutes/week is recommended for the prevention and control of diabetes mellitus (see 'Physical activity and exercise').

confirm dysglycaemia and diabetes and to provide expert lifestyle management, providing smoking cessation support where appropriate, dietary advice, weight management, and safe access to physical activity and exercise (► **Box 11.9**). In addition, screening for microalbuminuria is recommended to identify renal dysfunction.

The principal drug therapies used to manage diabetes are listed here (more information about these therapies can be found in Chapter 12):

- Sodium–glucose co-transporter 2 (SGLT2) inhibitors.
- Glucagon-like peptide-1 receptor agonists (GLP-1RAs).
- Angiotensin-converting enzyme inhibitor or angiotensin receptor blocker for blood pressure control and renal protection.
- Statins plus added ezetimibe (if necessary) to manage lipids.
- PCSK9 inhibitors if above mentioned drugs not tolerated or ineffective.

Lifestyle goals are listed in ► **Box 11.9**.

Addressing psychosocial aspects, illness perceptions, and health-related quality of life

In most CVPR programmes, efforts are focused primarily on encouraging people to take more exercise, lose weight, stop smoking, and eat a healthy diet. While these are important, issues such as mood changes, lack of

social support, illness misconceptions, and health-related quality of life are often relegated as secondary considerations.^{136,137} Yet addressing psychosocial issues often impacts directly on how well people manage their health and initiate behaviour changes and adhere to them and their medications.^{138–140} These are vital considerations not only for patients but for their partners, carers, and families as demonstrated by a large and growing body of empirical research identifying that psychosocial risk factors such as low socioeconomic status, social isolation, stress, depression, and anxiety increase the risk of CVD and stroke and also contribute to poorer health-related quality of life and prognosis in patients with established heart disease.^{57,141} For example, depression and anxiety are common in people with CVD, with over 30% of women and 20% of men reporting symptoms of depression and 39% of women and 22% of men reporting symptoms of anxiety.¹⁴² Depression and anxiety are associated with female gender, lower educational level, more sedentary lifestyle, lower quality of life, poorer somatic symptoms, higher mortality, and higher healthcare costs.^{142,143} Moreover, as CVD and depression are the two most common causes of disability in high-income countries, and are expected to become so globally by 2030,¹⁴⁴ the challenges they pose in CVD prevention and rehabilitation are great.

Lower socioeconomic status, loneliness, and social isolation are significant risk factors and commonly found among people with CVD and associated with depression, both as a cause and sequela,^{145–147} and are compounded by factors such as unemployment, occupational stress, job strain, financial insecurity, loss of independence, and low self-esteem.¹⁴¹ Thus, social and environmental factors are important. For example, living alone, particularly among men in middle and lower socioeconomic positions, is associated with all-cause and cardiovascular mortality.¹⁴⁸ Furthermore, social support provides protection from depression.¹⁴⁹

Perceptions of illness are also important. Illness perceptions are cognitive frameworks which patients construct to make sense of their illness, and which subsequently, guide their behaviour directed at managing the illness.¹⁵⁰ These perceptions include beliefs about the cause, expected symptoms, cure/control, timeline, and consequences. They vary widely among patients including both positive and negative perceptions that influence an individual's ability to cope with disease and to perceive it as manageable or threatening. Hence, poorer illness perceptions are related to outcomes such as depressive symptoms and treatment adherence.¹⁵⁰

All of these factors have potential to impact adversely on a patient's health-related quality of life: their physical, mental, emotional, social, and spiritual functioning, including activity limitations and personal perceptions.¹⁵¹

The challenge is to try to address these issues, some more difficult than others, with the choice of intervention guided by an individual assessment of need, patient choice and preference, and taking account of considerations such as health and social care referral systems, resources, personnel, location, and surveillance. Thus, for example, interventions may be delivered in the home or community setting, depending on ease of access, monitoring, follow-up, continuity of care and use of technologies such as telehealth or eHealth. For example, psychosocial well-being and quality of life among other factors have been shown to improve, at least in the shorter term, among mobile app users.¹⁵² Counselling, education, and feedback will be informed by factors such as culture, race, ethnicity, language, and health literacy. The goal is to offer appropriate, holistic, and patient-centred care that will enhance a patient's experience and health outcome.

Effective communication is fundamental to patient assessment and determining if and what intervention is required (see also Chapter 13). This involves establishing a mutually respectful active partnership with the patient and their partner, family, or social support network. This requires communication skills such as active listening, summarizing, reflecting, and chunking information.¹⁴¹ By using counselling skills and OARS principles, a rapport can be established with the patient and an assessment made of their readiness, willingness, and ability to make any necessary changes.¹⁴¹ The person is likely to feel anxious, fearful, and uncertain and should be reassured that such reactions are normal and given ample time to discuss their feelings and concerns with family members.

Assessment

Patients should be assessed for the risk factors outlined using appropriate, brief, valid, and reliable measures. A routine structured clinical diagnostic interview is often impractical and the use of self-screening tools in the cardiac rehabilitation centre, outpatient clinic, or patient's home is a realistic alternative.

Suitable measures for mood include the Patient Health Questionnaire-9 for depressive symptoms,¹⁵³ the Generalized Anxiety Disorder Scale-7 for anxiety symptoms,¹⁵⁴ or the Hospital Anxiety and Depression Scale (HADS) for both depression and anxiety.¹⁵⁵ Measures for social support include the Multidimensional Scale of

Perceived Social Support,¹⁵⁶ and for illness perceptions the Brief Illness Perception Questionnaire.¹⁵⁷ If it is deemed that patients have developed inaccurate or unrealistic illness perceptions, referral to a mental health professional may be warranted. Alternatively, brief psychoeducational interventions aimed at modifying such illness perceptions have been shown to improve quality of life and treatment adherence and reduce anxiety and depression.¹⁵⁸

In people with CVD, health-related quality of life is usually measured by a combination of generic and disease-specific measures.¹⁵⁹ Generic measures are designed to address multiple aspects of health-related quality of life across a range of different patient or disease groups. Thus, they focus on general issues of health (or ill health, such as functional capacity, disability, and distress), rather than specific features of a particular disease. Examples of generic measures include the Short-Form 36-item (SF-36) health survey¹⁶⁰ and the EuroQoL 5D (EQ-5D).¹⁶¹ Disease-specific measures are designed to examine those aspects of health-related quality of life that are relevant to a specific disease group and are, overall, more clinically sensitive and potentially more responsive in detecting change. Examples of disease-specific measures include the Seattle Angina Questionnaire (SAQ),¹⁶² the Myocardial Infarction Dimensional Assessment Scale (MIDAS),¹⁶³ and the Minnesota Living with Heart Failure (MLHF) questionnaire.¹⁶⁴ In addition to psychometric properties such as reliability, validity, and responsiveness, the choice of measure will depend on factors such as the patient/clinician burden its use may impose, resources, costs, and intellectual property and copyright issues (see also Chapter 2).

Interventions

In order to be effective, interventions require a friendly and positive interaction to enhance a patient's ability to cope and adhere to recommended lifestyle changes and treatments. Such empowerment means gauging the patient's experiences, thoughts, attitudes, beliefs, worries, knowledge and understanding, and their motivation and commitment. This is likely to be enhanced by including the patient's partner or family member who can reinforce information, correct misconceptions, dispel myths, and allay fears. Behavioural interventions such as motivational interviewing are designed to increase motivation and self-efficacy by helping set realistic, incremental goals in combination with self-monitoring to reduce targeted risk factors. The focus of such interventions should be on coping and empowerment strategies and include measurable and feasible goal setting and pacing (see also

'Supporting patients and families to make healthy lifestyle changes').

The choice of intervention will depend on the issue to be addressed. However, many people will respond to brief advice (5 minutes) using the 5As (Ask, Advise, Assess, Assist, Arrange). Some may require brief behaviour counselling (15–20 minutes) or more specialized counselling such as motivational interviewing, mindfulness, cognitive behaviour therapy, or behavioural activation. Goals can be negotiated using 'SMART' principles and graded in terms of priority and duration. For successful behaviour change to occur, three conditions (COM-B) are necessary: capability, opportunity, and motivation⁷² (see also section 'Supporting patients and families to make healthy lifestyle changes').

Specialized psychological interventions have additional beneficial effects in terms of distress, depression, and anxiety.¹⁶⁵ These interventions include individual or group counselling regarding psychosocial risk factors and coping with illness, stress management programmes, meditation, autogenic training, biofeedback, breathing, yoga, and/or muscular relaxation. Multimodal behavioural interventions, integrating health education, physical exercise, and psychological therapy, for psychosocial risk factors and coping with illness are recommended in patients with established CVD and mental health symptoms in order to improve their mental health.

Whatever approach is adopted, consideration should be given to a person's preferences, personal circumstances, and technical skills. Tailoring and adapting the content and delivery of interventions to the capacity of the individual has the potential to exert the most impact. For instance, for some, text-based materials may be seen as too strenuous or time-consuming to read, and telephone calls may be offered as an alternative to written feedback.

It is important that healthcare professionals recognize issues such as financial worries, cultural, racial, ethnic, and linguistic backgrounds, rural and remote locations, family circumstances, social networks, sleep difficulties, and travel restrictions as barriers for patients. For example, CVD can result in loss of workability and early retirement and return to work is associated with better psychosocial well-being and health-related quality of life.¹⁶⁶

Gender and culturally sensitive interventions may be needed, as notions of masculine/feminine social roles and sexual orientation can determine social norms and traditions to support self-care and self-management, which vary by race and ethnicity.

Many patients, particularly those who are young, are heavy users of technology for connecting with friends and finding information and support. The challenge for

online health services is to design interventions specifically suitable for them that are action based and focus on changing short- and long-term behaviours, rather than just increasing knowledge. In considering the use of new technologies, app characteristics such as brevity of interactions, minimal on-screen text, and a solutions-oriented approach are deemed essential.

Depression and anxiety

Psychological interventions are likely to improve a person's function, quality of life, and general health,¹⁶⁰ although it is recognized that psychological problems are underreported and undertreated. Patients who are screened at 'moderate to high' risk of depression have higher levels of depression and anxiety, and lower levels of well-being and social support at follow-up, than those at 'no to low' risk of depression. Importantly, screening and referral alone is insufficient to achieve optimal disease management: a collaborative care approach with integrated pathways to primary care is necessary.¹⁶⁷ A promising approach is one that takes a patient preference, stepped-care approach in which depressed patients participate in decision-making on whether to initiate medications and/or psychotherapy and receive frequent follow-up assessments with decisions as to whether to intensify, switch, or maintain therapies.^{168,169}

eHealth services such as guided Internet-based cognitive behaviour therapy may improve access to acceptable, effective, and cost-effective interventions to reduce symptoms of anxiety and depression.¹⁷⁰ Given that mood disorders are common and impose a considerable burden on quality of life,¹⁷¹ attention should be focused on alleviating these. Apart from pharmacotherapy, cognitive behaviour therapy is a frontline option, with novel approaches such as Panic Attack Treatment in Comorbid Heart Diseases (PATCHD) showing promise.¹⁷² Another promising and less intensive and costly approach, for depression at least, is the use of behavioural activation, a simpler psychological treatment than cognitive behaviour therapy.¹⁷³

Psychological interventions can improve psychological symptoms and reduce mortality in people with CVD, but there remains considerable uncertainty regarding the magnitude of these effects and the specific techniques most likely to benefit people with different presentations of CVD.¹⁶⁵

Partners

Partners may have more distress than the patient, although they can share the emotional burden and provide social support. They can also bolster confidence, instil

hope, and encourage the patient to seek healthcare, attend CVPR, and adhere to lifestyle and medications.¹⁴¹ While family and friends are often the preferred source of support for many, there is a fear of placing undue worry on loved ones. The role of partners in caring for patients and serving as their primary source of support has the potential to place an undue burden on them. Hence, they need support themselves.

Cardiovascular prevention and rehabilitation

Encouraging patients to attend a CVPR programme that integrates counselling for psychosocial risk factors and exercise is effective in reducing anxiety, distress, and stress, and may be home or community based.^{138–140} Indeed, all eligible patients with CVD should be automatically referred to such a programme as it is a useful vehicle for not only addressing psychosocial issues but also for encouraging adherence to secondary prevention measures. It also provides an ideal opportunity for addressing through vocational counselling particular concerns such as return to work or early retirement. Whatever interventions are deemed appropriate will depend on an individual consultation and assessment of capability, motivation, and opportunity for behaviour change and realistic goal setting and support including self-help information, teaching techniques that support understanding and knowledge, and peer support.

Conclusion

Psychosocial factors, illness perceptions, and quality of life are important factors in the cause of, coping with, and outcome of CVD and need to be considered on an individual basis. A successful experience and outcome for patients will depend on an assessment of their risk factors, characteristics, and expectations, their engagement in shared decision-making, and ongoing outcome monitoring to evaluate their responsiveness to any intervention.

Settings and delivery modes for cardiovascular prevention and rehabilitation

The aim of CVPR is to promote secondary prevention in patients with coronary heart disease by promoting lifestyle changes, with a multifactorial interdisciplinary approach. It is a comprehensive programme which includes exercise, education, lifestyle and risk factor assessment

and management, and motivational and psychological support for cardiac patients.^{174,175} The benefits and efficacy have been well documented and the core components have been standardized; however, the length and structure of programmes varies greatly across Europe depending on national guidelines and government policy.¹⁷⁶

Hospital setting

Historical perspective

For many years now, CVPR has been recognized as making an important contribution in the protection of physical and psychological health of patients with heart disease. It has evolved over time and the use of exercise in the treatment of heart disease is not a new concept. As far back as 1768, Herberden observed that his patient with angina pectoris was ‘nearly cured’ by sawing wood for half an hour every day. This valuable information was forgotten and overlooked. By the early twentieth century, heart disease was recognized as a grave problem. When a diagnosis of myocardial infarction was made, prolonged bedrest was thought to be the cure if the patient’s life was to be saved and improved. The treatment was strict bedrest, which inevitably led to deconditioning of patients and subsequently to them becoming ‘cardiac cripples’.¹⁷⁷ Nonetheless, it was around this time that the treatment began to change. Levine and Lown¹⁷⁸ established that getting out of bed and sitting in a chair for 7 days after the onset of acute coronary symptoms was safe and had physical and psychological benefits. Additionally, the use of physical training to aid post-infarction recovery began, following findings in the 1950s that coronary patients have responses to exercise that are similar to normal, but modified by deconditioning. Research suggested that many patients led miserable unproductive lives after their cardiac event. They were frightened to return to work and needlessly, became cardiac invalids. Coexisting with gradual changes from sedentary convalescence to early mobilization, the importance of lifestyle and risk factors was realized and the concept of ‘cardiac rehabilitation’ was born.

Hospital-based programmes

Many programmes include exercise for the patients while still in hospital in phase 1 of rehabilitation. Education was introduced in phase 1 by Johnson et al. in 1976,¹⁷⁹ when they included advice on smoking, diet, and activities post discharge. In order to supervise early activity, Harrington et al. devised a programme with electrocardiogram telemetry monitoring in 1981.¹⁸⁰ This was to detect

arrhythmias while carrying out activities of daily living and light exercise.

Gottheiner pioneered the first outpatient programme in Israel in 1955 and by 1968 had experience of over 1000 patients.¹⁸¹ The exercise programme started with several months of build-up exercises, which graduated to endurance training such as running, cycling, or swimming. When enrolled, the patients were expected to stay in the programme for life. The early cardiac rehabilitation programmes developed in the 1950s and 1960s were mainly exercise based. Following Gottheiner in Israel, other researchers such as Kellerman and Brunner developed programmes of exercise twice or three times a week for 3 months. Brunner reported the reduction of angina in his study group.¹⁸² In addition, his subjects were fitter after the programme than before and were even fitter than non-trained healthy individuals of the same age. The first controlled trial of exercise was conducted by Naughton et al.¹⁸³ in 24 post myocardial patients. After 8 months of exercise, the exercise group had lower heart rates and blood pressure at rest and at exercise than the sedentary groups. Subsequently, comprehensive guidelines for exercise in cardiac rehabilitation were established.

In America in 1975, Hellerstein and Ford¹⁸⁴ were the first to develop a more comprehensive programme for post-myocardial infarction patients. This included education, vocational advice, and a listing of the different energy expenditure of different daily activities at work and at leisure. They introduced exercise testing before and after the exercise programme with the aim of exercising patients to approximately 60–70% of their aerobic capacity. This led to the belief that a more comprehensive programme was more beneficial to cardiac patients than exercise alone.

From this early development, CVPR has advanced worldwide and the programmes are now integral to the comprehensive care of patients with coronary heart disease and are coordinated multifactorial interventions.

CVPR differs in delivery from country to country. In Ireland and the UK, the duration of programmes varies from 6 to 12 weeks. Whereas in the US and Canada, programmes can last up to 6 months or a year.

The Carinex study¹⁸⁵ reported duration, content of programmes, staffing, and organizational activities across Western Europe. It is evident from the study that programmes are varied but well organized. The most notable difference is the length of the programme, which varied from 3 weeks in France to 20 weeks in parts of Belgium. CVPR in Eastern Europe and parts of Germany and Switzerland, is organized differently and is mostly on

an inpatient basis in residential clinics. These clinics are usually run by a cardiologist with a follow-on maintenance programme. In western Europe, many programmes are still based in hospital outpatient services; however, there are now several examples of community-based services. Most programmes are now set up on a rolling basis where patients start and finish at different times, thus allowing for flexibility. CVPR programmes amalgamate an exercise programme with education and counselling, which includes aggressive risk factor management, psychosocial and vocational counselling, and the use of cardioprotective medicines which has been shown to be efficient in secondary prevention of CVD.¹⁸⁶

The mode of delivery of programmes varies throughout Europe and the rest of the world, as local resources and population needs dictate what can be done.^{185,186} However, most programmes incorporate the goals of CVPR into their delivery, which can be identified specifically as medical, psychological, behavioural, social, and health services goals.¹⁸⁶ To achieve these goals, an interdisciplinary team is recommended to deliver a CVPR service. The team may include cardiologists, nurses, physiotherapists, psychologists, dieticians, pharmacists, occupational therapists, vocational counsellors, social workers, and others. The programme carried out by the team should be flexible and individualized since patients' medical problems and needs, educational level, and social and vocational situations vary. Consequently, it may not be necessary for all patients to attend every component of the programme and such flexibility within programmes could increase attendance.¹⁸⁷

Patients should be assessed on an individual basis and risk stratified prior to commencing a structured programme. Hospital programmes may include high-risk stratified patients monitoring with telemetry and easy access to a cardiology department (Irish Association of Cardiac Rehabilitation guidelines, American Heart Association guidelines). Exercise capacity assessment should be conducted using recommended methods such as exercise stress testing, which is the gold standard, or the incremental shuttle walk test.

More recently, a European survey¹⁸⁸ found that CVPR was available in 40/44 (90.9%) of European countries. Programme availability was greatest in western European countries, but overall were higher than in other high-income countries ($P < 0.001$). Typically, throughout Europe, there was only one CVPR slot per seven cardiac patients, with a vital need of 3,449,460 slots annually. Guidelines were used in 70% or more of programmes with no regional variation. Programmes had a multidisciplinary

team of 6.5 ± 3.0 staff number with a variation in type of staff regionally. Notably, European programmes had more staff than other high-income countries, offering $8.5 \pm 1.5/10$ core components over 24.8 ± 26.0 hours (regional differences, $P < 0.05$).

Guidelines, standards, and core components for CVPR have been developed and updated by various expert associations across the world. The Scottish Intercollegiate Guideline network, Working Group on Cardiac Rehabilitation and Exercise Physiology, American Association of Cardiovascular and Pulmonary Rehabilitation, and many European countries offer guidance on the most effective method of CCPR to be provided.

Regarding exercise, eminent societies recommend that patients progress from moderate to vigorous intensity aerobic exercise over the timeframe of the programme, with resistance training introduced in the latter half of the programme as an important extra. This mode of delivery has been deemed safe and provides for a better outcome for the cardiac patient.¹⁷⁶

The British Association for Cardiovascular Prevention and Rehabilitation (BACPR) published the third edition of its standards and core components for CVPR in 2017.¹⁸⁹ The aim of this publication was to further emphasize to commissioners, clinicians, politicians, and the public the significance of robust, quality indicators of CVPR service delivery. The 2017 revision has six standards and six core

components (► Fig. 11.13), with greater emphasis on quantifiable clinical and health outcomes, audit, and certification. The standards are outlined as follows:

1. The delivery of six core components by a qualified and competent multidisciplinary team, led by a clinical coordinator.
2. Prompt identification, referral, and recruitment of eligible patient populations.
3. Early initial assessment of individual patient needs which informs the agreed personalized goals that are reviewed regularly.
4. Early provision of a structured CVPR programme, with a defined pathway of care, which meets the individual's goals and is aligned with patient preference and choice.
5. Upon programme completion, a final assessment of individual patient needs and demonstration of sustainable health outcomes.
6. Registration and submission of data to the National Audit for Cardiac Rehabilitation and participation in the National Certification Programme.

A six-step clinical pathway has been developed from inpatient stay to discharge following a CVPR programme which can be used in most countries depending on local logistics¹⁹⁰ (► Fig. 11.14).

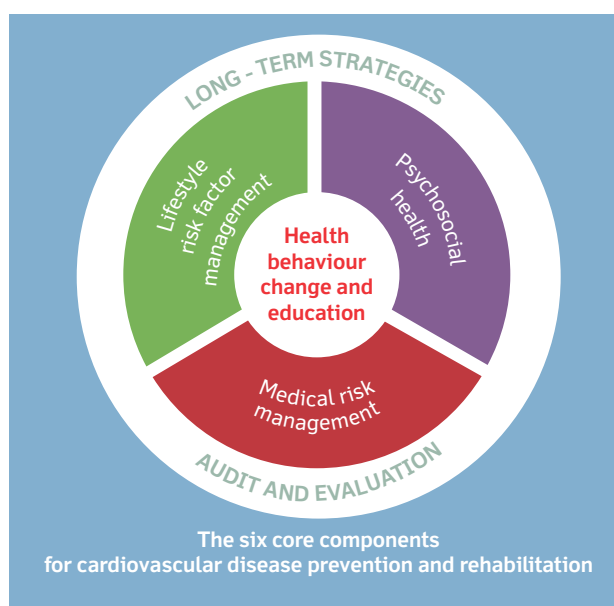


Fig. 11.13 The British Association for Cardiovascular Prevention and Rehabilitation (BACPR) six core components.

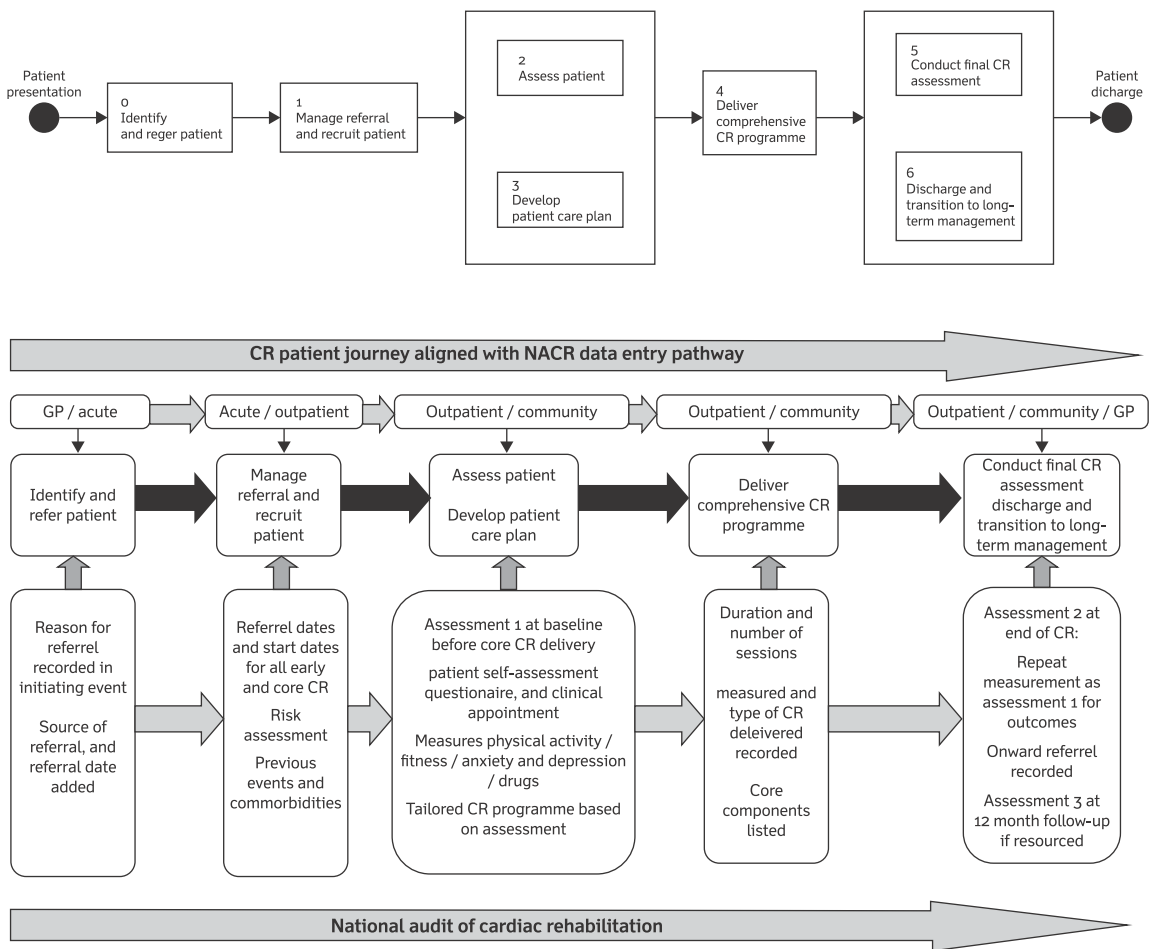
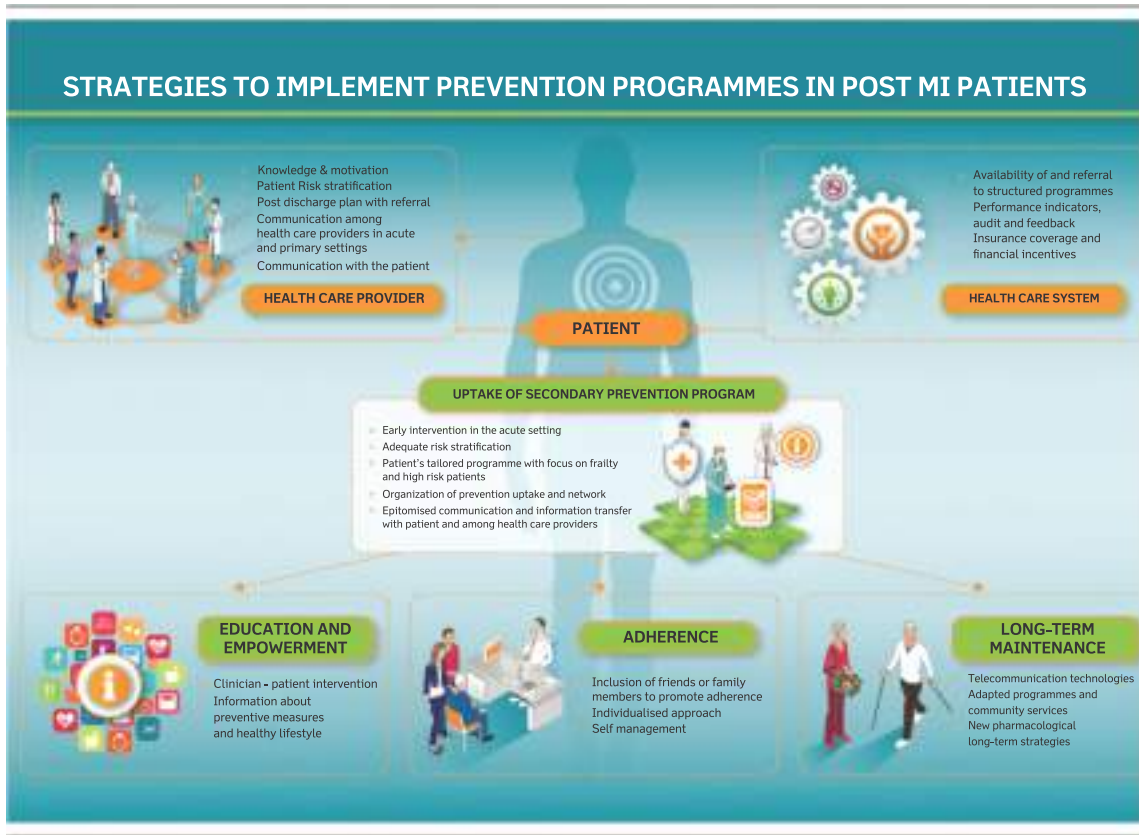


Fig. 11.14 Cardiac rehabilitation patient pathway aligned with National Audit of Cardiac Rehabilitation (NACR) data entry pathway. CR, cardiac rehabilitation; GP, general practitioner.

In a consensus document,¹⁷⁵ strategies are outlined to implement prevention programmes in post-myocardial infarction patients (► Fig. 11.15). The main thrust of the strategy is that CVPR should begin in hospital during the admission for the acute event or intervention procedure. At this stage, all professionals involved in patient care should encourage and promote lifestyle changes with prevention as a priority. Lifestyle changes and preventive medications should be pivotal to discharge planning. This early intervention along with automatic referral to structured, ambulatory programmes post discharge is designed to promote uptake. Maintenance will be promoted by family involvement and integrated care process with healthcare providers outside secondary care settings.¹⁷⁵

The European Cardiac Rehabilitation Inventory Survey¹⁹¹ assessed topics including national guidelines, legislation and funding mechanisms, types of CVPR provided, and characteristics of included patients. It found that less than half of eligible cardiovascular patients benefit from CVPR in most European countries.

The results yielded responses from 28 of 39 (72%) countries; 61% had national CVPR associations and 57% had national professional guidelines. Most countries (86%) provided early CVPR during the acute inpatient phase, although service provision varied; 29% reported delivery to over 80% patients. Support in the early post-discharge period was available; however, 15 countries reported provision in less than 30%. Almost half (46%) had national legislation for this kind of support. Three-quarters had



Massimo F Piepoli et al 2016

Fig. 11.15 Strategies to implement prevention programmes in post-myocardial infarction patients.

government funding and an associated tariff. Structured ambulatory programmes to follow early support were less supported. Although they were available in most countries, 11 could not provide estimates of numbers participating. Thirteen reported that all costs were met by patients.

Primary care setting

The World Health Organization

The WHO defines primary care as a place of first contact for healthcare, but more than just 'gate keeping', for example, in deciding where patients should be referred for specialist care (<https://www.euro.who.int/en/health-topics/Health-systems/primary-health-care/main-terminology>). Primary care should provide continued, comprehensive, and co-ordinated care in the long term.

An ageing population, adverse trends in cardiovascular risk factors, and the burden of chronic non-communicable

disease has intensified the demand for high-quality primary care services.^{57,192} As cardiovascular risk is predominantly driven by poor lifestyle habits learned early in life, preventive efforts should begin in childhood (see also 'The global imperative'). Embracing this concept, primary care addresses health over the life course providing an optimal environment to deliver health promotion and integrated primary and secondary prevention. Its wide reach into the population (via routine check-ups, episodic visits, and chronic disease support), unrivalled knowledge of patients' social situation, and access to continuous care and coordination highlight its suitability.¹⁹³

While combining all healthcare professionals' diverse knowledge and skills into multimodal interventions can optimize preventive efforts, nurses working in primary care are integral members of the primary care team, which also can include general practitioners and other professionals such as community or district nurses, midwives, feldshers, dentists, physiotherapists, social workers, psychiatrists,

speech therapists, dietitians, pharmacists, and administrative staff and managers. Their holistic approach and frequent patient contact provide unlimited opportunities to address the needs of patients and families including screening, healthy lifestyle promotion, and planned evidence-based interventions. Given the compelling data demonstrating the impact of nurse-led prevention programmes,^{30,196} there is a critical need to expand nurses' roles in primary care as this could increase access to these services, alleviating general practitioner shortages while enhancing care at a lower cost. However, various constraints including time and educational preparation prevent them from practising to their full potential.¹⁹⁵

Although preparing and maintaining a well-educated workforce is fundamental, nurse training programmes routinely focus on acute care settings with less emphasis on primary care, leading to a weakness in training for nurses working in primary care. Existing undergraduate programmes need to revise curricula to reflect emerging healthcare needs with a clear focus on prevention and primary care health delivery. It is equally important that nurses maintain their competence to practise, after basic training, through ongoing education. This gap has been acknowledged within the European context through the development by ACNAP of a core curriculum intended to guide the continuing education of nurses working in cardiovascular care (see also Chapter 3).¹⁹⁶ In addition, highly beneficial postgraduate masters' programmes are available, although currently are not a prerequisite for employment.

Risk identification.

Preventive efforts should be targeted at those who will benefit the most and systematic risk screening can be easily integrated into routine clinical practice using global risk assessment tools (see 'Concept of total cardiovascular risk and total risk management'). These tools provide a valuable guide for primary care nurses to prioritize and plan prevention management.

Providing a clear understanding of the patient's cardiovascular risk along with potential effects of lifestyle and/or pharmacological interventions is key to fulfilling their active role in shared decision-making. Importance of training staff to overcome challenges of communicating this risk has been highlighted within screening programmes.¹⁹⁷ Considering patients' level of health literacy, avoiding technical terms, and using tailored, and/or interactive decision aids can all enhance the nurse–patient risk discussion. In particular, the ESC HeartScore, an interactive online version of SCORE, is valuable for conveying

powerful messages, such as risk age and demonstrating the relative contribution of each risk factor to overall risk.¹⁹⁸ For example, illustrating to a smoker how smoking alone impacts their risk may be more compelling than just words.

Brief and very brief interventions opportunities in primary care

Lifestyle change is a key priority in promoting CVH (see 'Components of prevention and rehabilitation in clinical practice'). Primary care nurses are in an ideal position to offer brief, opportunistic advice about behaviour change during routine encounters with their patients. These 'teachable moments' are a powerful strategy to identify and effectively address unhealthy behaviours, without using additional resources.^{199,200} For example, a child's visit for immunization, with a history of repeated otitis media, represents a *teachable moment* to counsel parents regarding the health effects of passive smoking (i.e. doubles the risk of a child having an ear infection).²⁰¹ Very brief interventions (<5 minutes), while limited to active behaviour change techniques such as self-monitoring and review of behavioural goals are equally valuable and crucial in a busy primary care setting.

The therapeutic relationship established between primary care nurses and patients through repeated encounters provides a strong foundation to incorporate behavioural strategies and offers a menu of strategies to move patients from the 'why to how'. While these evidence-based approaches are no 'magic bullet', they are useful in time-limited health consultations serving as catalysts for more comprehensive, personalized discussions contributing to healthy lifestyle changes.

Active follow-up is vital to build a relationship, evaluate interventions, and adjust action plans accordingly. As long-term adherence diminishes, primarily with reduced interactions, booster reinforcement sessions are essential. While family and other caregivers add an important source of social support to improve long-term changes, it also increases the reach of preventive care.^{57,202}

Health education programmes and self-management support

Patients with chronic conditions interact frequently in primary care and self-management support, a key component of the Chronic Care Model, enhances patient skills and confidence to manage their chronic condition. Nurse-led self-management support interventions have yielded numerous health outcomes in a range of

chronic diseases,^{203–206} thus, embedding systematic education and supportive interventions (e.g. goal-setting, self-monitoring) into routine practice is now a priority.²⁰⁷ Employing simple but effective tools can empower patients such as, for example, the ‘Guide to Healthy Shopping’ card which develops knowledge and skills in understanding food labels and facilitates informed healthy choices.²⁰⁸ This guide from Ireland uses traffic light colours to facilitate patients to make informed healthier food choices. While some manufacturers use traffic light labelling on prepacked food and drinks, it is inconsistent. Other successful factors include having interactive components such as online tools (e.g. tracking dietary progress) and providing opportunities for peer support (e.g. family/friends, social groups).

Guideline implementation and quality

Nurse-led teams have proven effective in implementing evidence-based guidelines,^{20,209–211} which in turn, provide clinical standards for high-quality preventive care and decision support. Systematic monitoring of these activities and outcomes are important drivers of translating evidence into clinical practice with publishable outcomes. This exploration of programme effectiveness enhances good practice, builds an evidence-base for effectiveness to drive service improvement, and improves care.⁵⁷

Clinical community linkage

As a gateway to community prevention resources, primary care should have an established link to a comprehensive network both locally and nationally. This community linkage will facilitate the nurse’s role as preventive health navigators, especially for vulnerable patients, providing information and steering them to link with other providers (e.g. community-based support groups).

Options for the future

Primary care has a key role in the frontline management of prevention, treatment, and control across the lifespan with the patient/family as central entities in the process. Nurses working in primary care, as effective champions, are well poised to guide patient care delivery, coordination, and lead interdisciplinary teams to optimize preventive efforts. Risk stratification, driving resource allocation and directing care intensity, accompanied by routine application of behaviour change practices can enhance frequency and quality of preventive care. While competency-based pathways can support expanding roles of these nurses,

political activism is vital to influence a higher investment in preventive activities.

Community setting

Internationally, there is a growing need to extend the current provision of CVPR beyond the traditional hospital and primary care settings and develop more innovative, integrated models of high-quality care that will address the challenges that exist around uptake and accessibility of these programmes.

The community is particularly important as a setting for prevention as it offers many opportunities to address the barriers associated with prevention (► **Box 11.10**). It offers greater access to ‘hard to reach’ population groups including ethnic minorities, women, the elderly, and those with limited social support and low socioeconomic status. Individuals with low socioeconomic status as defined by educational attainment, income level, employment status, and environmental factors, are at increased CVD risk and disproportionately experience poor health outcomes and CVD prognosis. With 80% of the global CVD burden in low- to middle-income countries,²¹² translating evidence-based practice to non-conventional community-based healthcare settings offers an alternative way to address the health inequalities associated with CVD. There is increasing evidence to support these non-traditional health promotion approaches to prevention in community settings such as schools, social networks, religious organizations, workplaces, and retail outlets. Data from recent RCTs of blood pressure

Box 11.10 Opportunities to address the barriers to prevention in the community

- Offers greater convenience, overcoming barriers related to access, geography, and transport.
- Promotes greater uptake of prevention and cardiac rehabilitation among underserved populations which include women, heart failure, stroke and peripheral vascular disease patients, and ethnic minority groups.
- Removes the barrier of attending the general practitioner and hospital clinic.
- Promotes long-term maintenance of behaviour change as the individual is empowered to continue making lifestyle changes in their local community where they live, work, and play.

management in black barbershops and community-based lifestyle interventions in churches^{213,214} demonstrated improved health outcomes and significantly greater reductions in blood pressure than those in the control group. Furthermore, the Fifty, Fifty study²¹⁵ demonstrated the benefits of a comprehensive lifestyle peer group-based programme delivered in the community on cardiovascular risk factors.

Integrated models of community-based cardiovascular disease care

In reorientating health systems to respond effectively to the increasing burden of non-communicable diseases including CVD, global recommendations call for community-based, patient-centred, integrated models of chronic disease management.²¹⁶ The MyAction programme^{26,209} is an example of one such model, which manages CVD as a single family of diseases and integrates primary and secondary prevention in one community-based service. The programme is nurse led and is based on the EUROACTION study intervention model²⁰⁸ which demonstrated that an intensive nurse-led programme can achieve effective and substantial improvement of CVD risk factors in high-risk groups of patients in comparison to usual care (see also 'The global imperative'). The key components of this 12–16-week interdisciplinary care model include lifestyle modification (smoking cessation, healthy food choices, and physical activity), medical risk factor management (blood pressure, lipids, and glucose), and the prescription of cardioprotective medication where appropriate. Utilizing specific behavioural change techniques, the programme places a strong emphasis on the promotion of self-management, where patients are empowered to become active participants in their own care. Adopting this multifactorial approach, which addresses six or more risk factors, has been shown to achieve best patient outcomes, reducing myocardial infarction, stroke, cardiovascular, and all-cause mortality.¹²

The MyAction programme has demonstrated effectiveness in a real-world setting,^{26,209} among different population cohorts and geographical regions, highlighting its acceptability and transferability as an alternative, model of preventive care. Critical to the success of the programme has been its patient-centred approach ensuring a flexible offering of sessions and involvement of families recognizing that healthy lifestyle change is easier to achieve if the family change together. The outcomes of MyAction emphasize that it is possible to implement prevention guidelines into everyday clinical practice and achieve significant reductions in cardiovascular risk in

those with established CVD and asymptomatic high-risk individuals, which are sustained at 1 year follow-up.

Optimizing on the role of the nurse in the community

Lack of access to healthcare providers, is a well-documented barrier to prevention,²¹² particularly in low- to middle-income countries. Given the increasing demands and reorientation of health services to primary care, there needs to be an increased focus on task sharing or team-based care models, maximizing the role of nurses working outside hospital and primary care settings and other healthcare professionals working in prevention and chronic disease management. This may involve opportunistic approaches to screening and early detection of CVD, addressing major modifiable risk factors, including tobacco use, hypertension, high blood cholesterol, and diabetes, through comprehensive prevention and rehabilitation programmes and promoting lifelong CVD prevention. While there are various specialities of nurses working in the community, including, but not limited to, public health nurses, community registered nurses, to those working with non-governmental organizations, their roles tend to be more of a generalist nature, with variations in skill set, competencies, and experience in cardiovascular care. Therefore, to truly optimize the role of nurses working in cardiovascular health promotion, prevention, and management, there is a recognized need to build capacity around nursing education and training to ensure that nurses are equipped with the appropriate skills and strategies to deliver evidence-based, high-quality, patient-centred care.^{217,218}

The community is one of many settings where comprehensive prevention and cardiac rehabilitation can be successfully delivered; however, due consideration does need to be given to a number of factors in establishing programmes in this setting (► **Box 11.11**). The community offers a modern-day approach to addressing the challenges that exist around implementing evidence-based guidelines and should be considered as part of a menu-based approach that promotes individual choice.

Technology to support prevention and rehabilitation initiatives

While provision of prevention and rehabilitation programmes in the community, closer to people's homes,

Box 11.11 Key considerations for delivering programmes in the community

- There is no 'one-size-fits-all' approach and for optimal impact prevention programmes must be designed with service user input, and shaped accordingly to the cultural needs and literacy levels of the target population.
- There should be close alignment between community-based prevention and rehabilitation programmes and hospital programmes to ensure patient choice is prioritized and supported by one efficient and effective seamless referral system.
- It is imperative that all models of prevention and cardiac rehabilitation service provision, regardless of setting should be underpinned by evidence-based, nationally/internationally accepted key components. This will reduce variability of service provision and ensure standardization of care.
- Appropriate clinical governance and programme protocols with standard operating procedures including inclusion and exclusion criteria, key performance indicators, and policies and procedures should be in place.
- Nurses who work in the community need to be equipped with the appropriate skills and training to deliver evidence-based, high-quality, patient-centred care.

has the potential to improve access and so increase uptake as explained previously (see 'Community setting'), integrating technology may address other barriers to uptake such as, for example, a dislike of group-based programmes and timing in relation to working hours. Technology offers more flexibility and alternative delivery models that may include interventions based in general practice or in the home environment.

Over the past 10 years, there has been a marked increase in the number of health interventions which are delivered digitally. Digital health, or 'telehealth', including mobile apps, Internet-based interventions, and video-conferencing have been shown to be effective in reducing risk factors and improving quality of life. Moreover, these interventions can also be used as an adjunct to traditional CVPR, and provide additive benefit to those who received both interventions. The key challenge exists in understanding the active ingredients of digital health solutions. A recent systematic review²¹⁹ of 30 unique trials investigating the effects of telehealth highlighted the

complexity of the interventions and the difficulty in understanding which element works for whom. Indeed, among individual trials delivered via mobile apps, only one of them used a single intervention (► **Table 11.26**).^{220–226} This study, called 'TEXT ME',²²⁰ used a computer to randomly select study participants to receive text messages providing information on lifestyle change semi-tailored to the individual. Although the participants were told that they should not respond to the messages, a number of them did. They associated these computer-provided messages with the research assistant who had recruited them to the study.

This fascinating finding of 'TEXT ME' highlights the importance of personalization in digital health. In future, virtual coaches in the form of avatars may help to increase the sense of personalized support and so reduce the burden on healthcare providers. An avatar is the graphical representation of a healthcare provider in a digital environment. Avatars can be simple, for example, the Apple watch activity app provides a visual representation of the user's daily activity using circles. Avatars also have the capacity to deliver more complex information. Recent work in Australia has highlighted the potential for an avatar to improve understanding of chest pain and timely presentation to healthcare services (► **Fig. 11.16**).²²⁷ Of even more importance, avatars can be tailored to be culturally sensitive, to speak multiple languages, and information can be revisited multiple times.

One of the key challenges that exists in delivering digital health is the rapid evolution of technology. Over 6000 apps are released daily in the Google play store. Researchers struggle with the rapid evolution of technology and the slow pace of research funding, ethics approval, and length of time for conducting studies. This means it is critical for us to understand what is likely to be the active ingredient of an app. A review conducted in 2015²²⁸ demonstrated some key features that are likely to be critical in improving cardiovascular health:

1. Simplicity of the app appears to be of great importance in acceptance and use of health-related apps. If the app requires active input from the user, the choices must be clear and unambiguous, and minimal steps must be required to navigate from one part of the app to another.
2. Users want to be assured that the information comes from a credible source, such as the national heart foundation of the country of origin.
3. It is thought that embedding behaviour change concepts will improve use and effectiveness of apps.

Table 11.26 Key components of digital interventions

Blasco et al. ²²¹	Acute coronary syndrome patients with 1+ cardiovascular risk factor (Spain)	Combination: telephone, Internet, risk factor monitoring by cardiologist, individualized SMS feedback
Chow et al. (TEXT ME) ²²⁰	Patients >18 years with coronary heart disease (Australia)	Text messages, based on American Heart Foundation guidelines, regular semi-personalized messages, individualized risk factor modification
Johnston et al. (SUPPORT) ²²²	Myocardial infarction patients prescribed ticagrelor (Sweden)	Combination: smartphone app, self-managed, risk factor monitoring, automated feedback SMS
Karhula et al. ²²³	Patients >18 years with coronary heart disease or diabetes (Finland)	Combination: Internet, health coaching, mobile phone coaching to risk factor targets, self-management
Maddison et al. (HEART) ²²⁴	Patients >18 years diagnosed with ischaemic heart disease within past 3–24 months (New Zealand)	Combination: Internet, web-based exercise intervention, self-managed, behaviour change, Internet behaviour monitoring, SMS encouragement
Pfaeffli Dale et al. (Text4Heart) ²²⁵	Coronary heart disease patients with home Internet access (New Zealand)	Combination: text messaging, based on cardiac rehabilitation, patient education, risk factor management, daily messages, Internet support
Varnfield et al. (CAP-CR) ²²⁶	Post-myocardial infarction patients referred to cardiac rehabilitation (Australia)	Combination: smartphone, mentor-managed, motivational/education messages, weekly phone consultation, web monitoring with weekly consultation

4. Being able to track behaviour in real-time is also thought to be very important. For example, wearable technology may improve engagement.
5. Personalized information is particularly important. The ability in the future for patients to hold their own electronic information will increase the possibility for personalized tailored information.
6. Opportunities for social comparison and social support have been shown to improve physical activity compared to apps without these features. In cardiovascular health prevention, there is limited trial evidence about the importance of these features. However, work by an Australian group led by Tashi Dorje (unpublished data) demonstrates the huge

**Fig. 11.16** Cora digital avatar provides health information to improve timely presentation with chest pain.

potential of social media sites such as WeChat to reach patients who otherwise have no opportunities to participate in CVPR.

Although critics suggest that digital health may not be suitable for older adults, this is not supported by the available evidence. Smartphone ownership is on the rise among the older generation. Digital technology has been used to successfully improve physical activity and cognitive function in the older adult. There are some considerations for app use in older adults, for example, decreased vision and reduced fine motor skills may make using apps on a smartphone more challenging. Another finding is that older adults are less likely to feel confident navigating apps and may worry that they will break it. Providing older apps with digital resources requires reassurance that the apps cannot be broken.

The potential for digital technology to transform CVPR is vast. Consequently, it is essential that healthcare providers are familiar with technologies and understand what to recommend to improve access to CVPR and give

people opportunities to improve their cardiovascular health.

Role of professional societies, associations, and foundations in cardiovascular prevention and rehabilitation

Professional associations and societies play an important role in supporting healthcare providers, patients, and caregivers. It is important for nurses to engage with these organizations to support their continuing professional development (see also Chapter 3). They have the power to influence policy, advocate for professionals and patients, provide educational materials and programmes, publish and disseminate research in journals, offer networking opportunities, patient support groups, and professional development. ➤ **Table 11.27** provides a list of organizations that are concerned with CVPR across the globe.

Table 11.27 The professional association/societies listed focus on cardiovascular disease prevention and management

Name	Mission	Website
ACNAP (Association of Cardiovascular Nursing and Allied Professionals)	Our mission: to reduce the burden of cardiovascular disease	https://www.escardio.org/Sub-specialty-communities/Association-of-Cardiovascular-Nursing-&-Allied-Professions/About
AHA (American Heart Association)	To be a relentless force for a world of longer, healthier lives	https://www.heart.org/en/about-us
AHN (African Heart Network)	The African Heart Network’s vision is to play a leading role in the prevention and reduction of the burden related to cardiovascular disease, including heart disease and stroke, so that it will no longer be the major cause of premature death and disability throughout Africa	http://www.ahnnetwork.org/about-us/vision-mission
ASPC (American Society for Preventive Cardiology)	To promote the prevention of cardiovascular disease, advocate for the preservation of cardiovascular health, and disseminate high-quality, evidence-based information through the education of healthcare clinicians and their patients	https://www.aspconline.org/
BHF (British Heart Foundation)	To support research into the causes, prevention, diagnosis, and treatment of heart and circulatory diseases	https://www.bhf.org.uk/

Table 11.27 Continued

Name	Mission	Website
BACPR (British Association for Cardiovascular Prevention and Rehabilitation)	To support health professionals in the development, delivery, and assessment of evidence-based, individualized programmes of prevention and rehabilitation which have been appropriately funded and which are accessed both by individuals with established cardiovascular disease and those with significant cardiovascular disease risk factors	https://www.bacpr.com/pages/default.asp
CACPR (Canadian Association of Cardiovascular Prevention and Rehabilitation)	The Canadian Association of Cardiovascular Prevention and Rehabilitation (CACPR) is a national body comprised of interdisciplinary health professionals. Our focus is enhancing knowledge and clinical care, as well as enabling research for those who work in cardiovascular prevention and rehabilitation	https://cacpr.ca/About-Us
CIPRECAR (acronym in Spanish)	The Inter-American Working Committee on Cardiovascular Prevention and Rehabilitation is composed of people interested in the prevention of cardiovascular diseases and the timely and adequate rehabilitation of patients who already suffer from any of these pathologies. Mission: to reduce the burden of cardiovascular disease in Latin America and reduce the morbidity and mortality of patients already affected with cardiovascular diseases	http://www.ciprecar.org/nosotros/
EAPC (European Association of Preventive Cardiology)	Our mission is to promote excellence in research, practice, education, and policy in cardiovascular health, and primary and secondary prevention	https://www.escardio.org/Sub-specialty-communities/European-Association-of-Preventive-Cardiology-(EAPC)
EHN (European Heart Network)	The European Heart Network plays a leading role in the prevention and reduction of cardiovascular diseases, in particular heart disease and stroke, through advocacy, networking, capacity-building, patient support, and research so that they are no longer a major cause of premature death and disability throughout Europe	http://www.ehnheart.org/
HFATW (Heart Friends Around The World)	Heart Friends Around the World (HFATW) is an international organization and an affiliated member of the WHF that promotes cardiovascular disease prevention worldwide through a membership network	http://www.hfatw.org/

(continued)

Table 11.27 Continued

Name	Mission	Website
IACR (Irish Association of Cardiac Rehabilitation)	To facilitate communication and support between cardiac rehabilitation multidisciplinary professionals who wish to promote a greater awareness and understanding of cardiac rehabilitation throughout the healthcare system. To endeavour to provide and improve the standard of professional education within cardiovascular rehabilitation through the promotion of conferences, scientific meetings, publications, and contact with appropriate national and international agencies. To cooperate and fully collaborate with existing national and international organizations working in this field to promote an evidence-based approach to client care within cardiac rehabilitation	https://iacronline.ie/
ICCPR (International Council of Cardiovascular Prevention and Rehabilitation)	The primary goals of the International Council of Cardiovascular Prevention and Rehabilitation (ICCPR) are to: To bring together national associations from around the world, to harmonize efforts in promoting cardiovascular prevention and rehabilitation. To work towards ongoing consensus among national associations globally, regarding the internationally common core elements and standards of cardiovascular disease prevention and rehabilitation. To promote cardiovascular prevention and rehabilitation as an essential, not optional service to ensure broader access to these proven services. To support countries to establish and augment programmes of cardiovascular prevention and rehabilitation, adapted to local needs and conditions. To consider and communicate the emerging evidence base for cardiac rehabilitation	http://globalcardiacrehab.com/
IHF (Irish Heart Foundation)	Our mission is to affect positive change in the lifestyles of Irish people, to achieve better outcomes for those affected by heart disease and stroke, and to challenge when the health of our nation is put at risk. We empower people to live longer, healthier lives	https://irishheart.ie/our-mission/mission-statement/
NIPC (National Institute for Prevention and Cardiovascular Health, Ireland)	To provide leadership through discovery, training, and applied programmes to prevent and control cardiovascular disease for all, promote healthier living, raise the standards of preventive cardiology practice, and prepare leaders to advance preventive healthcare in Ireland	http://www.nipc.ie/about.html

Table 11.27 Continued

Name	Mission	Website
PCNA (Preventive Cardiovascular Nurses Association) and GCNLF (The Global Cardiovascular Nursing Leadership Forum)	PCNA's mission is to promote nurses as leaders in cardiovascular disease prevention and management across the lifespan. The mission of the GCNLF is to engage and mobilize an international community of nurse leaders to promote the prevention of cardiovascular disease and stroke worldwide through research, education, policy, and advocacy	https://pcna.net/about/
NHF (Nigerian Heart Foundation)	To play a leading role in the fight against heart disease and stroke with the aim of reducing the number of Nigerians suffering from premature death and disabilities	http://www.nigerianheart.org/
Russian National Medical Society of Preventive Cardiology	To promote the development of policy, improvement of scientific research, clinical practice and education projects in the field of preventive cardiology in the Russian Federation	http://www.cardioprevent.ru/scientific-society/about/_eng_/default.asp
SBC (Society of Brazilian Cardiology)	Expand and disseminate knowledge in cardiovascular science representing and promoting the development of the cardiologist to carry out actions in favour of cardiovascular health in the country	http://prevencao.cardiol.br/quem_somos.asp
SHA (Saudi Heart Association)	Promote research in cardiovascular medicine through the <i>Journal of the Saudi Heart Association</i> where specialists in cardiovascular medicine exchange knowledge	https://saudi-heart.com/
The Global Heart Hub	An international alliance of heart patient organizations established to create a unified global voice for those living with or affected by heart disease	https://www.heartscore.org/
WHF (World Heart Federation)	By 2025, we aim to drive the WHO target for non-communicable disease mortality reduction by reducing premature deaths from cardiovascular disease by at least 25%	https://www.world-heart-federation.org/about-us/

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12 Pharmacology for cardiovascular nurses

JAN KEENAN, RANI KHATIB, GABRIELLE MCKEE, TODD RUPPAR, AND FRANKI WILSON

CHAPTER CONTENTS

Introduction 370

Management of medication in people with cardiovascular disease 370

Nursing and allied health professional prescribing 370

Approaches to nursing and allied health professional prescribing 371

Interdisciplinary working in medicines reconciliation 372

Community heart failure care setting 372

Heart failure care across acute and community settings 372

Introducing novel treatments in coronary artery disease 372

Adherence to medication regimens 373

Overview of medication adherence in cardiovascular disease 373

Influences on medication adherence 374

Identifying and addressing non-adherence 374

The role of the cardiovascular nurse in addressing adherence 374

Introduction to medicines used in cardiovascular care 377

Lipid-lowering therapies 379

Anticoagulants and antiplatelet drugs 381

Antiarrhythmic drugs 387

New diabetes drugs with cardiovascular benefits 388

Drugs used to promote tissue perfusion 388

Drugs used in emergency and cardiogenic shock 391

How are pharmacodynamics affected by pharmacogenetics and pharmacogenomics? 391

Conclusion 392

This chapter aims to develop understanding of pharmacology gained from earlier chapters by introducing some of the main drug groups used in cardiovascular care. It describes developments in nurse and allied health professional prescribing, and its potential benefits across the patient pathway. Examples are offered of how non-medical prescribing contributes to good practice in managing medication and the achievement of secondary prevention targets. The concept of medication adherence is explored and applied to the practice of managing medication and

individualizing patient care and its importance emphasized in long-term management of the patient with cardiovascular disease.

KEY MESSAGES

1. Pharmacological therapies are the mainstay in management of primary and secondary prevention of cardiovascular disease.

2. Nurses have an important role in medicines management in collaboration with professional colleagues, particularly physicians and pharmacists.
3. Training nurses in advanced practice skills in relation to medications can improve post-acute event care.
4. Approaches to nursing and allied health professional prescribing are described in three different ways, referred to as 'independent', 'supplementary', and 'dependent' prescribing.
5. Up to half of patients prescribed medication for long-term conditions are not adherent to their prescribed regimen.
6. It is important for nurses to identify the reason for non-adherence before attempting to implement strategies to address it.
7. In cases of intentional non-adherence, it is essential to address patients' beliefs or concerns, or advocate for the patient to have the treatment plan modified to an approach that fits the patient's needs.

Introduction

Nurses have an important role to play in the management of their patients' medicines in cardiovascular care in collaboration with other disciplines, in particular physicians and pharmacists. This role covers elements such as coordination of their patients' medicines which is a part of the overall coordination of their care. In both acute and community settings, nurses take a holistic approach to care which involves viewing the big picture of the care that the patient and their family are receiving. Nurses are often responsible for 'joining up the dots' and ensuring integrated care. Nurses may also be involved in prescribing and optimization of drug therapies whether as an independent prescriber or in collaboration with physicians and pharmacists. This varies across countries and depends on education, training, and legislation. In the UK and the US, legislation now allows and facilitates independent prescribing by nurses and pharmacists with appropriate training and specialization. Nurses can also contribute to the reconciliation of medicines process because of their close and frequent contact with their patients which helps to avoid unnecessary polypharmacy and ensures safety and avoidance of adverse events.

In order to maximize adherence with medicines by patients, nurses are also well placed and can initiate educational (see also Chapter 13) and other interventions. In this chapter, we will cover these elements of the nurse's role in more detail and also describe how this role dovetails with that of other health professionals, in particular, physicians and pharmacists.

Management of medication in people with cardiovascular disease

Cardiovascular patients encounter many health professionals across their treatment pathway in primary, secondary, and tertiary care sectors; all those professionals will have an impact or influence on the patient's management, whether in prescribing or monitoring the effects of preventive therapies, and the ongoing identification and management of risk factors such as diabetes, high blood pressure, hyperlipidaemias, and health behaviours. There is nevertheless evidence that a large majority of coronary patients do not achieve guideline standards for secondary prevention¹ with a high prevalence of persistent smoking, unhealthy diets, physical inactivity, and inadequate risk factor control despite high reported use of medications.¹ Ongoing care and management of risk factors remains a challenge.

Cardiovascular medications remain the commonest intervention worldwide for primary and secondary prevention of cardiovascular diseases, yet despite their importance and known benefit, appropriate medication use is a challenge for both patients and for providers of healthcare. Patients frequently do not adhere to medications, resulting in poor clinical outcomes.² There is little question that in the management of cardiovascular disease, all health professionals across the patient pathway through presentation, acute treatment, follow-up, prevention, and rehabilitation need to have the ability to proactively influence pharmacological and non-pharmacological approaches to the management of the patient. ► **Box 12.1** shows an example of how training nurses in advanced practice skills in relation to medications management can improve care following an acute event.

Nursing and allied health professional prescribing

The development of prescribing by nurses and allied health professionals has been driven by the necessity to improve healthcare delivery in an era in which there is a need to improve accessibility to treatment, including medication, at the point of care. The growth of nursing and allied health professional prescribing has been influenced by economic circumstances, a diminishing number of medical providers, the unavailability of adequate healthcare services in rural areas, and growing specialization among the professions.³ Nurse and pharmacist prescribing is increasing

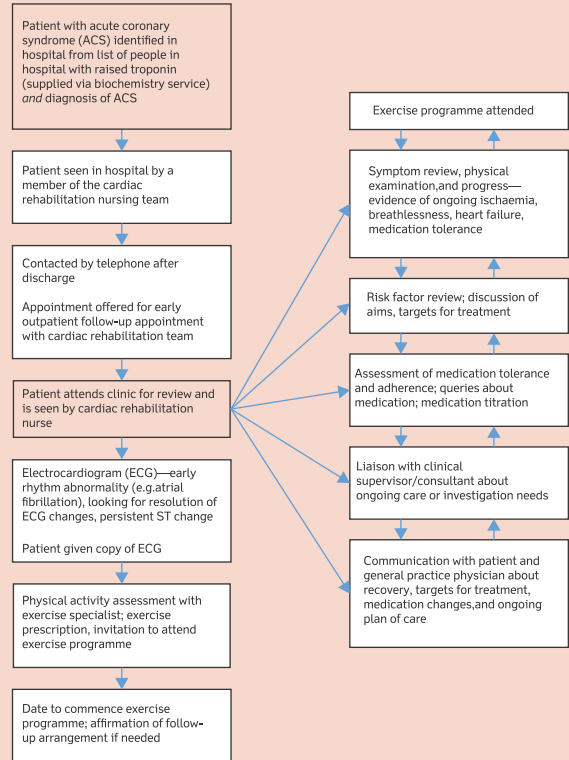
Box 12.1 Improving risk factor control, patient management, and access to cardiac rehabilitation through advanced nursing

The Oxford University Hospitals NHS Foundation Trust in the UK has invested in the development of members of the cardiac rehabilitation team to enable team members to develop skills in advanced practice, including history taking and physical assessment, and prescribing (see also Chapter 3).

In Oxford, UK, an audit of risk factor modification established that the achievement of targets for lipid lowering and for blood pressure levels was suboptimal. In addition, the uptitration of cardioprotective medication such as angiotensin-converting enzyme inhibitors (ACEIs) was not taking place after patients were discharged from hospital.

Through establishing a programme of early follow-up and early access to cardiovascular prevention and rehabilitation (see also Chapter 11) alongside the development of advanced skills, the nursing team proactively manage risk factors, titrate medication in a timely way, and address early medication concerns. Where people have been offered earlier access (within 2 weeks) to the commencement of the programme, the uptake of the programme has improved, patients have returned to work earlier after myocardial infarction (MI), and smoking cessation rates have improved. Unintended benefits were the early identification of complications of MI, and improvement in referral pathways to primary care or back to secondary care for the management of ongoing symptoms, higher-risk patients, or those in need of specialist advice from, for example, diabetologists or lipid specialists.

Recovery and rehabilitation after an acute coronary syndrome: the Oxford pathway



in primary and secondary care settings in the UK and is safe, clinically appropriate, acceptable to patients, and viewed positively by other health professionals.⁴ Nursing and allied health professional prescribers as well as physicians have reported that patients accessing prescribing from nurses and allied health professionals receive higher-quality care, with more choice and convenience,⁵ greater flexibility, and access to appointments.⁶

Approaches to nursing and allied health professional prescribing

Nursing and allied health professional prescribing was introduced in the UK in 1992. Its development has been influenced by changes in legislation that have led to the development of independent prescribing for nurses, pharmacists, and a range of allied health professionals.⁷ While

the UK has led the way in introducing nursing and allied health professional prescribing, it is emerging as an integral part of patient care in many Western European countries, the US, Canada, Australia, and New Zealand, although in most areas prescribing authority is restricted only to nurses and pharmacists. However, while the term 'nurse prescribing' suffices as a description of an activity, the practice it refers to varies between countries and internationally.⁸ Approaches to nursing and allied health professional prescribing are described in three different ways, referred to as 'independent', 'supplementary', and 'dependent' prescribing.

An independent prescriber is responsible for clinical assessment, diagnosis, decisions about the appropriateness of a medication, and the issuing of a prescription. The independent prescriber has the authority to prescribe medications without the supervision of another health professional. This might be undertaken from a limited

formulary that defines the medications that can be prescribed, or from an open formulary.

Supplementary prescribing is a voluntary relationship between an independent prescriber, usually a physician or dentist, and a supplementary prescriber who might be a nurse or pharmacist, or in the UK an allied health professional, for example, a physiotherapist, podiatrist, or dietitian. The supplementary prescriber manages the condition diagnosed by the independent prescriber, within a clinical management plan for a defined patient and condition, agreed with the independent prescriber and the patient, and specifies the medications that might be used to manage a specific condition (e.g. asthma, diabetes, or coronary heart disease) and the circumstances in which the patient will be referred to the independent prescriber for review. In the UK, nurses and pharmacists qualify as both independent and supplementary prescribers, but currently a nurse or pharmacist cannot be the named independent prescriber for the purposes of a clinical management plan.

Dependent prescribing authority implies that the nurse or pharmacist's prescribing authority is delegated by an independent prescriber, usually a physician, on the basis that the nurse or pharmacist is capable of performing the delegated duty.⁹ The dependent prescriber shares responsibility for the management of the patient with the shared responsibility described through a collaborative drug therapy management. This was the original model for advanced practice nurse prescribing in the US, and is still in use in those parts of the US that have not implemented full practice privileges for advanced practice nurses (e.g. nurse practitioners).

Interdisciplinary working in medicines reconciliation

Community heart failure care setting

At Leeds Teaching Hospitals in the UK, pharmacists and nurses work together in the care of heart failure patients in the community. This partnership between heart failure nurses and cardiology pharmacists operates as a virtual clinic, whereby the nurse reviews patients in the community and seeks expert advice on heart failure medication from the hospital-based cardiology pharmacist. There is traditionally an emphasis on medicines reconciliation at transfer of care, for example, when a patient is discharged back to the care of the community heart failure nurse following a hospital admission. Here, community heart

failure nurses ensure that an accurate list of medication is maintained and may consult with the cardiology pharmacist, via a virtual clinic, to clarify and confirm the rationale for changes made during hospital admission. The ongoing challenge is to ensure that this list of medication is adjusted and optimized to prevent hospital admissions. The heart failure nurse and cardiology pharmacist work together to ensure that medications are assessed when the patient's clinical condition changes.

Heart failure care across acute and community settings

Community and acute services heart failure teams at the Oxford University Hospitals NHS Foundation Trust in the UK meet on a monthly basis to discuss and review cases. The review is undertaken with a consultant cardiologist, a cardiac pharmacist, and the nursing teams working in acute and community settings. This provides an opportunity for clinical supervision and for those involved in the patient's care pathway to discuss management of particularly complex patients. The treatment pathway can be discussed and the evidence supporting the use of novel treatments for heart failure that might benefit the individual patient discussed with review planned for the patient to discuss changes or developments that may have benefit. This multiprofessional approach gives an opportunity for learning, for discussion of how treatment decisions impact the individual, and for individual optimization of medication for heart failure.

Introducing novel treatments in coronary artery disease

In 2019, the European Society of Cardiology asserted that clinical presentations of coronary artery disease can be categorized as either acute or chronic coronary syndrome and updated its guideline for management. Previous guidance is extended to add the use of, for example, sodium-glucose co-transporter 2 inhibitors (e.g. empagliflozin and dapagliflozin) for diabetes and cardiovascular disease, and the use of glucagon-like peptide-1 receptor agonists (e.g. liraglutide) for people with diabetes and cardiovascular disease. There are novel treatments for people with hyperlipidaemias recommended and there is clearer guidance for people taking oral anticoagulation. There is an era rapidly upon us in which individualization of secondary prevention medication is necessary in order to achieve the greatest risk reduction, particularly for high-risk patients with coronary artery disease.

One reaction to this at the Oxford University Hospitals NHS Foundation Trust in the UK has been to develop protocols for the set-up of a new clinic, for people at high risk of recurrent cardiovascular events. People who fulfil the criteria will be identified in hospital by the medical or nursing teams caring for the patient, who will be invited to discuss the management of their individual risk profile with experts in, for example, lipid management, coronary artery disease, diabetes, and hypertension, with a view to optimizing and individualizing medication and communicating long-term management plans with primary care physicians.

Adherence to medication regimens

► **Box 12.2** provides an evolution of terminology used in relation to medication adherence.^{10–13}

Overview of medication adherence in cardiovascular disease

Pharmacotherapy for patients with cardiovascular disease can only be effective if patients are willing and able to take the medications appropriately prescribed for their condition. Unfortunately, up to half of patients prescribed medication for long-term conditions are not adherent to their

prescribed regimen.^{14,15} Low adherence to cardiovascular medications has been associated with poor clinical outcomes including higher rates of MI, stroke, renal failure, and overall mortality.^{16,17} Estimates of the proportion of hospitalizations due to medication non-adherence range from 4.3% to 69%, with cardiovascular conditions having higher rates of non-adherence-related hospitalizations.^{18,19}

Medication non-adherence is estimated to cost over €125 billion per year and \$105 billion per year in avoidable healthcare costs.²⁰ Patients who adhere to cardiovascular medication regimens have 15–23% lower healthcare costs than patients who are non-adherent.²¹ While pharmacy costs are typically higher for adherent patients, overall healthcare costs are consistently much lower.²²

The term ‘adherence’ considers that people choose to take medication and have control over its use. Adherence to medications is defined as the process by which patients take medications as agreed with the prescriber.¹³ Successful medication adherence involves multiple behaviours. The prescription must be filled and picked up from the pharmacy and the first dose taken (initiation); doses must be correctly taken as prescribed on a day-to-day basis (implementation); and patients must continue to take the medication for as long as it is indicated (persistence).¹³ When addressing non-adherence to medications, the type of non-adherence will contribute to the approach a healthcare provider will take towards helping the patient improve their medication-taking. Further, the patient’s reasons for non-adherence will be

Box 12.2 The evolution of medication adherence terminology

Many terms have been used in the literature to describe the process of how patients manage and take medications. The original term, ‘compliance’, emerged in the 1970s and was defined as ‘the extent to which the patient’s behaviour coincides with the clinical prescription’. Over time, ‘compliance’ became viewed as reflecting a paternalistic approach to healthcare delivery, and the term ‘adherence’ emerged in the 1990s as a concept that acknowledges the shared decision-making by patients and healthcare providers in the prescribing and medication-taking processes. This movement to ‘adherence’ culminated in a 2003 World Health Organization report that defined adherence as ‘the extent to which a person’s behaviour—taking medication, following a diet, and/or executing lifestyle changes—corresponds with agreed recommendations from a health care provider’.

During the same time period that ‘adherence’ emerged, the concept of ‘concordance’ was developed

to describe the process of healthcare providers and patients working together to identify mutually agreeable treatment plans.

The Ascertaining Barriers to Adherence (ABC) Project published an expanded review and taxonomy of medication adherence in 2012, defining adherence to medications as ‘the process by which patients take their medications as prescribed, composed of initiation, implementation, and discontinuation’:

Initiation is the time point when a patient takes the first dose of medication regimen.

Implementation is the extent to which the patient takes the doses as prescribed, on a daily basis.

Discontinuation is the time point when a patient stops taking a medication, regardless of the reason.

Persistence is then measured as the time between initiation and the last dose of medication.

of great importance. Broadly, a distinction can be made between non-adherence that is unintentional, or intentional. Unintentional non-adherence occurs when a patient wishes to follow a prescribed regimen but is unable to do so due to factors beyond their control, such as poor recall, inability to pay, problems with the treatment, or simply forgetting. Unintentional non-adherence will necessarily require different intervention approaches than would intentional non-adherence, where a patient decides not to take their medication, or modifies their medication regimen. Intentional non-adherence is a far more complex phenomenon that is 'likely better explained with an understanding of beliefs and preferences that influence motivation to start and continue with treatment'.²³

Influences on medication adherence

There is an array of factors that impact intentional medication adherence, including sociodemographic and psychosocial factors, beliefs about medication, health system factors, and the patient's experience of their illness and recovery. Sociodemographic influences include a higher level of education and increasing age,²⁴ which have a positive influence on adherence. Cost of medication²⁵ and unemployment²⁶ can have a negative impact on adherence, and it has also been established that a lack of information about medication can have a negative impact on adherence, as can the perception of side effects.²⁴ Psychosocial factors that impact adherence include a low understanding of treatment, with some studies suggesting that very early in starting treatment, there are unmet needs for information about both the disease and the medication.^{26,27} Beliefs about medication also influence adherence, specifically concerns about medication and its perceived necessity²⁸ as does the patient's experience of the health system, including follow-up care,²⁹ their recovery, and their perception of the illness itself.³⁰

Identifying and addressing non-adherence

Addressing medicines non-adherence requires it to be identified first. In line with the National Institute for Health and Care Excellence (NICE) recommendations²³ in its guidance on adherence, the medicines-taking experience of patients should be routinely explored and modifiable barriers to adherence should be addressed. Evidence shows that non-adherence behaviour is often a hidden problem which is under-recognized by prescribers. Most importantly, it is not necessarily disclosed by patients and

it can change. Therefore, healthcare professionals should assess, elicit, and explore patients' beliefs and experiences with their medicines to help them make informed choices and address any barriers.

The complexity of non-adherence behaviour was illustrated in a study which explored barriers to adhering to secondary prevention medicines among patients with coronary artery disease.³¹ Among those who were non-adherent, over half had non-adherence to only one secondary prevention medicine, indicating that certain patients have 'selective' non-adherence. Barriers to adherence included forgetfulness, worry that medicines will do more harm than good, feeling hassled about medicines taking, feeling worse when taking medicines, and not being convinced of the benefit of medicines. Different factors were often associated with intentional versus unintentional non-adherence.

The recently introduced concept of 'medicines optimization'³² has these elements at the heart of its definition: 'a person-centred approach to safe and effective medicines use, to ensure people obtain the best possible outcomes from their medicines'. Delivering person-centred medicines optimization requires understanding the patient's experience; this is one of the four pillars of medicines optimization as defined by NICE.³³ In addition, NICE places an emphasis on the importance of adopting a shared decision-making approach in delivering medicines optimization. Shared decision-making is an essential part of evidence-based medicine, seeking to use the best available evidence to guide decisions about the care of the individual patient, taking into account their needs, preferences, and values. This more person-centred approach (see also Chapter 2) is more likely to address barriers to adherence and improve it. Further, when patients have caregivers involved with helping to manage their health conditions, person-centred care may also incorporate caregivers in medication education and discussions, as caregiver involvement has been shown to improve adherence to medications for persons with cardiovascular disease.³⁴ ► **Box 12.3** shows an example of a pharmacist-led intervention to improving medicines optimization and adherence.³⁵

The role of the cardiovascular nurse in addressing adherence

Cardiovascular nurses play an important role in helping patients to successfully adhere to medication regimens, and ultimately reduce patients' risk for poor cardiovascular health outcomes. Cardiovascular nurses are likely to spend a greater amount of time with patients and can

Box 12.3 Good practice example: medicines optimization

The use of appropriate self-report tools can assist learning about the patient experience and identify barriers to adherence. A UK-based study³⁵ which used a locally developed tool, the 'My Experience of Taking Medicines' (MYMEDS), succeeded in giving patients the opportunity to share any barriers they might have to adherence to post-MI secondary prevention medicines. In this model, after completing the MYMEDS questionnaire, patients attended a consultant pharmacist-led medicines optimization clinic. Adopting the principles of medicines optimization, the pharmacist had a better understanding of individual patient's experiences in taking secondary prevention medicines and their needs and barriers to adherence were identified and addressed. This model of working led to substantial improvement in the levels of medicines optimization, patient concerns about their medications were significantly decreased, rates of non-adherence fell, and readmission rates also declined after the service was delivered.

use that time to identify medication-taking behaviour that may be inhibiting the success of therapy, and work with the healthcare team to identify appropriate interventions for each patient.

Assessment

The first step in addressing adherence is to assess patients' adherence to their medication regimen. The simplest approach is to ask patients in a non-judgemental manner whether they have ever missed or skipped any doses of their medication. It is important to phrase questions in a manner that will elicit responses about both unintentional and intentional non-adherence. Self-report of adherence behaviour, however, is subject to recall bias. Patients often think they do better with managing their medications than they actually do. If the patient is not using a type of medication organization system that would provide feedback about missed doses (blister packs, pill organizers, etc.), the patient may be unaware of missed doses. The cardiovascular nurse may suggest that the patient use a pill organizer or keep a medication log for a defined period to monitor their own medication-taking and see if they are missing doses.

Another method for assessing adherence is to look at pharmacy refill data, if it is available. If patients are not refilling prescriptions on time, it is likely that they are not correctly implementing the dosing regimen, and this should be investigated further. However, pharmacy

refill data can only reflect adherence behaviour over long periods of time and cannot provide information on specific patterns of medication-taking behaviour that would help to guide selection of interventions. Thus, pharmacy refill data may be useful as a screening tool for potential non-adherence but is less useful for guiding interventions.

Additional technological approaches for assessing adherence are available, such as electronic adherence monitoring caps, but these methods typically involve substantial added cost. The benefit of such methods, however, is detailed, objective information about patients' medication-taking patterns that can be used to identify when doses are missed or skipped, and what factors may be influencing the low adherence.

Side effects are one of the most common reasons that patients report not taking medications as prescribed.^{36–38} Cardiovascular nurses should ask patients if they are experiencing any problematic symptoms or side effects. This is an opportunity to educate patients on likely side effects, how to manage problematic side effects, and to reshape thinking about side effects when a patient has misattributed a symptom as a side effect. Part of the cardiovascular nurse's role also includes identifying, advocating, and, where possible, making changes in therapy when problematic side effects are causing distress for patients or are impeding a patient's ability or willingness to adhere to their medication regimen.

Implementing adherence-enhancing strategies

Cardiovascular nurses have available a number of interventions that may help to improve patients' adherence to cardiovascular medications (► **Table 12.1**). Interventions should be chosen based on the assessment of the type of non-adherence and the patient's reasons for non-adherence (e.g. barriers, medication, or health beliefs). For patients who struggle to remember to take medications, the first-line approach is to suggest a medication organizer, pillbox, or blister pack system, if the patient is not already using such an approach.³⁹ This allows patients to be able to quickly identify which medications should be taken at the time of medication administration, reducing cognitive burden, and allows patients to easily see whether doses have been taken or missed.

After medication organizer systems, the next approach could include a type of a reminder system. This could be done using technology such as a smartphone app or through a simple alarm; however, some patients eventually tire of simple alarms. Many apps are available

Table 12.1 Strategies to enhance medication adherence

Strategies	Type of non-adherence	Description
Medications organizer, pillbox, blister pack	Unintentional	Organization system that separates medications by dose so that patients are able to see whether a particular dose has been taken
Reminder system, e.g. mobile device app, alarm	Unintentional	Reminders or cues that prompt patients to take their medications at the appropriate time
Integrate into daily habits, e.g. tooth brushing	Unintentional	Strategies that link medication-taking with existing daily habits and routines so that medication-taking can, over time, become a habitual behaviour
Educational intervention	Intentional	Education interventions typically focus on content about the specifics of a patient's medication regimen—the names of medications, reasons why medications are needed, doses, frequency, potential side effects, what to do if a dose is missed, etc. These strategies ensure that patients have the information necessary to successfully adhere to their medication regimen
Motivational interviewing	Intentional	Motivational interventions move beyond education to address <i>why</i> patients have been prescribed medications. Addresses what medications do, what the consequences might be if medications are discontinued or doses are missed. These interventions typically also address patients' goals, and how medication-taking fits into their health and life goals

^a See 'Overview of medication adherence in cardiovascular disease' section for definitions.

with different types of reminders or the ability to track medication-taking. It may be more helpful for long-term behaviour change to also counsel the patient to integrate medication-taking into other daily habits and routines. Keeping medications in a visible location next to other objects that are tied to habitual behaviour, such as a toothbrush or coffee equipment, can help patients to link medication-taking with those habits and make the medication-taking a regular habit itself. Habit formation interventions have been shown to be effective at helping to improve unintentional non-adherence.⁴⁰

Sometimes low medication adherence is driven by a low intention to adhere. Patients may be unsure of the efficacy or have concerns about the safety of their prescribed medications or may have made a decision not to take their medication. Cardiovascular nurses can intervene by providing evidence-based education on the specific medications the patient has been prescribed, the reasons why the medication is needed, and the health risks involved in not taking the medication. Motivational interviewing approaches (see also Chapter 11) have been shown to

be effective at augmenting standard patient education methods.^{41,42} If the patient continues to have concerns, the cardiovascular nurse's role will also involve facilitating communication between the patient and the prescriber, or to intervene as the prescriber where possible, to explore alternative treatment options.

Improving medication adherence is often a gradual process. Several different approaches may need to be attempted or combined to find the strategy that works for a particular patient. Recent studies have shown success at taking a continuous self-improvement approach, similar to the model used for quality improvement in healthcare institutions.^{43,44} The cardiovascular nurse helps the patient to assess their reasons for non-adherence, implements a strategy to improve adherence, evaluates the impact of that strategy, and then decides whether additional strategies are needed.

Adherence to cardiovascular medication regimens is key for achieving good clinical outcomes for patients. Whether in an inpatient or outpatient setting, cardiovascular nurses are in an ideal position to influence patients' adherence

to medication regimens. Nurses and other professionals such as pharmacists can do this by thoroughly assessing their patients' level of adherence, their medication-taking processes and habits, and suggesting changes in the patients' systems for managing their medications to reduce the likelihood of missed or forgotten doses. For patients who choose to modify or not take their medications, the cardiovascular nurse should assess each patient's reasons for non-adherence and provide interventions designed to address the patient's beliefs or concerns, or advocate for the patient to have the treatment plan modified to an approach that fits the patient's needs.

Introduction to medicines used in cardiovascular care

This section aims to further develop the understanding of the pharmacological treatment of cardiovascular disease outlined in previous chapters. It will introduce some of the

commonly used drug groups, the main disorders in which they are used, outline their mode of action, and highlight some of their potential adverse effects. This serves as a useful introduction for nurses working in cardiovascular care to understand the rationale for the prescribing of the different drug groups, and provides a useful adjunct to European Society of Cardiology guidelines for the management of cardiovascular disorders, national pharmacological drug guidelines, and regulatory sites so as to enhance the understanding of treatment strategies. The section covers lipid-lowering therapies, anticoagulants and antiplatelets, antiarrhythmic drugs, drugs affecting tissue perfusion, new diabetes drugs with cardiovascular benefits, and blood pressure-lowering drugs. In addition, a brief introduction is given to drugs used in emergency and cardiogenic shock. This complements the sections on care of the deteriorating patient (see also Chapter 5).

► **Table 12.2** and ► **Table 12.3** provide a summary overview of these therapies. Finally, a brief introduction is provided to the science of pharmacogenetics.

Table 12.2 Overview of medicines for cardioprotection used in cardiovascular care

Action	Drug name	Mode of administration	Side effects
Lipid lowering	Statins HMG-CoA reductase inhibitors Simvastatin, fluvastatin, pravastatin, atorvastatin, rosuvastatin	Oral	Myopathy, gastrointestinal disturbance, insomnia, rash, altered liver function tests Rare: rhabdomyolysis, angioedema
	Anion exchange resins (bile acid sequestrants) Colestyramine, colestipol, colesevelam	Oral	Gastrointestinal symptoms: abdominal bloating, discomfort, diarrhoea, constipation
	Fibrates E.g. gemfibrozil, bezafibrate, fenofibrate	Oral	Myositis Rare: severe rhabdomyolysis
	Niacin; nicotinic acid	Oral	Flushing, palpitations, dizziness, gastrointestinal disturbance
	Cholesterol absorption inhibitors Ezetimibe	Oral	Abdominal pain, diarrhoea, headache Rare: liver dysfunction, thrombocytopenia, pancreatitis Very rare: muscle toxicity
	PCSKg inhibitors Evolocumab, alirocumab	Subcutaneous injection	Flu-like symptoms, injection-site reactions, nausea, rash
	Inclisiran	Subcutaneous injection	None yet seen

Table 12.2 Continued

Action	Drug name	Mode of administration	Side effects
Anticoagulant	Heparin and related drugs Unfractionated heparin (UFH) Low-molecular-weight heparin (LMWH)—dalteparin, enoxaparin, tinzaparin, fondaparinux	Intravenous or subcutaneous injection	Increased haemorrhage risk, hyperkalaemia, heparin-induced thrombocytopenia, osteoporosis
	Vitamin K antagonists Warfarin	Oral	Haemorrhage
	Direct oral anticoagulants (DOACs) Apixaban, edoxaban, rivaroxaban, dabigatran	Oral	Haemorrhage
Antiplatelet	Aspirin	Oral	Aspirin: nausea, heartburn, indigestion, major bleeding Rare: urticaria, rhinitis, bronchoconstriction, respiratory compromise
	ADP inhibitors: clopidogrel, prasugrel, ticagrelor	Oral	Bleeding, dyspnoea
	Glycoprotein IIb/IIIa inhibitors Abciximab, tirofiban, eptifibatide	Intravenous	Bleeding, hypotension, hypersensitivity
Dual pathway inhibition	Low-dose rivaroxaban plus aspirin	Oral	Gastrointestinal bleeding
Antiarrhythmic	Vaughan Williams classification E.g. disopyramide, lidocaine, flecainide, propranolol, amiodarone, verapamil	Oral and intravenous	Bradycardia, rhythm disturbance, fatigue, exercise intolerance, malaise, cold extremities, sexual dysfunction Amiodarone: altered liver and thyroid function, skin discoloration, photosensitivity, pulmonary toxicity, corneal deposits
	Not classified in Vaughan Williams classification E.g. atropine, adrenaline (epinephrine), isoprenaline, digoxin, adenosine, calcium chloride, magnesium chloride		Bradycardia, rhythm disturbance, fatigue, exercise intolerance, malaise, cold extremities, sexual dysfunction Digoxin toxicity: severe bradycardia, diarrhoea, vomiting, dizziness, visual disturbance
New diabetes drugs with cardiovascular benefits	GLP-1RAs E.g. dulaglutide, liraglutide, semaglutide	Subcutaneous injection	Back pain, cystitis, increased infection risk
	SGL2 inhibitors E.g. empagliflozin, dapagliflozin, canagliflozin	Oral	Skin reactions, thirst, urinary disorders, hypoglycaemia Euglycaemic ketoacidosis in patients with diabetes

Table 12.2 Continued

Action	Drug name	Mode of administration	Side effects
Promotion of tissue perfusion	Nitrates Glycerol trinitrate (GTN)	Sublingual	Flushing, dizziness, migraine type headaches, hypotension
Blood pressure lowering	Angiotensin-converting enzyme inhibitors (ACEIs) E.g. ramipril, perindopril, lisinopril	Oral	Cough, headaches, dizziness, rash, postural hypotension, angioedema, acute kidney injury
	Angiotensin II receptor blocker (ARBs) E.g. candesartan, valsartan, losartan	Oral	Headaches, dizziness, postural hypotension, angioedema, acute kidney injury
	Mineralocorticoid receptor antagonists for heart failure Spironolactone, eplerenone	Oral	Hyperkalaemia, gynaecomastia, mastodynia, vaginal bleeding
	Combination ARB plus neprilysin inhibitor for heart failure Sacubitril–valsartan	Oral	Dizziness, postural hypotension, hyperkalaemia, renal impairment, angioedema
	Beta-blockers Atenolol, bisoprolol	Oral	Bradycardia, rhythm disturbance, fatigue, exercise intolerance, malaise, cold extremities, sexual dysfunction
	Calcium channel blockers (two types) Dihydropyridine, e.g. amlodipine, felodipine, and nifedipine More cardioselective, e.g. verapamil, diltiazem	Oral	Headache, flushing, rash, swelling, malaise, constipation Excessive bradycardia, heart block Rare: hepatotoxicity, MI, heart failure, hypotension, hypersensitivity

Table 12.3 Vaughan Williams classification of antiarrhythmic agents

Class	Example	Mechanism
Ia	Disopyramide	Sodium channel blockade
Ib	Lidocaine	Sodium channel blockade
Ic	Flecainide	Sodium channel blockade
II	Propranolol	Beta-adrenoceptor blockade
III	Amiodarone, sotalol	Potassium channel blockade
IV	Verapamil	Calcium channel blockade

Lipid-lowering therapies

Atherosclerosis provides a common underlying theme for many cardiovascular diseases, including thrombotic MI, heart failure, and stroke. In addition to hypertension, dyslipidaemia is a significant risk factor for atherosclerosis. Here we describe how various agents target lipid transport systems to reduce low-density lipoprotein cholesterol (LDL-C) and atheroma.

Patients most likely to benefit from lipid-lowering therapy are those with known cardiovascular disease, including coronary artery disease, history of MI and/or stroke, those at high risk of developing cardiovascular disease, and those with familial hypercholesterolaemia.

Statins: HMG-CoA reductase inhibitors

Statins are usually the lipid-lowering agent of first choice, owing to their ability to produce significant reductions in plasma LDL-C, coupled with strong evidence that this leads to a reduction in cardiovascular events and all-cause mortality.⁴⁵

Statins in clinical use are simvastatin, fluvastatin, pravastatin, atorvastatin, and rosuvastatin. The latter two are longer acting and produce the greatest reductions in cholesterol⁴⁶ and, from a clinical perspective, are often better tolerated.

Mechanism of action: statins inhibit hepatic cholesterol synthesis, which leads to upregulation of the transport receptors responsible for removing LDL-C from the plasma into the liver.⁴⁷ Statins also exhibit a number of 'pleiotropic effects'; that is, they have actions other than those for which they were specifically developed. These include improved endothelial function, reduced vascular inflammation, and stabilization of atherosclerotic plaques, which may also be important in reducing cardiovascular events.⁴⁸

Adverse effects: statins are well tolerated; however, side effects include myopathy, gastrointestinal disturbance, insomnia, rash, and altered liver function tests.⁴⁹ More serious adverse effects are rare and include rhabdomyolysis and angioedema.⁵⁰ Myopathy is a class effect of statins and other lipid-lowering agents and is more likely to occur in patients with low muscle mass, uncorrected hypothyroidism, or on interacting medications.

Interactions: simvastatin, fluvastatin, and atorvastatin are metabolized by cytochrome P450 enzymes and are affected, in varying degrees, by drugs which induce or inhibit this enzyme system. Rosuvastatin and pravastatin do not undergo extensive metabolism and therefore have fewer metabolic interactions.

Anion exchange resins (bile acid sequestrants)

Colestyramine, colestipol, and colessevelam are not generally recommended for primary and secondary prevention of cardiovascular disease due to a lack of evidence for clinically relevant outcomes, such as reductions in cardiovascular or all-cause mortality.⁴⁵ Their main place in therapy is for the treatment of familial hypercholesterolaemia, where they may be added to statin therapy under specialist care.⁴⁵ However, their poor adherence due to side effect and interaction profiles makes anion exchange

resins unlikely candidates as a second-line cholesterol-lowering agent in statin intolerance.

Mechanism of action: anion exchange resins bind to intestinal bile acids, forming an insoluble complex and increasing their excretion. This leads to an increase in conversion of cholesterol to bile acids and a compensatory upregulation of hepatic LDL-C receptors, with a subsequent reduction in plasma LDL-C. They have little effect on high-density lipoprotein cholesterol (HDL-C) but can elevate triglycerides.

Adverse effects: as anion exchange resins are not absorbed, adverse effects are limited to the gastrointestinal tract. These are often the cause of poor adherence to treatment and include abdominal bloating and discomfort, diarrhoea, and constipation.

Interactions: anion exchange resins can bind to other medications in the gut and prevent their absorption. For this reason, other medications should be taken at least 1 hour prior to or 4 hours after anion exchange resins, to avoid this interaction.⁴⁹

Fibrates

Fibrates (e.g. gemfibrozil, bezafibrate, fenofibrate) are not routinely offered for primary or secondary prevention of cardiovascular disease in the UK or in Europe.^{45,46} They elicit a reduction in LDL-C and increase in HDL-C by up to 20%, as well as eliciting up to a 50% reduction in triglycerides.⁵¹ This makes them potentially useful in treating mixed dyslipidaemias. In specialist use they can be combined with statins for patients who meet LDL-C targets but have raised triglycerides.⁴⁵

Mechanism of action: through a complex mechanism of action, fibrates increase transcription of genes encoding proteins involved in lipid and lipoprotein metabolism and increase hepatic uptake of LDL-C to remove it from plasma.⁴⁵

Adverse effects: myositis, rarely including severe rhabdomyolysis, can be caused by fibrates and is more common in alcoholics and patients with renal dysfunction. The risk is increased by concomitant administration of statins. Gemfibrozil is contraindicated alongside a statin; however, other fibrates may be cautiously combined with statins in specialist use.⁴⁹

Interactions: there are a significant number of drug interactions, some theoretical and some having arisen from their use in studies. Particularly of note is the interaction with statins, which is why fibrates should be used under specialist advice in combination therapy; there

are also potential interactions with insulins and with ezetimibe.

Niacin or nicotinic acid

Nicotinic acid, or niacin, is rarely used. It is not recommended for primary or secondary prevention of cardiovascular disease, owing to the lack of evidence for mortality reduction^{52,53} and its unacceptable side effect profile.

Mechanism of action: nicotinamide, the active form, inhibits the release of very LDL-C in the liver, which results in a reduction in plasma triglycerides and LDL-C, and an increase in HDL-C. The exact mechanism by which this occurs is poorly understood.

Adverse effects: use of nicotinic acid is limited by the frequency of side effects, which include flushing, palpitations, dizziness, and gastrointestinal disturbance. Dose-related adverse effects include impairment of glucose tolerance, increased uric acid, and deranged liver function.⁵¹

Cholesterol absorption inhibitor (ezetimibe)

Ezetimibe is most effective as add-on therapy for patients who do not meet secondary preventative LDL-C targets on maximum tolerated statin therapy.⁵⁴ It can also be combined with a proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitor or used as monotherapy in true statin intolerance.⁴⁵

Mechanism of action: ezetimibe inhibits duodenal absorption of dietary and biliary cholesterol, increasing excretion. This reduces hepatic cholesterol, which causes upregulation of hepatic LDL-C receptors and, consequently, increased removal of LDL-C from plasma.⁵⁵ Ezetimibe alone reduces LDL-C by approximately 20%⁵⁶, however, its synergy with statins means that greater reductions can be seen when combined.

Adverse effects: ezetimibe is usually well tolerated with the most frequent unwanted effects being abdominal pain, diarrhoea, and headache. Rarely, more severe side effects can occur, including liver dysfunction, thrombocytopenia, and pancreatitis. Muscle toxicity is very rare, and the frequency is unlikely to increase on combination with a statin.⁵⁷

PCSK9 inhibitors

PCSK9 inhibitors form a relatively new class of drugs comprising evolocumab and alirocumab. They are monoclonal antibodies, which are administered by subcutaneous

injection every 2–4 weeks. Clinical trials have demonstrated significant LDL-C reductions (average 60%) in patients at high risk of CVD (primary or secondary prevention), including those with familial hypercholesterolaemia who are intolerant of statins or fail to meet target LDL-C on the maximum tolerated dose of statin in combination with ezetimibe.^{58,59} There is some evidence that this reduction in LDL-C corresponds to a reduction in CV events.^{60,61}

Mechanism of action: PCSK9 inhibitors block the targeted degradation of LDL-C receptors in the hepatocellular membrane, thereby reducing plasma LDL-C.⁶² The greatest LDL-C reductions are seen when used in combination with a statin, owing to the compensatory increase in PCSK9 caused by statins.

Adverse effects: few side effects were reported in the clinical trials leading to marketing authorization but include flu-like symptoms, injection site reactions, nausea, and rash.⁴⁹ Active post-marketing surveillance continues, with patients and healthcare professionals encouraged to report any unwanted effects to the relevant regulatory body.

Inclisiran

Inclisiran is a small interfering RNA (siRNA) which is administered every 6 months by subcutaneous injection. This new, emerging treatment will provide a more convenient alternative to the monoclonal antibody PCSK9 inhibitors, with potential for improved adherence.

Mechanism of action: inclisiran blocks the hepatic production of PCSK9, which reduces the targeted degradation of LDL-C receptors in the hepatocellular membrane and, ultimately, plasma LDL-C.⁶³ It has been shown to reduce LDL-C by 56% in patients with stable atherosclerotic cardiovascular disease on maximally tolerated statin therapy.⁶⁴ Trials investigating the impact of this LDL-C lowering on cardiovascular outcomes are ongoing at the time of writing.

Adverse events: inclisiran has been shown to be safe and tolerable so far, with no detrimental effects on kidneys, liver, muscle, or platelets seen in clinical trials to date.⁶⁵

Anticoagulants and antiplatelet drugs

Anticoagulants inhibit thrombin generation and antiplatelets inhibit platelet activation at various points in their respective cascades. ► Fig. 12.1 and ► Fig. 12.2

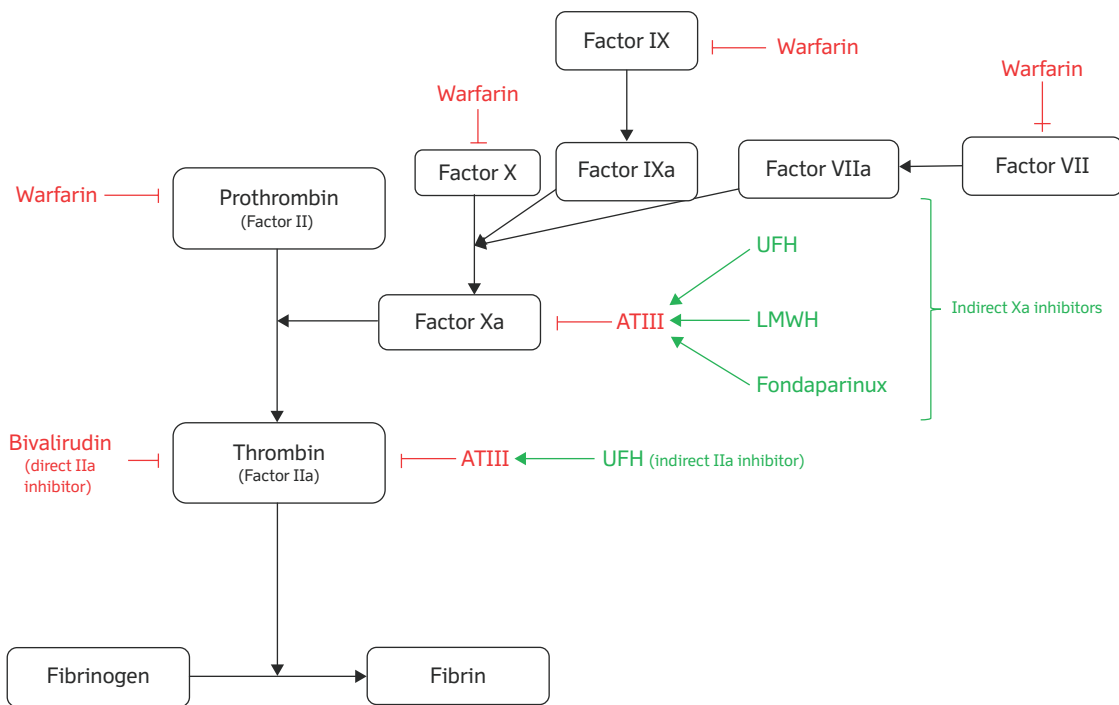


Fig. 12.1 Site(s) of action of anticoagulant agents within the clotting cascade.

ATIII, antithrombin III; LMWH, low-molecular-weight heparin; UFH, unfractionated heparin.

show the sites of action of the anticoagulants and antiplatelets discussed in this chapter, respectively.

Anticoagulants

Heparin and related drugs

Unfractionated heparin (UFH), low-molecular-weight heparins (LMWHs) such as dalteparin, enoxaparin, and tinzaparin, and fondaparinux, a synthetic pentasaccharide, are parenteral anticoagulants. The longer-acting LMWHs have replaced heparin for many indications, including prevention and treatment of venous thromboembolism and treatment of acute coronary syndromes. They can be administered subcutaneously once daily and require no routine monitoring for most patients; the exceptions being extremes of body weight and renal failure, where monitoring anti-factor Xa levels as a surrogate to measure the activity of the drug might be indicated.

UFH is still used when a rapid offset of action is required (e.g. high bleeding risk due to patient or procedural factors) and sometimes in patients with poor renal function. It is usually administered as an intravenous infusion and the dose is adjusted according to activated partial thromboplastin time. It is also commonly used during

procedures such as coronary angiography due to its rapid onset and offset as an anticoagulant.

UFH and LMWH are porcine-derived so care should be taken in groups of patients in whom porcine-derived products may not be acceptable, such as practising Jewish and Muslim patients.

Mechanism of action: UFH, LMWH, and fondaparinux inhibit coagulation by preventing thrombin generation (► Fig. 12.1). They bind to antithrombin III, inducing a conformational change which increases its ability to inhibit clotting factors, primarily factor Xa and thrombin.

Adverse effects: parenteral anticoagulants increase the risk of haemorrhage. As heparin is short acting, ceasing administration may be sufficient to control bleeding. Protamine, a specific antidote, can be injected intravenously to neutralize heparin. It can also be used to partially reverse LMWH-induced bleeding. There is no specific antidote for fondaparinux.

Other unwanted effects of heparins include hyperkalaemia, particularly in patients with diabetes and renal impairment, and heparin-induced thrombocytopenia, which is a potentially devastating immune reaction caused by antibodies that activate platelets in the presence of heparin. Both are less likely to occur with

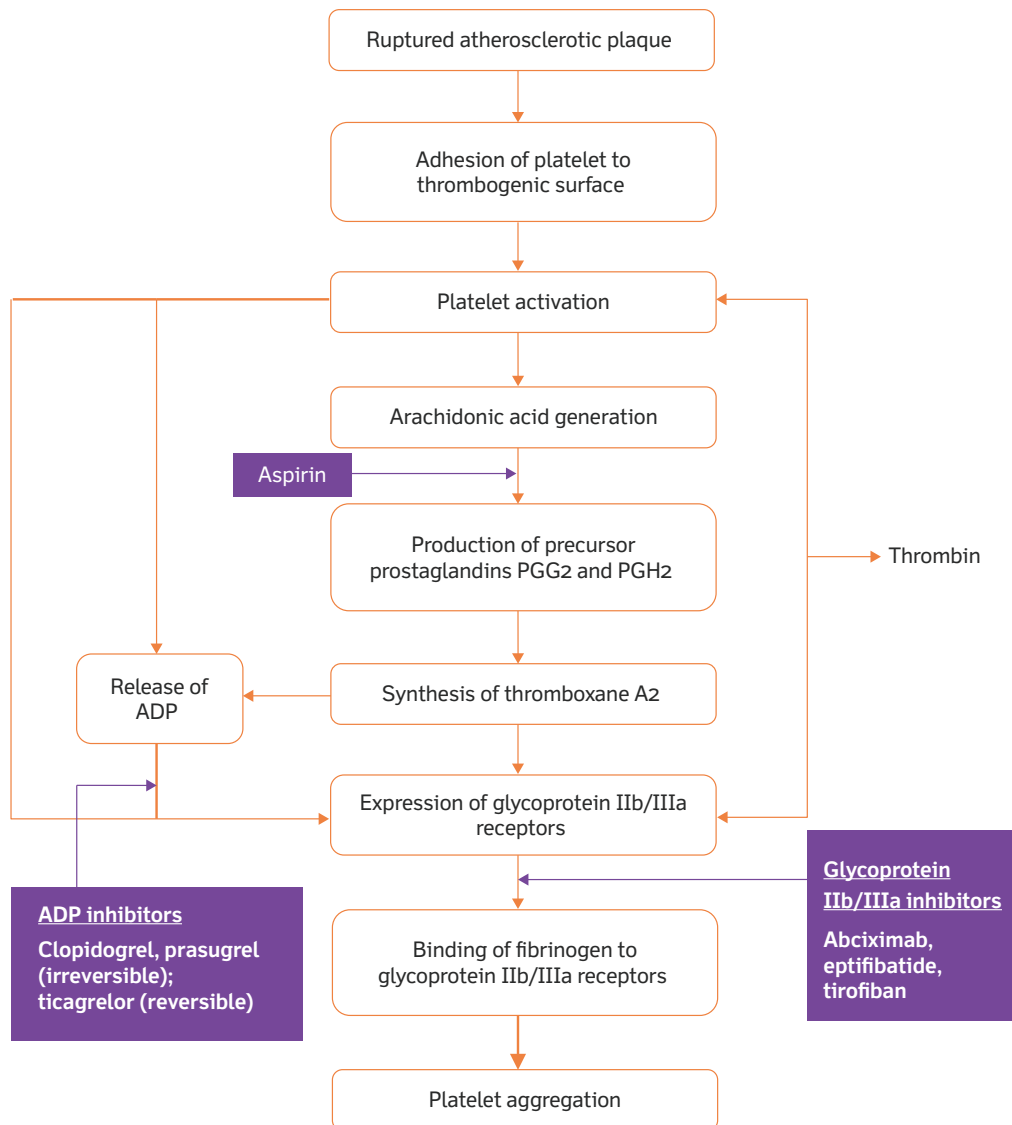


Fig. 12.2 Site of action of antiplatelet agents within the platelet aggregation pathway.

LMWH compared to UFH. Osteoporosis is associated with prolonged use.⁴⁸

Vitamin K antagonists

Warfarin is the most commonly used vitamin K antagonist. The alternatives (phenindione and acenocoumarol) are generally only used in patients who cannot tolerate warfarin. Warfarin is the main stay of anticoagulation for patients with mechanical valve replacements. Its use for atrial fibrillation has diminished since the establishment

of direct oral anticoagulants (DOACs), although use continues in some patients, particularly where DOACs are not tolerated or are contraindicated, for example, in severe renal impairment or valvular atrial fibrillation, or where DOACs are not recommended, for example, in people with very high body weight (>120 kg) (see 'Direct oral anticoagulants').

Mechanism of action: warfarin inhibits the synthesis of vitamin K-dependent clotting factors II, VII, IX, and X, which ultimately prevents conversion of fibrinogen to fibrin that

is required for clot formation (► Fig. 12.1). Therapy takes several days to become established, due to the need for natural degradation of existing clotting factors. Its narrow therapeutic window necessitates frequent monitoring of the international normalized ratio (INR). The dose is adjusted to achieve an INR of between 2 and 4, depending on the indication and patient risk factors. However, it is this need for dose adjustment and monitoring, along with its multiple food and drug interactions, that makes warfarin an inconvenient treatment for most patients.

Adverse effects: as with all anticoagulants, haemorrhage is the most common adverse effect, but can be more difficult to manage due to its long duration of action. Treatment of warfarin-induced bleeding ranges from withholding warfarin, for example, for minor bleeds, to administration of vitamin K, fresh frozen plasma, or coagulation factor concentrates for life-threatening haemorrhage.

Interactions: warfarin is subject to multiple drug, food, and disease interactions. Enzyme inducers, for example, rifampicin or carbamazepine, and foods containing vitamin K such as spinach or egg yolk, reduce its effect and will therefore reduce the INR leading to a reduction or even loss of its therapeutic effect. Enzyme inhibitors such as amiodarone or erythromycin increase the effect of warfarin and therefore increase the INR, leading to an increased risk of bleeding. Liver disease can cause impaired levels of clotting factors, leading to prolonged prothrombin time and higher INR, and other disease states such as decompensated heart failure can also alter the effect of warfarin.

Direct oral anticoagulants

DOACs are a convenient alternative to vitamin K antagonists for oral anticoagulation for many patients. They are licensed for treatment and prevention of venous thromboembolism and for prophylaxis of stroke in patients with non-valvular AF.⁴⁹ They are also used for the treatment of deep vein thrombosis and pulmonary embolus and prevention of recurrence; they can be used to prevent stroke in patients undergoing cardioversion and ablation, and to treat left ventricular thrombus. The benefits offered by DOACs include faster onset of action, lack of monitoring and dose adjustment, and the ability to dispense in a compliance aid. However, the short duration of action of the DOACs makes adherence to the intended treatment regimen, including accurately spaced dosing in daily or twice-daily DOACs, of paramount importance.

The major trials of DOACs excluded patients with significant mitral stenosis, and their use is therefore currently contraindicated in patients with moderate to severe mitral stenosis due to lack of evidence for their efficacy. In

addition, a very low number of patients with bioprosthetic valves were included in trials and recommendations suggest the DOACs should be avoided in the first 3 months following bioprosthetic valve replacement, until more data are available.⁶⁶

Mechanism of action: DOACs are direct inhibitors of factor Xa (apixaban, edoxaban, rivaroxaban) or thrombin (dabigatran). They act at a more specific point in the clotting cascade to prevent generation of fibrin and clots. Specific anti-factor Xa assays can be performed in patients at high risk of thrombosis or haemorrhage, for example, people who are at the extremes of weight or who have renal failure.

Adverse effects: as with other anticoagulants, bleeding is the most important side effect of DOACs. Risk of bleeding is generally lower than with warfarin and their shorter duration of action can mean that minor bleeding is more easily controlled. An early concern about the routine use of DOACs was lack of reversibility, although Praxbind, a specific antidote to dabigatran and Ondexxya, an antidote to rivaroxaban and apixaban, are available'. At the time of writing, a specific reversal agent for apixaban and rivaroxaban is in development.

Antiplatelet drugs

Platelet activation pathways are important therapeutic targets in the treatment and prevention of cardiovascular disease.

Platelet inhibitors: aspirin and adenosine diphosphate receptor antagonists (P2Y₁₂ inhibitors)

Aspirin is used in the primary and secondary prevention of cardiovascular disease. Adenosine diphosphate (ADP) inhibitors include clopidogrel, prasugrel, and ticagrelor. They are combined with aspirin following MI and/or percutaneous coronary intervention for 1–12 months depending on their original indication, bleeding risk, stent type, and the need for concomitant anticoagulation (► Fig. 12.3).

Mechanism of action: aspirin irreversibly inhibits cyclooxygenase-1 (COX-1), which results in decreased thromboxane A₂ (TA₂) synthesis, and a subsequent reduction in platelet activation and aggregation (► Fig. 12.2). Since platelets cannot produce more TA₂, inhibition occurs for the duration of the cell life cycle, which is 7–10 days.

ADP mediates platelet activation and aggregation by binding to the P2Y₁₂ receptor on the platelet surface. Clopidogrel and prasugrel are prodrugs; this means that they need to be metabolized to form an active drug.

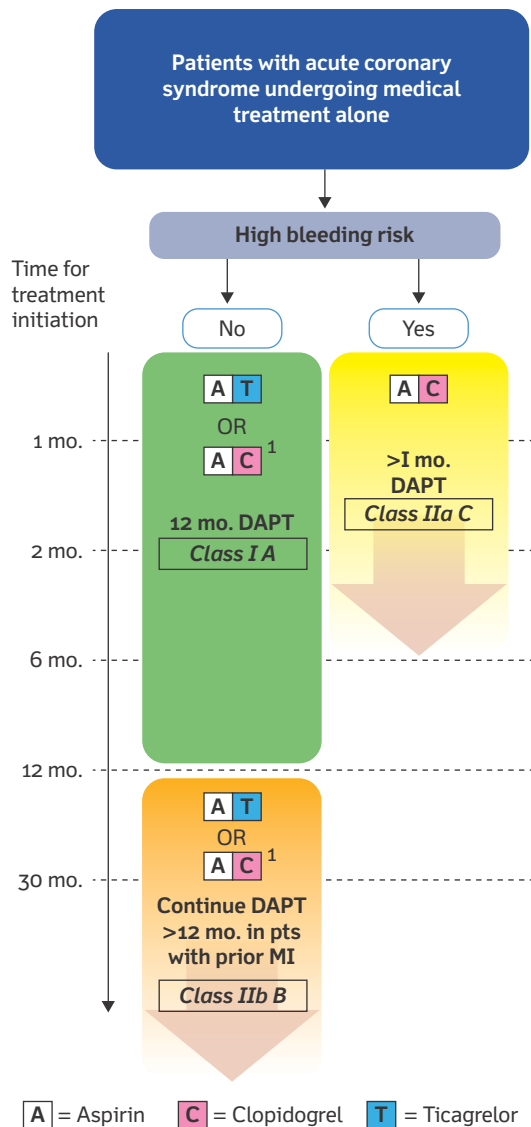


Fig. 12.3 European Society of Cardiology recommendations for duration of antiplatelet agents in acute coronary syndromes.

Valgimigli M, Bueno H, Byrne RA, et al; ESC Scientific Document Group; ESC Committee for Practice Guidelines (CPG); ESC National Cardiac Societies. 2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS: The Task Force for dual antiplatelet therapy in coronary artery disease of the European Society of Cardiology (ESC) and of the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*. 2018 Jan 14;39(3):213–260. doi: 10.1093/eurheartj/ehx419. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

Once activated, they bind covalently to P2Y₁₂ receptors, therefore preventing binding of ADP, causing irreversible platelet inhibition.⁶⁷ Like with aspirin, platelet activity recovers only when new platelets are generated. Ticagrelor is a reversible inhibitor of ADP, which means platelet function is more rapidly recovered on cessation of therapy, taking approximately 5 days. Ticagrelor is not a prodrug and does not therefore require activation, making it faster acting and more potent than clopidogrel.⁶⁸

Adverse effects: aspirin's dose-related adverse gastrointestinal effects range from minor symptoms (nausea, heartburn, indigestion) to major bleeding.⁴⁹ Antisecretory drugs, such as proton pump inhibitors, can be used to reduce the risk of gastrointestinal bleeding. A small proportion of patients suffering with asthma are sensitive to aspirin, which may result in symptoms ranging from urticaria and rhinitis to bronchoconstriction and respiratory compromise.

Of the ADP inhibitors, the bleeding risk is greatest with ticagrelor and prasugrel, owing to their higher potency.⁶⁹ Ticagrelor can cause dyspnoea through an adenosine-like reaction⁷⁰; this tends to be harmless and often transient, although it can be an effect that is poorly tolerated.

Interactions: combining antiplatelets with other antiplatelets or anticoagulants has known therapeutic benefits; however, caution is required due to increased bleeding risk. Use with other drugs known to increase the risk of bleeding, such as non-steroidal anti-inflammatory drugs, should be avoided or used with caution. Clopidogrel and ticagrelor are subject to metabolic interactions via cytochrome P450 enzymes. Strong inducers, such as carbamazepine, and strong inhibitors, such as clarithromycin, can decrease or increase the efficacy of ticagrelor, respectively. This effect is thought to be significant enough to warrant a change in therapy. Prasugrel has far fewer clinically relevant interactions.

Dual and triple therapy

In patients with an indication for antiplatelets and an anticoagulant, for example, a patient with atrial fibrillation, or following a mechanical valve replacement who undergo percutaneous coronary intervention, it may be necessary to combine antiplatelet and anticoagulant therapies. The management strategy is individualized, depending on the specific indication, as well as disease severity, past medical history, and bleeding risk (► Fig. 12.4).

Dual or triple therapy warrants caution due to additive bleeding risk. Compared to anticoagulant therapy alone, the risk of bleeding can increase two- to three-fold for patients taking dual antiplatelet therapy with

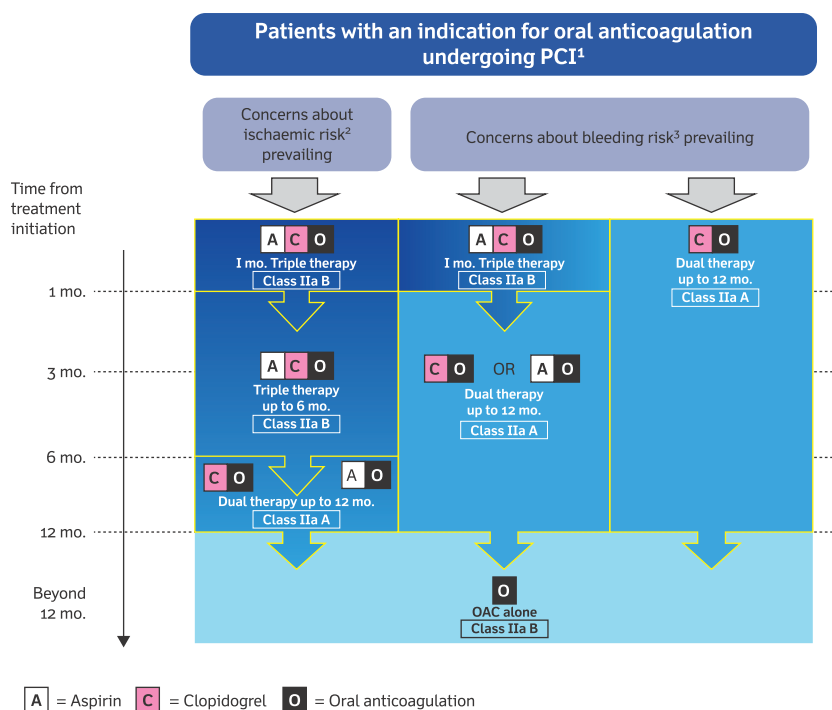


Fig. 12.4 European Society of Cardiology recommendations for antithrombotic strategy in patients with an indication for anticoagulation who undergo percutaneous coronary intervention.

Valgimigli M, Bueno H, Byrne RA, et al; ESC Scientific Document Group; ESC Committee for Practice Guidelines (CPG); ESC National Cardiac Societies. 2017 ESC focused update on dual antiplatelet therapy in coronary artery disease developed in collaboration with EACTS: The Task Force for dual antiplatelet therapy in coronary artery disease of the European Society of Cardiology (ESC) and of the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*. 2018 Jan 14;39(3):213–260. doi: 10.1093/eurheartj/ehx419. © The European Society of Cardiology. Reprinted by permission of Oxford University Press.

anticoagulation. Careful management involves close monitoring of INR in patients taking warfarin and consideration of dose reduction of a DOAC where appropriate.

Glycoprotein IIb/IIIa inhibitors

This class of intravenous antiplatelets comprises abciximab, tirofiban, and eptifibatide, which are licensed for use alongside heparin and oral antiplatelets for ST-segment elevation MI and non-ST-segment elevation MI, particularly for patients at risk of a further coronary event who are unable to have percutaneous coronary intervention immediately.

Mechanism of action: glycoprotein IIb/IIIa inhibitors inhibit the binding of pro-aggregatory substances to activated platelets.⁷¹ Because their site of action is near the end of the clotting cascade (► Fig. 12.2), they inhibit platelet activation irrespective of the provoking factor.

Adverse effects: combination with antithrombins and oral antiplatelets offers therapeutic benefit; however, the increased bleeding risk warrants caution.⁷² Other side effects include hypotension and hypersensitivity, particularly with abciximab which should not be readministered.⁷² Dose adjustments may be required in renal impairment.

Dual pathway inhibition (low-dose rivaroxaban plus aspirin)

In patients with stable atherosclerotic cardiovascular disease, adding low-dose rivaroxaban 2.5 mg twice daily to aspirin has been shown to improve cardiovascular outcomes compared with aspirin alone.⁷³ Its place in therapy is in those with coronary artery disease with additional high-risk factors, such as age greater than 65 years, current smoking, history of diabetes, renal impairment, heart failure, stroke, and/or atherosclerosis in another vascular bed.⁷³

Adverse effects: combining low-dose rivaroxaban with aspirin increases the risk of major bleeding into the gastrointestinal tract. An assessment of bleeding risk should be made prior to initiation and dual pathway inhibition should be avoided in patients considered to be high bleeding risk.⁷³

Antiarrhythmic drugs

- Vaughan Williams classification.
- Digoxin.

The Vaughan Williams classification broadly categorizes antiarrhythmics into four classes according to mechanism of action; however, there are some clinically useful antiarrhythmics which do not meet these criteria. Examples of antiarrhythmic drugs are summarized in ► **Table 12.3** and ► **Table 12.4** (see also Chapter 7).

Mechanisms of action

Class I antiarrhythmics block voltage-gated sodium channels and can be further divided into three subcategories: Ia, Ib, and Ic. They have differing mechanisms but share a common characteristic: inhibition of high-frequency myocardial excitation in non-nodal tissue. As such, they suppress tachyarrhythmias caused by abnormal conduction. This effect is achieved through 'use dependent block', that is, the higher the frequency of channel activation, the greater the degree of block.

Class II antiarrhythmics block beta-adrenoceptors. Beta-blockers suppress the sympathetic response,

increasing the refractory period of the atrioventricular node. As such, they are useful in treating ventricular arrhythmias post-MI, supraventricular tachycardia, and paroxysmal atrial fibrillation.

Class III antiarrhythmics prolong the action potential and refractory period in cardiac cells, primarily through inhibition of potassium channels, although the exact mechanism is not well understood. Amiodarone is usually used when other suitable treatments have failed, owing to its poor side effect profile. Sotalol has both class III and class II activity.

Class IV antiarrhythmics block I type voltage-gated calcium channels to slow conduction in both the sinoatrial and atrioventricular nodes. The main use is to terminate supraventricular tachycardia. They also reduce cardiac contractility and for this reason should not be combined with beta-blockers or quinidine.

Digoxin causes release of acetylcholine, which slows atrioventricular node conduction and reduces ventricular rate. It is used to treat rapid atrial fibrillation and flutter. It requires a loading dose, which can be administered orally or intravenously, depending on severity.

Adverse effects: paradoxically, antiarrhythmics can have a proarrhythmic effect. Specifically, they can increase the duration, frequency, or rate of an existing arrhythmia, or cause a new arrhythmia.⁵⁰

The side effects of beta-blockers can mainly be attributed to reduced heart function and output and include most commonly bradycardia, rhythm disturbance, fatigue, exercise intolerance, malaise, cold extremities, and sexual dysfunction. There are also numerous interactions with other drugs; of particular note are the interactions that occur with other cardiovascular therapies such as calcium channel blockers, clonidine, digitalis, and nifedipine.

Amiodarone has many unpleasant side effects, including altered liver and thyroid function, skin discoloration, photosensitivity, pulmonary toxicity, and corneal deposits.⁴⁹ Liver and thyroid function tests, as well as a chest X-ray, are required prior to initiation. It also has many drug interactions which, owing to its long duration of action, may persist for weeks after treatment cessation.

Digoxin has a narrow therapeutic window and is affected by serum potassium, renal function, age, and interacting drugs. Therapeutic drug monitoring is warranted in acute kidney injury, hypokalaemia, and in elderly patients or if an interacting medication is started or stopped. Signs of toxicity include severe bradycardia, diarrhoea, vomiting, dizziness, and visual disturbances.⁴⁹ A reversal agent is available for extreme digoxin toxicity.

Table 12.4 Antiarrhythmic drugs not classified in Vaughan Williams classification

Drug	Use
Atropine	Sinus bradycardia
Adrenaline (epinephrine)	Cardiac arrest
Isoprenaline	Heart block
Digoxin	Atrial fibrillation
Adenosine	Supraventricular tachycardia
Calcium chloride	Hyperkalaemia-induced ventricular tachycardia
Magnesium chloride	Ventricular fibrillation

New diabetes drugs with cardiovascular benefits

- Glucagon-like peptide-1 receptor agonists (GLP-1RAs).
- Sodium-glucose co-transporter 2 (SGLT2) inhibitors.

A full description of diabetes management is beyond the scope of this chapter; however, the recent surge in evidence from large randomized controlled trials for cardiovascular benefits of two new classes of oral glucose-lowering agents warrants discussion.

GLP-1RAs and SGLT2 inhibitors confer benefit and should be recommended for patients with type 2 diabetes mellitus who have established cardiovascular disease or high cardiovascular disease risk.⁷⁴

GLP-1RAs (e.g. dulaglutide, liraglutide, and semaglutide) are administered by subcutaneous injection and work by activating GLP-1 receptors to increase insulin secretion, suppress glucagon secretion, and slow gastric emptying. They have been shown in trials to reduce cardiovascular events and there is evidence that liraglutide reduces mortality.^{75–78} The cardiovascular benefit is likely due to a reduction in atherosclerotic events. Common side effects include back pain, cystitis, and increased risk of infection.

SGLT2 inhibitors (e.g. empagliflozin, dapagliflozin, and canagliflozin) are administered orally and act by blocking this transporter in the renal proximal convoluted tubule to inhibit glucose reabsorption, thus increasing its excretion in the urine. All have been shown to lower heart failure hospitalizations; furthermore, there is evidence that empagliflozin reduces cardiovascular and overall mortality.^{80–82} Common side effects include skin reactions, thirst, urinary disorders, and hypoglycaemia (when combined with insulin or a sulphonylurea). In randomized controlled trials, canagliflozin seemed to have an increased risk in lower limb amputation and fracture.⁸¹

Drugs used to promote tissue perfusion

Tissue perfusion can be restricted due to the presence of atherosclerotic plaque and/or as a result of hypertension (see Chapter 6). In the treatment and prevention of cardiovascular disease, there are a range of drugs prescribed for patients that enhance perfusion, either locally within the coronary circulation or in the periphery. Four main categories are outlined: nitrates, beta-blockers (beta-adrenergic antagonists), drugs that act on the renin–angiotensin–aldosterone system (RAAS) including ACEIs and angiotensin II receptor blockers (ARBs), and calcium channel blockers.

Nitrates

This class of drugs, mainly used in the prevention of or the acute treatment of angina can also be referred to as organic nitrates, and are peripheral or coronary vasodilators. They are available in several different chemical forms, the most commonly used being glyceryl trinitrate (GTN; nitroglycerine). Many nitrates undergo nearly 100% first-pass metabolism in the liver; this means that, for nitrates, the most common route of administration would be sublingual, transdermal, or intravenous.

Glyceryl trinitrate

Mechanism of action: as mentioned in Chapter 4, nitric oxide is a naturally occurring vasodilator that is present in both arterial and venous vasculature. GTN is converted to nitric oxide in the vascular wall, which triggers reduction of calcium in the smooth muscle, creating a consequential relaxation of the smooth muscles of the blood vessels, leading to vasodilation. This increases blood flow in the coronary vessels to the areas of the heart that generate ischaemic angina discomfort and increases venous dilatation, reducing venous return and, therefore, myocardial workload.

Adverse effects: the adverse effects of GTN arise due to excessive vasodilation within the peripheral circulation. Common adverse effects include flushing, dizziness, migraine-type headaches, and hypotension. Caution is needed when taken with other vasodilators as this may result in significant hypotension, leading to collapse.

Drugs that affect the renin–angiotensin–aldosterone system

Two main drug groups affect the RAAS: ACEIs and ARBs. Either of these can be used in the management of hypertension and coronary artery disease. To understand the mode of action of these drugs, it is useful to briefly explain the RAAS (► Fig. 12.5).

In the normal non-baroreceptor control of blood pressure, the RAAS is activated by the release of renin from the kidney. The main stimulus for this release is a drop in blood pressure. Renin converts the inactive protein angiotensinogen to angiotensin I. As angiotensin I circulates around the body, particularly to the lungs, it comes into contact with angiotensin I-converting enzyme, produced in the lungs, which converts angiotensin I (ACE) to angiotensin II. Angiotensin II has two main actions: it acts directly on the blood vessels as a potent vasoconstrictor, and it stimulates the release of aldosterone, a hormone that will stimulate the retention

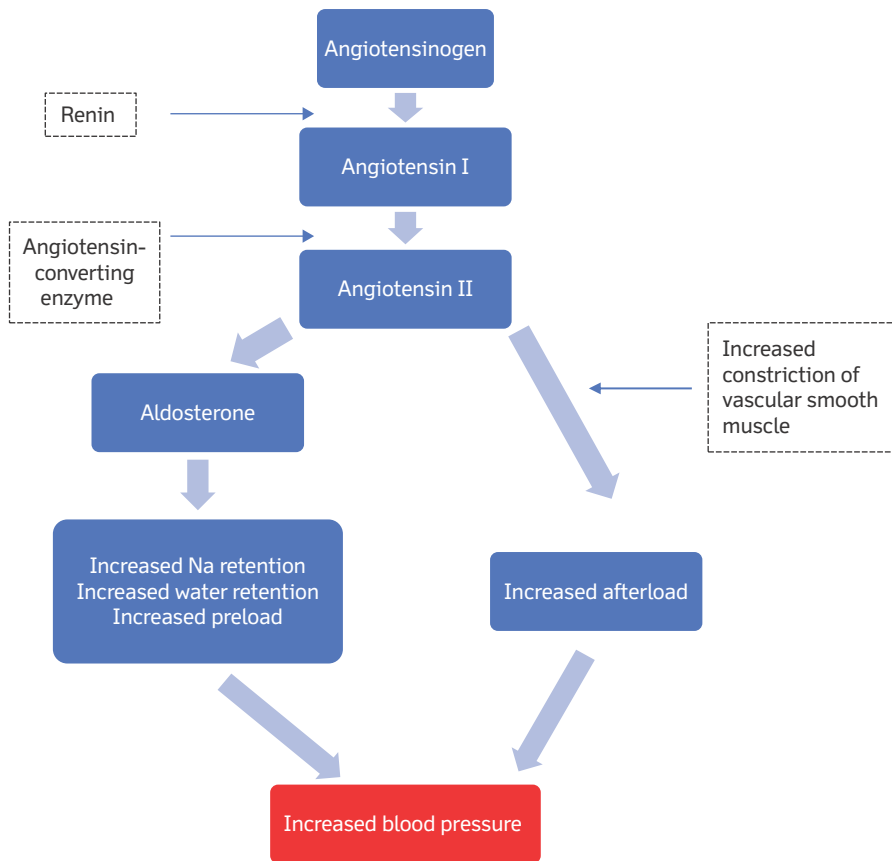


Fig. 12.5 The renin–angiotensin–aldosterone system (RAAS). Na, sodium.

of sodium and consequentially water to increase body fluid volume (► Fig. 12.5).

Angiotensin-converting enzyme inhibitors

ACEIs are used in the first line of treatment for hypertension and also in heart failure, prevention of stroke, secondary prevention after MI, and in type 1 diabetic nephropathy.

Mechanism of action: ACEIs bind to and inhibit the action of angiotensin-converting enzyme, preventing the production of angiotensin II; in addition, ACEIs prevent the conversion of bradykinin to active metabolites, which has two major effects. First, this action leads to a reduction in vasoconstriction, directly causing a reduction in peripheral resistance and blood pressure. Second, it will reduce sodium retention and consequently blood volume, which proves particularly helpful in the fluid retention associated with heart failure.

Adverse effects: ACEIs are usually well tolerated with transient side effects. As a result of its interference with

bradykinin, a cough may develop. The vasodilation that occurs can result in headaches, dizziness, rash, and postural hypotension. Due to aldosterone effects, some patients may develop hyperkalaemia. Serious adverse effects include angioedema and acute kidney injury. For these reasons, the monitoring of serum electrolyte levels and renal function are an important part of initiating, uptitrating, and maintaining therapy.

Angiotensin II receptor blockers

ARBs are also used in the first line of treatment of hypertension, in heart failure, stroke, peripheral vascular disease, and for people with diabetes who have organ failure.

Mechanism of action: ARBs bind to angiotensin II receptors preventing the action of angiotensin II. Its consequences are therefore similar to those of ACEIs in that there is a resultant reduction in vasoconstriction, directly causing a reduction in peripheral resistance and blood

pressure, and a reduction in sodium retention, thereby reducing blood volume.

Adverse effects: these are similar to those in ACEIs—headaches, dizziness, postural hypotension, and rash. Due to the aldosterone effects, some patients may develop hyperkalaemia. Serious adverse effects include angioedema, although the incidence is lower than in ACEIs, and acute kidney injury.

Mineralocorticoid receptor antagonists

Mineralocorticoid receptor antagonists, namely spironolactone and eplerenone, are used in the treatment of heart failure with reduced ejection fraction, particularly in patients who continue to have symptoms despite optimal doses of ACEI (or ARB) and beta-blocker. Eplerenone is also licensed in patients who have reduced left ventricular ejection fraction following MI.

Mechanism of action: spironolactone and eplerenone are also termed ‘aldosterone antagonists’. They compete with aldosterone to bind to mineralocorticoid receptors, thereby blocking its action.⁸² Mineralocorticoid receptor antagonists lower blood pressure by reducing sodium and water reabsorption. Perhaps more importantly, they improve left ventricular function by reducing endothelial dysfunction and collagen overproduction, which contribute to left ventricular remodelling.⁸³

Adverse effects: mineralocorticoid receptor antagonists are ‘potassium sparing’ and can lead to hyperkalaemia. The risk is greater in those with existing renal impairment, diabetes, and those taking other medicines which increase serum potassium. Caution should be exercised in patients with moderate renal impairment, with lower starting doses and more frequent monitoring recommended.

As eplerenone is more selective for mineralocorticoid receptors over other steroid receptors, it is less likely to cause hormone-related side effects such as gynaecomastia, mastodynia, and vaginal bleeding, compared to spironolactone.⁸²

Sacubitril–valsartan

Sacubitril–valsartan combines an ARB (valsartan) with a neprilysin inhibitor (sacubitril) for the treatment of heart failure in patients with reduced ejection fraction who remain symptomatic despite optimization of first-line heart failure treatment, such as ACEIs, beta-blockers, and mineralocorticoid receptor antagonists.

Mechanism of action: neprilysin catalyses the degradation of natriuretic peptides, which are responsible for vasodilation, diuresis, and natriuresis, as well as inhibition of renin and aldosterone and improved renal blood flow.

Sacubitril inhibits the effect of neprilysin and therefore prolongs the beneficial effect of natriuretic peptides.

Adverse effects: these are similar to ACEIs and ARBs—dizziness, postural hypotension, hyperkalaemia, and renal impairment are often managed with close monitoring and dose adjustment. Again, the incidence of angioedema is lower than with ACEIs.

Beta-blockers (beta-adrenergic antagonists)

Adrenergic antagonists, although now less commonly prescribed than ACEIs or ARBs, continue to be a choice for treatment of hypertension. Beta-blockers are also used in the management of angina, cardiac arrhythmias, in the treatment and prevention of MI, and can also be used in the prevention of migraine.

Mechanism of action: beta-receptors are one of the main types of receptors that are activated by the sympathetic nervous system and are stimulated by adrenaline and noradrenaline. Beta-blockers can be non-selective in that they can block both beta-1 and beta-2 receptors. Beta-1 selective blockers such as atenolol, bisoprolol, metoprolol, and nebivolol are more commonly used as they are better tolerated with fewer people experiencing side effects. Beta-1 receptors are dominant in the heart and the kidney; blocking beta-1 receptors leads to reduced workload of the heart by reducing heart rate and contractility, and consequently cardiac output leading to lower blood pressure. Blocking beta-1 receptors in the kidneys leads to a reduction in renin, resulting in reduction in angiotensin II and thereby causing a reduction in peripheral vasoconstriction and fluid retention, all contributing to reduced blood pressure.

Adverse effects: the side effects were outlined previously, see ‘Antiarrhythmic drugs’.

Calcium channel blockers

Calcium channel blockers can be used to treat high blood pressure, angina, and arrhythmias.

Mechanism of action: calcium is an essential element needed in the contraction of all muscle types. Nerve impulses cause the opening of calcium channels in muscle cells to allow calcium to flow into the muscle, causing contraction. There is a wide range of calcium channel blockers that will inhibit this action in cardiac muscle and arterial vessels, which will result in reduced cardiac contractility and vasodilation. Certain types of calcium channel blocker are more effective in the heart than in the blood vessels and vice versa. Dihydropyridine calcium channel blockers

such as amlodipine, felodipine, and nifedipine have high vascular selectivity, resulting in systemic vasodilation, reducing blood pressure and also myocardial oxygen demand, which gives rise to their antianginal effect. More cardioselective calcium channel blockers such as verapamil and diltiazem reduce heart rate and therefore myocardial oxygen demand, also making them effective as antianginal agents. These also reduce the firing rate of aberrant pacemaker cells and prolong repolarization, particularly at the atrioventricular node, which makes them useful antiarrhythmic medications.

Adverse effects: adverse effects vary between different types of calcium channel blockers. Common side effects of dihydropyridines include those related to vasodilation such as headache, flushing, rash, and swelling, but malaise and constipation can also occur. The cardioselective calcium channel blockers can cause excessive bradycardia and induce heart blocks and for this reason, are not prescribed alongside other rate-limiting drugs such as beta-blockers. Rare but severe adverse effects with calcium channel blockers include hepatotoxicity, MI, heart failure, hypotension, and some types exhibit hypersensitivity.

Drugs used in emergency and cardiogenic shock

Cardiogenic shock, which involves severely impaired myocardial contractility and circulatory collapse, is the most common cause of mortality in acute MI. The aims of treatment include restoration of adequate blood flow and oxygen delivery to avoid or limit end-organ damage.

A full description of pharmacological management of cardiogenic shock and other emergencies is beyond the scope of this chapter (see also Chapter 5). ► **Table 12.5** provides a summary of some common emergency medications used in cardiology emergencies. This list is not exhaustive.

How are pharmacodynamics affected by pharmacogenetics and pharmacogenomics?

The influence of genetics on interindividual variability in pharmacodynamics is becoming an increasingly

Table 12.5 Drugs used in emergency and acute care (cardiogenic shock)

Agent	Mechanism	Action
Phenylephrine	Alpha-1 agonist	Vasoconstrictor
Noradrenaline	Alpha (+) and beta (++) agonist	Inotrope Chronotrope Vasoconstrictor
Adrenaline	Alpha (+) and beta (+++) agonist	Inotrope Chronotrope Vasoconstrictor
Dopamine	Alpha, beta, and dopamine agonist (dose dependent)	Inotrope Chronotrope Vasoconstrictor (high doses only)
Dobutamine	Beta agonist	Inotrope Vasodilator (mild)
Vasopressin	Vasopressin-1 agonist	Vasoconstrictor
Milrinone	Phosphodiesterase type 3 inhibitor	Inotrope Vasodilator
Levosimendan	Myocytic calcium sensitizer Potassium channel activator	Inotrope Inodilator

intriguing area. Pharmacogenomics can influence both the degree of response to a medication and the likelihood and severity of side effects. Important drug groups in cardiovascular care include warfarin, clopidogrel, and statins.

Genetic ‘resistance’ to clopidogrel is seen in approximately 30% of patients,⁶⁷ caused by a genetic polymorphism in the gene encoding the enzyme responsible for the conversion of clopidogrel into its active form. This can lead to reduced platelet inhibition and increased risk of cardiovascular events, such as stent thrombosis.

Genetic factors have been demonstrated to have the greatest impact on warfarin dosing variability.⁸⁴ A study of 5000 genotyped patients on warfarin showed that patients with genetic polymorphisms which increase sensitivity to warfarin are at higher risk of haemorrhagic events when standard dosing protocols are used.⁸⁵ Studies provide conflicting results regarding the clinical application of a pharmacogenetic-guided dosing regimen.⁸⁵

Conclusion

This chapter has reviewed the role of the nurse in adopting pharmacological approaches to the management of cardiovascular disease. It has explored the development of non-medical prescribing and how this might continue to develop, to contribute to the acute and ongoing management of the patient with cardiovascular disease, providing examples of good practice.

In addition, the chapter has addressed the ongoing concern relating to medication adherence in cardiovascular diseases, further exploring the role of the nurse and other health professionals in addressing concerns about medication and the potential for contribution to improving patient adherence to medication regimens.

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Section 3: Professional considerations for nurses working in cardiovascular care

13 Patient education and communication

FELICITY ASTIN, EMMA HARRIS, LIS NEUBECK, ROBYN GALLAGHER,
AND JENNIFER JONES

CHAPTER CONTENTS

Introduction 399

Educational theory and principles of adult learning 400

Involving informal carers in therapeutic patient education 402

Principles and practices of effective communication 402

What is effective therapeutic communication? 402

Verbal and non-verbal communication techniques 403

Active listening 404

Demonstrating empathy 404

Using plain language 405

Teach-back using 'chunk and check' 405

Which patient education strategies are effective? 406

Top tips in providing quality patient education 406

Health literacy as a barrier to effective therapeutic patient education 408

Prevalence and impact of inadequate health literacy 409

Health educational needs of patients with cardiovascular disease 411

Education of the patient living with heart failure 411

Education of patients recovering from myocardial infarction and coronary interventions 414

Conclusion 416

KEY MESSAGES

- Nurses and allied health professionals play a key role in communicating and educating patients and informal carers.
- Comprehensive therapeutic patient education requires planning, delivery, evaluation, and documentation.
- Informal carers should be involved in all aspects of therapeutic education.
- Communication skills training for health professionals can improve patient satisfaction with care.
- Therapeutic education is more likely to be effective if best practice communication and teaching skills are applied in clinical practice which includes a learning needs assessment.

- Single sessions of therapeutic education are less effective than multiple sessions with follow-up.
- Problematic health literacy is a major obstacle to therapeutic patient education.
- Universal health literacy precautions should be implemented to reduce health inequalities.
- Effective therapeutic patient education has the potential to reduce unnecessary health resource use by patients and adverse events.

Introduction

A vital part of the health professional's role is to communicate with patients, and those close to them, in a

way that can promote physical and mental health, patient safety, and well-being. Education and communication are important, but rather neglected, aspects of the health professional's role. Education and communication are interrelated; education refers to a process in which knowledge and skills are shared. Communication refers to ways in which information is given, received, or exchanged using spoken and written words as well as body language. Therapeutic patient education goes one step further and is defined as an approach designed to improve patient outcomes in which education is seen as a therapy that is part of overall treatment.^{1,2} Successful therapeutic patient education requires a rebalance of the health professional–patient 'power' dynamic to enable the patient to take greater responsibility for their health and well-being, working with the multidisciplinary health and social care team. The aim of therapeutic education is to help patients, and those close to them, to develop competencies to effectively self-manage their health to optimize their quantity and quality of life.^{1,2}

This chapter will begin with making a case for the more consistent application of educational theory to underpin educational interventions developed for cardiovascular patients. The section that follows will describe therapeutic patient education and emphasize the importance of involving those close to the patient in educational interventions. We will recap on the principles and practices of effective communication for health professionals and review the characteristics of effective patient education. The next sections of the chapter focus upon the importance of health literacy as a potential barrier to effective therapeutic patient education with concluding comments. The chapter includes case studies to showcase the health education needs of cardiac patients diagnosed with common cardiovascular conditions.

Educational theory and principles of adult learning

All members of the multidisciplinary health and social care team play a role in the education of patients with cardiovascular disease, and those close to them. Effective health education has the potential to improve health outcomes, well-being, and quality of life. There are many stages in the patient journey where effective patient education can improve patient outcomes. The point at which patients are discharged home from hospital is especially important. Hospital readmission within

30 days of discharge is not uncommon among cardiac patients and often for avoidable reasons. Health professionals play an important educational role in the discharge process.

Interestingly the role of 'teacher' is one that health professionals do not always have the opportunity to fully prepare for, or reflect upon. Surprisingly few educational interventions delivered in cardiovascular care settings make any reference to the principles of educational theory. In this context, we refer to theories as simply a set of general rules that can be used to guide the development of an educational intervention. For the purpose of this brief introduction, two key educational theories, or approaches, have been selected for health professionals to integrate into their programme of therapeutic patient and informal carer education.³

We will begin with a 'constructivist' approach to teaching. In simple terms this teaching approach recognizes that the adult learner is not a 'blank canvas', but rather a person who will actively decide how, and when, to modify their existing knowledge. Health professionals who use a 'constructivist' teaching approach see their role as a learning 'facilitator', rather than an expert 'informer' who transmits their knowledge to the learner. They involve the patient and informal carer by evaluating their prior knowledge and understanding to identify potential inconsistencies. Participatory teaching and learning techniques are used, such as problem-based learning with time allocated to reflect upon new learning and experiences. In this way, 'new' knowledge is constructed. ► **Fig. 13.1** illustrates the difference between a learner/informal carer-centred versus a health professional-centred approach to teaching and learning.

More often than not, health professionals have used the more dated health professional-centred learning approach. Complete the learning activity in ► **Box 13.1** to identify your approach to patient education and your perception of the role of 'teacher'.

Experiential learning theory is the second approach we will introduce which focuses upon the process of learning and identifies four steps that occur in a cyclical or spiral sequence:

1. Concrete experience, which refers to 'doing', that is, an event or encounter that has happened to a person in their daily life (e.g. a senior nurse in a coronary care unit instigates a programme of study leave to encourage colleagues to attend an international conference to develop awareness of latest research evidence).

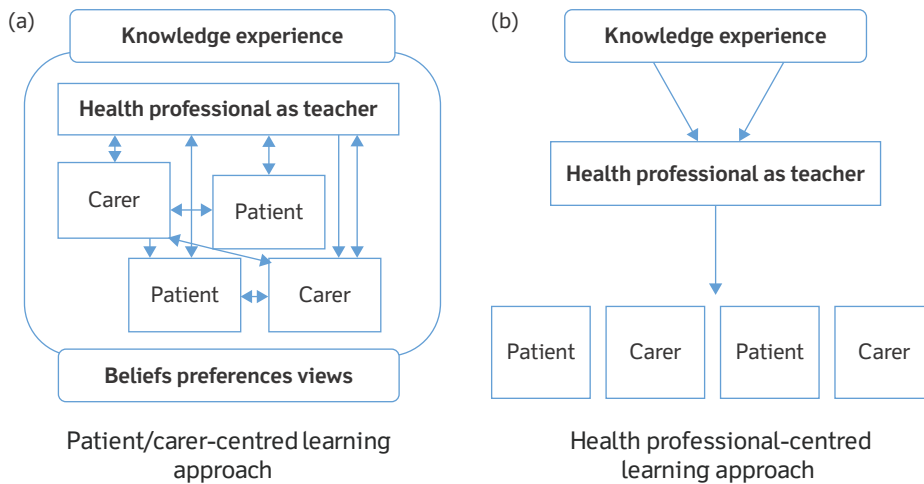


Fig. 13.1 Diagram to compare patient/informal care centred versus health professional-centred education.

2. Reflective observation, a natural 'thinking' process that takes place after a new experience (e.g. the senior nurse thinks about how the colleagues responded differently to this opportunity, develops ideas about why there were differences, and evaluates the impact of them attending the conference).
3. Development of abstract concepts, a 'channelling' process in which new ideas and observations that have evolved from reflecting on the new experience are used as personal feedback that informs future experiences (e.g. the senior nurse talks to other senior colleagues to see if they have had a similar experience

with staff attending conferences to understand more generally how different colleagues respond).

4. Testing concepts in a new situation, this step requires the learner to apply the new knowledge to a different situation (e.g. the senior nurse offers a study leave opportunity to allied health professionals to see if there are similar effects on clinical practice).

Experiential learning approaches such as apprenticeship, mentorship, and clinical supervision are used in many forms of health professional education. The principles also apply to patient and informal carer education. Many common cardiovascular conditions such as coronary heart disease and heart failure have no cure. Therefore, supporting a patient to develop the necessary knowledge, skills, and confidence to self-manage their own health and care, on a daily basis, is an important approach to maximize patient health and well-being. It is important that health professionals use effective techniques to support patients, and those close to them, to self-manage their lifestyle and adhere to prescribed medications. Interventions designed to optimize health-related quality of life are a priority. For this reason, it is recommended that health professionals draw upon educational theories to inform patient education in clinical practice. The therapeutic value of health education can be realized by assessing patients' learning needs and using a range of teaching and learning approaches to match the health literacy levels of patients and informal carers. Ideas about educational theories and approaches help us to understand the principles of effective teaching.

Box 13.1 What teaching approach do you use?

- Think about a recent discussion with a patient or colleague, in which you were either sharing knowledge or teaching a skill. Write a brief description of what happened.
- Read through your description and note how you felt and what you thought during the interaction.
- Evaluate the overall experience and note what went well and less well.
- Did you use a patient/carer-centred learning approach? Think about why you used the approach that you did.
- What have you learned about your teaching approach and could you have done it differently?
- Would you change anything in a similar situation? If yes, what actions would you consider?

Involving informal carers in therapeutic patient education

People typically belong to social units and communities. Therefore, there should be an emphasis on how to involve 'informal carers' (defined as family friends or neighbours who provide instrumental or emotional support that is unpaid) anywhere and anytime that healthcare is given.⁴ Informal carers can contribute to all aspects of healthcare and also provide emotional and practical support to patients during times of illness. The active involvement of informal carers is pivotal to realizing better health outcomes, both in the individual patient but also in those close to them.⁵ The family comprises one of the most immediate contexts of care and family involvement in care can be critical in health outcomes, including the impact on the patient's well-being.⁶

The growing population of older adults living with chronic conditions means that family members play an increasingly essential role in reducing the burden on healthcare systems. The care they provide contributes substantially to tangible benefits, including reduced hospital stay and hospital admissions. Consequently, it is vital for nurses to work in partnership with patients, and those closest to them; the latter are integral members of the healthcare team. It is also important that nurses are aware that informal caregivers often lack support and tend to experience poorer physical and mental health outcomes compared to those without caring responsibilities. Nurses play a vital role in supporting informal carers in maintaining their health and well-being. Finding effective ways to support informal caregivers to provide care to their loved ones is becoming increasingly important as a core part of nurse education, curricula, and practice standards. Regardless of speciality, the proactive involvement of informal carers in promoting health and well-being through prevention or in acute, chronic, or end of life care settings translates into multiple benefits.

High-quality communication is a pivotal part of nursing. How well the nurse communicates with those closest to the patient has a significant impact on not only the individual patient's well-being and outcome but also the quality of the patient and family experience.² Providing a good patient experience requires health professionals to work effectively with patients and informal care givers. Communication and relationships are key to the individual nurse-family partnership and important to the provision of coordinated care that extends beyond settings, practitioners, and time.⁴

Health education is more effective when delivered using a family/group-orientated approach, whether this be educating a household to manage a life-limiting condition or supporting a family in wellness and the prevention of cardiovascular disease. Family households, and particularly couples, often share the same lifestyle and risk factors.⁷ While a positive family history is an independent risk factor, incidence of cardiovascular disease in families is also a result of the aggregation of major risk factors, for example, raised blood pressure, raised cholesterol, and diabetes, resulting from a shared lifestyle. Consequently, cardiovascular risk is often elevated and partners (spouses) and first-degree relatives of patients with atherosclerotic disease are at a higher risk of developing cardiovascular disease than the general population. For health professionals to deliver optimal care, it is vital to engage patients and their families/informal carers as partners. Informal caregivers are integral members of the healthcare team, contributing substantially to the effective implementation of patient care. There are many health benefits for patients, and those close to them, that can be gained by including them in education-based interventions.⁶

Principles and practices of effective communication

What is effective therapeutic communication?

Effective communication between health professionals, patients, and those close to them is necessary to establish positive and collaborative partnerships which form the foundation of patient-centred care.^{8,9} Therapeutic communication occurs as a two-way, interpersonal, interaction in which information, thoughts, and feelings are exchanged and expressed both verbally and non-verbally.¹⁰ Therapeutic communication is central to all aspects of healthcare, such as explanations about diagnoses, shared decision-making about potential treatment options, and the provision of psychological and self-management support, to name a few.¹⁰ Effective communication has a powerful potential influence on patients' physical and psychological health and well-being through multiple mechanisms, including improved access to care, timely and accurate diagnosis and treatment, promoting patients to feel valued, reduction in anxiety levels, and feeling more

motivated to self-manage their health and adhere to recommended treatments.¹¹

Informal caregivers play an important role in the patient recovery process. Patients' accounts of their recovery experiences provide us with invaluable learning. Mr Brian Boyle, an intensive care unit survivor, described the importance of having his family nearby; 'Having my parents there with me in the hospital meant everything to me. Growing up, they were my role models, my friends, my supporters—and in the hospital, my guardian angels' (p. 5).¹² ► **Box 13.2** shows Mr Boyle's communication tips for health professionals.

Effective communication between health professionals, patients, and informal care givers is:

- Patient driven: the patient's health and well-being are the main purpose of the interaction. Information should be tailored to each individual.
- Understandable: spoken language should be clear, accurate, and concise. Patients can misinterpret information when medical terminology and complex words are used.
- A reciprocal process: the interaction requires engagement by both parties; it is not a one-way exchange of information. Patients and informal caregivers receive and understand verbal, and non-verbal, information given by healthcare professionals. This prompts a response or reaction by the patient, which allows the health professional to know how well the information was received and understood. The health professional

responds appropriately to correct misunderstandings, emphasize key messages, and/or provide further information.¹⁰

- Supportive and caring: empathic communication helps to build trust and effective relationships with patients. Patients are more engaged with interactions when they feel valued and listened to.

Verbal and non-verbal communication techniques

Verbal communication is the use of spoken language to exchange information during interactions between people. Verbal communication has three important components. First, the literal content of the message including the type of words and sentence structure used. Second, the voice used to convey the message. Third, the non-verbal communication. Health professionals often tend to focus upon the content of a health message. However, the other aspects of communication are equally as important. The vocal aspect of communication is often overlooked (e.g. the volume, tone, pitch, rate, pausing, word emphasis, and use of 'fillers' such as 'OK' and 'um'). Both the content of the message and the characteristics of the voice used to communicate it can influence how well the content is understood. For example, long sentences that are packed with medical jargon, communicated quickly, using a loud voice, can be difficult for a patient to understand.

Non-verbal communication such as body language, eye contact, and facial expressions are important cues that

Box 13.2 Top tips on communication: a patient perspective

Mr Boyle identifies recommendations for health professionals on best practice communication with informal caregivers:

- Identify one person in the social network who will relay information to others.
- Consider using digital approaches, for example, create a website to share information regarding the patient with family and friends (e.g. <https://www.caringbridge.org/>).
- Recap on key information about hospital procedures, for example, visiting hours, and key contacts and their phone numbers.
- Think about what you are saying but also how you say it.
- Try and use a gentle tone of voice and use the patient's and informal carer's names.

- Try to develop a rapport that will help to promote trust.
- Reflect upon the type of communication that will best match the informal care giver's needs.
- Try to manage expectations so that they are realistic.
- Taking the time to listen is important even if you cannot answer all of their questions.

'Similar to a mechanical system of interlocked gears, the communication between the patient, family, and health care providers is very important throughout the entire recovery process' (p. 5)

Source data from Boyle, Brian (2015). The critical role of family in patient experience. *Patient Experience Journal*: 2(2), Article 2. Available at: <https://pxjournal.org/journal/vol2/iss2/2>.

accompany verbal communication and convey thoughts and feelings. Research on non-verbal communication conducted in the 1960s identified that non-verbal communication was more important in the communication process than previously recognized; findings showed that when an inconsistent or mixed message was communicated to a person, they evaluated the message by evaluating non-verbal factors such as voice tone and body language.¹³ A communication model developed from this research suggested that in this context, 55% of communication consisted of body language, 38% through the use of one's voice, with only 7% consisting of the literal content of the message. Several techniques can be used to support positive verbal and non-verbal communication which build positive collaborative relationships that are central to patient-centred care.¹⁴

Active listening

Active listening requires a high degree of concentration to ensure that the health professional focuses completely on the information being communicated by a patient coupled with an appropriate response.¹⁵ If you are already thinking about what you are going to say in response to the dialogue with your patient, then you are probably not actively listening. To actively listen, healthcare professionals must try to minimize any distraction and focus on the patient rather than on their own agenda. It is also important to pay attention to the patients' body language, as well as the types of words they are using to convey their views.

Three approaches that demonstrate active listening are the use of non-verbal cues, verbal prompts, and exploratory questioning techniques. First, non-verbal cues, such as eye contact, head nodding, raising eyebrows, and other facial expressions, are powerful physical demonstrations that can communicate active listening to patients and informal carers. Second, verbal prompts can be used to encourage the patient to continue with their explanations.¹⁰ For example, 'Please tell me more about ...' Third, a follow-on question, such as 'Why do you think you are feeling this way?' can be used to help to interpret and clarify patients' 'messages'. ► **Table 13.1** shows some examples of verbal and non-verbal communication techniques that can be used in clinical practice.

Demonstrating empathy

Showing empathy is a core skill for all healthcare professionals. Empathy is a way of expressing understanding of a patient's experience and concerns.¹⁵ Showing empathy as part of healthcare helps patients to feel valued, reassured, and comforted. Non-verbal gestures may include sympathetic head nodding, appropriate facial expressions, and leaning forwards.¹⁵ Touching or holding a patient's hand is a powerful emotive gesture, but should only be used in appropriate situations. Empathy can be explicitly conveyed by using specific phrases such as 'I'm very sorry to hear that', 'That must have been difficult for you', and 'I'd like to see you again to find out how you're getting on'.

Table 13.1 Verbal and non-verbal communication techniques

Verbal	Non-verbal
1. Use open-ended questions: 'Can you tell me more about how you're feeling?' ✓ 'Have you been feeling breathless?' ✗ 2. Summarize what the patient has said: 'In summary, you have told me so far ...' ✓ 3. Repeat important information ✓ 4. Avoid complex medical words and abbreviations: 'Your ICD may be deactivated at end of life' ✗ 5. Speak at a moderate pace: Speaking too fast makes it difficult to understand and retain information ✗ 6. Avoid judgemental or confronting language and don't raise the level of your voice People who smoke deserve to get sick ✗ 7. Use a tone of voice (i.e. assertive, comforting, persuasive) to match the message ✓	1. Don't interrupt ✗ 2. Maintain eye contact to show attentiveness ✓ 3. Head nodding where appropriate ✓ 4. Avoid crossing arms/legs ✗ 5. Turn towards the patient ✓ 6. Avoid completing other tasks such as updating medical records, while the patient is talking ✗ 7. Use appropriate facial expressions, e.g. concerned frowning, smiling ✓ 8. Use touch when appropriate ✓ 9. Use silent pauses to encourage patient responses and allow thinking time ✓

Using plain language

Healthcare professionals routinely assess the communication needs of their patients as part of a comprehensive health assessment process. Plain language should be used in all types of communication to help ensure that information is accessible for all patients. Patients and informal carers are more likely to understand the health information you communicate to them the first time they read or hear it if plain language is used. It is important that health-related messages are concise, use simple language, and avoid complex medical terminology and abbreviations. Patients who are not fluent in the language being used should be offered the services of a professional interpreter; this service may be financially costly but the use of professional interpreters reduces adverse events, improves patient outcomes, and increases patient satisfaction.¹⁶ Every effort should be made to avoid using relatives and friends as interpreters as this can cause distress and may compromise the accuracy of the information being conveyed.

Teach-back using 'chunk and check'

It is estimated that between 40% and 80% of health-related information communicated to patients during a

consultation is immediately forgotten.¹⁷ Patients may also have difficulty in understanding the information communicated to them. There are many factors that can influence patient comprehension and recall including age, gender, educational level, emotional status, the volume of information presented, perceived importance of the information, and the way that the information is delivered.

Teach-back is an effective communication technique used to evaluate the effectiveness of an educational session; patients are asked to recount the key messages they have learned back to their 'teacher'.¹⁸ The emphasis is upon the skill of the health professional as an educator rather than testing the patient. Teach-back helps to establish whether healthcare professionals have communicated clearly and asks the patient to explain the information in their own words. Teach-back can be applied to any health-related information or skills teaching from diagnosis, prognosis, and shared decision-making about treatment options through to discharge advice and self-management support. Dividing information into shorter sections (chunks) helps patients' understanding. Incorporating the teach-back and 'chunk and check' techniques into clinical practice is an effective way for healthcare professionals to assess patients' comprehension.

The steps involved are shown in ► Fig. 13.2. Essentially, the technique involves dividing information into shorter

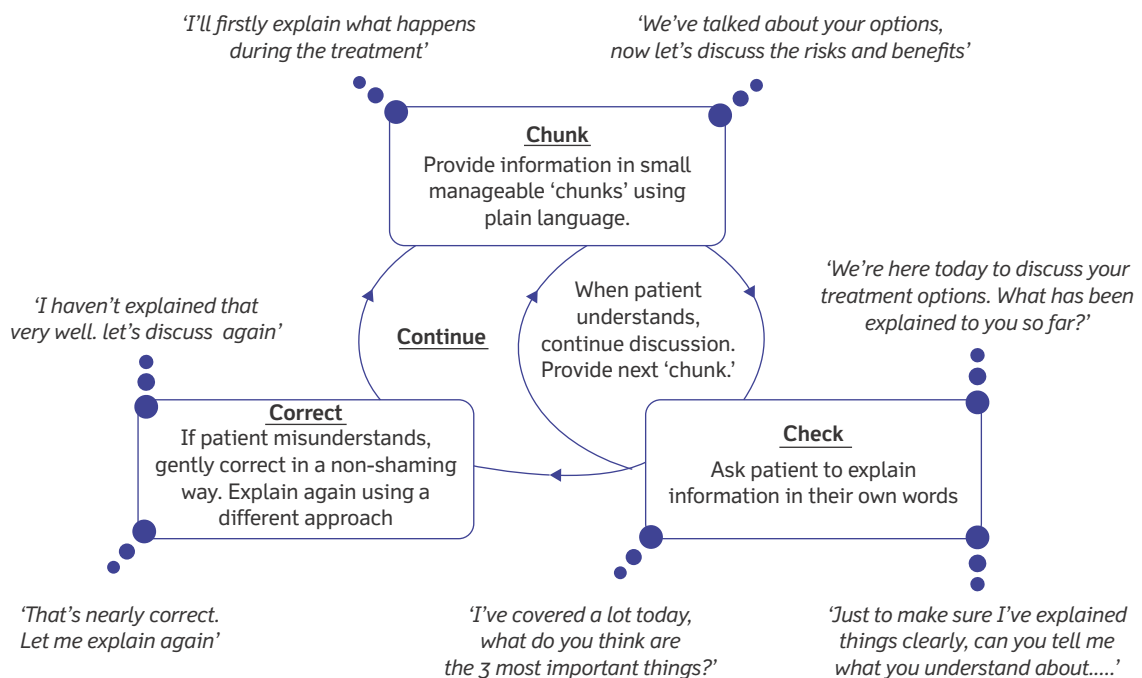


Fig. 13.2 Diagram of Teach-Back technique.

sections (chunks) and getting the patient to 'teach-back' to you, in their own words, after each 'chunk'. In this way, you can check that your teaching has been effective in helping the patients to understand the health information you presented.

This approach can also be applied to skills teaching such as using a glyceryl trinitrate spray (e.g. Nitrolingual® Pumpspray). If the patient is unable to provide an adequate explanation, the healthcare professional can communicate the information again in a different way. The cycle is repeated once or twice until it is clear the patient has understood the health information. This also has a positive effect on patient outcomes. When used correctly, teach-back can result in improved patient self-efficacy (the belief in oneself that a given task can be completed), knowledge of health condition and self-management, as well as reduced hospitalization and readmissions.¹⁸

In summary, effective communication between health professionals, patients, and informal caregivers is an important skill that contributes to overall care quality and is central to high-quality patient education.

Which patient education strategies are effective?

Systematic reviews bring together primary research to help us to identify which teaching and learning approaches are most likely to be effective in therapeutic patient education for patients with cardiovascular disease and cancer. From this evidence, we can identify some general themes that can be implemented to maximize the positive effects of therapeutic patient education for patients with cardiovascular disease and their informal caregivers.

Top tips in providing quality patient education

Planning patient education

When an educational intervention is planned, it is very important that the health professional considers the educational outcomes and focus upon 'teaching to goal', that is, being very clear about the educational outcomes you wish to achieve which may be changes in knowledge, skills, or behaviours. The learning objectives agreed with the patient should be realistic and match the amount of patient contact time available. Some flexibility is required as depending on the context of care as there may be just a few minutes of patient contact time available or longer.

Educational interventions that focus upon skills development to enhance communication, self-care, and problem-solving are known to be more effective in enabling lifestyle change and improving clinical outcomes, compared to interventions that focus upon the provision of information alone.¹⁹ It is important to build in time to assess the patient's learning needs and preferred learning style. This aligns with the constructionist learning theory described at the beginning of the chapter.

The teaching session may start by asking the patient about what they already know about their health condition to establish what their learning needs are. This will also provide an opportunity to correct any misunderstandings. To stimulate patient interest, it is essential to help them to understand why the educational session is important to them. One way to achieve this is to ask about any specific concerns they have about their health.

Asking a patient about whether they learn best by reading or watching a video (please replace 'DVD' with 'video' as I do not think people use DVDs anymore!) will give you information that can be used to tailor educational resources to a preferred learning style. This will also give some indication of the patient's health literacy level (see 'Health literacy as a barrier to effective therapeutic patient education' for more detail). A mismatch between the health literacy level of the patient and the educational resources being used is a major barrier to effective therapeutic patient education. Physical or cognitive impairments can also impact the ability to learn. For example, if a patient is hearing impaired, using visual resources may be more effective than verbal instruction alone. Other factors such as fatigue, distress, anxiety, and depression can blunt the ability of patients to process and retain health-related information. By combining the information gathered in the initial assessment, patient education can be individualized to specific learning needs which is more effective compared to a more generic 'one-size-fits-all' approach.

Teaching tips

The teaching approaches you use will depend upon the amount of patient contact time available but there are some important principles that you can consider.

Single educational sessions are less likely to be effective compared to programmes with scheduled follow-up.¹⁹ To address this challenge, you may integrate different modes of educational delivery to supplement face-to-face education. For example, self-management support for patients with cardiovascular disease can be provided using telehealth approaches such as telephoning, video conferencing, and telemonitoring.²⁰

Verbal teaching and discussion are two of the most frequently used teaching strategies, but are the least effective approaches unless used in conjunction with other teaching methods.²¹ Think creatively about the educational approaches you use and consider using a combination of audiotapes, videotapes, written materials, and lectures.²¹ Some other approaches you may wish to try are the use of posters or charts, checklists, video or DVDs, podcasts, models or props, group sessions, or trained peer educators.

The use of computers as part of a patient education strategy has also been shown to be effective.²¹ Digital solutions offer several advantages as potential barriers to patient education can be addressed. Educational content can be needs based and provided in advance of consultations. This frees up health professional time to focus upon discussion of the educational content, rather than on delivery. Educational content can be referred to as many times as desired to boost patient comprehension and recall. The user can also tailor their learning making it individualized and learner centred. The use of multimedia can accommodate different learning styles and health literacy levels as well as promoting patient engagement. High-quality verbal and visual information can be provided at the patient's bedside using videos delivered via a tablet or television. Where possible, encourage patients and informal carers to demonstrate the practical skills you are teaching, such as the use of glyceryl trinitrate spray. Demonstration is proven to be one of the most effective teaching techniques.

Patients frequently need to make important decisions about their care which requires them to choose between different treatment options. As part of making an informed decision, patients need to have comprehensive information about their treatment options provided to them in a way that they understand to help them make choices. This is an important aspect of patient education as, to be fully informed, patients need to be supported to understand the risks and benefits of each treatment option, what alternative treatments are available, and what would happen if they decided to refuse treatment. Research about this process in patients treated with coronary angioplasty has shown that there is room for improvement; patients often underestimate the risks and overestimate the benefits believing that the treatment has 'fixed' their coronary heart disease.²²

Patient decision aids are effective educational tools that help people to make informed decisions about their healthcare that match their personal preferences and personal values. Patient decision aids help to support a shared decision-making process between patients, those close to them, and health professionals. There are a range of high-quality tools available that can complement the discussions that take place between a patient and health

professional about treatment options (<https://decisionaid.ohri.ca/implement.html>). Digital resources can be used to support shared decision-making and provide another example of the potential benefit of using technology in the context of patient education.

The integration of a patient decision aids into the patient pathway can lead to several improvements in patients' understanding and recall of health information. Patients tend to be more involved in the overall decision-making process and are better informed, clearer about their values and preferences, and have a more realistic understanding of treatment risks.²³ See ► **Box 13.3** for some other examples of other digital approaches that can be used to support patients with cardiovascular disease.^{24,25}

As well as using digital aids to enhance patient education, it is also important to spend some time refining your communication skills and techniques (see 'Principles and practices of effective communication') to maximize the effectiveness of your therapeutic patient education.

When designing written resources, it is important to ensure that materials are of a suitable reading age for the general population and that the content is culturally appropriate and available in different languages.²¹ Ensure that any written information resources are reviewed by the target patient group to improve the accessibility of the information.

Your educational interventions are much more likely to be effective if you involve those people close to the patients who may be either family or friends (see 'Involving informal caregivers in therapeutic patient education').

To ensure there is continuity in the provision of patient education it is important to document the details of your teaching in the patient records. Key aspects to document include a brief description of the goal of the teaching session, any barriers to learning, a list of the resources you supplied or 'sign-posted' the patient to and techniques you used to evaluate what the patients had learnt, for example, Teach-back (see 'Teach-back using 'chunk and check'). Documenting this information will enhance the continuity of care for your patients and enable other members of the multidisciplinary team to build upon the educational sessions you have delivered.

Finally, an important part of patient education is to regularly evaluate your teaching. As a health professional, you will be familiar with the process of self-reflection in which you evaluate your performance. This can be readily applied to your role as a 'teacher' (see 'Educational theory and principles of adult learning'). It is also helpful to ask patients and those close to them to give you informal feedback about what they liked about the educational session and what could be improved. Other potential evaluation questions

Box 13.3 Examples of the use of digital technology to enhance cardiovascular care**Digital interventions to improve adherence to lipid-lowering medication****What did the systematic review show?**

Lowering elevated lipid levels reduces the risk of cardiovascular events. Only about one in four patients take this medicine as prescribed. As part of this review, 35 studies, with over 925,000 adult participants prescribed lipid-lowering therapy, were evaluated.²⁴ The authors concluded that there was high-quality evidence to support ‘intensified care’ interventions that led to better medication adherence rates in the short (≤ 6 months) and long (≥ 6 months) term, when compared to usual care. Moreover, the changes in medication adherence rates led to measurable improvements in total cholesterol levels in the intervention group.

Which interventions worked in the ‘intensification’ interventions?

The types of interventions that were most effective, compared to usual care, were telephone reminders, calendar reminders, integrated multidisciplinary educational activities, and pharmacist-led interventions. Effective educational interventions used a variety of approaches including educative text messages, videotapes, information booklets, freephone patient helplines, websites, tailored medication labels, personalized letters, and phone calls.

Take-home message

A combination of strategies including information, reminders, adherence reinforcement techniques, and an

understanding of the patient perspective are likely to improve adherence to lipid-lowering medications.

Mobile phone text messaging and app-based interventions for smoking cessation**What did the systematic review show?**

Tobacco smoking is an addiction that causes avoidable premature death. Not everybody attempting to quit wants face-to-face support. Mobile phone-based smoking cessation support (mCessation) is an alternative. As part of this review, 26 studies, with over 33,000 adult participants, attempting to quit tobacco smoking were evaluated.²⁵ The authors concluded that there was moderate-quality evidence that automated text message-based smoking cessation interventions resulted in quit rates 50–60% greater than minimal smoking cessation support. The evidence to support smartphone apps was of low certainty and more research is required.

Which interventions worked?

The text message interventions varied in duration and ran from 1 week to 6 months. Some text messages were individualized and/or contained interactive components while others were not. The frequency of text messaging varied across studies from 1 to 35 texts per week. Additional analysis indicated that the intensity of the intervention did not influence abstinence rates.

Take-home message

Text messages are an effective addition and increase quit rates when added to minimal smoking cessation support interventions.

may focus upon your communication techniques, content and organization of the subject matter, and appropriateness of learning objectives/teaching goals. Feedback can be used to inform a cycle of continuous improvement.

Health literacy as a barrier to effective therapeutic patient education

Health professionals communicate with a diverse range of people in their day-to-day work. Some people may not have had the opportunity to experience ongoing education. This will influence how well they can understand verbal communication and written information. This means that

they may have difficulties in understanding medication prescriptions, food labels, and health information leaflets. Tailoring health information to an individual’s health literacy level helps to make it accessible to everyone.

The concept of health literacy first appeared in academic literature in 1974, but the more modern interpretation did not appear until the 1990s. Several definitions of health literacy exist; the European Health Literacy Study Consortium integrated 17 health literacy definitions to produce the comprehensive version shown here²⁶:

“Health literacy is linked to literacy and entails people’s knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare,

disease prevention and health promotion to maintain or improve quality of life during the life course". (p. 3)

In simple terms, health literacy is the ability to read and understand health information and successfully use it to undertake activities that are beneficial to one's health. Health literacy can be categorized into three levels: functional, interactive, and critical, as described in ► **Table 13.2**.²⁷

Prevalence and impact of inadequate health literacy

In adults, an inadequate level of health literacy refers to those with a US/international sixth grade reading level or lower, which equates to the reading level of an average 11–12-year-old child. A survey of 7795 people from the general population of eight European countries showed that 47.6% of the sample had a limited (i.e. inadequate or problematic) health literacy level.²⁸ Other studies focusing on patients with cardiovascular disease have reported that 30–40% of heart failure and coronary artery disease patients have low health literacy levels respectively.^{29,30}

To put this into context, about half of the patients you see in practice are likely to have a below-average level of functional health literacy. As a result, many patients will have difficulties with a variety of health-related activities

and tasks. Patients with low levels of health literacy are more likely to be older (>65 years), non-white, or have a lower socioeconomic status, income, or level of education.^{28,30} In cardiovascular patients, low health literacy is independently associated with increased healthcare use.³¹

It is important to provide support for patients with low health literacy levels as these patients are more likely to experience poorer health outcomes. For example, in patients with chronic cardiac conditions, low health literacy levels are associated with poorer self-care, quality of life, cardiac knowledge, and adherence to medications and increased hospitalization.^{29,30} Therefore, differences in health literacy levels are powerful determinants that can widen existing health inequalities.³² Improving health literacy and ensuring that health services are accessible for everyone is advocated by the World Health Organization and included within country-specific health policies.³²

As a healthcare professional, there are two key things to think about with regard to health literacy:

1. Identifying patients with low health literacy levels.
2. Ensuring communication is accessible to all patients (see 'Which patient education strategies are effective?').

It can be challenging to identify patients who have low levels of health literacy in the busy environment of a

Table 13.2 Levels of health literacy

Classification	Description	Example
Functional health literacy	Attained basic literacy and numeracy skills required to access and understand relevant health information related to one's self. Able to relate to the communication of information about health risks and health services	A 55-year-old man receives information about referral to cardiac rehabilitation following acute myocardial infarction. After reading the information he decides to attend the programme
Interactive health literacy	Attained a level of functional health literacy plus additional personal skills that enable oneself to respond to health information from different sources. Involves motivational skills and self-confidence	As above plus: during cardiac rehabilitation, the patient asks questions relevant to his own health and lifestyle. He follows the advice given and sets lifestyle change goals to self-manage his health condition
Critical health literacy	Attained advanced cognitive and social skills that lead to personal and community empowerment. Involves critically analysing information and using initiative to respond to changes in personal, social, and economic circumstances	As above plus: the patient knows that he will need further support to help him maintain a healthier lifestyle. To do this he thinks about what will help him. He joins a heart support group. The patient understands the barriers that prevents people like him from attending cardiac rehabilitation. He initiates a walking group at his local community general practice

hospital or clinic. Many patients will feel embarrassed by their level of ability and will try to hide this from others. Although factors such as older age and ethnicity are associated with low health literacy, these are generalizations and do not apply to every individual. Therefore, it is important not to make judgements about health literacy levels based on a patient's appearance or demographics alone. However, there are several signs that may indicate that a patient has a limited level of health literacy³³:

- Patient uses excuses when asked to read written text. For example, 'I've forgotten my glasses'.
- Forms (e.g. consent forms) are filled out incompletely or inaccurately.
- Appointments are often missed or referral appointments not booked.
- Health and lifestyle advice are not followed.
- Poor medication adherence or patient identifies tablets from their appearance and does not refer to their name.
- Lack of engagement during consultations with few questions asked.

Another way of assessing patients' health literacy levels is by using specific validated screening tools. A variety of different instruments have been used to assess the health literacy of patients with cardiovascular disease and several are available in different languages.³⁴ Among the

most commonly used are the short version of the Test of Functional Health Literacy in Adults (s-TOFHLA), Rapid Estimate of Adult Literacy in Medicine (REALM), and the Three-item Brief Health Literacy Screen (3-item BHLS).³⁴ The characteristics of each instrument are provided in

► **Table 13.3.**

However, in routine clinical practice it may not be feasible to administer these instruments. Studies have shown that asking patients a simple screening question can effectively identify those with low levels of health literacy³³ such as 'How confident are you filling out medical forms by yourself?' (responses range from '5', extremely, to '1', not at all).

Free toolkits are available that have been designed to support healthcare professionals to implement health literacy universal precautions in practice (e.g. from the Agency for Healthcare Research and Quality (<https://www.ahrq.gov/health-literacy/improve/precautions/index.html>) and the Health Literacy Centre for Europe (<http://healthliteracycentre.eu/>)). By adopting health literacy universal precautions, health professionals can work towards ensuring that all health-related communication for patients is simplified. Using this universal approach means that health literacy screening is no longer necessary and the risk of miscommunication reduced. Adapting all aspects of health communication to reflect health literacy universal precautions is an effective way to improve care quality and the health outcomes of your patients and informal carers.

Table 13.3 Comparison of commonly used health literacy screening instruments in patients with cardiovascular disease

Instrument	Number of items	Advantages and disadvantages
s-TOFHLA	36 items	+ Objective measure of functional health literacy + Completed by the patient, therefore less likely to cause embarrassment – Time-consuming to complete (15 minutes) – Requires a level of writing ability and visual acuity – Not specific to cardiovascular disease
REALM	66 words	+ Objective measure of functional health literacy + Quick to complete (<3 minutes) – Administered by a clinician – Requires a level of writing ability and visual acuity – Not specific to cardiovascular disease
3-item BHLS	3 questions	+ Quick to complete (1–2 minutes) + Feasible for use in clinical settings + Not performance based so less likely to cause the patient embarrassment – Administered by a clinician – Subjective measure of confidence in health-related tasks – Difficult to equate to a specific health literacy level – Not specific to cardiovascular disease

Health educational needs of patients with cardiovascular disease

Cardiovascular disease once diagnosed is a lifelong condition that is primarily managed by the patient. The effectiveness of current treatment guidelines depends on the patient being appropriately informed and engaged in their treatment plan. The aim of patient education for all cardiac patients is to improve health outcomes, avoid complications, and implement long-term secondary prevention behaviours. However, in an era of short hospital stays, therapeutic patient education must be targeted, effective, and efficient with a seamless transition to post-discharge education and support.

Cardiac patients need sufficient information about their disease process, tests, and treatments so that they understand how their treatments work and can recognize any side effects or complications and seek medical help when required. Patients also need to know about follow-up appointments, medication dosage and frequency, how to manage symptoms including anxiety and depression, and how best to implement lifestyle behaviours such as physical activity and dietary changes.²⁰ Health information needs will vary according to the specific cardiac condition and patient circumstances. For instance, heart failure patients often manage multiple symptoms and the stress of having a chronic condition as well as complex medication regimens in the context of a declining disease trajectory, whereas patients diagnosed with acute coronary syndrome often have treatments including percutaneous coronary intervention (PCI) or coronary artery bypass graft surgery. These interventions aim to improve coronary blood flow but have quite different recovery trajectories.

Education of the patient living with heart failure

After hospitalization for an acute heart failure event, patients require substantial support, even when they are considered to be fit for discharge. Transition to home marks a period of time where patients move from having the continuous support of healthcare professionals to being their own primary caregiver.³⁵ During this time, patients remain at high risk for rehospitalization and death. In fact, the risk of mortality is greater in the immediate discharge phase for up to 3 months, than it was during the inpatient stay. Therefore, every patient who is discharged from hospital should have a personalized discharge and patient education plan, which emphasizes the need for follow-up appointments with their healthcare professionals.³⁶

A multidisciplinary approach is essential, and where possible the pharmacist and heart failure nurse should be

included. The pharmacist is needed because the majority of people living with heart failure have comorbid disease, for example, one-third of heart failure patients have diabetes, and one-quarter have atrial fibrillation, making medication regimens complex.³⁷ The pharmacist and heart failure nurse can work effectively to provide tailored patient education concerning self-care and medication management to ensure a smooth transition to specialist services at home. Patients are likely to have complex ongoing learning needs. This emphasizes the importance of working within a multidisciplinary team in liaison with either heart failure management, or cardiac rehabilitation programmes, to ensure that individual patient needs are met. Eligible patients who are able to access comprehensive heart failure management programmes, which include an exercise component, demonstrate clinical improvements in health-related quality of life and a reduced risk of hospitalization.³⁸ The evidence for the benefit of programmes for patients diagnosed with heart failure with preserved ejection fraction are less clear due to a lack of studies.

As heart failure is both progressive and lifelong, the information provided to patients needs to focus on the long-term management of the condition. Individualized management focuses on maximizing physical capacity, preventing disease progression, and reducing likelihood of relapse.³⁶ In particular, psychosocial needs are highlighted by patients as being the most pressing concerns they have. In order to achieve these goals, regular consultations will be necessary to assess symptoms, make adjustments to medication, and determine whether a patient would require further treatment.

The patient education plan may need to include topics about potential ongoing treatments and therapies such as the need for the implantation of cardiac resynchronization therapy devices, left ventricular assist devices, or consideration of heart transplantation where warranted. As described in earlier sections, the principles of effective communication and patient education should be fully integrated into care; understanding an individual's health literacy level and their cognitive status will help to tailor the individualized patient education strategy. Importantly, patient education should be individualized to the patient, taking into account their clinical and personal circumstances, and ensuring that the patient's wishes and preferences are discussed.³⁹

Self-management in heart failure is essential (see Chapter 10). Self-care education and support should commence during the hospital admission and continue after discharge. Because patients do not live in isolation, it is essential to include family members and informal caregivers in self-care education to ensure retention of health-related information.⁴⁰ People living with heart failure need both clinical and psychosocial support, but effective support for self-management is crucial to ensure that heart failure symptoms are minimized.

Assessing patients' learning needs and any obstacles to patient education such as low health literacy or cognitive impairment should be considered in the development of the educational plan. The educational content should include sessions on dietary restrictions, information on key symptoms that flag deterioration, as well as medicines management. It is important to help patients and informal caregivers to develop the knowledge and skills to monitor key signs and symptoms including weight, oedema, and shortness of breath. Support is needed to develop an action plan about how to seek help when signs of clinical deterioration occur. As the ability to self-manage is linked to life circumstances, social support, and individual levels of motivation, the patient education plan should discuss these elements. It may be necessary to make lifestyle changes in order to maintain health.

For example, exercise has been shown to improve quality of life, reduce hospitalizations, and decrease mortality in people with heart failure. However, adopting exercise may be difficult for somebody who has previously been inactive.

Developing a therapeutic relationship with patients and their families assists the patient education process. When patients are partners with healthcare providers in their treatment and long-term management plans, there is improved likelihood of effective self-management.⁴¹ As previously discussed, didactic models of education are less likely to engage the individuals and support effective self-care behaviour. Techniques of motivational interviewing can also be useful to improve patient engagement and self-management (see Chapter 11).

See ► **Table 13.4** for a case study in heart failure.

Table 13.4 Case study 2: heart failure

Mrs Maria Verdi is a 76-year-old female, admitted with heart failure. She lives with her daughter, having emigrated from her home country 10 years ago and has some difficulty with the local language. She has had type 2 diabetes diagnosed 7 years ago. She does not drink alcohol, but does have the occasional cigarette. Her body mass index is 31. On this admission, her electrocardiogram showed atrial fibrillation and she was started on an oral anticoagulant. She also takes aspirin, metformin, bisoprolol, ramipril, and atorvastatin. She lives in a house with stairs which she seldom leaves. She is being discharged from hospital today and you need to provide her with discharge advice. (Strategies described throughout this chapter would be applied in this case study, such as a learning needs assessment and identification of potential preferences for, and obstacles to, learning, e.g. low health literacy level and cognitive impairments)

Essential topics in patient education

Nursing action

Definition and aetiology of heart failure

Provide Mrs Verdi with information she can understand about her health condition. To be effective, verbal instruction should be reinforced with 'easy to read' written information. Cognitive impairment is common in patients with heart failure and recall is likely to be affected. Comprehensive health information can be accessed from national heart foundations, e.g. British Heart Foundation (<https://www.bhf.org.uk/>). Mrs Verdi may need information translated in to her first language. Having a family member present is important and Mrs Verdi's daughter can play an important role in helping her mother to understand the health information. However, family members should not be routinely used as translators, as they may not wish to pass on difficult information and professional interpreters should be used

Signs and symptoms of heart failure

Mrs Verdi needs to be able to recognize when her condition is deteriorating. She should demonstrate how she will record her daily weight and demonstrate her understanding about the significance of weight gain as a symptom of clinical deterioration. Mrs Verdi will need to know how and when to notify her healthcare provider; you can work together to develop a written action plan. In discussion with Mrs Verdi, it may also be appropriate to initiate a flexible diuretic therapy programme

Pharmacological treatment

Mrs Verdi is on multiple medications and has commenced a new medication during this hospital admission. Using teach-back (see 'Teach-back using 'chunk and check'') will help you to evaluate how effective your teaching has been in helping Mrs Verdi to understand the dose, mode of action, and common side effects of her prescribed medications. It is also important that she understands when to take any 'as-needed' medicines and what to do when she is unwell. In particular, it is important to discuss over-the-counter drugs with Mrs Verdi to ensure that she knows not to take anti-inflammatory drugs, which may increase the risk of bleeding. If available, bilingual staff can provide support or a professional interpreter. Consultation time needs to be allocated to facilitate the necessary time for teach-back and questions

(continued)

Table 13.4 Continued

Risk factor modification	Although Mrs Verdi reports smoking tobacco only occasionally, it is important to recommend that she stops. Her smoking status should be discussed including her readiness to quit and sources of support she might consider. Mrs Verdi should be having her blood pressure checked regularly. She may be able to do this at home, through a telemetry monitoring programme and at regular visits with the heart failure nurse and her home physician. Check Mrs Verdi's understanding of her diabetes and ensure that she can explain and demonstrate how to monitor and manage her diabetes. Mrs Verdi is obese and weight reduction should be considered using a sensitive approach
Dietary recommendations	Sodium restriction may be prescribed by Mrs Verdi's cardiologist, if so, then she needs to be given 'easy-to-read' information on reducing sodium intake. Clear and specific instructions need to be given to Mrs Verdi concerning the avoidance of excessive fluid intake; however, fluid restriction is not usually necessary. Loss of appetite could be of concern and unintentional weight loss can be a predictor of morbidity and mortality. However, Mrs Verdi may benefit from a referral to a dietician to discuss how to manage her diabetes and concurrently lose weight to improve her overall health
Exercise recommendations	Regular physical activity is important to improve the symptoms of heart failure. Lack of confidence is common in people diagnosed with heart failure and tailored individual advice is important. Specific instructions and a written action plan are recommended. Participation in cardiac rehabilitation where available will help Mrs Verdi to improve her confidence to exercise through experiential learning and peer support
Sexual activity	Although Mrs Verdi does not mention having a current partner, it is still important to offer her the opportunity to discuss sexual activity
Immunization	Mrs Verdi needs to be advised about the need to have annual vaccinations against infections such as influenza and pneumococcal disease and signposted to where she can access services
Sleep and breathing disorders	Mrs Verdi may prefer to sleep more upright. It is important for her to understand that weight loss, and smoking cessation, may improve her breathing, sleep quantity, and quality
Adherence	Non-adherence to medications is common in people diagnosed with heart failure. Ensure that Mrs Verdi understands the key details about her medications; the importance of taking these regularly and for life; and an action plan for strategies she can use to support concordance, such as the use of a dosette/medication organizer. As mentioned earlier, it is important to assess Mrs Verdi's cognitive state as even mild cognitive impairment can affect adherence
Psychosocial aspects	Depressive symptoms are common in patients diagnosed with heart failure and all patients should be screened for depression and referred on for additional support if required. It is important to understand how well Mrs Verdi copes at home while respecting her own goals, values, and preferences
Prognosis	Mrs Verdi needs to understand the lifelong nature of heart failure, the likelihood of deterioration, and the need for further interventions or palliation. It is important to initiate sensitive discussions about Mrs Verdi's prognosis and establish how much she wants to be told. In this way, the amount of information provided will match her preference. Ideally, care should be planned in advance to support her preferences around end of life care

For additional information, please refer to Chapters 10–12.

Education of patients recovering from myocardial infarction and coronary interventions

For many patients diagnosed with acute myocardial infarction (AMI), it is their first cardiac diagnosis and they often experience the stress of acute and life-threatening symptoms and urgent hospitalization. Complications, such as dysrhythmias, are not uncommon and additional interventions including PCI and coronary artery bypass grafting often occur within a short time frame following hospital admission. While clinically ready for discharge, 11–14% of myocardial infarction patients are readmitted within 30 days⁴² indicating the need for comprehensive discharge planning, patient education, and follow-up. The goals of patient education are to support the transition home, optimize recovery and adjustment, and ensure secondary prevention behaviours are initiated. Many patients will have coexisting conditions that are both cardiac (heart failure) and non-cardiac (diabetes, kidney disease) that they must also manage with support from the multidisciplinary team.⁴³

Post AMI, patients must primarily self-manage, which means dealing with all that AMI and associated treatments, recovery, and secondary prevention of coronary heart disease entails. Optimal self-management is promoted by effective patient education that includes information provision and about coronary heart disease, treatments, and consequences, but also skills concerning symptom management and medicines management. Problem-solving skills need to be developed around which health resources are needed, particularly around care transitions and how to best optimize physical and emotional health.⁴⁴ The support of informal caregivers, particularly partners, is vital. Partners may have similar diagnoses and are likely to share lifestyle behaviours, so a collaborative effort must be adopted and informal carers involved in the patient education process.

Discharge planning is essential to safe, coordinated care post AMI, even more so when the length of stay is short.⁴⁵ A multidisciplinary effort is required that includes information about coronary heart disease, medications, heart attack warning signs with a related action plan, and a structured physical activity plan that incorporates all aspects of activity including driving, return to work, and sexual activity. Physiotherapists and exercise professionals have an important role in AMI patient education and can accurately assess, prescribe, and provide education for a graduated exercise plan rehabilitation. Additional written advice on sternal precautions if a sternal split has occurred, ongoing exercise and activity, and referral to cardiac rehabilitation

is important for short-term safety and long-term success. Similarly, pharmacists should be involved as multiple medications are required long-term. Initial motivation to take medications, spurred by the emergency myocardial infarction event, decreases over time, sometimes due to the occurrence of side effects and widespread misinformation. Many patients diagnosed with AMI stop taking statin medications at 6 months.²⁴ Medicine information must include information about medication action, common side effects and the importance of concordance. Patients should be advised not to cease any medication without consulting their physician. Their pharmacist will also be able to provide medicines information.

For patients who have wound/s either from the PCI access site or following coronary artery bypass graft surgery, specific guidance is required on how to manage their wound during recovery. Patients must receive guidance on care of the wound during bathing and activity and be made aware of the specific signs and symptoms that warrant seeking health professional advice, such as increased oozing, heat and swelling, and any wound breakdown. Application of thromboembolic prevention stockings and wound observation often requires informal caregiver support in early recovery so they should be involved in education sessions.

Psychosocial adjustment to a coronary heart disease diagnosis with the associated lifelong medications and prevention strategies takes time. Many patients experience depression and/or anxiety and it is important that negative mood states are recognized and treated, especially because depression is associated with increased mortality and morbidity⁴⁶ and has pervasive effects on patients. Informal caregivers should be included in patient education regarding psychosocial adjustment as they may be the first to notice signs of depression and have an important role to play in supporting the recovery process including when to seek professional help. Spouses of AMI patients often experience comparable levels of mental distress as their affected partner.

Patients with coronary heart disease benefit from exercise-based cardiac rehabilitation as cardiovascular mortality and hospitalization is reduced.⁴⁷

The case studies in ► **Table 13.4** (Mrs Verdi diagnosed with heart failure) and ► **Table 13.5** (Mr King diagnosed with acute ST-segment elevation myocardial infarction), provide the reader with an overview of the key topics that should be covered as part of therapeutic patient and family focused health education. Cardiovascular disease is a condition of ageing. Populations have the opportunity to slow the progression of atherosclerosis by making healthy lifestyle changes and taking medicines as

Table 13.5 Case study 2: acute ST-segment elevation myocardial infarction

Mr Robert King is a 62-year-old male, admitted with acute ST-segment elevation myocardial infarction (STEMI) followed by primary PCI and two stents deployed to the left anterior descending artery. He owns and manages a small employment agency, which employs five people and his role requires regular driving. He lives with his wife, two adult daughters, and grandson. He has hypertension controlled by ramipril and type 2 diabetes diagnosed 2 years ago, for which he takes metformin. He drinks 4 units of alcohol four or five times/week, and does not smoke cigarettes. His body mass index is 32 and he walks for 30 minutes every second day. During this admission he has been commenced on clopidogrel, aspirin, atorvastatin, and Nitrolingual® Pumpspray as needed. He is being discharged this afternoon and his wife and oldest daughter are present. (Strategies described earlier sections of this chapter would be applied in this case study, such as a learning needs assessment and identification of preferences for and potential obstacles to learning, e.g. low health literacy level and cognitive impairments)

Essential topics in patient education	Nursing action
Definition and aetiology of coronary heart disease and heart attack; explanation of PCI	Provide Mr King with information about his condition that he can understand. Ensure verbal information is supplemented by written information. It is important to explain that distress in response to a life-threatening event is normal. As a result, health-related information provided during hospitalization may not be fully understood or remembered. Health information from national heart foundations can be used to supplement discussions
Signs and symptoms of heart attack	Mr King needs to be able to recognize when chest symptoms are serious and potentially indicative of a heart attack. He needs to understand and follow an action plan for how he will recognize and respond to a recurrence of symptoms, should they occur, including the appropriate use of Nitrolingual® Pumpspray and seeking help from emergency services
Pharmacological treatment	Mr King is on multiple medications, four of which have been newly prescribed during this hospital admission. Mr King needs to recognize the actions and common side effects of his drugs and understand the importance of using the correct dose and frequency. He must understand the need to persist with these medications even when his cholesterol levels, for instance, return to normal. Using a teach-back technique (see 'Teach-back using 'chunk and check') will help the health professional to be sure that their teaching has been effective and that Mr King understands how to manage his medications. The potential for over-the-counter drugs to interact with dual antiplatelet therapy should also be discussed. Signpost Mr King to the best online websites for information
Psychosocial aspects	Depressive symptoms are common following a heart attack and all patients should be screened for depression given the potential impact on survival and risk factor modification. It is important to provide advice on how Mr King might expect to feel during the process of psychosocial adjustment. It is important to involve informal caregivers as an important source of social support. They may play a role in noticing signs of depression and supporting help-seeking and management strategies should they be required. Cardiac rehabilitation attendance also provides an opportunity to receive social support from peers
Return to work	Mr King owns and manages his own business and is likely to be concerned about when he can resume his work. Temporary restrictions may be placed on driving, which are country specific and must be adhered to. A supportive discussion with Mr King about his specific work demands is essential and a tailored return to work plan including referral to an occupational therapist may be beneficial

(continued)

Table 13.5 Continued

Risk factor modification	Mr King should monitor his blood pressure regularly, which he may be able to do himself at home and track on an App. This will enable him to manage his health and discuss readings with his physician during regular follow-up visits. Check Mr King’s understanding of his diabetes and ensure that he knows how to monitor and manage his condition. Mr King drinks 16–20 units of alcohol per week which is above recommendations (14 units per week). It is important to explore his understanding about the impact of this level of alcohol intake on his health and potential interaction with prescribed medications. He should be advised to decrease his alcohol intake
Diet recommendation	Mr King is obese and has type 2 diabetes. He may benefit from referral to a dietician to get support to help him to manage his diabetes and lose weight to improve his health
Exercise recommendations	Regular physical activity is important to improve cardiovascular health, functional capacity, and manage depression post heart attack. Participation in cardiac rehabilitation, where available, will help Mr King to improve his confidence in participating in exercise. While Mr King has regular exercise through walking, he may experience a lack of confidence during recovery and tailored individual advice is important in safely increasing exercise duration, frequency, and intensity
Sexual activity	Mr King is married and sexually active and it is essential that he has the opportunity to discuss resumption of sexual activity, including any safety concerns or medication side effects he may experience
Adherence	Non-adherence to medications and lifestyle changes is common in people with cardiovascular disease. Mr King needs to understand the lifelong nature of coronary heart disease and that the PCI procedure is not a ‘fix’. He needs to understand that the PCI treatment has treated culprit lesions but that other narrowings may develop. Making healthy lifestyle changes can improve the health of his heart vessels. Ensure that Mr King understands his medications and the importance of taking them regularly and for life, as well as the need for regular check-ups and discussion of any side effects with his physician

prescribed. Therapeutic patient and family focused health education is the foundation of prevention.

Conclusion

Nurses and allied health professionals play a vital role in the therapeutic education process for patients with cardiovascular disease. To improve patient outcomes, communication and teaching skills need to be fully integrated into educational curricula and continuing professional development. Support is needed for health professionals to consolidate their skills to enable them to plan, deliver, evaluate, and document educational sessions. Universal health literacy precautions should be applied to all health information resources and educational interventions to reduce the health inequalities that currently exist.

Opportunities for the integration of digital technologies to enhance patient communication and education should be the focus of future research. Effective therapeutic patient education using appropriate strategies has the potential to reduce unnecessary health resource use by patients and avoidable adverse events.

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14 Addressing the current challenges for the delivery of holistic care

DAVID R. THOMPSON, MARTHA KYRIAKOU, IZABELLA UCHMANOWICZ, JAN KEENAN, RANI KHATIB, LOREENA HILL, LIS NEUBECK, EKATERINI LAMBRINOU, AND ABIGAIL BARROWCLIFF

CHAPTER CONTENTS

Outlining the challenges 420

Frailty and ageing 420

Introduction 420

Definition and recognition criteria 421

Assessment tools 421

Conclusion 422

Multimorbidity 422

Introduction 422

Caring for people with multimorbidity 423

Conclusion 424

Polypharmacy 424

Introduction 424

Appropriate polypharmacy 424

Problematic polypharmacy 424

Why polypharmacy is an issue 425

Polypharmacy and cardiovascular disease 425

What can we do? 426

Conclusion 426

Palliative and supportive care 427

Introduction 427

Conclusion 428

Cultural and gender issues and socioeconomic factors 428

Introduction 428

Conclusion 430

Cardiovascular disease in women and sex disparities 431

Introduction 431

Coronary heart disease in women 431

Heart failure 431

Other vascular diseases in women 434

Management of women with cardiovascular diseases 435

Conclusion 435

KEY MESSAGES

- Contemporary challenges for holistic care include frailty and ageing, multimorbidity, polypharmacy, caregiver involvement, palliative and supportive care, and cultural and socioeconomic issues.
- Frailty is a growing health problem among older people, especially women, and in the very old, linked with an increased risk in mortality, disability, and cognitive decline.
- Patients with cardiovascular disease often present with other conditions—multimorbidity—such as diabetes, obesity, cancer, depression, arthritis, frailty, and cognitive

impairment, which require a more nuanced approach to care than the usual focus on a single condition.

- Polypharmacy, the concurrent use of multiple medications by a person, is a growing issue, especially among older people with multimorbidity, and requires regular review.
- Many patients with advanced cardiovascular disease and serious symptoms now require palliative and supportive care which should be integrated early in cardiovascular management, preferably following diagnosis.
- Cultural and socioeconomic issues are increasingly being recognized as important determinants of the cause and outcome of cardiovascular disease and should be considered in any intervention, such as health behaviour change, when holistically assessing a patient with cardiovascular disease and when developing a person-centred nursing care plan.
- Females with cardiovascular disease should be provided with equal access to care, a prompt diagnosis, and treatments based on the guidelines and recommendations at the same rate and intensity as their male counterparts.

Outlining the challenges

In this chapter, the contemporary challenges for holistic care will be described and solutions proposed on how they can be addressed (► **Fig. 14.1**). Challenges include a frail and ageing population with multimorbidity and environmental, psychosocial, and cultural issues. This patient population is often prescribed a multitude of medications causing problems associated with polypharmacy, they have both formal and informal caregiver involvement, require palliative and supportive care, and often have cultural and socioeconomic issues. Women often bear a major burden in relation to all of these factors, further to the fact they still face gender discriminations in terms of diagnosis and care.

Frailty and ageing

Introduction

Frailty is a syndrome (FS) considered to be a major health problem for older people (see also Chapter 8). The

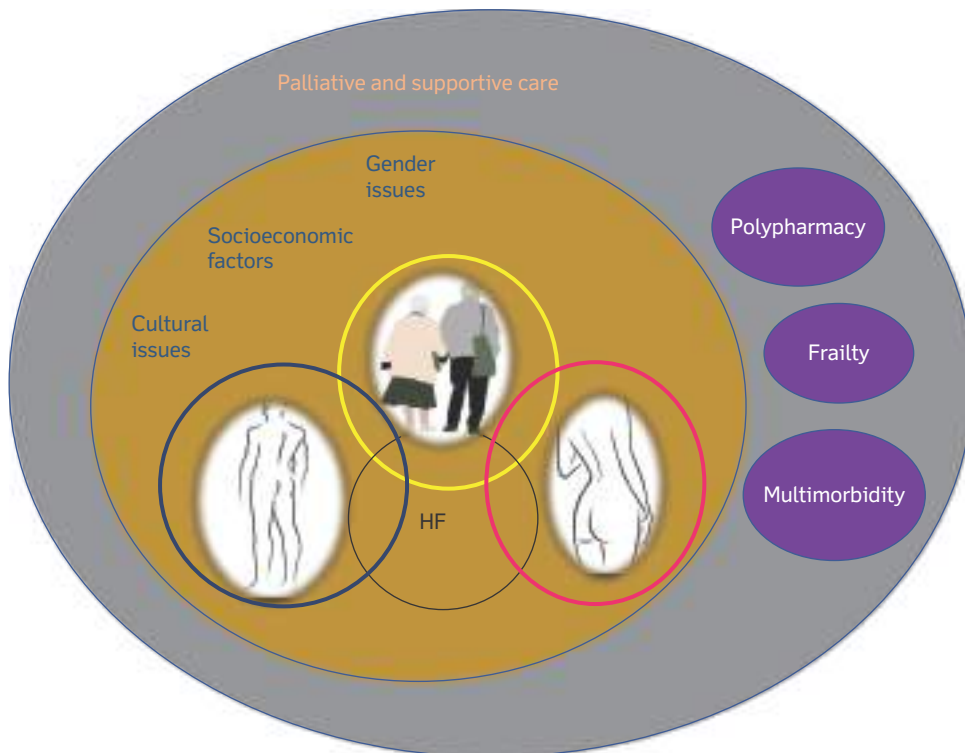


Fig. 14.1 The contemporary challenges to the delivery of holistic cardiovascular care.

prevalence of FS is variable and depends on the type of assessment criteria used and the age group. The prevalence of FS increases with age, so with the current tendency towards higher life expectancy, an increase in the number of people with FS is expected.¹ The overall prevalence of FS in the US population over 65 years of age ranges from 7% to 12%; the incidence of FS increases with age and the FS rate is 3.9% in the 65–74 years of age group, and in the 85+ years of age group it is 25%. It occurs more frequently in women than in men (8% versus 5%).¹

In very elderly people (80+ years of age), frailty is significantly associated with an increased risk of mortality, disability, and cognitive decline.² Moreover, in people aged 65 years and over, the biological age was significantly more related to death than the chronological age.³ The occurrence of FS is associated with a worse perception of one's health condition, an increase in the number of coexisting diseases, and social isolation.⁴

Definition and recognition criteria

At present, there is insufficient evidence to adopt a single universal definition of FS⁵ or explain the relationship between FS and ageing, disability, and chronic diseases.⁶ There is a lack of consensus on a uniform definition of FS and a lack of uniform criteria for screening,⁷ and the debate continues on whether FS should be defined solely in terms of biomedical factors, or whether it should also include psychosocial and cognitive factors.⁸ The Clinical Consortium on Healthy Ageing within the World Health Organization introduced in 2016 the concept of intrinsic capacity which is defined as the composite of all physical and mental capacities that an individual can draw upon during his/her life. Frailty and intrinsic capacity are two constructs stemming from the same need of overcoming traditional medical paradigms that negatively impact the correct way clinical and research practice should be conducted in older people.⁹

Considered in the context of disability, FS is an important forecast measure of the need for care and treatment. Furthermore, the correct delineation of the boundary between FS and disability allows for the implementation of measures to reverse or prevent the progress of current changes.^{5,7,10}

FS is an exponent of advanced biological age and an important risk factor for the development of complications in elderly as well as in chronically ill people. The published consensus¹¹ recommends the introduction of screening for FS in clinical practice. It is proposed that the clinical manifestations of FS are related to the intensification of the negative energy balance cycle, sarcopenia, or reduced effort tolerance¹ and that there are five markers of FS¹¹:

- Unintentional weight loss of 10 pounds (4.5 kg) in the last year or up to 10% of age 60 weight.
- Weakness of muscle strength—tested by weakness grip strength.
- Slow walking speed.
- Self-reported exhaustion.
- Low physical activity.

There are at least three diagnostic criteria for the diagnosis of FS: the presence of one or two criteria is referred to as pre-frailty, thus identifying individuals with a high probability of developing FS in the future.¹² However, it is recognized that cognitive function, mood, or even social support are equally important in the assessment.^{13–15} The Canadian Initiative on Frailty and Aging⁵ indicates that FS should be considered in the context of biological, psychological, and socioenvironmental factors that affect every phase of human life and can be influenced effectively.

Thus, there are currently two approaches that correlate with each other: the biomedical (physical) and the biopsychosocial.¹⁶

Assessment tools

An important problem in identifying FS is the effective distinction between coexisting diseases or disabilities and FS. Understanding the causes of FS is essential for the early identification of people at risk and for the implementation of preventive measures to reverse the disrupted homeostasis of individual systems that may be potentially reversible. This is why the ability to detect preclinically any symptoms leading to FS is so important.¹²

Tools to evaluate FS can be divided into two groups—the first is based on the physical aspect of FS,^{1,16} and the second is based on the biopsychosocial aspect.^{14,17,18}

The five markers of FS¹ are based on a narrow definition of FS, which allows the identification of 'physically fragile' individuals.¹⁹ Tools that take into account the broader definition of FS in their assessment are usually more comprehensive and include physical, psychosocial, and/or environmental factors. Tools that can be used in a comprehensive evaluation of FS include the Edmonton Frail Scale¹³ and the Canadian Study Health and Aging Frailty Index¹⁷ and others with a more specific focus.^{20–25} Other tools are referenced in Chapter 8.

The use of appropriate assessment tools will make it possible to assess and identify individuals with or at risk of developing FS. This, in turn, will allow for preventive action and specific interventions to delay the onset of FS or significantly reduce disability and its negative consequences.²⁶

FS is considered an important risk factor for cardiovascular disease (CVD) and a more important predictor of treatment outcome than the chronological age of the patient. Early identification of FS creates a chance for an individually selected and effective treatment and targeted healthcare. Prevention of complications as a strategic health issue should be a priority in therapeutic decision-making based on clinical trials in the elderly. Identification of a frail person or early identification of a pre-frail person can be an important element in preventing the consequences of FS. The prospect of benefits from CVD treatment in the elderly population should be based on identifying potential benefits and risks and of identifying FS. A proper diagnosis of people with FS will identify groups with worse prognosis and a higher risk of occurrence of adverse effects in relation to the treatment being conducted.^{27,28}

Conclusion

FS is a growing problem and clinical teams may implement their own strategies to take care of elderly frail patients. FS can be challenging; however, it should be remembered that the proper diagnosis of FS will allow the identification of patients who require intensified care and intervention, to avoid complications of medical treatment and hospitalization.²⁹ Nursing interventions are outlined in ► **Box 14.1** based on those outlined in a recent practice update.²⁹ This requires collaborative skills on the part of

Box 14.1 Nursing interventions to identify and address frailty

- Maintain a healthy nutritional status.
- Avoid harmful polypharmacy which is linked to multimorbidity and falls (see later in this chapter).
- Improve adherence to treatment (see Chapter 12).
- Prevent falls (risk assessment and appropriate intervention).
- Encourage multicomponent exercise (take into account physical and functional fitness, gait, balance, strength, cognitive function, mood, and overall well-being).
- Improve mood and cognitive function (screen, stimulate, external memory aids, episodic memory such as list recall and face–name association, and self-assertiveness training).

Source data from Uchmanowicz I, Jankowska-Polańska B, Wleklik M, Lisiak M, Gobbens R. Frailty Syndrome: Nursing Interventions. *SAGE Open Nurs.* 2018;4:1–11.

the healthcare professionals and also demands a willingness from them to look beyond the borders of their own disciplines.

Multimorbidity

Introduction

Although life expectancy is improving markedly, the proportion of people with two or more health conditions simultaneously is rising steadily.³⁰ Multimorbidity, commonly defined as the presence of two or more chronic medical conditions in an individual, is increasingly common among older people, the socioeconomically deprived, younger people with congenital or acquired impairments, and those with serious mental illness. Globally, around one in three of all adults suffer from multiple chronic conditions.³¹ Patients with comorbidities are characterized by increased mortality, impaired health-related quality of life, and increased use of healthcare services compared to patients without any comorbidity.³² Patients with CVD are at increased risk for comorbidities^{33,34} making the management of the disease more complex. The degree of physical or mental disability, the number of hospitalizations, the number of drugs, the average length of stay, and in-hospital mortality is significantly higher in patients with multiple comorbidities.³⁵ This impacts healthcare delivery and expenditure and imposes a burden on patients and carers that includes impaired quality of life, polypharmacy, and inability to work, and at the same time, a burden on healthcare services.

More than 70% of adults develop CVD by 70 years of age, two-thirds of whom also develop non-CVD comorbidities.³⁶ Many people with CVD also have diabetes or chronic pulmonary disease, and older people may also have frailty or cognitive impairment. For example, it is not uncommon for men with CVD to also have depression or another mental health condition.³⁷ Perhaps surprisingly, common comorbidities include arthritis and mental illness.³⁸ Patients with heart failure (HF) have two or more non-cardiac comorbidities at 86% and more than 25% have six or more comorbidities.³⁹ For many older adults with multimorbidity, CVD is not necessarily experienced as the most important of their health or healthcare concerns,³⁶ even though in older people, isolated cardiovascular multimorbidity is associated with loss of physical mobility, whereas neuropsychiatric multimorbidity is associated with declines in mobility and independence.⁴⁰ Non-cardiovascular comorbidities are associated with a

higher overall symptom burden and more severe symptoms than cardiovascular comorbidities, and the latter are more likely to be associated with pain and anxiety than shortness of breath and fatigue.⁴¹

Nowadays, the typical person with CVD is aged older than 65 years and has multiple diseases,^{36,38} and the proportion of people with CVD and higher numbers of comorbidities is increasing,⁴² and those with a higher burden of multimorbidity are at substantially increased risk of death several years after the acute event.⁴³ Thus, healthcare professionals must always consider for those comorbid conditions in patients with CVD, and monitor these patients closely in an effort to prevent comorbidities or slow down disease progression over time, resulting in better quality of life and decreased mortality.³² These days, telemedicine provides solutions and opportunities for close monitoring via telemonitoring (see also Chapter 15).

Caring for people with multimorbidity

Caring for people with multimorbidity is complicated because of the complex interaction between different conditions and their treatments. Conventional care delivery is often based around individual conditions rather than around the person as a whole and, as a consequence, care is often fragmented. Typical priorities among older adults include physical and cognitive functioning, symptom control, reduced burden of therapy, health-related quality of life, maintenance of independence, and overall well-being.⁴⁴ These priorities and concerns should serve to inform clinical care.⁴⁵

Guiding principles for the care of older adults with multimorbidity include (1) eliciting and incorporating patient preferences into decision-making; (2) applying evidence but acknowledging the limitations of the evidence base; (3) framing care decisions in a context of risks, burdens, benefits, and prognosis; (4) assessing care complexity and feasibility; and (5) choosing interventions that optimize benefit, minimize harm, and enhance quality of life.⁴⁶ A person-centred care approach, incorporating patients' preferences and values and empowering them to work as partners in decision-making with their interdisciplinary teams is advocated.⁴⁶⁻⁴⁸ This requires the application of good clinical skills, time, and thought, and being cautious of the temptation to intervene and move on.

A tailored 'person-centred' holistic approach using skilled clinical judgement and good communication is likely to be much more effective than merely focusing on the conditions themselves. A person-centred care approach should aim to empower self-management and

draw upon a range of resources, including informal carers, friends, and family, who often provide considerable support to people with multimorbidity. Focusing on the patient and not on the disease, better management of the disease, along with patient satisfaction can be achieved through individual empowerment of patients to become knowledgeable and more informed about their diagnosis, successfully manage their symptoms, and engage in self-care behaviours.^{49,50} In this context, person-centred care is effective regarding a patient's self-efficacy, improving health-related quality of life and reducing healthcare utilization for a number of CVDs⁵¹ (see also Chapter 2 and Chapter 8).

By optimizing care, the aim is to reduce care burden, adverse events, polypharmacy, multiple appointments, and unplanned care, and improve quality of life and care coordination by promoting shared decision-making based on what is important to each patient in terms of care, health priorities, lifestyle, goals, and values.⁴⁸ This involves agreeing on an individualized care plan with the patient that incorporates goals and plans for future care (including advance care planning), and identifies who is responsible for care coordination and how this is communicated to all healthcare professionals and services involved (such as mental health or social services). Ideally, this plan of care is offered through a multidisciplinary team. A multidisciplinary team offering adequate care to CVD patients includes physicians, nurses, pharmacists, dietitians, physiotherapists, psychologists, social workers, and other allied professionals.^{52,53} No single profession can provide the knowledge, skills, and resources to meet the requirements of today's patient with complex health needs, so contributions from each multidisciplinary team member are important.^{54,55} Efficient team-based care is crucial to effective management of CVD conditions; however, since goals have been agreed and action plans developed, the patient and their family have to integrate the new behaviours into their everyday lives in order to manage the lifestyle recommendations and medication regimens.⁵⁵ Especially for HF patients, there is a variety of different management programmes^{56,57} all aiming to provide evidence-based diagnosis and therapy to these patients and to educate patients and their caregivers.⁵⁸ The implementation of the management programme begins with discharge planning, involving the patient and their family⁵⁹ (see also Chapter 10). It should specify the timing of follow-up and how to access urgent care if needed, recognizing that many people with multimorbidity are forced to navigate complex and fragmented healthcare systems. To do this well requires listening to people and

asking what matters to them, their carers, and their family, including their outcomes and experiences through continuous assessment of the patient's needs. Continuing individualized assessment gives both to the patients and the healthcare professionals the capacity of early recognition and action to meet patients' needs.⁶⁰

Conclusion

Healthcare professionals need to rise to the challenge of multimorbidity and change the care approach to better respond to it. This should focus on goal-oriented outcomes and emphasize communication and collaboration across healthcare professionals and care settings. It is important to acknowledge that so-called mental and physical illnesses frequently coexist and that this conceptual distinction between them is artificial and highly questionable. Person-centred care, regular reassessment of patients' needs, and adapting of tailored therapy accordingly, gives the opportunity of a holistic approach and care. Multidisciplinary teams could offer more comprehensive care as each profession discipline offers 'different' knowledge and skills management programmes. We must be able to respond to this growing problem and recognize that the pattern of health and disease and care delivery in our population is changing. ► **Box 14.2** summarizes the nursing priorities in caring for adults with comorbidities.

Polypharmacy

Introduction

Polypharmacy refers to the concurrent use of multiple medications by one individual. This may be considered

Box 14.2 Nursing priorities in caring for adults with multimorbidity

- Identify comorbidities when assessing patients with cardiovascular problems (e.g. arthritis and mental illness).
- Adopt a holistic person/patient-centred approach taking into account patient preferences and values in shared decision-making.
- Empower patients to self-manage.
- Draw on family and other social support.
- Ensure care is well coordinated, joined up, and integrated between various disciplines.

appropriate or problematic. It is important to distinguish between the two as in some scenarios the combination of at least two or three drugs can be beneficial to the patient.⁶¹

Polypharmacy is becoming increasingly common. In the UK, the number of items prescribed per patient increased from 11.9 to 18.3 between 2001 and 2011. Contributing factors include the increase in prescribing of preventive medication, and the ageing population and the subsequent increase in chronic disease prevalence resulting in comorbidity and multimorbidity.⁶²

Appropriate polypharmacy

The number of medicines appropriate for a patient depends on their conditions, functional status, life expectancy, and drug-taking preferences.⁶¹ In patients with complex comorbidities, there are cases where prescribing several medicines is the best management for the patient.⁶² Polypharmacy can be considered appropriate when each medicine is prescribed to achieve a specific, achievable benefit and they have been optimized in order to reduce the risk of adverse drug events.⁶¹ The emphasis needs to be on a person-centred approach (see also Chapter 2) which involves collaborating with the patient to identify an appropriate combination of drugs. Patients should be involved in this decision and be motivated and capable of taking the medicines as prescribed. The objective of polypharmacy in this scenario is to maintain quality of life, improve longevity, and minimize harm.⁶¹

Problematic polypharmacy

Problematic polypharmacy is the inappropriate prescribing of several medications. This is either when the intended benefits of medicines are not realized or the patient is unable to cope with the demands of taking all the medication.⁶¹ The importance of discussions with the patient cannot be overstated. Other examples of inappropriate problematic pharmacy occur when risks of adverse drug reactions (ADRs) outweigh benefits or if one or more medicines are no longer required.⁶¹ It can also arise when medicines are prescribed to combat the side effects of other drugs (incremental prescribing).⁶¹

There are several reasons for problematic polypharmacy and they include hesitation from prescribers to add in extra medication with a strong evidence base due to 'pill burden', failure to frequently assess medications for their continued benefit and appropriateness, and prescribing of medication to overcome side effects where an alternative solution is available.

Why polypharmacy is an issue

Although sometimes appropriate, polypharmacy can pose challenges for healthcare professionals and patients:

1. *Polypharmacy increases the risk of ADRs.* ADRs are unwanted reactions after taking a drug under normal clinical conditions and may result in harm to the patient. Two types have been reported. Type A reactions are a predictable, exaggerated reaction based on the known pharmacology (i.e. bradycardia in patients taking a beta-blocker) and have a high morbidity and low mortality; type B reactions are unpredictable and idiosyncratic reactions to a medication (i.e. anaphylaxis after taking a penicillin) and have a low morbidity and high mortality. One study found that over four non-consecutive weeks, the incidence of hospital admissions due to ADRs was 8.37 per 100 admissions. The number of drugs taken was listed as one of the most important factors associated with ADRs.⁶³
2. *Polypharmacy increases the risk of drug–drug interactions.* Drug–drug interactions occur when the effect of a drug is altered by the presence of another. This may result in reduced effectiveness of one or more medications, or even harm to the patient from toxicity. A comparison of drugs recommended by the UK National Institute for Health and Care Excellence (NICE) for HF, depression, and type 2 diabetes against 11 other comorbidities seen among patients with these three conditions identified 111, 89, and 133 potentially serious drug–drug interactions, respectively.⁶⁴ The study highlighted the importance of considering drug–drug interactions in the context of polypharmacy and when prescribing a new medication in those patients with comorbidities, even when recommended by clinical guidelines.
3. *Polypharmacy can be associated with unwanted drug–disease interaction.* Unwanted drug–disease interaction is an adverse outcome resulting from a drug exacerbating a chronic disease.⁶⁵ A study identified 32 potentially serious drug–disease interactions between drugs recommended in the NICE guidelines for managing type 2 diabetes and 11 other common comorbidities. There were ten potentially serious drug–disease interactions for drugs recommended in the guideline for HF. Of these drug–disease interactions, 27 (84%) in the type 2 diabetes guidelines and all of those in the HF guidelines were between the recommended drug and chronic kidney disease.⁶⁴ In the context of CVD, one study found

that the two most common drug–disease interactions were use of first-generation calcium channel blockers in patients with congestive HF and use of aspirin in patients with peptic ulcer disease (both, 3.7%).⁶⁵

4. *Polypharmacy can impact medicines adherence* (see also Chapter 12). Polypharmacy can lead to suboptimal adherence. Adherence to medicines is defined as the extent to which a patient's drug-taking behaviour matches the agreement between them and the prescriber, based on the prescriber's recommendations.⁶⁶ This may be unintentional, where the patient wants to follow treatment recommendations but is unable (forgetting, difficulty understanding, problems with using the treatment, inability to pay), or intentional, where the patient decides not to follow recommended treatment (beliefs, preferences).⁶⁶

Polypharmacy and cardiovascular disease

Polypharmacy is a particular issue in those patients with established CVD or at high risk of developing it.^{67,68} CVD is highly preventable, and many more asymptomatic patients are being treated with preventive medication.⁶⁹ As well as lifestyle changes, six conditions are associated with a high risk of causing CVD events⁶⁹—high blood pressure, high cholesterol, atrial fibrillation (AF), chronic kidney disease, pre-diabetes, and diabetes—recommendations for the management of which are associated with use of drugs and therefore lead to polypharmacy.

In addition to the hypoglycaemic medicine required for adequate treatment of diabetes to prevent the microvascular complications, patients with diabetes are all recognized as at least moderate risk of developing CVD.⁷⁰ As well as lifestyle factors, the following are recommended to help prevent CVD: tight blood pressure control (drug therapy often necessary); lower target for LDL cholesterol in patients with a moderate risk of CVD and combination therapy with statin and ezetimibe recommended if statin therapy alone is insufficient; and in high/very high risk patients aspirin can be considered as primary prevention plus a proton pump inhibitor (PPI) to prevent gastrointestinal bleeding. Thus, it is easy to see how the number of medications in patients with diabetes can add up, simply for primary prevention of CVD. Also, an unhealthy lifestyle can impact the control of modifiable cardiovascular risk and subsequently contribute to polypharmacy, leading to poor management of blood pressure and cholesterol. This can increase the risk of cardiovascular events and the

number of medications required for secondary prevention or optimizing control.⁶⁷

As the aetiology of CVD is multifactorial, patients with this condition are usually prescribed multiple medicines to manage lipids and blood pressure, for example, often based on the recommendations of various evidence-based guidelines. In addition, more than one cardiovascular condition could be present which requires multiple therapies for each of those conditions. Among those with post-acute coronary syndrome, the following medications are recommended: aspirin (plus a second antiplatelet for a year), beta-blockers, angiotensin converting enzyme inhibitors/angiotensin receptor blockers and statins. Similar prescribing of multiple medicines occurs in patients with HF. A study reported that the prevalence of polypharmacy (ten or more drugs) among the 848 hospitalizations for HF, in patients over 65 years old, was 47%. At discharge, the number of medications was increased and the prevalence of polypharmacy was 58%.⁷⁴ Patients with atrial fibrillation are often managed with prophylactic anticoagulants and rate and/or rhythm control medications. These are high-risk medications and can result in ADRs and harm for the patient. Also, atrial fibrillation rarely occurs in isolation and is known to coexist with multiple other conditions (most commonly, hypertension, HF, diabetes, stroke, and myocardial infarction) and therefore polypharmacy has high prevalence among patients with atrial fibrillation, as high as 76.5%.⁷²

With an estimated fourfold increase in people aged 75 years or older by 2050,⁶⁷ and increases in the prevalence of comorbid conditions and CVD as well, the number of relative medications required for their treatment (cardiovascular and non-cardiovascular drugs) will also increase.⁶⁷

What can we do?

Awareness of polypharmacy, particularly in relation to CVD, has increased. Polypharmacy can be associated with harm, as the number of drugs prescribed increases so does the risk of prescribing errors and ADRs.⁶¹ Further research is required to examine medicines management in polypharmacy as well as better education around multimorbidity and polypharmacy. In the meantime, we can examine patient preferences with regard to medicines taking, review how we manage multimorbidity, and consider appropriate deprescribing (see Chapter 12). A study of multimorbidity in older people and their desired processes of care found that they wanted convenient access to healthcare, individualized care plans, support from one care coordinator, continuity of relationships with

healthcare professionals, and healthcare professionals who were caring and listened, appreciating that their needs were unique.⁷³

To best understand issues around adherence, ADRs, and other medicines-related harm, it is important to ask patients about their medicines and listen to any concerns. This is part of the medicines optimization process (see also Chapter 12). As multimorbidity can lead to polypharmacy when the management of each condition is considered in isolation, this may necessitate longer consultation times, 'generalist' clinicians managing several conditions simultaneously, reviewing single condition clinics, and moving towards patients having all their conditions managed in one visit.⁶² This involves careful consideration of skill mixes and clearly defined roles for all healthcare professionals, of clinical pharmacists having a bigger role in overseeing complicated drug treatments, and of healthcare professionals working in a community setting having an important role in identifying those patients on multiple medicines. Deprescribing is the gradual withdrawal and cessation of medications by a healthcare professional after discussions and agreement with the patient, the objective being to cease inappropriate medications and improve outcomes relating to polypharmacy.⁷⁴ Deprescribing can be considered in the following scenarios^{61,62}: no indication; change in condition; the patient is no longer benefiting; change in evidence/guidelines; if the drug is being used to treat an iatrogenic condition; and patient choice. Especially in older people, the goals of treatments should be reviewed regularly. If a patient has a life-limiting illness, the value of some preventive medications should be considered.

Conclusion

Improvements in the management of CVD are contributing to an ageing population with several multimorbidities which require multiple therapies. In addition, guidelines are increasingly recommending preventive medications. All of this can lead to polypharmacy. Improving awareness of the issues surrounding both appropriate and problematic polypharmacy means that we can offer patients with CVD or those who are at risk of CVD better options to maximize their benefits from prescribed medicines, reduce their harm, and improve their quality of life. Thus, healthcare professionals should ensure that any polypharmacy is appropriate and address problematic polypharmacy. To do that, we must ensure that care is person-centred and medicines are optimized regularly to meet the patient's needs. We should also remember that appropriate deprescribing is part of the medicines

Box 14.3 Nursing considerations regarding polypharmacy

- Ensure a holistic integrated approach is adopted.
- Ensure a clear definition of roles/appropriate skill mix.
- Ensure access to medicines optimization and deprescribing.

optimization process. ► **Box 14.3** summarizes the key consideration for avoiding harmful polypharmacy.

Palliative and supportive care

Introduction

Individuals with cardiovascular conditions struggle with deteriorating health, symptom burden, or permanent disabilities facing palliative needs. Palliative care according to the World Health Organization (2009)⁷⁵ has the scope to ‘improve the quality of life of patients and their families facing problems that are associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual’.

The need of palliative care in CVD, especially in patients with HF, has been recognized in a more holistic approach, delivered to patients along with other treatments from the initial diagnosis to the end of life.^{76,77} Palliative care for HF patients has a dual role: treating symptoms and ensuring that patients’ treatment plans match their and family’s values and needs.⁷⁶

But is palliative care enough to meet patients’ needs? Patients with CVD have unmet supportive care needs,^{78,79} particularly HF patients, as they have higher needs than patients with other cardiovascular disorders regarding daily living.⁷⁹ The terms ‘palliative’ and ‘supportive’ care often cause confusion; however, there are different definitions for these two terms. A common goal is to improve the health-related quality of life of patients who have a serious or life-threatening disease and provide them with support.⁷⁷

Supportive care is multidisciplinary holistic care provided to the patient and his/her family, from the time of diagnosis and throughout treatment with the aim of prolonging life expectancy and improving health-related quality of life, and into end of life care.^{79,80} It is essential

to clarify that palliative care is an important part of supportive care, mainly concerning the internal and psychosocial components of supportive care.⁸⁰ Supportive care includes modifying interventions in an effort to manage symptoms, and psychosocial or existential distress, and to identify strategies in order to cope with HF.^{79,81} Supportive care is composed of four components: communication and decision-making; education; symptom management; and psychological and spiritual issues.⁸¹

It is important to highlight that patients require support and individualized care based on their preferences and values⁸¹ beginning from the time of the diagnosis.^{82,83} Typically, HF is characterized by acute events and followed by periods of stabilization, making prognosis challenging.^{59,79,83}

There is recognition for the benefits of supportive and palliative care for patients with CVD as this is referred to guidelines,^{59,82} although there is no available systematic design of supportive interventions that might be comparable with each other.⁷⁹ The challenge for healthcare professionals in CVD caring is to identify this design and this may occur through continuous assessment of the patient’s and the family’s needs and therefore advance care planning. Advance care planning is ‘a process that enables individuals to define goals and preferences for future medical treatment and care, to discuss these goals and preferences with family and healthcare providers, and to record and review these preferences if appropriate’.⁸⁴ Advance care planning is an essential component of palliative care; it increases the completion of advance directives, discussion of end of life preferences, and improves the concordance between preferred and received care.⁵²

Advance care planning as a supportive care approach may enhance patient–clinician communication, creating a relationship between them and allowing health professionals to assess the patient’s level of understanding regarding his or her condition.⁸⁴ Following the disease trajectory, health professionals have to explain the disease process to the patient and discuss the implications of advanced heart disease, ensuring that the patient has an adequate understanding of the disease process.^{77,79,82} Both the patient and family member should be provided with honest, up-to-date information concerning the prognosis, to enable an open discussion with shared realistic expectations and decisions to inform future management. Many professionals are reluctant to engage in prognostic discussions or make end of life decisions for fear of provoking unnecessary anxiety and removal of hope,^{85–87} but studies^{88–90} demonstrate the value of

integrating a palliative HF approach, with involvement of the specialist palliative care team as necessary, in terms of better communication, reduced anxiety, and improved quality of life. Practical tools are available⁹¹ to prompt the patient to raise conversations which may be challenging, but which the patient or family member would prefer to discuss when given the opportunity. Furthermore, during the coronavirus 2019 pandemic, a range of online resources in the form of communication scripts and conversation videos are available for professionals to access and provide support to initiate these conversations more readily.⁹²

Communications about end of life issues are also very important aspects of supportive and palliative care. Discussions about healthcare proxy, resuscitation, and potentially implantable cardioverter defibrillator/ventricular assist device deactivation have to be addressed with the patient and their family.⁸³ Once discussed and when an agreement is reached, it is vital that decisions are clearly documented and communicated with the rest of the multidisciplinary team (see also Chapter 7 and Chapter 10).

In conclusion, early implementation of supportive and palliative care is necessary for patients with CVD in order to ameliorate symptoms, carry out the expressed wishes of patients, and provide emotional support for their loved ones.

Conclusion

Supportive and palliative care must be offered to CVD patients from diagnosis to the end of life, aiming to improve patients' quality of life and provide them with support. Supportive care is a multidisciplinary holistic care approach compromised of interventions to help patients manage chronic conditions such as CVD. Through continuing assessment, healthcare professionals are willing to identify patient's needs, preferences, and values of care, offering them modifying interventions to meet those needs. This process compromises advance care planning—the development of a therapeutic relationship between healthcare professionals and patients throughout the disease trajectory. An important part of the disease trajectory is the end of life stage. End of life issues are part of palliative care and thereafter supportive care. Healthcare professionals need to have the skills and competencies to discuss and plan end of life issues according to patients' wishes. ► **Box 14.4** summarizes the key consideration of supportive and palliative care.

Box 14.4 Nursing priorities for delivering palliative care

- Be aware of triggers for the planning of palliative care (e.g. referral for device).
- Ensure patient and family are given honest up-to-date information about prognosis.
- Use communication skills to open up conversation and discussion (see also Chapter 13).
- Ensure clear communication within the interdisciplinary care team (e.g. 'do not attempt resuscitation' orders).
- Advocate for high-quality end of life care.
- Advance care planning implementation requires regular reassessment to follow the patient's needs, preferences, and values.

Cultural and gender issues and socioeconomic factors

Introduction

Cultural norms, such as socioeconomic status, contribute to behaviours associated with risk factors for chronic diseases including CVD⁹³ (see also Chapter 1). Convincing evidence has shown that there is an independent association between socioeconomic factors and mortality which is comparable to the traditional major risk factors.⁹⁴ The increased burden of CVD in individuals with low socioeconomic status is due to several factors including biological, behavioural, and psychosocial factors that are more prevalent to the particular population.⁹⁵ Four aspects of socioeconomic status are found to be linked with CVD in high-income countries; income level, educational level, employment status, and environmental factors.^{94,95}

The World Health Organization reports that CVD deaths are especially prevalent in low-income and middle-income countries due to unequal living conditions, maldistribution of healthcare services, and poor social policies.⁹⁶ The explanation of this phenomenon is multifactorial.^{93,95} Mortality differences may be driven by disparities in standards of care including accessibility to healthcare including screening for prevention,⁹⁷ percutaneous coronary interventions when presenting with acute myocardial infarction⁹⁸ or guideline-recommended medications such as statin therapy after acute myocardial infarction,⁹⁹ and cardiovascular prevention and rehabilitation which has been found to improve outcomes.¹⁰⁰

The same inverse relation applies for education level. Education affects multiple conditions from childhood

onwards, including exposures to community-level factors (such as living or working in healthier environments), and better access to health and social resources. Educational reforms can lead to reductions in cardiovascular and non-cardiovascular-related mortality.¹⁰¹ Individuals with a low educational level, independently of sociodemographic factors,¹⁰² face a higher risk of CVD, higher incidence of cardiovascular events, and higher cardiovascular mortality. Individuals with a low education level tend to have an increased number of CVD risk factors¹⁰¹; a potential contribution to CVD risk is the strong correlation between education and health literacy (see also Chapter 13).^{103,104} Individuals with a low educational level are less likely to adhere to medical recommendations; they are less physically active and adopt unhealthy lifestyle habits.¹⁰⁵ While higher education is associated with increased alcohol consumption, it is inversely related to smoking, high blood pressure, cholesterol levels, and diabetes.⁹⁵ Also, the epidemic of obesity is found to affect persons with lower educational level more.^{105,106}

Environmental and social circumstances influence exposure to risk factors and health. Furthermore, social isolation and a lack of social support are linked to increased CVD risk. Exposure to social risk factors starts at birth. The environment that someone is born into, and their lifestyle during childhood and adulthood, influence health status in later life. Socioeconomic differences in neighbourhood characteristics may impact the availability of resources and influence the promotion or maintenance of a healthy lifestyle.¹⁰⁷ It has been shown that individuals living in a disadvantaged environment have a higher risk of CVD, compared with individuals who live in a facilitated environment with easier access to physical activity and healthy food. This results in a lower prevalence of obesity and lower incidence of diabetes.⁹⁵ Adding to that, differences in health by race and ethnicity are a major public health concern.¹⁰² Furthermore, sharp shifts in demographic patterns and lifestyles have resulted from urbanization and industrialization, the globalization of the twentieth century that drove countries, communities, and non-Western cultures into the worldwide epidemic of CVD. The change reflects both a demographic shift towards increasing life expectancy and a shift in nutrition. People who live longer have greater exposure to cardiovascular risk factors, Westernized diets (e.g. higher animal products and fat), and patterns of physical inactivity resulting in elevations in blood pressure, body weight, blood glucose levels, and lipid concentrations.¹⁰⁶ Ambient air pollution is also found to be associated with a higher risk of CVD, while household

air pollution is strongly associated with a higher risk of death.¹⁰¹

Psychosocial factors, including stress and depression, are strongly associated with adverse CVD outcomes, such as cardiac death, arrhythmia, and changes in heart function. Growing evidence suggests that such factors may disparately affect individuals with low socioeconomic status.¹⁰¹ Psychosocial stress is recognized as a non-traditional risk factor for CVD and is strictly correlated with culture¹⁰⁸ and race discrimination. Race-related stress may also increase the tendency to follow negative health behaviours that impact the management of several CVD factors.¹⁰⁹ Furthermore, there is a greater burden of CVD in low- and middle-income countries where there may be cultural barriers, reduced accessibility to healthcare, and lower-quality healthcare services.¹⁰⁶ One global study that was undertaken in the US, Europe, Australasia, and South America investigated self-care behaviours in HF and found low adherence across countries in all behaviours except self-reported medication adherence. Patients from some cultures may use herbal or other traditional medication in addition to their prescribed pharmacotherapy. Furthermore, in some countries, people may have beliefs that pharmacotherapy is a 'Western medication' made of chemical ingredients which result in many side effects.¹¹⁰

Women are over-represented among those living in poverty. Reviews have shown that being older, being a woman, and being unemployed are factors associated with accessibility to healthcare. In more detail, restricted accessibility includes screening for cardiovascular prevention guideline-recommended interventions, medications, and non-participation in cardiovascular prevention and rehabilitation.¹⁰⁰ Gender differences, which are influenced by ethnicity, culture, and socioeconomic environment, are intimately involved in risk factors and risk behaviours (e.g. psychosocial risk factors, physical inactivity, participation in cardiovascular prevention and rehabilitation, obesity, and tobacco use). Those factors play a far greater role in outcomes among women with coronary heart disease than biological sex differences (see 'Cardiovascular disease in women and sex disparities'). A woman's ethnicity or cultural background creates complex norms and expectations that affect all aspects of life (e.g. marital status, childbearing, caregiving roles, food preparation, educational level, job choices, wage rates, health beliefs/practices, amount of political power, and degree of social influence).¹¹¹ These differences affect the mechanism and expression of CVD between the sexes. Data from registries and studies demonstrate discrepant results with respect to access to healthcare, the use of evidence-based

therapy, and clinical outcomes between men and women presenting with acute coronary syndrome^{112–117} (see ‘Coronary heart disease in women’). Even though much success has been achieved in reducing the components of delay once a patient enters the healthcare system, little has changed in treatment-seeking delay times for women. Women are less likely to be assessed for cardiac symptoms, but when assessment is performed, sex- and gender-based differences exist.

Risk factors have changed in recent years as evidenced by one review¹¹⁸ which found an important change in HF demography with HF occurring at an older age but with less traditional cardiovascular risk factors (e.g. smoking and blood pressure). Diabetes mellitus, obesity, hypertension, chronic kidney disease, and cancer comorbidities at HF onset are increasing, and these factors may be associated with the increasing prevalence of HF with preserved ejection fraction.^{119,120} Also, risk factors leading to CVD seem to have changed in the last decade making individual approaches necessary. HF prevention and treatment should be tailored to individual risk profiles to respond better to the individual’s needs and have the best possible outcomes.¹¹⁸

It is vital that healthcare providers accurately use cardiovascular risk assessment tools and effectively treat cardiovascular risk using recommended guidelines. It is equally vital that healthcare providers teach all patients about their cardiovascular risk in simple terms they can understand and provide lifestyle management counseling (see Chapter 13). Reducing any kind of disparities in health requires a multilevel and collaborative approach with a focus on identifying individuals and communities at greatest risk and putting more resources towards these groups, improving access to quality healthcare, increasing cultural competence, and revamping education of nurses and health professionals in general. Through the use of existing cohesive networks such as healthcare facilities, schools, religious organizations, worksites, social networks, media networks, e-health, and virtual communities, physicians, policymakers, and activists can develop a more effective platform to engage and intervene in communities at a grassroots level.

The relationship of patient and provider is crucial, as it may promote or discourage patient and family engagement in self-management of chronic conditions and adherence to therapy. A negative experience may reduce a patient’s use of healthcare services and have a negative impact on patient adherence and satisfaction.¹⁰⁹ It is very important to take into consideration cultural issues and socioeconomic factors when holistically assessing a

patient with CVD and when developing a person-centred nursing care plan. It will result in the development of enhanced trust between patients, families, and health professionals aiming for the same goals and health outcomes.

Conclusion

Culture, gender, psychosocial, and socioeconomic status are associated with risk factors leading to CVD. Several factors including low educational level, health literacy, social isolation, and lack of social support are linked with higher cardiovascular events and mortality. Also, socioeconomic differences may impact availability of resources or create barriers to maintain a healthy lifestyle. In addition, there is a complex relationship between gender differences, ethnicity, culture, and socioeconomic environment. Healthcare professionals must take into account differences regarding culture and socioeconomic status when they develop a plan of healthcare. Disparities in cardiovascular care could be addressed by identifying individuals at greatest risk, improving access to quality healthcare, increasing cultural competence, and revamping education of nurses and health professionals. ► **Box 14.5** summarizes the key factors relating to socioeconomic status and culture important to the awareness of nurses.

Box 14.5 Key factors relating to socioeconomic status and culture important for the awareness of nurses

- Low socioeconomic status is associated with low income, low educational level, employment status, and the environment.
- Individuals with low socioeconomic status are more at risk of CVD because of a higher prevalence of adverse health behaviours and cardiovascular risk factors.
- Race and culture are associated with increased cardiovascular risk because of a complex interrelationship with financial, educational, occupational, and environmental factors.
- Nurses should be aware of all of these factors when caring for their patients to avoid discrimination.
- Psychosocial factors are strongly associated with adverse CVD outcomes.
- Gender disparities do exist in cardiovascular care. Disparities in cardiovascular care could be addressed by identifying individuals at greatest risk, improving access to quality healthcare, increasing cultural competence, tailoring healthcare provided, and following clinical recommendations and guidelines for all patients with cardiovascular needs.

Cardiovascular disease in women and sex disparities

Introduction

CVD is the leading cause of death in women worldwide. In Europe, more women (51%) died from CVD compared with men (42%). However, the misconception of CVD as a man's disease and breast cancer as the greatest threat to women is still prevalent. Awareness of CVD as the primary cause of mortality in women has been slowly increasing; however, recent data suggest stagnation in the improvements in incidence and mortality of coronary heart disease, specifically among younger women (<55 years).¹²¹ In fact, CVD causes over 50% of death compared to 3% of death caused by breast cancer in women.¹²² Women have a higher prevalence of persistent chest pain, rehospitalization, and mortality from ischaemic heart disease than men, along with higher direct costs.^{123,124} Women also have greater patient-related delays, and these have remained unchanged for more than a decade.^{123,125,126} Despite the substantial risk of heart disease, women are less likely to receive guideline-directed care and counseling on their risk reduction from their clinicians than men. Importantly, once a diagnosis is correctly made, women with heart disease respond well to symptoms after prescription of cardiac medication.^{124,127} This evidence highlights the important gap in risk assessment, diagnosis, management, and prevention of heart disease in women.

Biological variances among women and men are called sex differences and are frequently reproducible. Sex differences in the cardiovascular system are due to differences in gene expression from the sex chromosomes, which may be further modified by sex differences in hormones resulting in sex-unique gene expression and function. These differences result in variations in prevalence and presentation of cardiovascular conditions, including those associated with autonomic regulation, hypertension, diabetes, and vascular and cardiac remodelling. The existence of crucial sex/gender-related differences in the prevalence, presentation, management, and outcomes of different CVDs, is related to differences in fat tissue distribution and different hormonal profiles and fluctuations.¹²¹ The key role of sex hormones in protecting women from CVD during the premenopausal state, providing an advantage over men, is lost when the hormonal profile changes at menopause transition. This hormonal-dependent shift of sex-related CVD risk strongly affects CVD epidemiology and CVD prevention/treatment, particularly in light of the ageing of the overall population. In contrast, gender

differences are unique to the human and arise from socio-cultural practices (e.g. behaviours, environment)^{121,127,128} (see later sections in this chapter).

Coronary heart disease in women

Coronary heart disease in women includes not only atherosclerotic obstructive coronary artery disease, but also an expanded spectrum of coronary disease, including coronary microvascular dysfunction, endothelial dysfunction, vasomotor abnormalities, spontaneous coronary artery dissection, and stress-induced cardiomyopathy.^{121,127,129} The three most important characteristics of coronary heart disease in women are that they have (1) a higher prevalence of angina, (2) a lower burden of obstructive coronary heart disease on angiography, and (3) a poorer prognosis in comparison to men.¹²¹ Compared with men, women more commonly present with non-ST-segment elevation myocardial infarction. Women are also more likely to have unusual pathophysiological mechanisms of coronary artery disease such as spontaneous coronary artery dissection or coronary artery spasm.^{121,130} Women are more likely to show ischaemia with no obstructive coronary arteries, although they report more chest pain compared to men.^{121,125} However, sex differences may also have a different impact on traditional CVD risk factors. Diabetes is associated with higher ischaemic heart disease in women compared to men, even if risk factors are exclusive to women (e.g. pregnancy-related complications) or they mainly disadvantage women (e.g. depression).^{123,125} After an acute coronary syndrome or coronary revascularization, women will spend longer in hospital, have higher in-hospital mortality, experience more bleeding complications, and have up to 30% more readmissions within 30 days after the index event compared to men.^{123,125,128} Sex and gender disparities in acute coronary syndrome are presented in ► Table 14.1.

Heart failure

Chronic HF (see also Chapter 10) predominantly affects the elderly; its incidence doubles in men and triples in women with each decade after the age of 65 years.¹³⁰ Registries and studies indicate women are around 5 years older than men at the time of HF diagnosis^{118,131} and more symptomatic, as indicated by a greater proportion of New York Heart Association class III or IV symptoms, present with more symptom burden, including more dyspnoea, bronchitis-like symptoms, oedema, fatigue, and worse health-related quality of life, despite similar clinical presentations and better left ventricular ejection fraction.^{131,132}

Table 14.1 Sex and gender disparities in Acute Coronary Syndromes

MALE	Risk factors	FEMALE
Prior MI or stroke (more common) (123,125)	Age (121,125,127)	Age (older than men) (123,125,127)
Younger men have higher BMI, prior MI, increased incidence of dyslipidemia and more likely to smoke, drink alcohol (125)	hypertension, dyslipidemia, abdominal obesity, high risk diet diabetes, lack of regular physical activity, psychosocial factors, alcohol consumption (121,125,127)	Increased correlation with coronary artery events (125,127) Smoking Diabetes Psychosocial Factors
		Women Specific Cardiovascular Risk Factors (125,127) Contraceptive Induced Hypertension Gestational Diabetes Hypertensive pregnancy disorders (gestational Hypertension, pre-eclampsia) Persistence of weight gain after pregnancy Prophylactic salpingo-oophorectomy and Menopause Autoimmune diseases (e.g. rheumatoid arthritis and systematic lupus erythematosus) are more common. Radiation and chemotherapy for breast cancer.
		More comorbidities: diabetes, anemia, hypertension, renal impairment, heart Failure, CVD, COPD (125,127)
	Symptoms	
Chest pain is more intense. Fatigue, weakness described as “aching”, “burning” or “dull” (125)	Chest pain (most common in both sexes) (127)	Back, neck, jaw pain, palpitations Chest Pain described as “crushing”, “burning”, “squeezing” or “tightness” (125)
	ECG	
Younger men (n≤55years old): anterior ST-segment depression (more common) (129)		N-STEMI (more common) Younger women (n≤55years old): anterior negative T waves (more common) (129)
	MINOCA	
		More common (121,125,130)
	DELAYS IN MEDICAL CARE	
		Longer delay in seeking emergency care (125)
	GUIDELINES BASED MANAGEMENT	
		Less likely to receive evidence-based treatment (125)

Table 14.1 Continued

MALE	Risk factors	FEMALE
	CORONARY INTERVENTIONS	
		Less likely to be referred to PCI
		Less likely to be referred to CABG
		Low risk women have better outcomes with a more conservative strategy
		Non-obstructive coronary artery disease (more frequent)
		More calcified lesions, smaller Vessel sizes
		Bleeding after PCI (more frequent in younger women)
		More complications after PCI (123,125)
		Higher all cause mortality after PCI for coronary artery disease (123,125)
		Higher readmission within 30 days after PCI due to cardiac reasons (123,125,128)

Some HF aetiologies are singular to women, such as peripartum cardiomyopathy, which can present up to 6 months after delivery and be confused with the early demands of an infant on the mother. Stress cardiomyopathy is also more common in women and comprises approximately 90% of cases and 80% of patients who present with spontaneous coronary artery dissection are female, and this should be considered in perimenopausal patients with chest pain.¹³²

The complex comorbid profile of women with HF with increasing hypertension and obesity may partly explain the higher proportion of women diagnosed first in hospital, compared with men, and highlights an emerging trend for primary prevention that will require novel approaches to improve prognosis and health.¹¹⁸ Also, the frequency of depression in HF in female patients is found to be more than double than in male patients.¹³¹ Nevertheless, women are under-represented in most of the registries and trials^{131–133} and the reasons remain unresolved. Possible explanations include women's or doctors' underestimation of cardiovascular symptoms in female patients and sociocultural difficulties faced by women in participating in clinical trials or registries. This discrepancy may be relevant in the applicability of evidence-based therapies to both sexes. For that reason,

HF prevention and treatment need to be tailored to individual risk profiles and be person-centred based.

Heart failure with preserved ejection fraction

Women with HF who present tend to be older than men^{43,131} and are approximately two times more likely than men to develop heart failure with preserved ejection fraction (HFpEF). The HFpEF phenotype is heterogeneous, encompassing various degrees of left ventricular systolic and diastolic function, pulmonary hypertension, and comorbid conditions. Specific risk factors for developing HFpEF include hypertension, obesity, and atrial fibrillation and common risk factors are ageing, adiposity, hypertension, and metabolic stress with impairments in cardiac, vascular, and peripheral reserve.¹³² There is no single diagnostic test with adequate predictive characteristics for the diagnosis of HFpEF. Symptoms of HFpEF are often non-specific, and thus, diagnosis is often supported with the addition of biomarkers, echocardiography, and right heart invasive catheterization. As this poorly understood entity disproportionately affects women, and particularly older women, it is in dire need of an individualized, person-centred, and holistic approach and care.

Peripartum cardiomyopathy

Peripartum is an idiopathic myocardial failure with onset in the puerperium and in the postpartum period¹³⁴ and is also known as pregnancy-associated cardiomyopathy.¹³⁵ Peripartum cardiomyopathy (PPCM) is defined as HF with unknown aetiology, with onset of symptoms in a period comprising the last month of pregnancy and the first 5 months postpartum,^{134,136} although there are several risk factors associated with PPCM including multiple pregnancies, increasing parity, advanced maternal age, chronic hypertension, obesity, smoking, and genetics.¹³⁴

Early signs and symptoms of PPCM may often mimic normal physiological findings of pregnancy such as pedal oedema, dyspnoea on exertion, orthopnoea, paroxysmal nocturnal dyspnoea, and persistent cough. Specific symptoms of PPCM are abdominal discomfort secondary to hepatic congestion, dizziness, precordial pain, and palpitations and in the later stages, postural hypotension. PPCM is a diagnosis of exclusion, thus all patients should have to undergo an investigation to identify any alternative aetiology of HF, considering all cardiac and non-cardiac causes of symptoms.¹³⁴

The majority of women demonstrate a partial or complete recovery within 2–6 months after the diagnosis of PPCM and the treatment is the same as in acute HF.^{127,134} Patients should be managed by a multidisciplinary team including cardiologists, obstetricians, neonatologists, nurses, and midwives.¹³⁴

Other vascular diseases in women

Stroke

Stroke incidence, prevalence, and mortality are higher in men than women in developing countries, except in Arab countries in the Middle East and North Africa, where the stroke mortality is higher in women. In Israel, women have a higher stroke mortality than men, and in western Europe, the stroke incidence is higher or similar in women compared with men.¹³⁷ Nevertheless, studies are showing differences in incidence when comparing different groups of age; a higher incidence of all stroke in men compared with women up to age 74 years, but a higher incidence in women older than 74 years.^{138–141} Individualized person-centred approach prevention is an important approach that focuses not only on genetics but also clinical data, environmental exposures, and lifestyle choices. Knowledge of differential susceptibility to risk factors informs the clinical management of patients

to prevent the incidence and reduce the burden of stroke. The larger influence of both diabetes and heart disease on white women than for men, suggests that, compared with white men¹³⁸ additional clinical attention should be focused on these factors in white women to reduce their stroke risk. While the findings for systolic blood pressure and use of antihypertensive medications are complex, the larger magnitude of association for systolic blood pressure suggests that increased attention to achieving blood pressure control in white women may also be particularly important.¹⁴⁰

Peripheral arterial disease

Peripheral arterial disease is a term used to describe atherosclerotic narrowing in arteries, other than coronary arteries and the aorta.¹⁴² It is associated with equal morbidity and mortality to coronary artery disease and stroke and is associated with significantly reduced quality of life, increased functional disability, myocardial infarction, stroke, and death from cardiovascular and non-cardiovascular causes.¹⁴³ Females tend to be older and suffer from different or even atypical symptoms at the time of presentation compared with their male counterparts.^{142,144} Intermittent claudication has been considered the hallmark feature of peripheral arterial disease, although women may often be asymptomatic, or present with atypical symptoms.^{142,143} Women compared with men are also shown to be associated with increased risk of depression and cardiovascular mortality.¹⁴³ Thorough clinical history and physical examination are key steps in peripheral arterial disease management. The non-invasive ankle–brachial index can diagnose lower extremity peripheral arterial disease and is also a strong marker for cardiovascular events. The management of peripheral arterial disease includes all interventions to address specific arterial symptoms and general cardiovascular risk prevention.¹⁴²

Abdominal aortic aneurysms

Abdominal aortic aneurysm is a condition characterized by dilatation of the abdominal aorta. It is the result of continued degradation of the structural components of the arterial wall. It is more common in men, develops later in women, but when established, appears to be more detrimental in women, who experience a higher risk of aneurysm rupture and a worse outcome after surgery than men. Nurses and other health professionals need to be aware that even though women are less likely to develop an abdominal aortic aneurysm, those who do fare worse than men.¹⁴⁵

Management of women with cardiovascular diseases

New therapeutic treatments useful to men have not led to a significant decrease in CVD fatality rates in women, supporting the key role of sex/gender differences in determining CVD risk, diagnosis, and prognosis and explaining the existing gap in the progress achieved to treat CVD in women compared to men. Although milestone studies in the last few decades have allowed the development/optimization of actual standard care in the context of CVD by taking advantage of more accurate clinical tests that have allowed a better definition of the risks and benefits of effective prevention/therapies, the majority of these studies did not appropriately consider women.^{125,146} Thus, much of the actual standard care available to test, prevent, and treat CVD in women can be considered a mere translation of the findings of studies conducted predominantly on middle-aged men, an approach that is inappropriate and risky given the emerging role of sex/gender differences in CVD pathophysiology.¹⁴⁷ Particular attention should also be paid to the transgender population. In light of the use of sex hormone treatments, this population needs careful consideration in order to address the real impact of therapies on metabolic profile, CVD risk, and other pathological conditions, such as diabetes, as well as to establish how tailored physical activity may decrease disease risk.¹⁴⁸

The 'gap' of disparities in knowledge regarding CVD in women over men can be overcome through a sex/gender-based 'holistic' approach to disease pathophysiology, spanning from clinical signs and manifestations up to risk establishment, diagnosis definition, and dedicated person-centred approach treatment with the close collaboration of a broader interdisciplinary team including nurses, midwives, gynaecologists (who often is the first medical doctor or health professional a woman visits), general practitioners, cardiologists, and allied professionals. A focus on primary prevention of CVD is necessary to reduce CVD mortality and the overall CVD burden. Also, the development of clinical recommendations and sex-specific therapeutic strategies for CVD based on ad hoc and ad personam physical exercise approaches will contribute to a more focused approach on sex/gender disparities.^{125,127,146}

Conclusion

CVD is the leading cause of death in women worldwide, even though it is not considered to be the greatest threat to women. Sex differences result in variations in

Box 14.6 Key factors relating to women and sex disparities important for the awareness of nurses

- There are crucial sex/gender-related differences in the prevalence, presentation, management, and outcomes of different CVDs.
- A sex/gender-based 'holistic' approach by the interdisciplinary team focusing on primary prevention of CVD may be the key to reduce CVD mortality and the overall CVD burden.
- Biological variances result in variations in prevalence and presentation of cardiovascular conditions and also in the management and outcomes of different cardiovascular conditions.
- Women are more commonly presented with non-ST-segment elevation myocardial infarction, have ischaemia with no obstructive coronary arteries, and more often are underdiagnosed with HF due to the more complex multimorbidity profile—they are more likely to have heart failure with preserved ejection fraction.
- Existing therapies are controversial regarding their effectiveness in women. A more 'holistic' individual approach is needed in the context of an interdisciplinary team including midwives, gynaecologists, as well as the cardiology specialists.
- The need of primary prevention of CVD, focusing on sex-specific therapeutic strategies.

prevalence and presentation of cardiovascular conditions, including those associated with autonomic regulation, hypertension, diabetes, and vascular and cardiac remodelling. The existence of crucial sex/gender-related differences in the prevalence, presentation, management, and outcomes of different CVDs means that women are less likely to receive guideline-directed care and counselling. The 'gap' of disparities in knowledge regarding CVD in women over men can be overcome through a sex/gender-based 'holistic' tailored approach by the interdisciplinary team including cardiology specialists, gynaecologists, and midwives. ► **Box 14.6** summarizes the key factors on sex disparities.

Conclusion

In this chapter we have explored some of the challenges that nurses and other professionals face in delivering high-quality holistic care to their patients. These were identified as frailty, multimorbidity, polypharmacy, the need for

palliative and supportive care, and inequalities associated with sex and gender, social, and cultural factors. Much of this challenge arises from the presence of increasingly ageing populations living with non-communicable diseases. Principles for delivering holistic care in response to the challenges are as follows:

1. Care should be integrated, joined up, and well coordinated.
2. Care should be person/patient centred.
3. Care should strive to empower patients to self-manage with the support of their families and other carers.
4. Care should be organized around the convenience of patients, families, and other carers.
5. Every effort should be made to avoid discrimination in relation to culture and special circumstances.
6. Care should be offered to patients through an interdisciplinary team in an effort to meet all patients' needs.
7. Care must include continuing assessment through regular follow-ups or even more often depending on each patient in an effort to meet patients' needs, preferences, and values.
8. Taking care of women must always consider the sex- and gender-related differences and in some cases the interdisciplinary team must include midwives and gynaecologists.

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15 Looking forward: the future of cardiovascular care

DAVID R. THOMPSON, LIS NEUBECK, AND ROBYN GALLAGHER

CHAPTER CONTENTS

Introduction 443

Technology and digital health 444

Artificial intelligence 445

Genetics and precision/personalized
medicine/health 448

Nursing workforce 448

Advanced practice 449

Opportunities 450

Conclusion 450

KEY MESSAGES

- Cardiovascular care is evolving rapidly in an era of unprecedented demand.
- Nurses are caring for a growing number of people who are older, present with multiple chronic conditions, and are socially isolated.
- There is public, political, economic, and professional pressure to work effectively and efficiently, ensuring value for money, and better patient outcomes and experience.
- Health services aim to keep people out of hospital; reduce waiting times and hospital stays; speed up, shorten, and avoid duplication of diagnostics, treatments, and clinic visits; and ensure care is patient centred and coordinated.
- Healthcare should be responsive and patient driven with staff thinking creatively, working smartly, and exploiting technology and other resources appropriately, taking

account of patient and family needs, values, choices, and preferences.

Introduction

The cardiovascular care landscape is changing rapidly, more so now than at any other time. This is typified by quicker and shorter diagnosis, access, treatment, and aftercare due to a host of factors including increased knowledge, expectations, and demands among the public and health professionals, and rapid advances in science and technology. The patient journey, experience, and outcome nowadays are vastly different from even 10–20 years ago. For example, patient and health professional access to information is immediate, though the validity of some of this information may be questionable, so patients and families need to be pointed to reliable sources. This is even more pressing when patients are living longer and

also presenting with more than one chronic health condition. It is not uncommon nowadays to see a patient with cardiovascular disease (CVD) also present with diabetes, a respiratory disease, or a mental illness. This presents many challenges to nurses working in cardiovascular care, an environment that is changing rapidly and is characterized by complexity, uncertainty, and unpredictability. Thus, nurses are being expected to work smartly and be more responsive, flexible, lean, and agile.

If nurses are to provide the best care, it is important that they keep abreast of developments in their own field and those of the social, behavioural, mathematical, engineering, and clinical sciences, recognizing their potential application to cardiovascular care (from CVD prevention, management, rehabilitation, and aftercare to palliative care). For instance, in terms of the social and behavioural sciences, nurses need to learn how better to engage and communicate with patients, families, and the public about their risks for CVD and the options for preventing and managing it, including how to tackle misconceptions and fear and avoid stigmatization. Rapid developments in science and technology are enabling a shift in cardiovascular care towards a more predictive, preventive, and personalized approach, where patients are truly leading their care, supported by nurses and easily accessible online applications that take advantage of artificial intelligence (AI).

Technology and digital health

Technology is being used across the whole spectrum of cardiovascular care including detection, monitoring, and treatment. Smartphone apps are rapidly being developed and applied for lifestyle modifications in CVD such as addressing obesity, physical inactivity, poor diet, and smoking.¹ These technologies can be quite simple, such as involving simple mobile text messaging, through tracking activities and measuring data such as the number of steps walked, heart rate, and quality of sleep, and using smartwatches to monitor heart rhythm, take an electrocardiogram, and detect atrial fibrillation.² Indeed, they can be used to detect acute coronary occlusion.³ Whatever type of technology is used, its purpose, benefits, and potential harms need to be explained to the patient and their family.

The evidence base for using technology to enhance care is large, complex, and growing rapidly. Despite concerns that technology might supplant humans, this is unlikely in the foreseeable future. Rather, technology

should be embraced as an adjunct to human interaction between the nurse and patient and an aid to the nurse providing care. Care is increasingly delivered in the home and technology is being used for social connectivity, independence, and emotional support. Wearable technologies combined with video encounters with nurses create new, convenient, and more realistic points of care. This approach particularly lends itself to certain clinical scenarios such as cardiac rehabilitation and secondary prevention programmes and heart failure management clinics.

Often the most important drivers for successful long-term behavioural change are a strong relationship between the patient and nurse together with collaborative eHealth tools.⁴

eHealth—health services and information delivered or enhanced through the Internet and related technologies⁵—encompasses the provision of health-related services, hardware devices, and software such as use of the Internet, Bluetooth devices, remote monitoring devices, wearable devices, text messages, and smartphone apps.⁶

Such tools are likely to be most effective if they facilitate one-to-one consultations, personalized lifestyle plans, coaching, self-monitoring and tracking, peer-to-peer support, and reminders and notifications. The combined effect of convenient, powerful digital technology and the motivation of frequent human-to-human interaction is likely to be more effective than either of these components alone.

Recent eHealth interventions have been shown to support positive behaviour and lifestyle change in reducing CVD such as increasing physical activity⁷ and reducing weight,⁸ and appear to have the potential to improve cardiovascular risk profiles.⁹

eHealth interventions offer tremendous potential for patient engagement and to support CVD care and can overcome the barriers of distance, capacity, and resources while being simple and meaningful.¹⁰ An added appeal of using eHealth approaches is to support the partner (who is often the informal carer) who may have similar or more distress than the patient. Poor partner health may compromise their ability to carry out their carer role and partners may lack information about CVD and the expectations of their role, which can lead to worry and uncertainty. Targeting both the patient and partner ensures that they receive the same information and support, thus maximizing retention and minimizing possible misinterpretation; facilitates sharing the emotional burden; and provides social support, bolsters confidence, instils hope, and encourages the patient to seek healthcare, attend

cardiac rehabilitation, and adhere to lifestyle plans and medications.

However, although these technologies have much to offer, they are often not used optimally and may provide information that appears redundant or of limited relevance to nurses; thus, nurses need to know what type of information is required and how and when to use it. Also, mobile health technologies (mHealth) can deliver interventions to prevent and manage CVD, but despite the high prevalence of smartphone ownership, mHealth uptake among those with or at risk of CVD is unclear.¹¹ ► **Box 15.1** includes a

case study of a patient after an acute cardiac event which outlines the care pathway and the role that technology could play.

Artificial intelligence

AI is the simulation of human intelligence processes by machines, especially computers. It is a rapidly evolving field and is revolutionizing health, including cardiovascular care, especially in terms of risk prediction and

Box 15.1 The role of technology in cardiovascular care—the future is now: a case study

Alex is a cardiac nurse coordinator working in the near future. He meets Dora, his new patient, via his personal device. Dora is a 51-year-old woman whose wearable tracker picked up that her heart rate was a bit fast. Dora was experiencing what she thought was indigestion. She sat down and rested and noticed that her discomfort was increasing. She sent an instant message to emergency services. Alex began receiving information when the emergency services data system recognized that her symptoms, electrocardiogram, vital signs as recorded by a fitted sensing fabric, and troponin elevation as noted by point-of-care testing provided a high-risk diagnosis of acute coronary syndrome. Alex approved the system to trigger Dora's rapid access to the cardiac catheterization laboratory (cath lab) for diagnostic angiograms and potential angioplasty and stent. He was also able to approve a trigger to the cath lab to transmit data which provided the size of the catheter and risks that would have to be managed specific to Dora.

Alex then notified the cardiology consultant via his personal device. The consultant then began a preliminary real-time discussion with Dora via video link about the potential procedure and consent processes while she was in transit. Alex also ensured that the consultant was linked to immediate family to discuss their concerns regarding Dora's diagnosis and treatment. Once the family was comfortable with the information that was provided, Alex discussed future care needs so that he could plan for Dora's discharge.

Emergency services signalled their arrival via location mapping of their imminent arrival to the cath lab rapid entrance. Bed management systems were alerted to ensure that beds and staffing were also available. Simultaneously, the cardiac nursing team were alerted

and a care plan was generated that was personally tailored for Dora based on her data.

During the cath lab angiogram and intervention, as data were generated an individualized medical treatment plan was created. Genomic data was also collected which enabled identification of medication effects that were personalized to Dora's profile so that dosing was individually tailored and accommodated Dora's existing hypertension and type 2 diabetes. This enabled the pharmacists to ensure that appropriate medications were dispensed.

On the ward, Alex was able to prepare the staff for Dora's arrival. A smart bed was provided that would monitor Dora's vital signs and any signs of distress to enable Alex to ensure that Dora's care was matched to the most appropriate times for her sleep and would minimize disturbance from routine monitoring. Cardiovascular prevention and rehabilitation was alerted to enable development of a tailored personalized programme for Dora. Nurses recorded voice notes after providing Dora's personal care, which helped create a more individual picture of Dora's personal situation so that when the multidisciplinary team met with Dora, a very effective personally appropriate plan could be determined for discharge. In addition, Dora's medications in hospital were stored in a secure bedside unit that could track when medication should be dispensed and the dose required, and record when the medications had been appropriately taken. Dora and her nurse had a discussion about whether Dora would like to be responsible for her medications herself or whether she would prefer the nursing staff to support her. The locker holding the medications was enabled with facial recognition and fingerprint confirmation so that only authorized people, either Dora, her nurse, or the pharmacist, could access the locker.

(continued)

Box 15.1 Continued

In discussion with Dora, Alex noted that she was having difficulty managing her type 2 diabetes. Alex recommended a wearable tracker with individualized sensing of blood glucose levels to help Dora understand the effect of her diet on her diabetes. This data would be transferred to Dora's diabetes educator who will arrange a transition plan to support her diabetes management. In addition, the genomic information helped to identify the effects of different types of nutrition on Dora's health, enabling the dietitian to help Dora tailor a personalized nutrition plan. The system generated a flag that reminded her consultant to discuss genetic risk with Dora's family. In preparation for discharge, Dora's information was shared electronically with the community pharmacist, her general practitioner, and other important members of the social care team who will be supporting Dora with her long-term management.

At the centre of this technology, data systems, and healthcare professional's work was Dora (► Fig. 15.1). Her records were personally controlled and she was able to make the decision about access to her data at every point of her care. Like many others, Dora was willing to share

health data as long as her privacy was ensured and her data was used to improve her health. This meant that Alex had to be aware of the cyber security risks of using large datasets and ensure that appropriate measures were taken to protect Dora's data at every stage of her journey.

When Dora was ready to go home, Alex arranged for the cardiovascular prevention and rehabilitation team to have a virtual meeting with Dora. Dora was provided with a mobile app that integrated information from her wearable device and provided her with personally tailored multidisciplinary support. Dora was offered a menu-based suite of options for cardiovascular prevention and rehabilitation. Because she did not feel confident exercising, Dora decided to go to a women-only cardiac dance programme which was supported with an online and social networking site. The social networking included support from healthcare professionals and Dora's peers. Dora's family were able to participate in every aspect of her care as and when Dora enabled access and were strongly encouraged to attend the integrated multimorbidity cardiovascular prevention and rehabilitation programme with her. In wrapping up Dora's treatment and clinical journey, her data including



Fig. 15.1 Digital health with the patient at the centre.

Box 15.1 Continued

genomics are safely shared for personal and family health prediction and integrated into public health data for research and health services improvement.

In the very near future, Alex and the nurses involved in this realistic scenario will require training in a range of areas related to delivery of digital health (► Fig. 15.2).

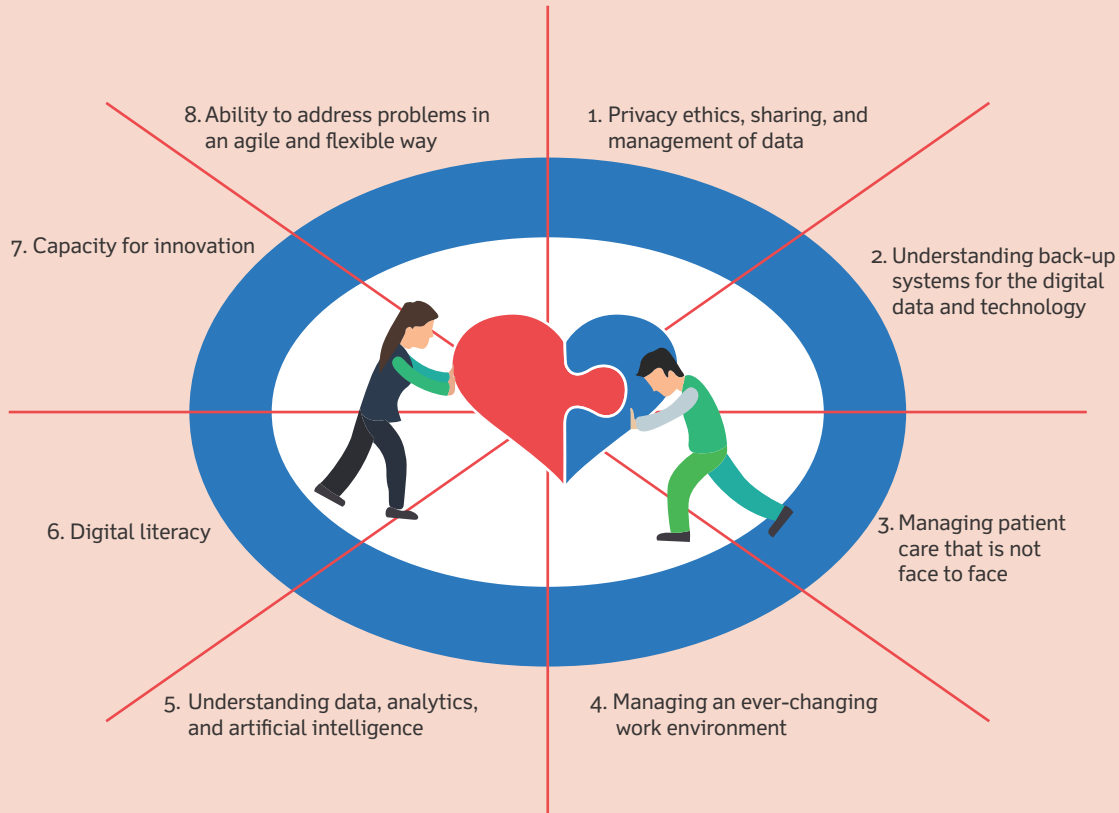


Fig. 15.2 Bringing together the skills required for digital care.

stratification, diagnostics, precision medicine, workflows, and efficiency.¹² AI does this by interpreting and finding meaning in vast sets of data, faster and more effectively than the human brain.¹³ Thus, with the exponential growth in all sorts of patient health data, AI offers great potential.

An example of its application is in heart failure with the aim of developing a virtual 'doctor at home' system.¹⁴ Being able to pool datasets smartly and extrapolate relevance at an individual level offers huge potential for reducing clinician burden, improving clinical efficacy, and enhancing patient experience and outcomes.¹⁴

The application of AI in cardiovascular care offers immense advantages for patients and nurses, such as improving clinical decision-making, patient and nurse

interactions, and overall patient experience, and reducing the risk of adverse events, patient waiting times, and costs. It is envisaged that AI will make unambiguous decisions and direct advice to patients, leaving more complex or ambiguous decisions to nurses and other healthcare professionals. The expected 'added value' of AI is assisting healthcare professionals in the delivery of care and interrogating 'big data'. Big data refers to extremely large data sets that can be analysed computationally to reveal patterns, trends, and associations. For example, patient health data sets need to be collected, analysed, and incorporated into clinical guidelines. Registries collect and provide data on patients' demographic characteristics, clinical profiles, management or care processes,

and outcomes, and serve an important role in quality assurance, in developing research hypotheses, and as a resource for information about patients receiving care outside of clinical trials. They provide standardized data collection with definitions and reporting, rapid feedback, centralized data compilation, and statistical analysis, as well as transparent reporting. However, whether big data can fulfil its promise is a moot point.¹⁵

There are concerns about AI, including the potential for error and fraud, ethics, data security, and accountability. The legal, ethical, and societal issues regarding the acceptance and implementation of AI into the healthcare system are profound, such as discrimination, transparency, and data protection. Therefore, standard reporting guidelines for AI and machine learning are needed.

Genetics and precision/ personalized medicine/health

The rapid increase in understanding of the role of genetics in disease and advancement in gene sequencing technology has given rise to precision medicine in CVD. Precision medicine is defined as using information about a person's genetic make-up to tailor strategies for the detection, treatment, or prevention of disease.¹⁶ It is an integrative form of medicine based on information about a person's genetics, lifestyle, and exposures as determinants of their cardiovascular health and disease phenotypes, which is used to prevent, diagnose, or treat disease.¹⁷ The terms precision medicine and personalized medicine are often used interchangeably, but they are not the same, though they do overlap. Precision medicine identifies the unique aspects of a person related to health and disease to select appropriate therapy, whereas personalized medicine refers to implementation of these data into a person-specific treatment plan.¹⁷

Precision medicine strives to delineate disease using multiple sources (including genomics and digital health metrics) to be more precise and accurate in diagnoses, definitions, and treatments of disease subtypes.¹⁷ However, despite some spectacular success in cardiovascular genetics research, there has been little evidence of personalizing treatment for CVD on the basis of an individual patient's genetic make-up or biomarkers. Indeed, there is scepticism about the promises made by proponents of precision medicine, which are yet to be realized, and the amount of money invested in it.¹⁸ For instance, there is little recognition of the inherent limits of prediction for individuals or the limits of approaches to prevention that

rely on individual agency. There also appears to be undue emphasis placed on individuals' genes and their 'big data' at the expense of their own preferences for a particular treatment.

Precision health—a more appealing and appropriate term in cardiovascular nursing—refers to personalized healthcare based on a person's unique genetic composition within the context of lifestyle, socioeconomic, cultural, and environmental influences to help the person achieve optimal health and well-being.¹⁹ The success of precision health depends on interdisciplinary clinical and research collaboration and successful community outreach and care coordination. This will entail cardiovascular nurses working together with data scientists, epidemiologists, and basic scientists to study patients and populations in clinical setting and communities.²⁰ It is a relatively recent development in nursing and efforts are needed to inform nurses of its potential and engage them in its possible application.

Nursing workforce

It is acknowledged that increased investment in nurses is necessary to meet the growing demands of healthcare globally. Nursing is key to achieving health for all, yet the World Health Organization (WHO) estimates a global shortfall of 9 million nurses needed to deliver and sustain universal health coverage by 2030.²¹ Thus, a key objective of the WHO global strategic directions for strengthening nursing is to educate, recruit, deploy, and retain the right number of nurses.²¹

The 'Nursing Now' campaign aims to improve health and healthcare globally by raising the status and profile of nursing worldwide.²² The campaign has several ambitious objectives, one of which is more nurses in education and employment.

The recent WHO report 'The State of the World's Nursing 2020' illustrates how nurses are critical to the delivery of healthcare and central to strengthening the health system, though the WHO notes that nursing is primarily a female-dominated profession.²³ Indeed, nursing is still perceived in many quarters as 'women's work'. Men continue to comprise only a small percentage—about 10%—of the global nursing workforce, even though men comprise roughly half of the population.²³

An important aspect of any profession is to accurately reflect the make-up of the general population, and to do this nursing needs to diversify and attract men to ultimately improve the patient experience. The numbers

of men in nursing remain low despite efforts to attract them into the profession. Addressing this disparity is important if the healthcare workforce is to reflect the diversity of the general population issue, especially in the context of today's changing sociocultural and healthcare landscapes.²⁴

Compounding the shortage of nurses is the fact that the nursing workforce is ageing and this is evident not just among clinicians but also educators. This dearth in educators impacts the education and preparation of the next generation of nurses. Regardless of gender, age, or ethnicity, there is a growing recognition of the need to attract and retain more nurses. Recruitment drives include a positive rebranding of nursing at a national level that is gender-neutral and education beginning early (preschool and in primary schools). However, there is an urgent need for a concerted effort to examine the reasons why so many nurses are leaving the profession. Efforts to reward, regrade, or rebrand nurses may help in the short term but are not long-term corrective measures.

Today, patients require increasingly complex care and many nurses feel overburdened. Optimizing skill mix so that the more highly qualified staff focus on tasks only they are qualified to undertake, can lead to lower costs, improved staff satisfaction, and better patient outcomes. Higher staff satisfaction often lowers staff turnover which benefits patients because of the increased time spent with them which, in turn, results in additional cost savings. However, it is important to acknowledge that a good proportion of activities, such as assisting patients with activities of daily living or transportation, can be safely performed by non-professional staff. This is why there has been a surge in the employment of healthcare assistants in hospitals, clinics, and the community.

The shift towards a patient-led, preventative health system will necessitate reshaping the healthcare workforce, and nowhere is this more apparent than in nursing. Nursing roles and responsibilities are changing rapidly but this should be done taking a systematic approach, taking account of training and development needs and ensuring sustainability.²⁵ Currently, there is a mix of skill flexibility (role substitution or delegation), skill development (role enhancement or enlargement), and new roles in nursing. But there is often a lack of role clarity and of national competence frameworks and regulation, which can result in a fragmentation of care and dissatisfaction among nurses.

Having sufficient and appropriately qualified (graduate) nurses impacts patient safety.²⁶ Also, when experienced specialist cardiac nurses are not allocated to patients

requiring their expertise, they often report lower work satisfaction and self-esteem.²⁷ Thus, nurses need to be better resourced, equipped, and prepared to address many of the new challenges they face.

An important consideration for the workforce is the issue of professional identity: the core beliefs, attitudes, values, motives, and experiences through which a person defines themselves. These core values and perspectives are integral to the art and science of nursing and become evident as the nurse learns, gains experience, and reflects.

Advanced practice

Nurses continue to be creative and make innovative and transformative actions in developing new roles to provide high-quality and safe care to patients, families, and communities. One area in which this is most apparent is advanced practice.

Surprisingly, there is no standard, accepted definition of advanced practice and its core competencies even though a plethora of specialist roles exist, including the clinical nurse specialist, nurse practitioner, advanced nurse practitioner, consultant nurse, and nurse case manager. However, many of these roles are unclear and their remit varies markedly. This is compounded, for instance, by the different preparation, education, registration, competencies, and autonomy of nurses in each country across Europe. The International Council of Nurses defines an advanced practice nurse (APN) as 'a registered nurse who has acquired the expert knowledge base, complex decision-making skills and clinical competencies for expanded practice, the characteristics of which are shaped by the context and/or country in which s/he is credentialed to practice. A master's degree is recommended for entry level'.²⁸ Though generally APN roles comprise clinical, educational, research, and management components, there is no common understanding or universal agreement about the APN role and wide variation in its regulation, licensure, and credentialing, as well as opposition from vested interests, including physicians.²⁹ In the US, the American College of Cardiology in its mission to transform cardiovascular care and improve heart health notes the importance of cardiovascular team-based care and collaborative care models. The American College of Cardiology exhorts team members to optimize their education, training, experience, and talent and recommends developing residency training programmes and other educational opportunities for advanced practice providers, including APNs.³⁰ Unfortunately, there appear to

be few postgraduate programmes for nurses in cardiovascular care to address workforce needs.³¹

Opportunities

Nurses are key, indeed, central, members of the cardiovascular care team by virtue of spending more time with the patient and family and having greater opportunity to instigate health promotion, risk reduction, and disease prevention, as well as management and rehabilitation. Nurses have made, and continue to make, significant—in some cases pioneering—contributions to key areas of cardiovascular care, such as cardiac rehabilitation,³² heart failure management,³³ and palliative and supportive care.³⁴ They have also led the way in examining the experiences and needs of patients, carers, and family members as well as developing novel interventions to address their needs and outcome measures to evaluate them.³⁵

In order to address the increasing demands of patients and healthcare systems, nurses have also been innovative in introducing new roles, and extending and expanding these and their scope of practice, and models and systems of care, including transitional care between the hospital and home or community setting. While these developments are all welcome, there are opportunities for nurses and nursing to better articulate, introduce, evaluate, and implement some of these developments and be more adroit at persuading opinion leaders and stakeholders and influencing policymaking. For instance, there has been a tendency to develop new initiatives and introduce them with little thought to rigorous and systematic evaluation and replication. Also, many initiatives which are essentially nurse led, such as cardiac rehabilitation or heart failure management, are undoubtedly effective but their evaluation has tended to be simplistic with questions posed such as ‘What works?’ Yet most of the clinical scenarios that nurses operate in and the interventions they deliver are complex; moreover, each patient is unique, with different experiences, needs, preferences, expectations, and outcome. Thus, nurses operate in a healthcare system that is ‘messy’, an environment typified by complexity, uncertainty, and unpredictability. A ‘one-size-fits-all’ approach to patient care is no longer tenable: the key question is to examine whether interventions that nurses design and deliver are beneficial or harmful to patients and/or families.³³

Nurses should focus on ‘What works for whom, when, and why?’³³ For example, although cardiac rehabilitation is effective in reducing mortality and morbidity and

improving quality of life, many of the programmes are standardized with little consideration given to choice of delivery and preferred outcomes³²; likewise with heart failure management and other nurse-led interventions.³³ Patient outcomes are rarely shaped by a single factor such as age, sex, race, and class but rather a combination of various factors such as middle-class, male, older adult of Asian origin who is an immigrant to the UK.³⁶ It is through adopting such approaches that we can help identify factors such as the crucial characteristics of a programme and determinants of issues such as self-care as well as context, settings, and possible mechanisms by which health outcomes are improved.

Finally, consideration of other important patient and family issues such as satisfaction with and experiences of their care is essential. It is all too easy for nurses to still adopt a ‘we know what’s best’ attitude when in fact the patient is the expert in their disease and its management.

Conclusion

Looking forward, cardiovascular care is evolving at a rapid pace and likely to present many challenges which, if grasped, will prove exciting and present cardiovascular nurses with the opportunity to think creatively and work nimbly. To optimize their potential to better meet the challenges they face, cardiovascular nurses need to be well prepared, equipped, supported, and led. Strong leadership is vital but so too is individual professional responsibility and accountability to ensure that nurses do the right thing, for the right person, at the right time, and in the right place. This depends on preparing staff with a sound education and training, equipping them with sufficient resources, encouraging them to make decisions and take risks in a supportive environment, fostering an ethos of thinking big and being bold and unafraid to challenge, while mindful of working collaboratively and keeping the patient at the centre of care. To deal with contemporary and ever-changing scenarios, nurses need support in the form of coaching, mentoring, and supervision as well as investment in research and development, education, and clinical skills training.³⁷ Good leadership should be about maximizing human capabilities: stirring curiosity, imagination, intuition, creativity, and empathy, but above all humility and compassion. Nursing needs to acknowledge and celebrate the vast array of talent among cardiovascular nurses and ensure it is harnessed to the betterment of our patients and society, who deserve nothing less. The future of cardiovascular nursing is bright.

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Index

Tables, figures and boxes are indicated by *t*, *f* and *b* following the page number.

Abbreviations used in the index

CAD - coronary artery disease

CVD - cardiovascular disease

CVPR - cardiovascular disease prevention & rehabilitation

DALYs - disability-adjusted life years

ECG - electrocardiography

A

ABCD approach 119, 122, 122–3^t

abciximab 378^t, 386

ABC (Ascending Barriers to Adherence) Project 373^b

abdominal aortic aneurysm (AAA) 434

ABPM (ambulatory blood pressure monitoring) 336, 336^t, 337^t

absolute cardiovascular risk 12

absolute risks 18

ACC (American College of Cardiology) 61

acculturation 19–20

ACE inhibitors *see* angiotensin-converting enzyme (ACE) inhibitors

ACNAP *see* Association of Cardiovascular Nursing and Allied Professions (ACNAP)

ACS *see* acute coronary syndrome (ACS)

actin 95, 95^f

Action on Smoking and Health (ASH) 322

action potential 97–8, 99^f

ECGs 98, 104–5, 104^f

active listening 404

activity assessment 118^t

acute aortic syndrome 174

Acute Cardiovascular Care Association 14–15

acute coronary syndrome (ACS) 146

assessment & management 152–72

case studies 156–60, 159^f, 161^t, 163^t, 164–5, 165^f, 166^t, 167

classification 150

diagnostic algorithm 154, 155^f

differential diagnosis 153^t

acute heart failure 153^t

acute kidney injury (AKI) 228

acute myocardial infarction (AMI)

patient education 414, 416

prevalence 4, 5^f, 6^f

acute settings, heart failure 372

adenine (A) 242

adenosine diphosphate receptor antagonists 378^t, 384–5, 387^t

adenosine monophosphate-activated protein kinase (*PRKAG2*) gene 250, 378^t

ADH (antidiuretic hormone) 86^t, 286

adolescents 16–18

adrenaline (epinephrine) 378^t, 387^t, 391^t

adrenoceptors 162

adult learning principles 400–1

advanced care planning 427–8

advanced nurse practitioner (ANP) 58–61, 59^f, 60

clinical experience 61–2

core competencies 61–2, 64^f, 65^b

education 61

European networks 59, 66^b

integrated care 63–4

model for 60^f

prescribing 63–4

regulation, barriers & enablers 61, 62^f

role expansion 59–61

advanced practice nurse

(APN) 449–50

adverse drug reactions (ADRs) 425

aerobic exercise 332

AF *see* atrial fibrillation (AF)

African Heart Network (AHN) 354^t

AFSS (Atrial Fibrillation Symptom Scale) 43

ageing

CVD prevention & rehabilitation 311

nursing workforce 449

Agency for Healthcare Research and Quality 410

age-standardized mortality

coronary heart disease 6

CVD 6–7

AHA *see* American Heart Association (AHA)

AI (artificial intelligence) 445, 447–8

airway (A) assessment 122^t
deteriorating patient care 134^t

AKI (acute kidney injury) 228

alarm fatigue, arrhythmias 185

alcohol septal ablation 251

alirocumab 377^t

allergies 114

alpha-galactosidase A (*GLA*) gene 250

ambulatory blood pressure monitoring (ABPM) 336, 336^t, 337^t

American College of Cardiology (ACC) 61

American Heart Association (AHA)

advanced nursing practice 60

arrhythmia monitoring 183

CVD prevention 354^t

high quality of care 36–7

American Society for Preventive Cardiology (ASPC) 354^t

AMI *see* acute myocardial infarction (AMI)

amiodarone 378^t

side effects 387

amlodipine 379^t, 391

anatomy 81–110

blood vessels *see* blood vessels

heart *see* cardiac anatomy

angina

aortic stenosis 219

CAD 152, 153^t

epidemiology 147

angiotensin-converting enzyme (ACE)

inhibitors 379^t, 389

heart failure 291

hypertrophic cardiomyopathy 251

unstable angina management 160

angiotensin II 86^t

- angiotensin II receptor
 - blockers 389–90
- anion exchange resins 377*t*, 380
- ankle-brachial index 15
- ANP *see* advanced nurse practitioner (ANP)
- ANS (autonomic nervous system) 97
- anterior cardiac vein 89*f*
- anterior internodal tract 98*f*
- anthropometry, overweight/obesity
 - assessment 327–8
- antiarrhythmic drugs 378*t*, 387, 387*t*
- anticoagulants 378*t*, 381–4
 - cardiogenic shock 141
 - heparin 382–3
 - mechanism of action 382*f*
 - stroke prevention 203
 - unstable angina management 160
 - vitamin K antagonists 383–4
- anticoagulation status 132
- antidiuretic hormone (ADH) 86*t*, 286
- antimicrobials 226
- antiplatelet agents 378*t*, 384–7
 - antithrombotic agents and 203, 204*f*
 - dual pathway inhibition 386–9
 - dual therapy 385–6, 386*f*
 - duration recommendations 385*f*
 - glycoprotein IIb/IIIa inhibitors 378*t*, 386–7
 - mechanism of action 383*f*
 - platelet inhibitors 384–5
 - stroke prevention 203
 - triple therapy 385–6, 386*f*
 - unstable angina management 160
- antithrombotic agents
 - antiplatelet therapy and 203, 204*f*
 - valvular heart disease 234, 235*f*
- anxiety 341, 343
 - heart failure 297
- Anxiety and Depression Scale (HADS) 342
- aorta 83*f*, 88*f*, 89
 - coarctation of 268*f*, 271–2
- aortic arch 89*f*
- aortic regurgitation
 - clinical presentation 219
 - pathophysiology 217–18
- aortic stenosis 270*f*
 - case studies 233–4*t*
 - clinical presentation 219
 - pathophysiology 217
 - surgical valve replacement 226
- aortic valve 93
 - implantation *see* transcatheter aortic valve implantation (TAVI)
 - stenosis 153*t*
- apixaban 378*t*, 384
- APN (advanced practice nurse) 449–50
- apolipoprotein B 15
- appropriate polypharmacy 424
- arrhythmias 179–214
 - case studies 207–9*t*
 - catheter ablation 200
 - clinical guidelines & practice standards 183–4, 183*t*
 - clinical presentation 180, 181*f*
 - diagnostic tests 181–99
 - differential diagnosis 181–99
 - ECG monitoring 182–6
 - epidemiology 180
 - evaluation/discharge/follow-up 202–3
 - heart failure 294
 - implantable cardioverter defibrillators 200–2
 - inherited arrhythmias 254–9, 254*t* *see also* Brugada syndrome (BS); catecholaminergic polymorphic ventricular tachycardia (CPVT); long QT syndrome (LQTS)
 - living with 199–202
 - nursing care 207*b*
 - palliative care 206
 - pathophysiology 180
 - permanent cardiac pacing 200
 - prevention 205
 - risk factors 205
 - signs & symptoms 180–1, 182*t*
 - temporary cardiac pacing 200
 - types of 187–91*t*
 - see also* bradyarrhythmia; tachyarrhythmias
- arrhythmogenic right ventricular cardiomyopathy (ARVC) 249*t*, 252–3
- arterial catheters 137
- arterial pulse 94, 128*f*
- arteries 82–4
- arterioles 84, 84*f*
- artificial intelligence (AI) 445, 447–8
- Ascending Barriers to Adherence (ABC) Project 373*b*
- ASDs (atrial septal defects) 269*f*, 273
- ASH (Action on Smoking and Health) 322
- ASPC (American Society for Preventive Cardiology) 354*t*
- aspirin 378*t*, 384–5
 - rivaroxaban and 386–9
- assessment 129–32
 - deteriorating patient care 122–3*t*, 133, 134–5*t*
 - eleven functional health patterns 117–19*t*
 - endocrine/haematological/immune systems 131–2
 - gastrointestinal system 131
 - initial *see* initial assessment
 - integumental system 132
 - medication adherence 375
 - neurological system 131
 - renal system 131
 - respiratory system 130–1
 - tobacco smoking cessation 319
- Association of Cardiovascular Nursing and Allied Professions (ACNAP) 14–15, 32–3, 74, 349
- Be Guideline Smart Initiative 71
- CVD prevention 354*t*
- professional development 56
- Science Committee 45
- webpage 34
- asystole 189*t*, 193
- atenolol 379*t*
- atherosclerosis 148, 148*f*
 - risk factors 149, 149*t*
 - see also* coronary artery disease (CAD)
- atorvastatin 377*t*, 380
- atria 87, 88*f*
 - cardiomyocytes 95
 - contraction 91
 - ectopic foci 96*t*
- atrial fibrillation (AF) 190*t*, 194–8
 - arrhythmias 184
 - case studies 207–9*t*
 - diagnosis 195–6

- follow-up/outpatient care 202–3
 - in-hospital ECG monitoring 183*t*
 - management 196–8, 196*f*
 - permanent 195
 - persistent 195
 - polypharmacy 425
 - stroke prevention 203
 - thromboembolic complications 195
 - types of 195
 - wearables for detection 196
 - Atrial Fibrillation Symptom Scale (AFSS) 43
 - atrial septal defects (ASDs) 269*f*, 273
 - atrioventricular (heart) block 192–3
 - atrioventricular (AV) node 96*t*, 98*f*
 - bradyarrhythmia 186
 - heart rate control 97
 - medicines, actions of 192
 - atrioventricular septal defects 268*f*, 272
 - atrioventricular valve 88*f*
 - atrioventricular (AV) valves 87–8, 88*f*
 - atropine 378*t*, 387*t*
 - auscultation of the heart 93
 - Austria, hospitalizations 11*t*
 - automated medical records 42
 - autonomic nervous system (ANS) 97
 - autopsy studies, children & adolescents 16
 - autorhythmic cells 96
 - autosomal dominant disease 243, 243*f*
 - arrhythmogenic right ventricular cardiomyopathy 252
 - autosomal recessive disease 243–4, 243*f*
 - AV node *see* atrioventricular (AV) node
 - AVPU mnemonic 124*b*
 - axis determination, ECG 101, 105–6
- B**
- Babinski reflex 126*f*
 - Bachmann's bundle 98*f*
 - BACPR (British Association for Cardiovascular Prevention and Rehabilitation) 346, 346*f*, 355*t*
 - bacterial infections, infective endocarditis 218
 - barriers, reflective practice 68
 - Be Guideline Smart Initiative (ACNAP) 71
 - behavioural change
 - environmental context 317*b*
 - theories & changes 317–18
 - tobacco smoking cessation 320–1
 - see also* lifestyle changes
 - Behavioural Change Wheel 318*f*
 - Belgium, CVD DALYs 11*t*
 - beta-blockers 379*t*, 390
 - catecholaminergic polymorphic ventricular tachycardia 258–9
 - heart failure 291
 - inherited cardiac conditions 264
 - long QT syndrome 256
 - Marfan syndrome 261
 - restrictive cardiomyopathy 253
 - side effects 387
 - unstable angina management 160
 - bezafibrate 377*t*, 380
 - biological risk factor management 334–41
 - biomarkers
 - cardiovascular system assessment 127*t*
 - physical examination 127*t*, 128–9
 - risk estimation and 15–16
 - bisoprolol 379*t*
 - bleeding, antiplatelet agent side effects 385
 - bleeding disorders 132
 - transcatheter aortic valve implantation 228
 - blood cholesterol 20
 - blood flow control 84–5, 85*f*, 86*t*
 - blood glucose 339–41
 - blood lipids 338–9
 - blood pressure 93–4, 335–8
 - classification 335–6, 335*t*
 - high *see* hypertension
 - home blood pressure monitoring 336, 336*t*
 - lowering drugs 336–8, 337*t*, 338*b*, 379*t*
 - measurement 336, 337*f*
 - physical examination 125
 - treatment goals 338*t*
 - blood pressure monitoring 20
 - public health measures 313
 - blood tests, arrhythmias 181–2
 - blood vessels 82–7, 84*f*
 - blood flow 85*f*
 - overall structure 83, 84*f*
 - body mass index (BMI) 327–8
 - body systems assessment *see* assessment
 - body temperature 125
 - National Early Warning System 2 133*t*
 - body weight measurement 328
 - Boud, D. 68, 69*f*
 - Boyle, B. 403
 - brachiocephalic artery 88*f*
 - bradyarrhythmia 186, 192–3
 - idioventricular rhythm 186, 192
 - bradycardia 181
 - breathing (B) assessment 122*t*
 - deteriorating patient care 134*t*
 - breathlessness 130, 236*t*
 - Brief Illness Perception Questionnaire 342
 - British Association for Cardiovascular Prevention and Rehabilitation (BACPR) 346, 346*f*, 355*t*
 - British Heart Foundation (BHF), CVD prevention 354*t*
 - broad complex tachycardia 190*t*, 198
 - Brugada syndrome (BS) 254*t*, 256–7
 - BS (Brugada syndrome) 254*t*, 256–7
 - Bulgaria, CVD DALYs 11*t*
 - bundle of His 98*f*
- C**
- CABG *see* coronary artery bypass graft (CABG)
 - cachexia 232, 285
 - CAD *see* coronary artery disease (CAD)
 - calcium channel blockers (CCBs) 253, 379*t*, 390–1
 - calcium chloride 378*t*, 387*t*
 - calsartan 379*t*
 - CAM (Confusion Assessment Method) 227
 - Cambridge Pulmonary Hypertension Outcomes Review (CAM-PHOR) 43
 - Canada Health Survey 330

- Canadian Association of Cardiovascular Prevention and Rehabilitation (CACPR) 355*t*
- Canadian Cardiovascular Society 152, 153*t*
- Canadian Initiative on Frailty and Ageing 421
- canagliflozin 378*t*, 388
- cancer 430
- capillaries 82–3, 84*f*, 85–6, 86*f*
- carbon dioxide, blood flow 86
- cardiac anatomy 87–90, 88*f*
- conduction system 96, 98*f*
- coronary circulation 89–90, 89*f*
- cardiac cachexia 297
- cardiac cycle 91–3, 92*f*
- cardiac genetic nurses 262
- cardiac output 170
- cardiac pacemakers 200
- cardiac pacing
- permanent 200
 - temporary *see* temporary cardiac pacing
- cardiac rehabilitation, valvular heart disease 237
- cardiac resynchronization therapy 298
- cardiac syncytium 94
- cardiac trauma 153*t*
- Cardiff Cardiac Ablation patient-reported outcome measure (C-CAP) 43
- cardiogenic shock 136–41
- assessment 137
 - classification 137, 137*f*
 - definition 136
 - diagnosis 136–7, 136*t*
 - management 137–8, 138*t*
 - NSTEMI 169
- cardiomyocyte necrosis, NSTEMI 151
- cardiomyopathies 153*t*
- inherited cardiomyopathies 248, 248*f*, 249*t*, 250–4
 - see also* arrhythmogenic right ventricular cardiomyopathy (ARVC); dilated cardiomyopathy (DCM); hypertrophic cardiomyopathy (HCM); left ventricular non-compaction (LVNC); restrictive cardiomyopathy (RCM)
- cardiovascular (C) assessment 135*t*
- cardiovascular disease (CVD)
- age-standardized mortality 6–7
 - economic burden 10–11
 - epidemiology 3–27
 - European risk assessment recommendations 10*f*
 - morbidity 8–10
 - mortality 5–8
 - polypharmacy 425–6
 - prevalence 422
- cardiovascular disease prevention & rehabilitation (CVPR) 304–7, 310–11
- ageing 311
 - components of 316–44
 - family 310
 - lifestyle changes 312, 316–18, 317*b* *see also* healthy eating habits; tobacco smoking cessation
 - multifactor risk reduction 306–7, 306*t*, 314*t*
 - nurses, importance of 309, 310
 - primary care settings *see* primary care settings
 - primary prevention 311–12
 - primordial prevention 311–12
 - programme risk reduction 305*t*
 - risk factors 312, 316
 - settings and delivery modes 344–51
 - technology 311, 351–4
 - term definition 304*t*
- Cardiovascular Risk Collaboration 20
- Cardiovascular Risk in Young Finns Study 16, 313
- cardiovascular shock (CS) 132
- cardiovascular system examination 124–5, 127*t*
- care
- advanced care planning 427–8
 - coordination in CAD 170
 - evidence-based *see* evidence-based care
 - evidence-informed care 32
 - integrated care 63–4
 - multimorbidity 423
 - outpatient care 202–3
 - palliative/supportive care 427–8, 428*b*
 - spiritual care 171
 - structural level 46–7
 - see also* deteriorating patient care; evidence-based care; high-quality care; holistic care; patient-centred care; people-centred care; primary care settings; self-care/management
- caregivers, self-care 48–9
- care plans 115*t*
- development 114*f*
- Carinex study 345
- carotid artery 83*f*
- cascade genetic testing 244
- CASP (Critical Appraisal Skills Programme) 34
- catecholaminergic polymorphic ventricular tachycardia (CPVT) 254*t*, 257–9, 259*b*
- catheter ablation, arrhythmias 200
- C-CAP (Cardiff Cardiac Ablation patient-reported outcome measure) 43
- CCS *see* chronic coronary syndromes (CCS)
- CCTGA (congenitally corrected transposition of the great arteries) 271
- central venous catheters 137
- CHA₂DS₂-VASc score 197
- Champix® (varenicline) 321, 322
- CHD *see* congenital heart disease (CHD); coronary heart disease (CHD)
- chest pain, CAD 151
- chest X-ray 129
- cardiogenic shock assessment 137
 - dilated cardiomyopathy 251
- children, risk estimation 16–18
- cholesterol *see* low-density lipoprotein-cholesterol (LDL-C)
- cholesterol absorption inhibitors 377*t*, 381, 425
- cholestyramine 377*t*, 380
- chordae tendinae 88*f*
- Chronic Care Model 349
- chronic coronary syndromes (CCS) 146, 172–3, 173*f*
- classification 150
- chronic kidney disease (CKD) 430
- polypharmacy 425

- CIPRECAR 355*t*
 circulation (C) assessment 122–3*t*
 circulatory system 82–3, 83*f*
 circumflex artery 89*f*
 CKD *see* chronic kidney disease (CKD)
 clinical community settings 350
 Clinical Consortium on Healthy Aging (WHO) 421
 clinical experience, advanced nursing practice 61–2
 clinical leadership 73
 clinical level of care 46
 clinical nurse specialist (CNS) 59
 clopidogrel 378*t*, 384, 392
 clotting disorders 132
 CNS (clinical nurse specialist) 59
 COACH Program 309*t*
 coarctation of the aorta 268*f*, 271–2
 cognitive impairments
 patient education 406
 valvular heart disease 236*t*
 cognitive screening tools 120*t*
 colesevelam 377*t*, 380
 colestipol 377*t*, 380
 collaboration, advanced nursing practice 63–4, 66*f*
 COM-B model 317, 317*f*
 COMET (Core Outcome Measures in Effectiveness Trials) 43
 communication 402–6, 403*b*
 active listening 404
 deteriorating patient care 135–6
 effectiveness definition 402–3
 empathy demonstration 404
 end-of-life care 428
 non-verbal techniques 403–4, 404*t*
 plain language 405
 psychological aspects 342
 Teach-Back technique 405–6, 405*f*
 verbal techniques 403–4, 404*t*
 community settings
 medicine reconciliation 372
 primary care settings 350–1, 350*b*
 comorbidities 16
 competence, advanced nursing practice 62
 comprehensive health assessment 113*b*
 comprehensive management, atrial fibrillation 202–3
 computed tomography (CT)
 infective endocarditis assessment 221
 valvular heart disease 221
 computed tomography coronary angiography (CTCA) 129
 computers, patient education 407
 concordance, medication adherence 373*b*
 Confusion Assessment Method (CAM) 227
 congenital aortic stenosis 273–4
 see also patent ductus arteriosus
 congenital heart disease (CHD) 266–77
 atrial septal defects 269*f*, 273
 continuity of care 274, 275*f*
 defect categorization 267, 267*b*
 genetics 246, 247*f*
 great complexity 267, 270–1 *see also* congenitally corrected transposition of the great arteries (CCTGA); transposition of the great arteries (TGA); truncus arteriosus
 key care elements 276–7
 mild complexity 272–4 *see also* atrial septal defects (ASDs); congenital aortic stenosis; patent ductus arteriosus
 moderate complexity 271–2 *see also* coarctation of the aorta; Ebstein's anomaly; tetralogy of Fallot (TOF)
 nursing care 274–7
 prevalence 266
 time trends 8*f*
 see also inherited cardiac conditions
 congenitally corrected transposition of the great arteries (CCTGA) 271
 connective tissue disorders, inherited *see* inherited connective tissue disorders
 consciousness 133*t*
 COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) 43
 constipation, valvular heart disease 236*t*
 constructivist approach to teaching 400
 contractility, heart mechanics 90
 control, quality management 38
 control charts 39, 40*f*, 41
 core competencies, advanced nursing practice 61–2, 64*f*, 65*b*
 Core Curriculum for the Continuing Professional Development of Nurses Working in Cardiovascular Settings 115–16, 116*f*, 117–19*t*, 120*b*, 120*t*
 Core Outcome Measures in Effectiveness Trials (COMET) 43
 coronary artery bypass graft (CABG) 155–6, 158*f*
 acute myocardial infarction 414
 MI type 5 151–2
 coronary artery disease (CAD) 145–77
 acute & chronic 150*f*
 categorization 150
 clinical manifestations 149–52
 epidemiology 146–7
 novel treatment 372–3
 nursing priorities 169–72
 pathophysiology 147–8
 see also acute coronary syndrome (ACS); atherosclerosis; chronic coronary syndromes (CCS); myocardial infarction (MI)
 coronary circulation 89*f*
 coronary heart disease (CHD)
 age-standardized mortality 6
 time trends 7*f*
 women 431
 coronary revascularization, chronic coronary syndromes 173
 Coronary Revascularization Outcome Questionnaire (CROQ) 43*t*
 coronary spasm 153*t*
 COSMIN (COnsensus-based Standards for the selection of health Measurement Instruments) 43
 COVID-19 pandemic 72, 147
 Cox risk estimation 13
 C-reactive protein (CRP) 15

Critical Appraisal Skills Programme (CASP) 34
 critical health literacy 409*t*
 critical thinking, CAD nursing care 170
 Croatia, CVD DALYs 11*t*
 CROQ (Coronary Revascularization Outcome Questionnaire) 43*t*
 cross-disciplinary teams 66*t*
 CS (cardiovascular shock) 132
 CT *see* computed tomography (CT)
 CTCA (computed tomography coronary angiography) 129
 culture 428–30, 430*b*
 CAD nursing care 171
 high quality of care 34–5
 quality care 50
 quality management 41
 sensitive intervention 343
 Cumulative Index to Nursing and Allied Health Literature (CINAHL) 71–2
 CVD *see* cardiovascular disease (CVD)
 CVPR *see* cardiovascular disease prevention & rehabilitation (CVPR)
 cytosine (C) 242
 Czech Republic
 CVD DALYs 11*t*
 hospitalizations 11*t*

D

dabigatran 378*t*, 384
 dalteparin 378*t*, 382
 DALYs (disability-adjusted life years) 9–10, 11*t*
 dapagliflozin 378*t*, 388
 DASH (Dietary Approaches to Stop Hypertension) 322–3
 data, quality management 39, 41
 Dawber, T. H. 12
 DCM *see* dilated cardiomyopathy (DCM)
 defibrillators *see* implantable cardioverter defibrillators (ICDs)
de novo genetic disease 243*f*, 244
 depression 341, 343, 429
 heart failure 297
 deteriorating patient care 132–6
 assessment 122–3*t*, 133, 134–5*t*
 communication 135–6
 emergencies 132
 management 133, 135–6
 recognition 132–3, 133*t*
 development, reflective practice 68
 diabetes mellitus 131, 339–41, 430
 diagnosis 340*t*
 European risk assessment recommendations 10*f*
 interventions 340–1
 risk factor goals 340*t*
 screening 339
 type 2 329, 339
 women 431
 diet 323
 children 17
 CVPR 312–13
 inherited cardiac conditions 265
 low-risk diets 322–3
 Mediterranean diet 322–3, 329
 quality care 50
 see also healthy eating habits; nutrition
 Dietary Approaches to Stop Hypertension (DASH) 322–3
 digital health 352
 digital technology 408*b*
 digoxin 378*t*, 387, 387*t*
 dihydropyridines 379*t*
 dilated cardiomyopathy (DCM) 249*t*, 251–2
 genetic testing 244
 direct oral anticoagulants (DOACs) 378*t*, 383, 384
 disability-adjusted life years (DALYs) 9–10, 11*t*
 disability (D) assessment 123*t*
 deteriorating patient care 135*t*
 discontinuation, medication adherence 373*b*
 disease burden 4–12
 historical framework 4–5
 disease penetrance 245*t*
 disease-specific questionnaires 43*t*
 disopyramide 378*t*
 diuretics 253, 291, 297
 DNA 242
 genetic testing samples 244

DOACs (direct oral anticoagulants) 378*t*, 383, 384
 dobutamine 391*t*
 dopamine 391*t*
 double switch operation, congenitally corrected transposition of the great arteries 271
 Down's syndrome 272
 driving, valvular heart disease 236*t*
 drug–disease interactions 425
 drug–drug interactions 425
 drug side effects
 heart failure 297
 medication adherence 375
 dual pathway inhibition, antiplatelet agents 386–9
 Duke criteria 221, 221*f*
 dulaglutide 378*t*, 388
 dysglycaemia 340–1, 340*t*
 dyslipidaemia 149
 dyspnoea 297–8
 scale 124*b*

E

EAPC (European Association of Preventative Cardiology) 14–15, 355*t*
 Ebstein's anomaly 268*f*, 272
 ECG *see* electrocardiography (ECG)
 echocardiography
 cardiogenic shock 137
 dilated cardiomyopathy 251
 left ventricular non-compaction 253
 post-heart valve procedures 234
 restrictive cardiomyopathy 253
 transthoracic *see* transthoracic echocardiography
 ECMO (extracorporeal membrane oxygenation) 140*f*
 Edmonton Frailty Index 421
 edoxaban 378*t*, 384
 education 401*f*
 across career 56, 58
 adult learning principles 400–1
 advanced nursing practice 61
 CAD nursing care 171–2
 constructivist approach 400
 core curriculum 57*b*
 healthy eating habits 325*b*

- medication adherence 376*t*
- nurses 31
- see also* patient education
- educational theory 400–1
- effectiveness, high-quality care 30*t*, 31–4
- effective nursing leadership 70–5, 72*t*
 - compassionate leadership 72–3, 72*f*
 - good working 72
 - importance of 71–2
 - traditional theories 71*t*
- efficiency, high-quality care 30*t*, 36–44
- eHealth 343, 444–5
- Ehlers–Danlos syndrome 261
- EHN (European Heart Network) 4, 355*t*
- Einthoven triangle 100, 100*f*
- ejection, cardiac cycle 91–2
- ejection fraction 94
 - valvular heart disease 220
- elderly
 - patient education 402
 - polypharmacy 426
 - see also* ageing; frailty syndrome (FS)
- electrical cardioversion 196
- electrical properties of heart 94–6
 - action potential 97–8, 99*f*
 - cardiac conduction 96, 98*f*
- electrocardiography (ECG) 98–104, 125–6, 128
 - action potential 98, 104–5, 104*f*
 - arrhythmias 181, 182–6, 184*f*
 - arrhythmogenic right ventricular cardiomyopathy (ARVC) 252
- axis determination 101, 103*b*
- Brugada syndrome 256–7, 257*f*
- cardiogenic shock 137
- cardiovascular system 127*t*
- catecholaminergic polymorphic ventricular tachycardia 258, 258*f*
- dilated cardiomyopathy 251
- heart failure 287, 292
- hypertrophic cardiomyopathy 250
- infective endocarditis 221
- in-hospital continuous arrhythmia monitoring 182
- intervals 107–8
- lead placement 129*f*, 130*f*
- limb lead position 99–101, 100*f*
- long QT syndrome 255
- normal/abnormal parameters 107*t*, 130*f*
- NSTE-ACS 159–60, 159*f*, 165, 165*f*, 167
- Prinzmetal angina 162, 162*f*, 164
- QRS mean axis 103–4, 103*f*, 103*t*, 104*t*
- reference ranges 105–8, 106*t*
- restrictive cardiomyopathy 253
- STEMI 167, 167*f*
- systemic analysis 105
- transfer from ambulance to hospital 182
- valvular heart disease 221
- ventricular tachycardia 198
- electronic medical records 42
- electronic ordering systems 184
- 11-point numeric rating scale (NRS-11) 121*f*
- elimination assessment 117–18*t*
- emergencies 119, 122, 122–3*t*
 - deteriorating patient care 132
- emotional challenges, inherited cardiac conditions 262
- emotional coping, reflective practice 68
- empagliflozin 378*t*, 388
- empathy demonstration 404
- employment 265
- endocardial pacing 200
- endocarditis
 - infective endocarditis *see* infective endocarditis
 - prophylaxis 235
- endocrine system assessment 131–2
- endothelin 86*t*
- endothelium, arteries 84
- enoxaparin 378*t*, 382
- environmental issues 429
 - behavioural change 317*b*
 - quality care 50
 - risk factors 20–1
- epicardium 87
- epinephrine (adrenaline) 378*t*, 387*t*, 391*t*
- episodic assessment 113*b*
- epitifibatide 378*t*
- eplerenone 379*t*, 390
- epitifibatide 386
- equitability, high-quality care 30*t*, 35–6
- Essential Frailty Toolset 222, 223*t*
- ethnic minorities 19–20
- EUROACTION study 351
- EUROASPIRE survey 304
- EURObservational Research programme (EORP) 147
- Europe, advanced nursing practice 59
- European Association of Percutaneous Coronary Intervention 61
- European Association of Preventative Cardiology (EAPC) 14–15, 355*t*
- European Cardiac Rehabilitation Inventory Survey 347–8
- European Heart Network (EHN) 4, 355*t*
- European Journal of Cardiovascular Nursing* 32
- European physical activity strategy (2016–2025) (WHO) 18
- European risk estimations 13, 14, 14*t*
- European Society of Cardiology (ESC)
 - CVD burden 4
 - Education Committee 56
 - heart failure diagnosis 287
 - physical examination 124
 - STEMI/NSTEMI 147
- European System for Cardiac Operation Risk Evaluation (EuroSCORE II) 155, 223
- EuroQoL 5D (EQ-5D) 342
- evidence-based care 31–2, 33*f*
 - definition 32
 - evaluation of 34
 - high-quality care 31–4
 - sources of 32
- evidence-based practice 31
- evidence-informed care 32
- evolocumab 377*t*
- examinations 113*b*
- excessive administration, quality care 49
- exercise
 - aerobic exercise 332
 - assessment 118*t*
 - inherited cardiac conditions 265
 - valvular heart disease 236*t*
 - see also* physical activity; physical inactivity

exercise testing 129
 exertional dyspnoea 288
 experiential learning theory 400–1
 exploratory questions 404
 exposure (E) assessment 123*t*
 external quality control 38
 extracorporeal membrane oxygenation (ECMO) 140*f*
 ezetimibe 339*t*, 377*t*, 381

F

Fabry disease 250
 Facial drooping, Arm weakness, Speech difficulties, Time to call for medical help (FAST) 174
 familial thoracic aortic aneurysm and dissection (FТАAD) 261–2
 family
 CVD presentation & rehabilitation 313
 CVD prevention & rehabilitation 311
 familial thoracic aortic aneurysm and dissection 262
 high-quality care 44, 46*f*
 sudden cardiac death in the young 260*f*
 tobacco smoking cessation 320
 valvular heart disease 236*t*
 family history 15
 patient education 402
 three-generation 243–4, 243*f*
 FAST (Facial drooping, Arm weakness, Speech difficulties, Time to call for medical help) 174
 fast-response action potentials 97–8, 99*f*
 fatigue 297–8
 feet, oedema 132
 felodipine 379*t*, 391
 fenofibrate 377*t*, 380
 fibrates 377*t*, 380–1
 Finland, CVD DALYs 11*t*
 first-degree atrioventricular block 188*t*, 192
 5As (Ask, Advice, Assess, Assist, Arrange) 343
 tobacco smoking cessation 319, 319*b*
 flecainide 378*t*
 fluid exchange 86
 fluid management, cardiogenic shock 138, 140
 fluvastatin 377*t*, 380
 focused assessment 113*b*
 follow-up assessment 113*b*
 atrial fibrillation 202–3
 Folstein test 120*t*
 fondaparinux 378*t*, 382
 food diary 324*t*
 formal transition programme, CHD 276
 frailty syndrome 222
 frailty syndrome (FS) 420–2
 assessment 421–2
 definition 421
 nursing interventions 422*b*
 recognition criteria 421
 Framingham equation 13
 Framingham Heart Study 311
 CVD risk factors 12
 physical activity 330
 France 11*t*
 Frank–Starling mechanism 285, 286*f*
 Fried Scale 222
 FS *see* frailty syndrome (FS)
 functional health literacy 409*t*
The Future of Nursing, Leading Change, Advancing Health (IOM) 74

G

gas exchange, blood flow 86
 gastrointestinal system assessment 131
 GCS (Glasgow Coma Scale) 124
 gemfibrozil 377*t*, 380
 gender issues 428–30, 431, 432–3*t*, 433–5
 CVD prevalence 9
 poverty and 429–30
 see also women
 gender-sensitive interventions 343
 Generalized Anxiety Disorder Scale-7 342
 genes 245*t*
 genetic conditions 12
 genetic counselling 246–7
 genetics 242–3
 terms 245*t*

genetic testing 244–5, 245*f*
 Brugada syndrome 257
 challenges of 246–7
 definition 245*t*
 dilated cardiomyopathy 251
 uncertain results 245, 246*t*
 Germany
 CVD DALYs 11*t*
 hospitalizations 11*t*
 Gibbs, G. 69–70, 69*f*
 GLA (alpha-galactosidase A) gene 250
 Glasgow Coma Scale (GCS) 124
 Global Burden of Disease (GBD) 4, 10
 Global Cardiovascular Nursing Leadership Forum (GCNLF) 74, 357*t*
 global cardiovascular risk 12
 The Global Heart Hub 357*t*
 GLP-1RAs 378*t*
 glucagon-like peptide-1 receptor agonists (GLP-1RAs) 388
 glyceryl trinitrate (GTN) 379*t*, 388, 406
 glycoprotein IIb/IIIa inhibitors 378*t*, 386–7
 GRACE score 171
 great cardiac vein 89*f*
 Group Health Research Institute 45
 guanine (G) 242
 guideline implementation, primary health settings 350
 Guide to Healthy Shopping 350

H

habit, medication adherence 376*t*
 haematological system assessment 131–2
 haemostasis management 141
 HbA1c 339–40
 HBPM (home blood pressure monitoring) 336, 336*t*
 HCM *see* hypertrophic cardiomyopathy (HCM)
 head tilt & chin lift manoeuvre 125*f*
 healing environment, CAD nursing care 170–1
 health assessment
 components 113
 definition 112

- nursing vs. medical assessment 112
- types of 113*b*
- Health Behaviour in School-age Children (HBSC) study 16–17
- Health Belief model 317
- healthcare professionals 276
- health education
 - programmes 349–50
- health history 114
- health information 263
- health literacy 410*t*
 - interactive health literacy 409*t*
 - levels of 409*t*
 - patient education and 408–10
 - prevalence 409–10
- Health Literacy Centre for Europe 410
- health perception & management 117*t*
- health-promotion 309
- health-related quality of life 341–4, 422
 - assessment 342
 - interventions 342–3
- healthy eating habits 322–9
 - behavioural strategies 323–4, 326
 - communication 325–6, 325*t*
 - dietary intake 323, 323*f*, 324*f*
 - low-density lipoprotein cholesterol lowering 326, 326*t*
 - low-risk diets 322–3
 - optimal weight 326–8, 327*f*, 328*t*
 - weight loss 328*f*, 329, 330*t*, 331*f*
 - see also* diet; nutrition
- HEalthy Life in an Urban Setting (HELIUS) study 20
- heart
 - auscultation 93
 - electrical properties *see* electrical properties of heart
 - sounds *in* physical examination 125, 129*f*
- heart failure (HF) 283–301
 - acute setting care 372
 - aetiology 285–6, 285*t*
 - aortic stenosis 219
 - cardiovascular system assessment 127*t*
 - case studies 294, 295–6*t*, 412–13*t*, 415–16*t*
 - classification 284*t*
 - clinical presentation 285–92
 - complications 294, 297–8, 297*b*
 - comprehensive management 292–4
 - diagnosis 289*f*, 290*f*
 - epidemiology 284–5
 - history-taking 287–8
 - laboratory tests 292
 - medical investigations 287
 - multimorbidity 422
 - nursing assessment 287–92
 - pathophysiology 284–5
 - patient education 410–11
 - physical examination 288–92
 - preserved ejection fraction
 - with 433
 - studies 48
 - symptoms and signs 287, 288*t*, 292*t*
 - ventricular remodelling 286
 - women 431, 433–4
- Heart Friends Around the World (HFATW) 355*t*
- heart mechanics 90–4
 - cardiac cycle 91–3, 92*f*
 - contractility 90
- heart rate 96, 97
 - atrial fibrillation 194
 - physical examination 124–5
- heart rate control, ECG 105
- HeartScore 349
- Heart Team 223, 225*f*
- Heart to Heart Project 309*t*
- heart valve procedures
 - echocardiography 234
 - home transition 232
 - post-procedure 232, 234–5, 237
 - surveillance 232, 234
- Heavy Smoking Index 319, 319*t*
- height measurement 328
- heparin 378*t*, 382–3
- hepatic portal vein 83*f*
- hepatic vein 83*f*
- hepatojugular reflux 291, 291*f*
- hexaxial reference system 100–1, 102*f*
- HF *see* heart failure (HF)
- HFATW (Heart Friends Around the World) 355*t*
- high blood pressure *see* hypertension
- high-quality care 29–53
 - barriers to 49–50
- core elements 30*t*
- definition 29–30
- effectiveness 31–4
- efficiency 36–44
- elements of 29–30
- equitability 35–6
- evidence-based care 31–4
- evidence for *see* evidence-based care
- fundamentals 30
- nursing workforce 30
- people-centred *see* people-centred care
- PROMs & PREMS 42–4
- safety 30–1
- technology & informatics 41–2
- timeliness 34–5
- high-quality communication 402
- high-risk strategy 21, 21*t*, 22*t*
- His-Purkinje network 96
- history-taking, heart failure 287–8
- holistic care 419–42
 - challenges 420, 420*f*
 - CVD prevention & rehabilitation 309
- Holter monitoring
 - arrhythmias 182
 - long QT syndrome 255
- home blood pressure monitoring (HBPM) 336, 336*t*
- Hospital Consumer Assessment of Healthcare Providers and System (HCAHPS) 43
- hospitalization 10, 11*t*, 344–8
 - ECG-monitoring in arrhythmias 182
 - in-hospital* mortality 31
- hospital settings
 - historical perspective 344
 - programmes 344–8
- Hungary, hospitalizations 11*t*
- hydrostatic pressure, capillaries 86
- hyperkalaemia
 - anticoagulant side effects 382–3
 - atrioventricular block 192
 - heart failure 297
- hypertension 425, 430
 - definitions of 336*t*
 - differential diagnosis 153*t*
 - women 433

- hypertrophic cardiomyopathy (HCM) 248, 249*t*, 250–1
 - genetic testing 244
- hypertrophy, ventricles 89
- hypoglycaemic medication 425
- H zone 95*f*
- I**
- IABP (intra-aortic balloon pump) 139*t*, 140*f*
- IACR (Irish Association of Cardiac Rehabilitation) 356*t*
- I band 95*f*
- ICCPR (International Council of Cardiovascular Prevention and Rehabilitation) 356*t*
- ICCU (intensive cardiac care units) 182
- ICDs *see* implantable cardioverter defibrillators (ICDs)
- ICHOM (International Consortium for Health Outcomes Measurements) 42
- ICN (International Council of Nurses) 59, 449
- idioventricular rhythm 187*t*
 - bradyarrhythmia 186, 192
- IFG (impaired fasting glucose) 340*t*
- IGT (impaired glucose tolerance) 340*t*
- IHF (Irish Heart Foundation) 356*t*
- IHI Model 39, 39*f*
- iliac artery 83*f*
- iliac vein 83*f*
- illness perceptions 341–4
 - assessment 342
 - interventions 342–3
- imaging
 - cardiovascular system assessment 127*t*
 - initial assessment 127*t*, 129
 - magnetic resonance imaging 250
 - valvular heart disease 220–2
 - see also* chest X-ray
- immigrants 19–20
- immune system assessment 131–2
- immunizations 265
- IMPACT modelling 7, 9*f*
- impaired fasting glucose (IFG) 340*t*
- impaired glucose tolerance (IGT) 340*t*
- Impella® 139*t*, 140*f*
- implantable cardioverter defibrillators (ICDs) 206
 - arrhythmias 199
 - catecholaminergic polymorphic ventricular tachycardia 259
 - deactivation 206
 - heart failure 294
 - indications 201
 - long QT syndrome 256
 - long-term management 299
 - patient care 298
 - patient education/psychoeducation 205
 - restrictions 201–2
 - surgical procedures 202
 - therapy types 201
 - types 200–1
- implantable loop recorders 182–3
- implanted cardiac devices, infective endocarditis 218
- improvement, quality management 38–9
- incisiran 377*t*, 381
- independent prescriber 370, 371–2
- infectious diseases 284
- infective endocarditis
 - assessment pathway 221–2, 221*f*
 - best practice integration 231–2
 - case studies 233–4*t*
 - clinical presentation 220
 - incidence 216–17
 - medical management 225–6
 - palliative care 231
 - pathophysiology 218–19
 - surgical treatment 231
- inferior vena cava 83*f*, 88*f*, 89*f*
- inflammation markers 127*t*
- informal carers 402
- informatics 41–2
- information, arrhythmias 185–6
- inherited arrhythmias 254–9, 254*t*
 - see also* Brugada syndrome (BS); catecholaminergic polymorphic ventricular tachycardia (CPVT); long QT syndrome (LQTS)
- inherited cardiac conditions 241–82
 - clinical management 264–5, 264*t*
 - diagnostic journey 264
 - emotional challenges 262
 - family care 265–6
 - genetic counselling 247–8
 - genetic testing *see* genetic testing
 - lifestyle advice 265
 - nursing care 262–6, 263*f*
 - psychological challenges 262
 - specialised multidisciplinary clinics 262
 - sudden cardiac death 266
 - see also* congenital heart disease (CHD); inherited arrhythmias; inherited cardiovascular conditions; inherited connective tissue disorders
- inherited cardiomyopathies 248, 248*f*, 249*t*, 250–4
 - see also* arrhythmogenic right ventricular cardiomyopathy (ARVC); dilated cardiomyopathy (DCM); hypertrophic cardiomyopathy (HCM); left ventricular non-compaction (LVNC); restrictive cardiomyopathy (RCM)
- inherited cardiovascular conditions 248, 250–60
 - see also* inherited cardiomyopathies
- inherited connective tissue disorders 260–2
 - familial thoracic aortic aneurysm and dissection 261–2
 - Marfan syndrome 260–1
 - vascular Ehlers–Danlos syndrome 261
- in-hospital continuous electrocardiographic monitoring, arrhythmias 182
- in-hospital mortality 31
- initial assessment 114–19
 - body systems *see* assessment
 - chief complaint 116, 119, 121*b*
 - imaging 127*t*, 129
 - life-threatening conditions 114–15
 - pain assessment 119
- initiation, medication adherence 373*b*
- inotropes 138

- Institute for Patient- and Family-Centred Care 44–5
- Institute of Medicine (IOM)
The Future of Nursing, Leading Change, Advancing Health 74
 high quality of care 29
- insulin 332, 332*t*
- insurance, inherited cardiac conditions 265
- integrated care 63–4
- integrated models, community settings 351
- integumental system assessment 132
- intensive cardiac care units (IC-CUs) 182
- interactive health literacy 409*t*
- interdisciplinary working
 definition 66*t*
 pharmacology 372–3
- INTERHEART study 12, 149, 306
- International Consortium for Health Outcomes Measurements (ICHOM) 42
- International Council of Cardiovascular Prevention and Rehabilitation (ICCPR) 356*t*
- International Council of Nurses (ICN) 59, 449
- International Diabetes Federation 328*t*
- interpersonal level of care 45–6
- INTERSTROKE study 306
- intra-aortic balloon counter-pulsation 139*t*
- intra-aortic balloon pump (IABP) 139*t*, 140*f*
- intrinsic heart rate 96, 96*t*, 97
- Investing in Children: The European Child and Adolescent Health Strategy 2015–2020* 18
- IOM *see* Institute of Medicine (IOM)
- ionizing radiation 63–4
- I-PAHC (Patient Experiences with Inpatient Care) 43
- Ireland
 CVD DALYs 11*t*
 hospitalizations 11*t*
- Irish Association of Cardiac Rehabilitation (IACR) 356*t*
- Irish Heart Foundation (IHF) 356*t*
- irregular narrow complex tachycardia 194
- ischaemic heart disease 8
- isoprenaline 378*t*, 387*t*
- isovolumetric contraction 91
- isovolumetric relaxation 92–3
- Italy, CVD DALYs 11*t*
- J**
- Joint Commission on Accreditation of Healthcare Organizations 30
- jugular vein 83*f*
- jugular venous distension 290–1, 291*f*
- junctional ectopic foci 96*t*
- junctional rhythm 187*t*
 bradyarrhythmia 186
- Juran, J. 37
- Juran Trilogy 37–9, 37*f*
- K**
- Kansas City Cardiomyopathy questionnaire (KCCQ) 43*t*
- KCNQ1 gene 254
- L**
- laboratory tests, heart failure 292
- LAMP-2 (lysosome-associated membrane protein-2) gene 250
- Latvia, CVD DALYs 11*t*
- LDL *see* low-density lipoprotein (LDL)
- LDL-C *see* low-density lipoprotein-cholesterol (LDL-C)
- leadership *see* effective nursing leadership
- Lean method 39
- left anterior descending artery 89*f*
- left atrium 88*f*
- left axis deviation, ECG 101
- left bundle branch 98*f*
- left cardiac sympathetic denervation 259
- left common carotid artery 88*f*
- left coronary arteries 89
- left main coronary artery 89*f*
 CAD 147–8
- left pulmonary artery 89*f*
- left pulmonary veins 88*f*
- left subclavian artery 88*f*
- left ventricle 88*f*
 decompression in cardiogenic shock 140–1
 masses in valvular heart disease 220
- left ventricular assist devices (LVADs) 298–9
- left ventricular non-compaction (LVNC) 249*t*, 253–4
- left ventricular outflow tract obstruction (LVOTO) 250
- levosimendan 391*t*
- lidocaine 378*t*
- life expectancy 422
 heart failure 284
- lifestyle changes 15, 48, 444
 blood lipid lowering 338–9, 339*f*
 blood-pressure lowering 338*b*
 chronic coronary syndromes 173
 CVPR 312–13, 316–18, 317*b*
 diabetes mellitus 341*b*
 inherited cardiac conditions 265
 polypharmacy 425
see also behavioural change
- life-threatening conditions assessment 114–15
- lifetime risk calculation 19
- limb lead position, ECG 99–101, 101*f*
- limb perfusion, cardiogenic shock 140
- lipid-lowering medications 377*t*, 379–81
 anion exchange resins 377*t*, 380
 cholesterol absorption inhibitors 377*t*, 381
 fibrates 377*t*, 380–1
 inclisiran 381
 niacin 381
 nicotinic acid 381
 PCSK9 inhibitors 377*t*, 381
 statins 377*t*, 380
 technology & adherence 408*b*
- liraglutide 378*t*, 388
- Lithuania, hospitalizations 11*t*
- LMWH (low-molecular weight heparin) 378*t*, 382
- local escalation policy 135
- Loeys–Dietz syndrome 260
- loneliness 341

long QT syndrome (LQTS) 254–6, 254*t*
 diagnostic criteria 256*b*
 genetic counselling 247
 risk scores 255*t*
 losartan 379*t*
 low- and middle-income countries
 (LMICs) 428
 low-carbohydrate diet 329
 low-density lipoprotein (LDL)
 atherosclerosis 148
 dietary reduction 330, 332
 low-density lipoprotein-cholesterol
 (LDL-C)
 dietary reduction 330, 332
 healthy eating habits 326, 326*t*
 low-molecular weight heparin
 (LMWH) 378*t*, 382
 low-risk diets 322–3
 LVADs (left ventricular assist de-
 vices) 298–9
 LVNC (left ventricular non-compac-
 tion) 249*t*, 253–4
 LVOTO (left ventricular outflow tract
 obstruction) 250
 lysosome-associated membrane pro-
 tein-2 (*LAMP2*) gene 250

M

magnesium chloride 378*t*, 387*t*
 magnetic resonance imaging
 (MRI) 250
 MAP (mean arterial pressure) 94, 94*f*
 Marfan syndrome 260–1
 McNew Questionnaire 43
 mean arterial pressure (MAP) 94, 94*f*
 mechanical circulatory support (MCS)
 cardiogenic shock 138–41, 139*t*
 complications 140*f*
 outcomes 141, 141*t*
 mediastinum 87, 87*b*, 88*f*
 medical assessment 112
 medication adherence 373–7
 definition 373–4
 influences on 374
 non-adherence 373, 374
 nurses role 374–7
 polypharmacy 425, 426
 side effects 375
 strategies 375–7, 376*t*
 terminology 373*b*

medication non-adherence 373, 374
 medication organizers 375–6, 376*t*
 medication prescribing 366–7
 advanced nursing practice 63–4
 approaches to 367–8
 responsibilities 367–8
 medications 377–9*t*, 377–91
 antiarrhythmic agents *see* antiar-
 rhythmic drugs
 anticoagulants *see* anticoagulants
 antiplatelet drugs *see* antiplatelet
 agents
 blood lipid lowering 339*t*
 blood-pressure lowering 336–8,
 337*t*, 338, 338*b*, 379*t*
 CVD 366
 emergency & cardiogenic
 shock 391, 391*t*
 health history 114
 lipid-lowering medications *see*
 lipid-lowering medications
 new diabetes drugs *see* new diabe-
 tes drugs with cardiovascular
 benefits
 optimization 374, 375*b*
 tissue perfusion promoters *see* tis-
 sue perfusion promoters
 tobacco smoking cessation 321
 Mediterranean diet 322–3, 329
 Mediterranean Diet Adherence
 Screener (MEDAS-14) 323,
 323*f*
 mental health
 multimorbidity 422
 valvular heart disease 236*t*, 237
 MESA (Multi Ethnic Study of Athero-
 sclerosis) 313
 mesenteric arteries 83*f*
 metabolic assessment 117*t*
 MFR *see* multifactor risk reduction
 (MFR)
 MHFQ (Minnesota Heart Failure
 Questionnaire) 43*t*
 MI *see* myocardial infarction (MI)
 MIDAS (Myocardial Infarction Dimen-
 sional Assessment Scale) 342
 middle internodal tract 98*f*
 milrinone 391*t*
 mineralocorticoid receptor antago-
 nists 379*t*, 390

Mini-Mental State Examination
 (MMSE) 120*t*
 Minnesota Heart Failure Question-
 naire (MHFQ) 43*t*
 Minnesota Living with Heart Failure
 (MLHF) questionnaire 342
 MINOCA (myocardial infarction with
 non-obstructive coronary
 arteries) 151–2
 mitochondrial disease 243*f*, 244
 mitral regurgitation
 clinical presentation 220
 pathophysiology 218
 surgical valve replacement 226
 mitral stenosis
 clinical presentation 219–20
 pathophysiology 218
 mitral valve 88*f*
 repair 226
 transcatheter repair 228, 231
 mitral valve leaflet plication 228, 231
 MLHF (Minnesota Living with Heart
 Failure) questionnaire 342
 M-line 95*f*
 MMSE (Mini-Mental State Examina-
 tion) 120*t*
 mobile cardiac telemetry
 devices 183
 mobile phone text messaging 408*b*
 mobility reduction, CAD nursing
 care 171
 Mobitz type I 188*t*, 192
 Mobitz type II 188*t*, 192
 temporary cardiac pacing 200
 Model for Improvement 39
 modifiable risk factors 16
 Modified Medical Research Council,
 dyspnoea scale 124*b*
 molecular autopsy 259
 MONICA (Multinational MONitoring
 of Trends and Determinants
 of Cardiovascular Disease)
 project 4–5
 monitor stations, arrhythmia 184
 mortality
 age-standardized *see* age-stan-
 dardized mortality
 cardiovascular disease 5–8
 risk models in valvular heart
 disease 223

- transcatheter aortic valve implan-
tation 228
 - motivational interviewing 376, 376*t*
 - MRI (magnetic resonance imag-
ing) 250
 - mucosal membrane integrity 141
 - multimorbidity 422–4
 - Multidimensional Scale of Perceived
Social Support 342
 - multidisciplinary approach, patient
education 411
 - multidisciplinary teams
 - atrial fibrillation 202
 - definition 66*t*
 - multimorbidity 423–4
 - Multi Ethnic Study of Atherosclerosis
(MESA) 313
 - multifactor risk reduction
(MFRR) 314
 - programmes 307–8*t*, 310
 - working models of care 309*t*
 - MULTIFIT 309*t*
 - multimorbidity 422–4, 424*b*
 - Multinational MONItoring of Trends
and Determinants of Cardio-
vascular Disease (MONICA)
project 4–5
 - multiple treatment options, valvular
heart disease 224
 - multiple ventricular septal defect 269*f*
 - muscular ventricular septal
defect 269*f*
 - My Action for Our Hearts 309*t*
 - MyAction programme 351
 - myocardial infarction (MI)
 - classification 150
 - thrombotic coronary artery occlu-
sion 147
 - transcatheter aortic valve implan-
tation 228
 - type 1 151
 - type 2 151
 - type 3 151
 - type 4 151
 - type 5 151–2
 - see also* non-ST-segment eleva-
tion myocardial infarction
(NSTEMI); ST-segment ele-
vation myocardial infarction
(STEMI)
 - Myocardial Infarction Dimensional
Assessment Scale
(MIDAS) 342
 - myocardial infarction with non-ob-
structive coronary arteries
(MINOCA) 151–2
 - myocardial ischaemia 150–1
 - CAD 149
 - cardiovascular system assess-
ment 127*t*
 - Myocardial Ischaemia National Audit
Project (MINAP) 38
 - myocardial ischaemia without cell
damage 151
 - myocardium 87
 - myocytes 94
 - myopericarditis 153*t*
 - myosin 95, 95*f*
- N**
- National Audit of Cardiac Rehabilita-
tion (NACR) 346, 347*f*
 - National Cardiac Audit Programme
(NACP) 38
 - National Center for Cultural Compe-
tence 34–5
 - National Early Warning System 2
(NEWS2) 133*t*
 - deteriorating patient care 133,
133*t*
 - National Institute for Health and Care
Excellence (NICE), medication
non-adherence 374
 - National Institute for Prevention and
Cardiovascular Health Ireland
(NIPC) 356*t*
 - natriuretic peptides 286
 - nausea, heart failure 297–8
 - Netherlands, hospitalizations 11*t*
 - net reclassification index 15
 - neurohormonal activation 285–6
 - neurological assessment 141
 - neurological system assessment 131
 - new diabetes drugs with cardiovascu-
lar benefits 378*t*, 388
 - NEWS2 *see* National Early Warning
System 2 (NEWS2)
 - NHA (Nigerian Heart Associa-
tion) 357*t*
 - niacin 377*t*, 381
 - NICE (National Institute for Health
and Care Excellence), medica-
tion non-adherence 374
 - nicotine replacement therapy
(NRT) 321–2
 - nicotinic acid 377*t*, 381
 - nifedipine 379*t*, 391
 - Nigerian Heart Association (NHA) 357*t*
 - NIPC (National Institute for Preven-
tion and Cardiovascular Health
Ireland) 356*t*
 - nitrates 251, 379*t*
 - non-ST-segment elevation-acute
coronary syndrome (NSTEMI-
ACS) 154, 157*f*
 - case studies 156–69, 159*f*, 161*t*,
162*f*, 165*f*, 166*t*, 167*f*, 168*t*
 - non-ST-segment elevation myocar-
dial infarction (NSTEMI) 147
 - in-hospital ECG monitoring 183*t*
 - unstable angina vs. 154
 - women 431
 - non-verbal communication 404*t*
 - non-verbal cues 404
 - non-vitamin K antagonists 203
 - noradrenaline (norepinephrine) 86*t*,
391*t*
 - cardiogenic shock 138
 - Nordic Research Project 330
 - nosocomial infections, telemetry
units 185
 - NRS *see* numeric rating scale (NRS)
 - NRT (nicotine replacement
therapy) 321–2
 - NSTEMI *see* non-ST-segment elevation
myocardial infarction (NSTEMI)
 - nucleotides, DNA 242
 - numeric rating scale (NRS)
 - 11-point numeric rating scale 121*f*
 - pain 119
 - nurses 448–9
 - arrhythmias 199–200
 - assessment 113–14
 - community settings 351, 352*b*
 - CVD prevention &
rehabilitation 309
 - frailty syndrome 422*b*
 - high-quality care 30
 - valvular heart disease 224, 224*b*
 - nursing education 56, 185, 351

Nursing Now campaign 448
 nutrition
 assessment 117*t*
 CAD nursing care 171
 valvular heart disease 236*t*
 see also diet; healthy eating habits

O

OARS (Open-ended questions, Affirmation, Reflective listening, Summarizing) 326–7
 OARS principles 318*b*
 obesity 326–7, 430
 children 17
 trends in 18
 women 431, 433
 see also overweight
 oculomotor glance reflex 126*f*
 OECD (Organization for Economic Co-operation and Development) 61
 oedema
 feet 132
 heart failure 297–8
 Office of the Nursing and Midwife Service Directory 62
 OGTT (oral glucose tolerance test) 339
 old age *see* ageing
 Open-ended questions, Affirmation, Reflective listening, Summarizing (OARS) 326–7
 oPQRSTa mnemonic 116, 121*b*
 optimal weight 326–8, 327*f*, 328*t*
 oral glucose tolerance test (OGTT) 339
 organ damage, heart failure 294, 297
 Organization for Economic Co-operation and Development (OECD) 61
 orthopnoea 288–9
 orthostatic hypotension 125
 Osteoporotic Fractures Index 222
 ostium primum atrial septal defects 269*f*, 273
 ostium secundum atrial septal defects 269*f*, 273
 outcome measures, high quality of care 35
 outpatient care, atrial fibrillation 202–3

overweight 326–7
 children 17
 trends in 18
 see also obesity
 oxygen, blood flow 86
 oxygen saturation 130
 oxygen therapy, cardiogenic shock 138

P

P2Y12 inhibitors 384–5
 pacemakers, permanent 193
 PAD (peripheral artery disease) 174, 434
 pain assessment
 initial assessment 119
 valvular heart disease 236*t*
 palliative/supportive care 427–8, 428*b*
 Panic Attack Treatment in Comorbid Heart Diseases (PATCHD) 343
 paroxysmal atrial fibrillation 195
 paroxysmal atrial tachycardia 190*t*, 194
 paroxysmal nocturnal dyspnoea 288–9
 PARTNER (Placement of Aortic Transcatheter Valve) clinical trial 227
 passive smoking 349
 past quit attempts, tobacco smoking cessation 320
 PATCHD (Panic Attack Treatment in Comorbid Heart Diseases) 343
 patent ductus arteriosus 270*f*, 273
 patient-centred care
 atrial fibrillation 202
 high-quality care 46*f*
 patient decision aids 407
 patient discharge
 acute myocardial infarction 414
 CAD nursing care 171–2, 172*b*
 surgical valve replacement 227
 patient education 401*f*
 acute myocardial infarction 414, 416
 adult learning principles 400–1
 CHD 276
 educational theory 400–1
 effective strategies 406–8
 health literacy and 408–10
 heart failure 410–11
 informal carers and 402
 teaching approach 401*b*
 valvular heart disease 235, 236*t*
 patient engagement 444
 Patient Experiences with Inpatient Care (I-PAHC) 43
 Patient Health Questionnaire Questionnaire-9 342
 patient-reported experience measures (PREMs)
 high-quality care 42–4
 valvular heart disease 237
 patient-reported outcome measures (PROMs) 31
 high-quality care 42–4
 valvular heart disease 237, 238*f*
 Patient-Reported Outcomes Measurement Information System (PROMIS) 43
 patients, deterioration of *see* deteriorating patient care
 PCI (percutaneous coronary intervention) 151
 PCNA (Preventative Cardiovascular Nurses Association) 74, 357*t*
 PCSK9 inhibitors 339*t*, 377*t*, 381
 PDSA (Plan–Do–Study–Act) 39
 people-centred care 44–9
 cardiovascular conditions 47–8
 concepts 44–5
 high-quality care 30*t*
 outcome effects 45
 self-care and 48–9
 strategies for 45–7
 percutaneous coronary intervention (PCI) 151
 pericardium 88*f*
 peripartum cardiomyopathy (PPCM) 433, 434
 peripheral artery disease (PAD) 174, 434
 peripheral oedema 127*t*
 peripheral pulses 127*t*
 permanent atrial fibrillation 195
 permanent cardiac pacing 200
 permanent pacemakers 193

- persistence, medication adherence 373*b*
 persistent atrial fibrillation 195
 person-centred holistic approach 423
 pharmacogenetics 391–2
 pharmacogenomics 391–2
 pharmacology 369–95
 cardioversion 196
 interdisciplinary working 372–3
 pharmacogenetics 391–2
 pharmacogenomics 391–2
 see also medication prescribing; medications; polypharmacy
 pharmacy refill data 375
 phenotype 245*t*
 physical activity 329–34, 331*f*
 benefit thresholds 332–3, 333*b*, 333*f*, 334*f*
 CAD nursing care 171
 cardioprotective effects 332*t*
 children 17
 efficiency 333–4, 334*t*, 335*f*
 insulin levels 332, 332*t*
 measurement 334*t*
 quality care 50
 see also physical inactivity
 physical disability 422
 physical examination 127*t*
 biomarkers 127*t*, 128–9
 cardiovascular system 124–5, 127*t*
 ECG *see* electrocardiography (ECG)
 heart failure 288–92
 physical impairments
 CHD 274, 276
 patient education 406
 physical inactivity 331*f*
 atherosclerosis 149
 reduction 331*t*
 see also exercise; physical activity
 physical rehabilitation, valvular heart disease 237
 physiology 81–110
 electrical properties 94–6
 Picker Patient Experience Questionnaire (PPE-15) 43
 PICOTS model 33–4, 34*t*
 Placement of Aortic Transcatheter Valve (PARTNER) clinical trial 227
 plain language, communication 405
 Plan–Do–Study–Act (PDSA) 39
 planning
 patient education 406
 quality management 38
 pleural effusion 291
 Poland, CVD DALYs 11*t*
 polypharmacy 424–7, 427*b*
 appropriate 424
 CVD 425–6
 elderly 426
 problematic 424
 Pompe disease 250
 population strategy 21, 21*t*, 22*t*
 positive behaviour 444
 post-acute coronary syndrome 426
 posterior intermodal tract 98*f*
 posterior interventricular artery 89
 postoperative delirium 227
 postoperative mobilization, surgical valve replacement 226
 post-primary percutaneous coronary intervention, NSTEMI 169
 poverty, gender issues and 429–30
 PPCI (primary percutaneous coronary intervention) 154, 156*f*
 PPCM (peripartum cardiomyopathy) 433, 434
 P-Q-R-S-T-A mnemonic 116
 prasugrel 378*t*, 384
 pravastatin 377*t*
 precapillary sphincters, arterioles 84
 precipitating factors, atrial fibrillation 196
 precision personalized medicine 448
 precordial lead position 101, 102*f*
 pre-diabetes 329
 PREDIMED study 323
 pregnancy, Marfan syndrome 261
 premembrane ventricular septal defect 269*f*
 PREMs *see* patient-reported experience measures (PREMs)
 prescribing *see* medication prescribing
 presyncope, aortic stenosis 219
 Prevención con Dieta Mediterránea (PREDIMED) trial 322–3
 Preventative Cardiovascular Nurses Association (PCNA) 74, 357*t*
 primary care settings 348–50
 community settings 350–1, 350*b*
 risk identification 349
 World Health Organization 348–9
 primary health settings
 brief interventions 349
 clinical community settings 350
 future options 350
 guideline implementation & quality 350
 health education programmes 349–50
 primary percutaneous coronary intervention (PPCI) 154, 156*f*
 primary prevention 21, 22*t*
 CVPR 312–14
 definition 304*t*
 primordial prevention 21, 22*t*
 CVPR 312–14
 definition 304*t*
 PR interval 104, 104*f*, 107
 normal/abnormal parameters 107*t*
 Prinzmetal angina 160, 162–4, 162*f*, 163*t*
 PRKAG2 gene (adenosine monophosphate-activated protein kinase) 250, 378*t*
 proband genetic testing 245*t*
 problematic polypharmacy 424
 problem-based assessment 113*b*
 professional associations 354, 354–7*t*
 professional development 55–77
 education over career 56, 57*f*, 58
 experience continuum 58*f*
 professional societies 73–4
 reflective practice 68
 professional societies 73–4
 PROMIS (Patient-Reported Outcomes Measurement Information System) 43
 PROMs *see* patient-reported outcome measures (PROMs)
 propranolol 378*t*
 protein 245*t*
 proton pump inhibitors (PPI) 425
 psychological factors 429
 behavioural change 317*b*
 CAD nursing care 171
 CHD 274, 276
 inherited cardiac conditions 262, 263
 medication adherence 374
 tobacco smoking cessation 320

psychosocial factors 341–4
 acute myocardial infarction 414
 assessment 342
 atherosclerosis 149
 CHD 276
 CVPR 313
 genetic counselling 247
 interventions 342–3
 public health measures 313–14
 Puerto Rico Heart Health Program 330
 pulmonary artery 83*f*, 89
 catheters in cardiogenic shock 137
 pulmonary complications, heart failure 297
 pulmonary oedema 289
 pulmonary valve 93
 stenosis 274
 pulmonary vein 83*f*
 pulmonic stenosis 270*f*
 pulse oximetry
 National Early Warning System 2 (NEWS2) 133*t*
 oxygen saturation 130
 pulse pressure 94
 heart failure 292
 pulse rate 125
 Purkinje fibres 96, 96*t*, 98*f*
 P wave 104–5, 104*f*, 106–7, 106*t*
 normal/abnormal parameters 107*t*

Q

QRS complex 104, 104*f*, 106*t*, 108
 mean axis 103–4, 103*f*, 103*t*, 104*t*
 normal/abnormal parameters 107*t*
 QTc interval 107–8
 QT interval 107–8
 arrhythmia monitoring 183
 ECG 104, 104*f*
 normal/abnormal parameters 107*t*
 qualitative data 34
 quality improvement (QI) 30
 quality management 37–9
 quality measurement 36–41
 quality of life (QoL) 297–8
 quantitative data 34
 questionnaires
 Brief Illness Perception Questionnaire 342

Coronary Revascularization Outcome Questionnaire 43*t*
 disease-specific questionnaires 43*t*
 exploratory questions 404
 Kansas City Cardiomyopathy questionnaire 43*t*
 McNew Questionnaire 43
 Minnesota Heart Failure Questionnaire 43*t*
 Minnesota Living with Heart Failure questionnaire 342
 Open-ended questions, Affirmation, Reflective listening, Summarizing 326–7
 Patient Health Questionnaire Questionnaire-9 342
 Seattle Angina Questionnaire 43*t*, 342
 Q wave 104, 104*f*
 normal/abnormal parameters 107*t*

R

RAAS (renin–angiotensin–aldosterone system) 286, 287*f*, 389*f*
 ramipril 379*t*
 randomized controlled trials (RCTs) 332
 Rapid Estimate of Adult Literacy in Medicine (REALM) 410, 410*t*
 Rastelli operation 271
 Rate Control Efficacy in Permanent AF (RACE II) study 197
 RCM (restrictive cardiomyopathy) 249*t*, 253
 REALM (Rapid Estimate of Adult Literacy in Medicine) 410, 410*t*
 reflective practice 65, 67*f*, 68–70
 applications 69–70
 Boud method 68, 69*f*
 Gibbs method 69–70, 69*f*, 70*t*
 methods of 68–9, 69*f*
 regulation, advanced nursing practice 61
 relative risks 12–13
 reminder systems, medication adherence 376*t*
 renal artery 83*f*
 renal system
 assessment 131
 cardiogenic shock 138
 renal vein 83*f*
 renin–angiotensin–aldosterone system (RAAS) 286, 287*f*, 389*f*
 renin–angiotensin–aldosterone system drugs 388–90
 mineralocorticoid receptor antagonists 390
 see also angiotensin-converting enzyme (ACE) inhibitors; angiotensin II receptor blockers
 reproductive health assessment 119*t*
 respiratory rate 133*t*
 respiratory support, cardiogenic shock 138
 respiratory system
 assessment 130–1
 heart failure 288–90
 restrictive cardiomyopathy (RCM) 249*t*, 253
 rheumatic mitral stenosis 219
 rheumatic valvular heart disease 218
 rhythm control strategy, atrial fibrillation 196–7
 right atrium 88*f*
 right axis deviation, ECG 101
 right bundle branch 98*f*
 right coronary artery (RCA) 89–90, 89*f*
 CAD 147–8
 right marginal artery 89*f*
 right pulmonary arteries 88*f*, 89*f*
 right pulmonary vein 88*f*
 right ventricle 88*f*
 risk across lifespan 12–20
 risk algorithms 13
 risk estimation 12–13, 314
 equations 13–15, 13*t*, 14*t*
 European recommendations 10*f*
 future work 20
 primary care settings 349
 stratification tests 264
 risk factor control
 CVD prevention & rehabilitation 304
 CVPR 316
 pharmaceuticals 367*b*
 risk estimation and 15–16
 risk factors
 CVPR 312–13
 modifiable 16
 modifiers of 19

rivaroxaban 378*t*, 384
 aspirin and 386–9
 role expansion, advanced nursing
 practice 59–61
 Romania, CVD DALYs 11*t*
 rosuvastatin 377*t*
 run charts 39, 40*f*, 41
 Russian National Medical Society of
 Preventive Cardiology 357*t*

S

sacubitril–valsartan 390
 safety, high-quality care 30–1
 Safety Quality and Experience (SQE)
 training programme 40*f*
 SAMPLE 115, 116*b*
 SA node *see* sinoatrial (SA) node
 SAQ (Seattle Angina Question-
 naire) 43*t*, 342
 sarcomeres 95, 95*f*
 genes 250
 Saudi Heart Association (SHA) 357*t*
 SBC (Society of Brazilian Cardiol-
 ogy) 357*t*
 SBP *see* systolic blood pressure (SBP)
 SCAI (Society for Cardiovascular
 Angiography and Interven-
 tions) 137, 137*f*
 SCD (sudden cardiac death) 266
 Schon, D. 65
 SCORE 2 20
 SCORE-OP 19
 SCORE (Systematic COronary Risk
 Evaluation) project 13, 19,
 315, 349
 Scottish Intercollegiate Guideline
 network 346
 screening assessment 113*b*
 Seattle Angina Questionnaire
 (SAQ) 43*t*, 342
 secondary prevention 21, 22*t*
 definition 304*t*
 second-degree AV block 188*t*, 192
 Second Manifestation of Arterial Di-
 sease (SMART) 315, 318
 dietary intake 323–4
 self-care/management 44, 401
 acute myocardial infarction 414
 caregiver contributions 48–9
 chronic coronary syndromes 173

heart failure 293–4, 411
 people-centred care and 48–9
 semaglutide 378*t*, 388
 semilunar valves 88*f*
 septal myectomy 251
 septum 88*f*
 severe rheumatic mitral stenosis 219
 sex chromosomes 242
 sexual history, arrhythmias 199
 sexuality
 arrhythmias 205–6
 assessment 119*t*
 implantable cardioverter defibrilla-
 tor 205–6
 inherited cardiac conditions 265
 valvular heart disease 236*t*
 SGL2 inhibitors 378*t*
 SGLT2 (sodium–glucose co-trans-
 porter 2) inhibitors 388
 Shewhart charts 39, 41
 shift assessment 113*b*
 shortness of breath 130, 236*t*
 Short Physical Performance Bat-
 tery 222
 silent atrial fibrillation screening 196
 simvastatin 377*t*, 380
 sinoatrial (SA) node 96*t*, 98*f*, 186
 heart rate control 97
 pacemaker cells 98
 sinoatrial node artery 89*f*
 sinus bradycardia 186, 187*t*
 NSTEMI 169
 sinus tachycardia 189*t*, 193
 sinus venosus atrial septal de-
 fects 269*f*, 273
 Six Sigma method 39
 skin integrity 141
 sleep assessment 118*t*
 sleep disturbances
 arrhythmias 185–6
 heart failure 297–8
 valvular heart disease 236*t*
 slow-response action potentials 97–8
 small cardiac vein 89*f*
 SMART *see* Second Manifestation of
 Arterial Disease (SMART)
 smartphone apps 444
 social aspects
 behavioural change 317*b*
 CHD 274, 276

social circumstances 429
 social isolation 341
 behavioural change 317*b*
 social support lack 429
 Society for Cardiovascular Angi-
 ography and Interventions
 (SCAI) 137, 137*f*
 Society of Brazilian Cardiology
 (SBC) 357*t*
 Society of Thoracic Surgeons (STS)
 score 155
 valvular heart disease 223
 sociodemographic factors 374
 socioeconomic factors 341, 428–30,
 430*b*
 behavioural change 317*b*
 sodium–glucose co-transporter 2
 (SGLT2) inhibitors 388
 sodium intake 313
 sodium–potassium pump 97
 soft drink consumption, children 17
 Spain, hospitalizations 11*t*
 specialization 59*f*
 core competencies 62, 63*f*
 definition 58–61
 education 61
 specialized clinics 262, 276
 valvular heart disease 224
 Special Turku Coronary Risk Factor
 Intervention Project for Chil-
 dren (STRIP) 312
 spiritual care, CAD nursing care 171
 spironolactone 379*t*, 390
 SpO₂ 133*t*
 sport, inherited cardiac condi-
 tions 265
 SQE (Safety Quality and Experience)
 training programme 40*f*
 stable angina 152
 Stanford Cardiac Rehabilitation
 Programme 309*t*
 Stanford Chronic Care Management
 System 309*t*
 The State of the World's Nursing 2020
 (WHO) 448
 statins 339*t*, 377*t*, 380
 ezetimibe and 339*t*
 unstable angina 160
 status assessment, tobacco smoking
 cessation 319

STEMI *see* ST-segment elevation myocardial infarction (STEMI)

sternal precautions

- surgical valve replacement 226
- valvular heart disease 236*t*

s-TOFHLA 410*t*

stress 429

stress cardiomyopathy 433

STRIP (Special Turku Coronary Risk Factor Intervention Project for Children) 312

stroke

- atrial fibrillation 196
- in-hospital ECG monitoring 183*t*
- prevention in atrial fibrillation 203
- transcatheter aortic valve implantation 228
- women 434

structural level of care 46–7

STS *see* Society of Thoracic Surgeons (STS)

ST-segment 104, 104*f*, 106*t*, 108

- arrhythmia monitoring 183
- elevation in Brugada syndrome 256–7, 257*f*
- normal/abnormal parameters 107*t*

ST-segment elevation myocardial infarction (STEMI) 147

- atherosclerosis 148
- case study 167–9, 167*f*, 168*t*, 415–16*t*
- in-hospital ECG monitoring 183*t*
- management 154
- pathway of 156*f*

subarterial ventricular septal defect 269*f*

subclavian artery 83*f*

subclavian vein 83*f*

subclinical atherosclerosis 15

sudden cardiac death (SCD) 266

sudden cardiac death (SCD) in the young 259

- family investigations 260*f*
- genetics 246

superior vena cava 83*f*, 88*f*, 89*f*

supplementary prescribing 368

support groups 266

supravalvular aortic stenosis 275

supraventricular tachycardia (SVT) 189*t*, 194

- case studies 207–9*t*
- signs & symptoms 182*t*

surgical valve replacement

- complications 227
- valvular heart disease 226–7

SVT *see* supraventricular tachycardia (SVT)

SWEDHEART Registry 38, 147

Sweden, CVD DALYs 11*t*

Swedish Annual Level of Living Survey 330

Switzerland

- CVD DALYs 11*t*
- hospitalizations 11*t*

sympathetic nervous system 285

syncope

- aortic stenosis 219
- in-hospital ECG monitoring 183*t*

Systematic COronary Risk Evaluation (SCORE) project 13, 19, 315, 349

systolic blood pressure (SBP) 94

- National Early Warning System 2 133*t*

T

tachyarrhythmias 180

- care 193–9
- diagnosis 193–9
- differential diagnosis 153*t*
- prevention 193–9
- treatment 193–9

tachycardias

- broad complex tachycardia 190*t*, 198
- catecholaminergic polymorphic ventricular tachycardia 254*t*, 257–9, 259*b*
- irregular narrow complex tachycardias 194
- paroxysmal atrial tachycardia 190*t*, 194
- sinus tachycardia 189*t*, 193
- supraventricular tachycardia *see* supraventricular tachycardia (SVT)
- ventricular tachycardia *see* ventricular tachycardia (VT)

Takotsubo syndrome 153*t*

TandemHeart® 139*t*, 140*f*

TAVI *see* transcatheter aortic valve implantation (TAVI)

TCS devices 139*t*

Teach-Back technique 405–6, 405*f*

teaching

- evaluation 407–8
- patient education 406–8, 408*b*

team training 64

teamwork

- advanced nursing practice 63–4
- CAD nursing care 170
- cross-disciplinary teams 66*t*
- Heart Team 223, 225*f*
- multidisciplinary teams *see* multidisciplinary teams
- transdisciplinary teams 66*t*

technology 444–5

- atrial fibrillation 202–3
- case study 445–7*b*, 446*f*, 447*f*
- CVD prevention & rehabilitation 312
- CVPR 351–4, 353*f*, 353*t*
- high-quality care 41–2

telehealth 352

telemetry, arrhythmia monitoring 184

temporary cardiac pacing 189*t*

- arrhythmias 200

tertiary prevention 21

Test of Functioning Health Literacy in Adults (s-TOFHLA) 410

tetralogy of Fallot (TOF) 268*f*, 271

TEXT ME study 352

TGA (transposition of the great arteries) 268*f*, 270–1

third-degree (complete) AV block 188*t*, 193

three augmented vector leads (aVR, aVL, aVF), ECG 100

three bipolar limb leads (I, II, III) 99–100

three-generation family history 243–4, 243*f*

Three-Item Brief Health Literacy Screen (3-item BHLS) 410, 410*t*

thromboembolism

- atrial fibrillation 195
- heart failure 294

thrombotic coronary artery occlusion 147

- thrombus formation 159
 - thymine (T) 242
 - thyroid function 132
 - ticagrelor 378*t*, 384
 - timeliness, CAD nursing care 170
 - timeliness, high-quality care 30*t*, 34–5
 - time trends, CHD 7*f*, 8*f*
 - tinzaparin 378*t*, 382
 - tirofiban 378*t*, 386
 - tissue perfusion promoters 379*t*, 388–91
 - calcium channel blockers 253, 379*t*, 390–1
 - nitrates 251, 379*t*, 388
 - renin–angiotensin–aldosterone system drugs 388–90
 - see also* beta-blockers
 - tobacco smoking
 - atherosclerosis 149
 - children 17–18
 - inherited cardiac conditions 265
 - passive smoking 349
 - tobacco smoking cessation 318–22, 319*b*
 - behavioural support 320–1
 - dependence assessment 319
 - family issues 320
 - medications 321
 - past quit attempts 320
 - psychological assessment 320
 - readiness to quit 320, 320*b*
 - status assessment 319
 - weight gain 322
 - torsades des pointes 191*t*, 199
 - total cardiovascular risk 12, 314–15, 315*t*
 - reduction of 315
 - Total Quality Management 39
 - total risk management 314–15
 - transcatheter aortic valve implantation (TAVI) 227–8
 - congenital aortic stenosis 274
 - post-procedure protocol 229–30*t*
 - transcatheter valve replacement
 - mitral valve repair (mitral valve leaflet plication) 228, 231
 - valvular heart disease 227–8, 231
 - transdisciplinary teams 66*t*
 - trans fatty acids 313
 - transposition of the great arteries (TGA) 268*f*, 270–1
 - transthoracic echocardiography
 - atrial fibrillation 196
 - valvular heart disease 220
 - transvalvular pressure gradients 220
 - treadmill exercise, arrhythmias 181–2
 - tricuspid atresia 268*f*
 - tricuspid valve 88*f*
 - truncus arteriosus 268*f*, 271
 - tunica externa 83, 84*f*
 - tunica intima 83, 84*f*
 - tunica media
 - arteries 83, 84*f*
 - arterioles 84
 - veins 86
 - T wave 104, 104*f*, 106*t*, 108
 - normal/abnormal parameters 107*t*
 - type 2 diabetes mellitus 329, 339
- U**
- Ukraine, CVD DALYs 11*t*
 - unfractionated heparin (UFH) 378*t*, 382
 - unintentional medication non-adherence 374
 - United Kingdom (UK)
 - CVD DALYs 11*t*
 - hospitalizations 11*t*
 - unstable angina (UA)
 - definition 156–7
 - management 160
 - NSTEMI vs. 154
 - U wave 107*t*, 108
- V**
- VA-ECMO (venoarterial extracorporeal membrane oxygenation) 138–41, 139*t*, 141, 141*t*
 - valvular heart disease 215–40
 - antithrombotic management 234
 - assessment pathway 220–2
 - clinical presentation 219–20
 - comprehensive management plan 222–32
 - endocarditis prophylaxis 235
 - epidemiology 216–17
 - follow-up 235
 - functional assessment 222
 - heart failure 294
 - medical management 225–6, 231–2
 - nursing role 224, 224*b*
 - pathophysiology 217–19
 - patient education 236*t*
 - patient education/information 235
 - surgical valve replacement 226–7
 - transcatheter valve replacement 227–8, 231
 - see also* aortic regurgitation; aortic stenosis; infective endocarditis; mitral regurgitation; mitral stenosis
 - varenicline (Champix®) 321, 322
 - variable expression 245*t*
 - variant classification 245*t*
 - vascular access complications 228
 - vascular age 19
 - vascular Ehlers–Danlos syndrome 261
 - vasoconstriction 85, 86*t*
 - vasodilatation 86*t*
 - vasopressin 286, 391*t*
 - vasopressors 138
 - Vaughn Williams antiarrhythmic drugs 378*t*, 379*t*
 - VCAM-1 148
 - veins 82–3, 84*f*, 86–7
 - venoarterial extracorporeal membrane oxygenation (VA-ECMO) 138–41, 139*t*, 141, 141*t*
 - ventricles 87, 88*f*
 - ventricular assist devices 298–9
 - ventricular cardiomyocytes 94–5
 - ventricular diastasis 93
 - ventricular ectopic foci 96*t*
 - ventricular fibrillation 191*t*, 199
 - ventricular filling 93
 - ventricular septal defects (VSDs) 269*f*, 272–3
 - ventricular tachycardia (VT) 191*t*, 198
 - hypertrophic cardiomyopathy 251
 - monitoring 185
 - venules 82–3, 84*f*
 - verapamil 378*t*
 - verbal communication 403–4, 404*t*
 - verbal prompts 404
 - verbal teaching 407
 - vital signs
 - cardiovascular system assessment 127*t*
 - heart failure 291–2
 - vitamin K antagonists 203, 378*t*

volume status, heart failure 290–1, 291f
VSDs (ventricular septal defects) 269f, 272–3
VT *see* ventricular tachycardia (VT)

W

Wagner's Chronic Care Mode 305–6, 305f
waist circumference
 measurement 328–9, 329f
 overweight/obesity 328t
warfarin 378t, 383–4
 genetic effects 392
 valvular heart disease 235b
weight 265
 optimal weight 326–8, 327f, 328t
weight gain 322
weight loss 328f, 329, 330t
Wellbull risk estimation 13
WHF (World Health Federation) 357t
WHO *see* World Health Organization (WHO)
women 431, 433–5, 435b
 abdominal aortic aneurysm 434

coronary heart disease 431
disease management 435
heart failure 431, 433–4
heart failure with preserved ejection fraction 433
peripartum cardiomyopathy 434
peripheral arterial disease 434
stroke 434
 see also gender issues
Wong–Baker Faces Pain Rating Scale 119, 121f
Working Group on Cardiac Rehabilitation and Exercise Physiology 346
workplace cultures 50
World Health Federation (WHF) 357t
World Health Organization (WHO) 348–9
 Clinical Consortium on Healthy Ageing 421
 CVD burden 4
 dysglycaemia diagnosis 340t
 European physical activity strategy (2016–2025) 18

evidence-based vs. evidence-informed practice 32
Health Behaviour in School-age Children 16–17
high quality of care 29
nursing shortage 448
palliative/supportive care 427
socioeconomic factors 428
The State of the World's Nursing 2020 448
wound management 169
written resources 407

X

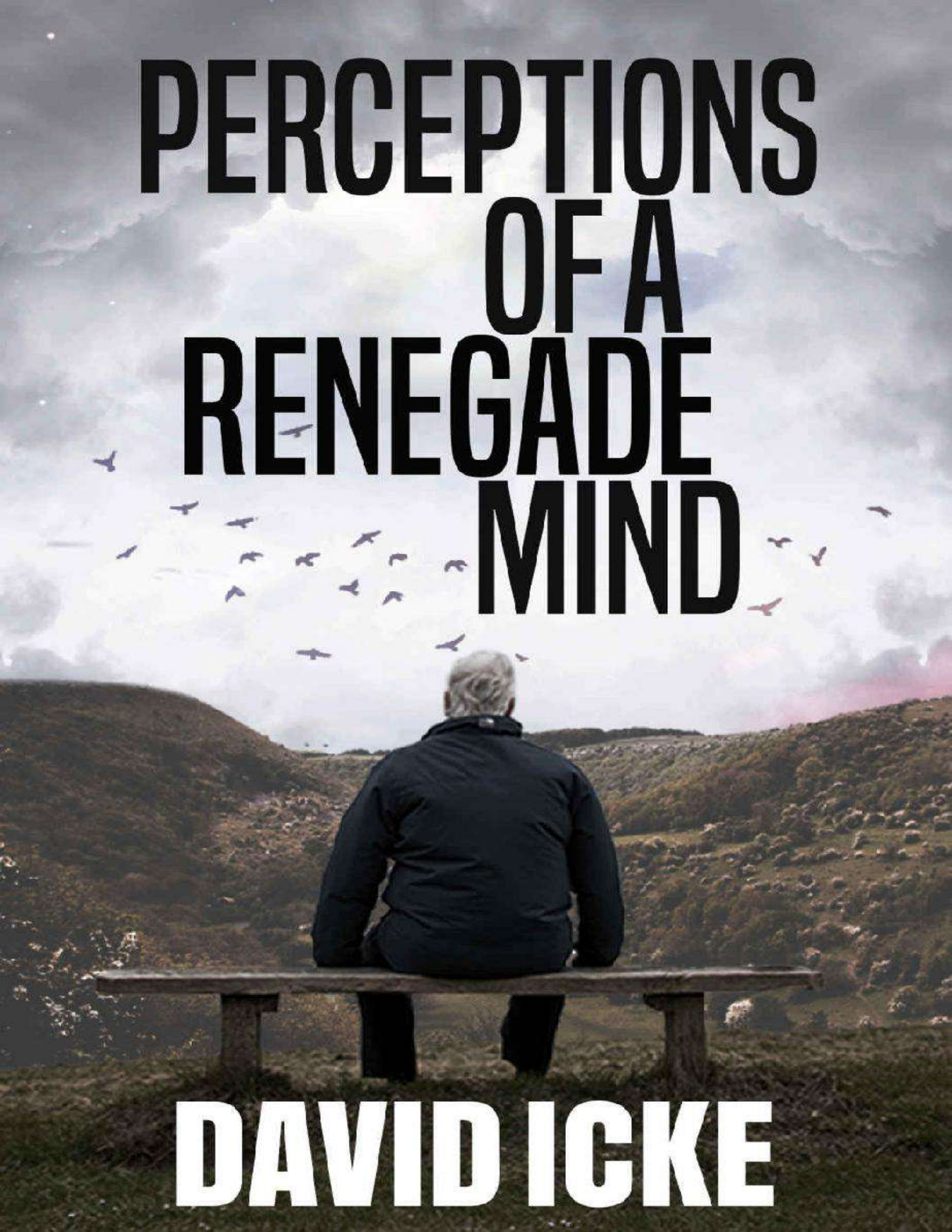
X-linked dominant disease 243f, 244
X-linked recessive disease 243f
X-ray, chest *see* chest X-ray

Y

young adults, risk estimation 18–19

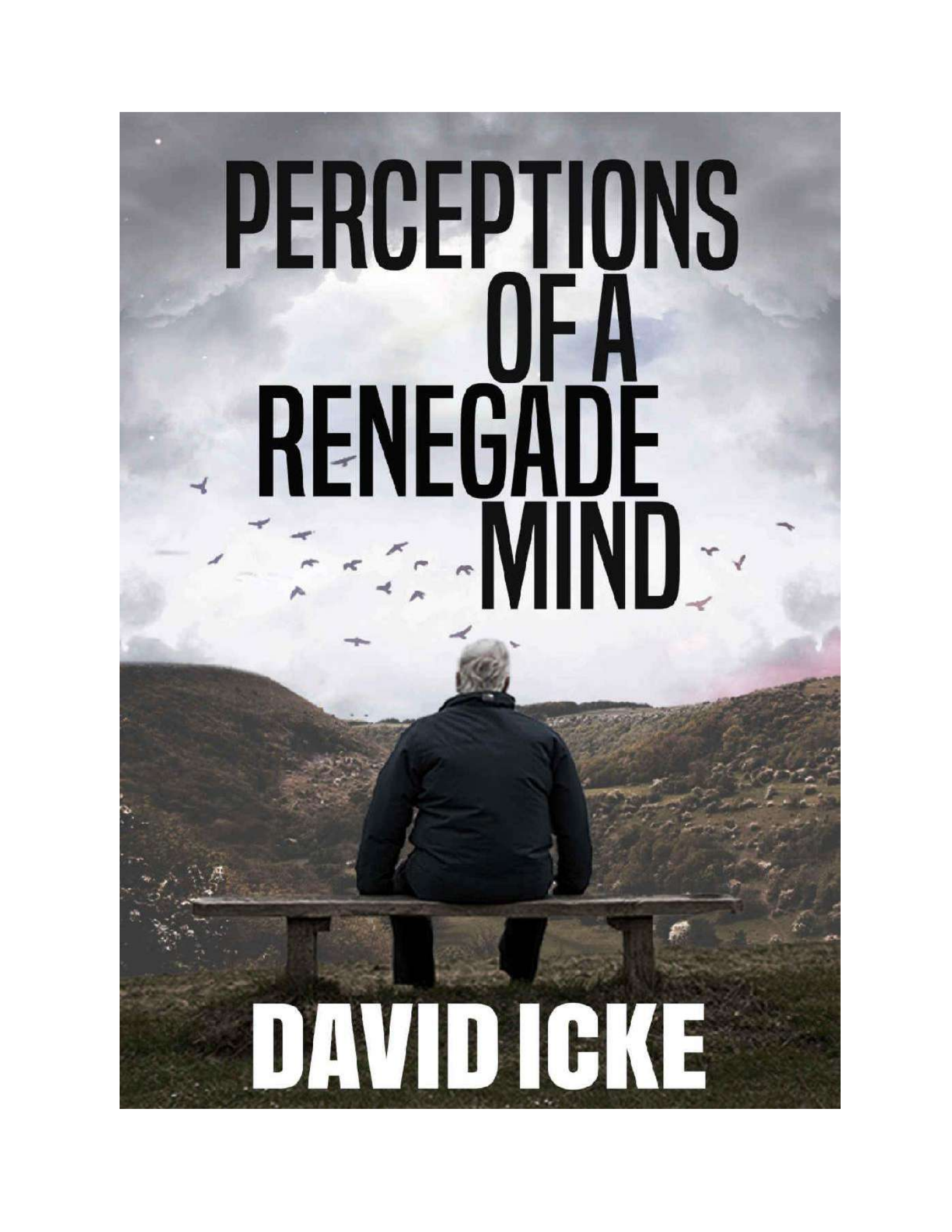
Z

Z band, sarcomeres 95

A person with grey hair, seen from behind, sits on a wooden bench. They are wearing a dark jacket and looking out over a vast, hilly landscape. The hills are covered in green and brown vegetation. In the sky above, a large flock of birds is flying in a circular pattern. The sky is filled with dramatic, grey and white clouds, with a hint of pinkish light on the right side.

PERCEPTIONS OF A RENEGADE MIND

DAVID ICKE



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**New Enterprise House
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email: gareth.icke@davidicke.com

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Renegade:

Adjective

‘Having rejected tradition: Unconventional.’

Merriam-Webster Dictionary

Acquiescence to tyranny is the death of the spirit

You may be 38 years old, as I happen to be. And one day, some great opportunity stands before you and calls you to stand up for some great principle, some great issue, some great cause. And you refuse to do it because you are afraid ... You refuse to do it because you want to live longer ... You're afraid that you will lose your job, or you are afraid that you will be criticised or that you will lose your popularity, or you're afraid that somebody will stab you, or shoot at you or bomb your house; so you refuse to take the stand.

Well, you may go on and live until you are 90, but you're just as dead at 38 as you would be at 90. And the cessation of breathing in your life is but the belated announcement of an earlier death of the spirit.

Martin Luther King

**How the few control the many and always have – the many do
whatever they're told**

'Forward, the Light Brigade!'
Was there a man dismayed?
Not though the soldier knew
Someone had blundered.
Theirs not to make reply,
Theirs not to reason why,
Theirs but to do and die.
Into the valley of Death
Rode the six hundred.

Cannon to right of them,
Cannon to left of them,
Cannon in front of them
Volleyed and thundered;
Stormed at with shot and shell,
Boldly they rode and well,
Into the jaws of Death,
Into the mouth of hell
Rode the six hundred

Alfred Lord Tennyson (1809-1892)

The mist is lifting slowly
I can see the way ahead
And I've left behind the empty streets
That once inspired my life
And the strength of the emotion
Is like thunder in the air
'Cos the promise that we made each other
Haunts me to the end

The secret of your beauty
And the mystery of your soul
I've been searching for in everyone I meet
And the times I've been mistaken
It's impossible to say
And the grass is growing
Underneath our feet

The words that I remember
From my childhood still are true
That there's none so blind
As those who will not see
And to those who lack the courage
And say it's dangerous to try
Well they just don't know
That love eternal will not be denied

I know you're out there somewhere
Somewhere, somewhere
I know you're out there somewhere

Somewhere you can hear my voice
I know I'll find you somehow
Somehow, somehow
I know I'll find you somehow
And somehow I'll return again to you

The Moody Blues

Are you a gutless wonder - or a Renegade Mind?

Monuments put from pen to paper,
Turns me into a gutless wonder,
And if you tolerate this,
Then your children will be next.
Gravity keeps my head down,
Or is it maybe shame ...

Manic Street Preachers

Rise like lions after slumber
In unvanquishable number.
Shake your chains to earth like dew
Which in sleep have fallen on you.
Ye are many – they are few.

Percy Shelley

Contents

CHAPTER 1	'I'm thinking' – Oh, but <i>are</i> you?
CHAPTER 2	Renegade perception
CHAPTER 3	The Pushbacker sting
CHAPTER 4	'Covid': The calculated catastrophe
CHAPTER 5	There <i>is no</i> 'virus'
CHAPTER 6	Sequence of deceit
CHAPTER 7	War on your mind
CHAPTER 8	'Reframing' insanity
CHAPTER 9	We must have it? So what is it?
CHAPTER 10	Human 2.0
CHAPTER 11	Who controls the Cult?
CHAPTER 12	Escaping Wetiko
POSTSCRIPT	
APPENDIX	Cowan-Kaufman-Morell Statement on Virus Isolation
BIBLIOGRAPHY	
INDEX	

CHAPTER ONE

I'm thinking' – Oh, but *are* you?

Think for yourself and let others enjoy the privilege of doing so too
Voltaire

French-born philosopher, mathematician and scientist René Descartes became famous for his statement in Latin in the 17th century which translates into English as: 'I think, therefore I am.'

On the face of it that is true. Thought reflects perception and perception leads to both behaviour and self-identity. In that sense 'we' are what we think. But who or what is doing the thinking and is thinking the only route to perception? Clearly, as we shall see, 'we' are not always the source of 'our' perception, indeed with regard to humanity as a whole this is rarely the case; and thinking is far from the only means of perception. Thought is the village idiot compared with other expressions of consciousness that we all have the potential to access and tap into. This has to be true when we *are* those other expressions of consciousness which are infinite in nature. We have forgotten this, or, more to the point, been manipulated to forget.

These are not just the esoteric musings of the navel. The whole foundation of human control and oppression is control of perception. Once perception is hijacked then so is behaviour which is dictated by perception. Collective perception becomes collective behaviour and collective behaviour is what we call human society. Perception is all and those behind human control know that which is

why perception is the target 24/7 of the psychopathic manipulators that I call the Global Cult. They know that if they dictate perception they will dictate behaviour and collectively dictate the nature of human society. They are further aware that perception is formed from information received and if they control the circulation of information they will to a vast extent direct human behaviour. Censorship of information and opinion has become globally Nazi-like in recent years and never more blatantly than since the illusory 'virus pandemic' was triggered out of China in 2019 and across the world in 2020. Why have billions submitted to house arrest and accepted fascistic societies in a way they would have never believed possible? Those controlling the information spewing from government, mainstream media and Silicon Valley (all controlled by the same Global Cult networks) told them they were in danger from a 'deadly virus' and only by submitting to house arrest and conceding their most basic of freedoms could they and their families be protected. This monumental and provable lie became the *perception* of the billions and therefore the *behaviour* of the billions. In those few words you have the whole structure and modus operandi of human control. Fear is a perception – False Emotion Appearing Real – and fear is the currency of control. In short ... get them by the balls (or give them the impression that you have) and their hearts and minds will follow. Nothing grips the dangly bits and freezes the rear-end more comprehensively than fear.

World number 1

There are two 'worlds' in what appears to be one 'world' and the prime difference between them is knowledge. First we have the mass of human society in which the population is maintained in coldly-calculated ignorance through control of information and the 'education' (indoctrination) system. That's all you really need to control to enslave billions in a perceptual delusion in which what are perceived to be *their* thoughts and opinions are ever-repeated mantras that the system has been downloading all their lives through 'education', media, science, medicine, politics and academia

in which the personnel and advocates are themselves overwhelmingly the perceptual products of the same repetition. Teachers and academics in general are processed by the same programming machine as everyone else, but unlike the great majority they never leave the 'education' program. It gripped them as students and continues to grip them as programmers of subsequent generations of students. The programmed become the programmers – the programmed programmers. The same can largely be said for scientists, doctors and politicians and not least because as the American writer Upton Sinclair said: 'It is difficult to get a man to understand something when his salary depends upon his not understanding it.' If your career and income depend on thinking the way the system demands then you will – bar a few free-minded exceptions – concede your mind to the Perceptual Mainframe that I call the Postage Stamp Consensus. This is a tiny band of perceived knowledge and possibility 'taught' (downloaded) in the schools and universities, pounded out by the mainstream media and on which all government policy is founded. Try thinking, and especially speaking and acting, outside of the 'box' of consensus and see what that does for your career in the Mainstream Everything which bullies, harasses, intimidates and ridicules the population into compliance. Here we have the simple structure which enslaves most of humanity in a perceptual prison cell for an entire lifetime and I'll go deeper into this process shortly. Most of what humanity is taught as fact is nothing more than programmed belief. American science fiction author Frank Herbert was right when he said: 'Belief can be manipulated. Only knowledge is dangerous.' In the 'Covid' age belief is promoted and knowledge is censored. It was always so, but never to the extreme of today.

World number 2

A 'number 2' is slang for 'doing a poo' and how appropriate that is when this other 'world' is doing just that on humanity every minute of every day. World number 2 is a global network of secret societies and semi-secret groups dictating the direction of society via

governments, corporations and authorities of every kind. I have spent more than 30 years uncovering and exposing this network that I call the Global Cult and knowing its agenda is what has made my books so accurate in predicting current and past events. Secret societies are secret for a reason. They want to keep their hoarded knowledge to themselves and their chosen initiates and to hide it from the population which they seek through ignorance to control and subdue. The whole foundation of the division between World 1 and World 2 is *knowledge*. What number 1 knows number 2 must not. Knowledge they have worked so hard to keep secret includes (a) the agenda to enslave humanity in a centrally-controlled global dictatorship, and (b) the nature of reality and life itself. The latter (b) must be suppressed to allow the former (a) to prevail as I shall be explaining. The way the Cult manipulates and interacts with the population can be likened to a spider's web. The 'spider' sits at the centre in the shadows and imposes its will through the web with each strand represented in World number 2 by a secret society, satanic or semi-secret group, and in World number 1 – the world of the seen – by governments, agencies of government, law enforcement, corporations, the banking system, media conglomerates and Silicon Valley (Fig 1 overleaf). The spider and the web connect and coordinate all these organisations to pursue the same global outcome while the population sees them as individual entities working randomly and independently. At the level of the web governments *are* the banking system *are* the corporations *are* the media *are* Silicon Valley *are* the World Health Organization working from their inner cores as one unit. Apparently unconnected countries, corporations, institutions, organisations and people are on the *same team* pursuing the same global outcome. Strands in the web immediately around the spider are the most secretive and exclusive secret societies and their membership is emphatically restricted to the Cult inner-circle emerging through the generations from particular bloodlines for reasons I will come to. At the core of the core you would get them in a single room. That's how many people are dictating the direction of human society and its transformation

through the 'Covid' hoax and other means. As the web expands out from the spider we meet the secret societies that many people will be aware of – the Freemasons, Knights Templar, Knights of Malta, Opus Dei, the inner sanctum of the Jesuit Order, and such like. Note how many are connected to the Church of Rome and there is a reason for that. The Roman Church was established as a revamp, a rebranding, of the relocated 'Church' of Babylon and the Cult imposing global tyranny today can be tracked back to Babylon and Sumer in what is now Iraq.



Figure 1: The global web through which the few control the many. (Image Neil Hague.)

Inner levels of the web operate in the unseen away from the public eye and then we have what I call the cusp organisations located at the point where the hidden meets the seen. They include a series of satellite organisations answering to a secret society founded in London in the late 19th century called the Round Table and among them are the Royal Institute of International Affairs (UK, founded in 1920); Council on Foreign Relations (US, 1921); Bilderberg Group (worldwide, 1954); Trilateral Commission (US/worldwide, 1972); and the Club of Rome (worldwide, 1968) which was created to exploit environmental concerns to justify the centralisation of global power to 'save the planet'. The Club of Rome instigated with others the human-caused climate change hoax which has led to all the 'green

new deals' demanding that very centralisation of control. Cusp organisations, which include endless 'think tanks' all over the world, are designed to coordinate a single global policy between political and business leaders, intelligence personnel, media organisations and anyone who can influence the direction of policy in their own sphere of operation. Major players and regular attenders will know what is happening – or some of it – while others come and go and are kept overwhelmingly in the dark about the big picture. I refer to these cusp groupings as semi-secret in that they can be publicly identified, but what goes on at the inner-core is kept very much 'in house' even from most of their members and participants through a fiercely-imposed system of compartmentalisation. Only let them know what they need to know to serve your interests and no more. The structure of secret societies serves as a perfect example of this principle. Most Freemasons never get higher than the bottom three levels of 'degree' (degree of knowledge) when there are 33 official degrees of the Scottish Rite. Initiates only qualify for the next higher 'compartment' or degree if those at that level choose to allow them. Knowledge can be carefully assigned only to those considered 'safe'. I went to my local Freemason's lodge a few years ago when they were having an 'open day' to show how cuddly they were and when I chatted to some of them I was astonished at how little the rank and file knew even about the most ubiquitous symbols they use. The mushroom technique – keep them in the dark and feed them bullshit – applies to most people in the web as well as the population as a whole. Sub-divisions of the web mirror in theme and structure transnational corporations which have a headquarters somewhere in the world dictating to all their subsidiaries in different countries. Subsidiaries operate in their methodology and branding to the same centrally-dictated plan and policy in pursuit of particular ends. The Cult web functions in the same way. Each country has its own web as a subsidiary of the global one. They consist of networks of secret societies, semi-secret groups and bloodline families and their job is to impose the will of the spider and the global web in their particular country. Subsidiary networks control and manipulate the national political system, finance, corporations, media, medicine, etc. to

ensure that they follow the globally-dictated Cult agenda. These networks were the means through which the 'Covid' hoax could be played out with almost every country responding in the same way.

The 'Yessir' pyramid

Compartmentalisation is the key to understanding how a tiny few can dictate the lives of billions when combined with a top-down sequence of imposition and acquiescence. The inner core of the Cult sits at the peak of the pyramidal hierarchy of human society (Fig 2 overleaf). It imposes its will – its agenda for the world – on the level immediately below which acquiesces to that imposition. This level then imposes the Cult will on the level below them which acquiesces and imposes on the next level. Very quickly we meet levels in the hierarchy that have no idea there even is a Cult, but the sequence of imposition and acquiescence continues down the pyramid in just the same way. 'I don't know why we are doing this but the order came from "on-high" and so we better just do it.' Alfred Lord Tennyson said of the cannon fodder levels in his poem *The Charge of the Light Brigade*: 'Theirs not to reason why; theirs but to do and die.' The next line says that 'into the valley of death rode the six hundred' and they died because they obeyed without question what their perceived 'superiors' told them to do. In the same way the population capitulated to 'Covid'. The whole hierarchical pyramid functions like this to allow the very few to direct the enormous many.

Eventually imposition-acquiescence-imposition-acquiescence comes down to the mass of the population at the foot of the pyramid. If they acquiesce to those levels of the hierarchy imposing on them (governments/law enforcement/doctors/media) a circuit is completed between the population and the handful of super-psychopaths in the Cult inner core at the top of the pyramid.

Without a circuit-breaking refusal to obey, the sequence of imposition and acquiescence allows a staggeringly few people to impose their will upon the entirety of humankind. We are looking at the very sequence that has subjugated billions since the start of 2020. Our freedom has not been taken from us. Humanity has given it

away. Fascists do not impose fascism because there are not enough of them. Fascism is imposed by the population acquiescing to fascism. Put another way allowing their perceptions to be programmed to the extent that leads to the population giving their freedom away by giving their perceptions – their mind – away. If this circuit is not broken by humanity ceasing to cooperate with their own enslavement then nothing can change. For that to happen people have to critically think and see through the lies and window dressing and then summon the backbone to act upon what they see. The Cult spends its days working to stop either happening and its methodology is systematic and highly detailed, but it can be overcome and that is what this book is all about.

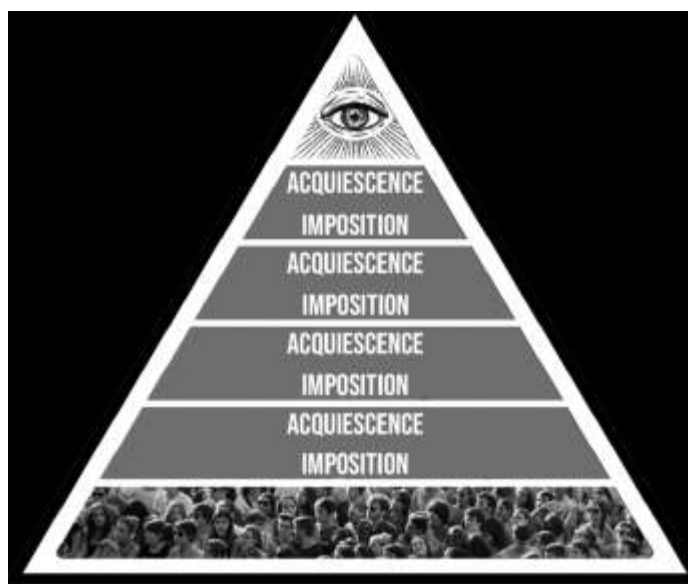


Figure 2: The simple sequence of imposition and compliance that allows a handful of people at the peak of the pyramid to dictate the lives of billions.

The Life Program

Okay, back to world number 1 or the world of the 'masses'. Observe the process of what we call 'life' and it is a perceptual download from cradle to grave. The Cult has created a global structure in which perception can be programmed and the program continually topped-up with what appears to be constant confirmation that the program is indeed true reality. The important word here is 'appears'.

This is the structure, the fly-trap, the Postage Stamp Consensus or Perceptual Mainframe, which represents that incredibly narrow band of perceived possibility delivered by the 'education' system, mainstream media, science and medicine. From the earliest age the download begins with parents who have themselves succumbed to the very programming their children are about to go through. Most parents don't do this out of malevolence and mostly it is quite the opposite. They do what they believe is best for their children and that is what the program has told them is best. Within three or four years comes the major transition from parental programming to full-blown state (Cult) programming in school, college and university where perceptually-programmed teachers and academics pass on their programming to the next generations. Teachers who resist are soon marginalised and their careers ended while children who resist are called a problem child for whom Ritalin may need to be prescribed. A few years after entering the 'world' children are under the control of authority figures representing the state telling them when they have to be there, when they can leave and when they can speak, eat, even go to the toilet. This is calculated preparation for a lifetime of obeying authority in all its forms. Reflex-action fear of authority is instilled by authority from the start. Children soon learn the carrot and stick consequences of obeying or defying authority which is underpinned daily for the rest of their life. Fortunately I daydreamed through this crap and never obeyed authority simply because it told me to. This approach to my alleged 'betters' continues to this day. There can be consequences of pursuing open-minded freedom in a world of closed-minded conformity. I spent a lot of time in school corridors after being ejected from the classroom for not taking some of it seriously and now I spend a lot of time being ejected from Facebook, YouTube and Twitter. But I can tell you that being true to yourself and not compromising your self-respect is far more exhilarating than bowing to authority for authority's sake. You don't have to be a sheep to the shepherd (authority) and the sheep dog (fear of not obeying authority).

The perceptual download continues throughout the formative years in school, college and university while script-reading 'teachers', 'academics' 'scientists', 'doctors' and 'journalists' insist that ongoing generations must be as programmed as they are. Accept the program or you will not pass your 'exams' which confirm your 'degree' of programming. It is tragic to think that many parents pressure their offspring to work hard at school to download the program and qualify for the next stage at college and university. The late, great, American comedian George Carlin said: 'Here's a bumper sticker I'd like to see: We are proud parents of a child who has resisted his teachers' attempts to break his spirit and bend him to the will of his corporate masters.' Well, the best of luck finding many of those, George. Then comes the moment to leave the formal programming years in academia and enter the 'adult' world of work. There you meet others in your chosen or prescribed arena who went through the same Postage Stamp Consensus program before you did. There is therefore overwhelming agreement between almost everyone on the basic foundations of Postage Stamp reality and the rejection, even contempt, of the few who have a mind of their own and are prepared to use it. This has two major effects. Firstly, the consensus confirms to the programmed that their download is really how things are. I mean, everyone knows that, right? Secondly, the arrogance and ignorance of Postage Stamp adherents ensure that anyone questioning the program will have unpleasant consequences for seeking their own truth and not picking their perceptions from the shelf marked: 'Things you must believe without question and if you don't you're a dangerous lunatic conspiracy theorist and a harebrained nutter'.

Every government, agency and corporation is founded on the same Postage Stamp prison cell and you can see why so many people believe the same thing while calling it their own 'opinion'. Fusion of governments and corporations in pursuit of the same agenda was the definition of fascism described by Italian dictator Benito Mussolini. The pressure to conform to perceptual norms downloaded for a lifetime is incessant and infiltrates society right

down to family groups that become censors and condemners of their own 'black sheep' for not, ironically, being sheep. We have seen an explosion of that in the 'Covid' era. Cult-owned global media unleashes its propaganda all day every day in support of the Postage Stamp and targets with abuse and ridicule anyone in the public eye who won't bend their mind to the will of the tyranny. Any response to this is denied (certainly in my case). They don't want to give a platform to expose official lies. Cult-owned-and-created Internet giants like Facebook, Google, YouTube and Twitter delete you for having an unapproved opinion. Facebook boasts that its AI censors delete 97-percent of 'hate speech' before anyone even reports it. Much of that 'hate speech' will simply be an opinion that Facebook and its masters don't want people to see. Such perceptual oppression is widely known as fascism. Even Facebook executive Benny Thomas, a 'CEO Global Planning Lead', said in comments secretly recorded by investigative journalism operation Project Veritas that Facebook is 'too powerful' and should be broken up:

I mean, no king in history has been the ruler of two billion people, but Mark Zuckerberg is ... And he's 36. That's too much for a 36-year-old ... You should not have power over two billion people. I just think that's wrong.

Thomas said Facebook-owned platforms like Instagram, Oculus, and WhatsApp needed to be separate companies. 'It's too much power when they're all one together'. That's the way the Cult likes it, however. We have an executive of a Cult organisation in Benny Thomas that doesn't know there is a Cult such is the compartmentalisation. Thomas said that Facebook and Google 'are no longer companies, they're countries'. Actually they are more powerful than countries on the basis that if you control information you control perception and control human society.

I love my oppressor

Another expression of this psychological trickery is for those who realise they are being pressured into compliance to eventually

convince themselves to believe the official narratives to protect their self-respect from accepting the truth that they have succumbed to meek and subservient compliance. Such people become some of the most vehement defenders of the system. You can see them everywhere screaming abuse at those who prefer to think for themselves and by doing so reminding the compliers of their own capitulation to conformity. 'You are talking dangerous nonsense you Covidiot!!' Are you trying to convince me or yourself? It is a potent form of Stockholm syndrome which is defined as: 'A psychological condition that occurs when a victim of abuse identifies and attaches, or bonds, positively with their abuser.' An example is hostages bonding and even 'falling in love' with their kidnappers. The syndrome has been observed in domestic violence, abused children, concentration camp inmates, prisoners of war and many and various Satanic cults. These are some traits of Stockholm syndrome listed at goodtherapy.org:

- Positive regard towards perpetrators of abuse or captor [see 'Covid'].
- Failure to cooperate with police and other government authorities when it comes to holding perpetrators of abuse or kidnapping accountable [or in the case of 'Covid' cooperating with the police to enforce and defend their captors' demands].
- Little or no effort to escape [see 'Covid'].
- Belief in the goodness of the perpetrators or kidnappers [see 'Covid'].
- Appeasement of captors. This is a manipulative strategy for maintaining one's safety. As victims get rewarded – perhaps with less abuse or even with life itself – their appeasing behaviours are reinforced [see 'Covid'].
- Learned helplessness. This can be akin to 'if you can't beat 'em, join 'em'. As the victims fail to escape the abuse or captivity, they may start giving up and soon realize it's just easier for everyone if they acquiesce all their power to their captors [see 'Covid'].

- Feelings of pity toward the abusers, believing they are actually victims themselves. Because of this, victims may go on a crusade or mission to 'save' [protect] their abuser [see the venom unleashed on those challenging the official 'Covid' narrative].
- Unwillingness to learn to detach from their perpetrators and heal. In essence, victims may tend to be less loyal to themselves than to their abuser [*definitely* see 'Covid'].

Ponder on those traits and compare them with the behaviour of great swathes of the global population who have defended governments and authorities which have spent every minute destroying their lives and livelihoods and those of their children and grandchildren since early 2020 with fascistic lockdowns, house arrest and employment deletion to 'protect' them from a 'deadly virus' that their abusers' perceptually created to bring about this very outcome. We are looking at mass Stockholm syndrome. All those that agree to concede their freedom will believe those perceptions are originating in their own independent 'mind' when in fact by conceding their reality to Stockholm syndrome they have by definition conceded any independence of mind. Listen to the 'opinions' of the acquiescing masses in this 'Covid' era and what gushes forth is the repetition of the official version of everything delivered unprocessed, unfiltered and unquestioned. The whole programming dynamic works this way. I must be free because I'm told that I am and so I think that I am.

You can see what I mean with the chapter theme of 'I'm thinking – Oh, but *are* you?' The great majority are not thinking, let alone for themselves. They are repeating what authority has told them to believe which allows them to be controlled. Weaving through this mentality is the fear that the 'conspiracy theorists' are right and this again explains the often hysterical abuse that ensues when you dare to contest the official narrative of anything. Denial is the mechanism of hiding from yourself what you don't want to be true. Telling people what they want to hear is easy, but it's an infinitely greater challenge to tell them what they would rather not be happening.

One is akin to pushing against an open door while the other is met with vehement resistance no matter what the scale of evidence. I don't want it to be true so I'll convince myself that it's not. Examples are everywhere from the denial that a partner is cheating despite all the signs to the reflex-action rejection of any idea that world events in which country after country act in exactly the same way are centrally coordinated. To accept the latter is to accept that a force of unspeakable evil is working to destroy your life and the lives of your children with nothing too horrific to achieve that end. Who the heck wants that to be true? But if we don't face reality the end is duly achieved and the consequences are far worse and ongoing than breaking through the walls of denial today with the courage to make a stand against tyranny.

Connect the dots – but how?

A crucial aspect of perceptual programming is to portray a world in which everything is random and almost nothing is connected to anything else. Randomness cannot be coordinated by its very nature and once you perceive events as random the idea they could be connected is waved away as the rantings of the tinfoil-hat brigade. You can't plan and coordinate random you idiot! No, you can't, but you can hide the coldly-calculated and long-planned behind the *illusion* of randomness. A foundation manifestation of the Renegade Mind is to scan reality for patterns that connect the apparently random and turn pixels and dots into pictures. This is the way I work and have done so for more than 30 years. You look for similarities in people, modus operandi and desired outcomes and slowly, then ever quicker, the picture forms. For instance: There would seem to be no connection between the 'Covid pandemic' hoax and the human-caused global-warming hoax and yet they are masks (appropriately) on the same face seeking the same outcome. Those pushing the global warming myth through the Club of Rome and other Cult agencies are driving the lies about 'Covid' – Bill Gates is an obvious one, but they are endless. Why would the same people be involved in both when they are clearly not connected? Oh, but they

are. Common themes with personnel are matched by common goals. The 'solutions' to both 'problems' are centralisation of global power to impose the will of the few on the many to 'save' humanity from 'Covid' and save the planet from an 'existential threat' (we need 'zero Covid' and 'zero carbon emissions'). These, in turn, connect with the 'dot' of globalisation which was coined to describe the centralisation of global power in every area of life through incessant political and corporate expansion, trading blocks and superstates like the European Union. If you are the few and you want to control the many you have to centralise power and decision-making. The more you centralise power the more power the few at the centre will have over the many; and the more that power is centralised the more power those at the centre have to centralise even quicker. The momentum of centralisation gets faster and faster which is exactly the process we have witnessed. In this way the hoaxed 'pandemic' and the fakery of human-caused global warming serve the interests of globalisation and the seizure of global power in the hands of the Cult inner-circle which is behind 'Covid', 'climate change' and globalisation. At this point random 'dots' become a clear and obvious picture or pattern.

Klaus Schwab, the classic Bond villain who founded the Cult's Gates-funded World Economic Forum, published a book in 2020, *The Great Reset*, in which he used the 'problem' of 'Covid' to justify a total transformation of human society to 'save' humanity from 'climate change'. Schwab said: 'The pandemic represents a rare but narrow window of opportunity to reflect, reimagine, and reset our world.' What he didn't mention is that the Cult he serves is behind both hoaxes as I show in my book *The Answer*. He and the Cult don't have to reimagine the world. They know precisely what they want and that's why they destroyed human society with 'Covid' to 'build back better' in their grand design. Their job is not to imagine, but to get humanity to imagine and agree with their plans while believing it's all random. It must be pure coincidence that 'The Great Reset' has long been the Cult's code name for the global imposition of fascism and replaced previous code-names of the 'New World

Order' used by Cult frontmen like Father George Bush and the 'New Order of the Ages' which emerged from Freemasonry and much older secret societies. New Order of the Ages appears on the reverse of the Great Seal of the United States as 'Novus ordo seclorum' underneath the Cult symbol used since way back of the pyramid and all seeing-eye (Fig 3). The pyramid is the hierarchy of human control headed by the illuminated eye that symbolises the force behind the Cult which I will expose in later chapters. The term 'Annuit Coeptis' translates as 'He favours our undertaking'. We are told the 'He' is the Christian god, but 'He' is not as I will be explaining.



Figure 3: The all-seeing eye of the Cult 'god' on the Freemason-designed Great Seal of the United States and also on the dollar bill.

Having you on

Two major Cult techniques of perceptual manipulation that relate to all this are what I have called since the 1990s Problem-Reaction-Solution (PRS) and the Totalitarian Tiptoe (TT). They can be uncovered by the inquiring mind with a simple question: Who benefits? The answer usually identifies the perpetrators of a given action or happening through the concept of 'he who most benefits from a crime is the one most likely to have committed it'. The Latin 'Cue bono?' – Who benefits? – is widely attributed to the Roman orator and statesman Marcus Tullius Cicero. No wonder it goes back so far when the concept has been relevant to human behaviour since

history was recorded. Problem-Reaction-Solution is the technique used to manipulate us every day by covertly creating a problem (or the illusion of one) and offering the solution to the problem (or the illusion of one). In the first phase you create the problem and blame someone or something else for why it has happened. This may relate to a financial collapse, terrorist attack, war, global warming or pandemic, anything in fact that will allow you to impose the 'solution' to change society in the way you desire at that time. The 'problem' doesn't have to be real. PRS is manipulation of perception and all you need is the population to believe the problem is real. Human-caused global warming and the 'Covid pandemic' only have to be *perceived* to be real for the population to accept the 'solutions' of authority. I refer to this technique as NO-Problem-Reaction-Solution. Billions did not meekly accept house arrest from early 2020 because there was a real deadly 'Covid pandemic' but because they perceived – believed – that to be the case. The antidote to Problem-Reaction-Solution is to ask who benefits from the proposed solution. Invariably it will be anyone who wants to justify more control through deletion of freedom and centralisation of power and decision-making.

The two world wars were Problem-Reaction-Solutions that transformed and realigned global society. Both were manipulated into being by the Cult as I have detailed in books since the mid-1990s. They dramatically centralised global power, especially World War Two, which led to the United Nations and other global bodies thanks to the overt and covert manipulations of the Rockefeller family and other Cult bloodlines like the Rothschilds. The UN is a stalking horse for full-blown world government that I will come to shortly. The land on which the UN building stands in New York was donated by the Rockefellers and the same Cult family was behind Big Pharma scalpel and drug 'medicine' and the creation of the World Health Organization as part of the UN. They have been stalwarts of the eugenics movement and funded Hitler's race-purity expert' Ernst Rudin. The human-caused global warming hoax has been orchestrated by the Club of Rome through the UN which is

manufacturing both the 'problem' through its Intergovernmental Panel on Climate Change and imposing the 'solution' through its Agenda 21 and Agenda 2030 which demand the total centralisation of global power to 'save the world' from a climate hoax the United Nations is itself perpetrating. What a small world the Cult can be seen to be particularly among the inner circles. The bedfellow of Problem-Reaction-Solution is the Totalitarian Tiptoe which became the Totalitarian Sprint in 2020. The technique is fashioned to hide the carefully-coordinated behind the cover of apparently random events. You start the sequence at 'A' and you know you are heading for 'Z'. You don't want people to know that and each step on the journey is presented as a random happening while all the steps strung together lead in the same direction. The speed may have quickened dramatically in recent times, but you can still see the incremental approach of the Tiptoe in the case of 'Covid' as each new imposition takes us deeper into fascism. Tell people they have to do this or that to get back to 'normal', then this and this and this. With each new demand adding to the ones that went before the population's freedom is deleted until it disappears. The spider wraps its web around the flies more comprehensively with each new diktat. I'll highlight this in more detail when I get to the 'Covid' hoax and how it has been pulled off. Another prime example of the Totalitarian Tiptoe is how the Cult-created European Union went from a 'free-trade zone' to a centralised bureaucratic dictatorship through the Tiptoe of incremental centralisation of power until nations became mere administrative units for Cult-owned dark suits in Brussels.

The antidote to ignorance is knowledge which the Cult seeks vehemently to deny us, but despite the systematic censorship to that end the Renegade Mind can overcome this by vociferously seeking out the facts no matter the impediments put in the way. There is also a method of thinking and perceiving – *knowing* – that doesn't even need names, dates, place-type facts to identify the patterns that reveal the story. I'll get to that in the final chapter. All you need to know about the manipulation of human society and to what end is still out there – *at the time of writing* – in the form of books, videos

and websites for those that really want to breach the walls of programmed perception. To access this knowledge requires the abandonment of the mainstream media as a source of information in the awareness that this is owned and controlled by the Cult and therefore promotes mass perceptions that suit the Cult. Mainstream media lies all day, every day. That is its function and very reason for being. Where it does tell the truth, here and there, is only because the truth and the Cult agenda very occasionally coincide. If you look for fact and insight to the BBC, CNN and virtually all the rest of them you are asking to be conned and perceptually programmed.

Know the outcome and you'll see the journey

Events seem random when you have no idea where the world is being taken. Once you do the random becomes the carefully planned. Know the outcome and you'll see the journey is a phrase I have been using for a long time to give context to daily happenings that appear unconnected. Does a problem, or illusion of a problem, trigger a proposed 'solution' that further drives society in the direction of the outcome? Invariably the answer will be yes and the random – *abracadabra* – becomes the clearly coordinated. So what is this outcome that unlocks the door to a massively expanded understanding of daily events? I will summarise its major aspects – the fine detail is in my other books – and those new to this information will see that the world they thought they were living in is a very different place. The foundation of the Cult agenda is the incessant centralisation of power and all such centralisation is ultimately in pursuit of Cult control on a global level. I have described for a long time the planned world structure of top-down dictatorship as the Hunger Games Society. The term obviously comes from the movie series which portrayed a world in which a few living in military-protected hi-tech luxury were the overlords of a population condemned to abject poverty in isolated 'sectors' that were not allowed to interact. 'Covid' lockdowns and travel bans anyone? The 'Hunger Games' pyramid of structural control has the inner circle of the Cult at the top with pretty much the entire

population at the bottom under their control through dependency for survival on the Cult. The whole structure is planned to be protected and enforced by a military-police state ([Fig 4](#)).

Here you have the reason for the global lockdowns of the fake pandemic to coldly destroy independent incomes and livelihoods and make everyone dependent on the 'state' (the Cult that controls the 'states'). I have warned in my books for many years about the plan to introduce a 'guaranteed income' – a barely survivable pittance – designed to impose dependency when employment was destroyed by AI technology and now even more comprehensively at great speed by the 'Covid' scam. Once the pandemic was played and lockdown consequences began to delete independent income the authorities began to talk right on cue about the need for a guaranteed income and a 'Great Reset'. Guaranteed income will be presented as benevolent governments seeking to help a desperate people – desperate as a direct result of actions of the same governments. The truth is that such payments are a trap. You will only get them if you do exactly what the authorities demand including mass vaccination (genetic manipulation). We have seen this theme already in Australia where those dependent on government benefits have them reduced if parents don't agree to have their children vaccinated according to an insane health-destroying government-dictated schedule. Calculated economic collapse applies to governments as well as people. The Cult wants rid of countries through the creation of a world state with countries broken up into regions ruled by a world government and super states like the European Union. Countries must be bankrupted, too, to this end and it's being achieved by the trillions in 'rescue packages' and furlough payments, trillions in lost taxation, and money-no-object spending on 'Covid' including constant all-medium advertising (programming) which has made the media dependent on government for much of its income. The day of reckoning is coming – as planned – for government spending and given that it has been made possible by printing money and not by production/taxation there is inflation on the way that has the

potential to wipe out monetary value. In that case there will be no need for the Cult to steal your money. It just won't be worth anything (see the German Weimar Republic before the Nazis took over). Many have been okay with lockdowns while getting a percentage of their income from so-called furlough payments without having to work. Those payments are dependent, however, on people having at least a theoretical job with a business considered non-essential and ordered to close. As these business go under because they are closed by lockdown after lockdown the furlough stops and it will for everyone eventually. Then what? The 'then what?' is precisely the idea.



Figure 4: The Hunger Games Society structure I have long warned was planned and now the 'Covid' hoax has made it possible. This is the real reason for lockdowns.

Hired hands

Between the Hunger Games Cult elite and the dependent population is planned to be a vicious military-police state (a fusion of the two into one force). This has been in the making for a long time with police looking ever more like the military and carrying weapons to match. The pandemic scam has seen this process accelerate so fast as

lockdown house arrest is brutally enforced by carefully recruited fascist minds and gormless system-servers. The police and military are planned to merge into a centrally-directed world army in a global structure headed by a world government which wouldn't be elected even by the election fixes now in place. The world army is not planned even to be human and instead wars would be fought, primarily against the population, using robot technology controlled by artificial intelligence. I have been warning about this for decades and now militaries around the world are being transformed by this very AI technology. The global regime that I describe is a particular form of fascism known as a technocracy in which decisions are not made by clueless and co-opted politicians but by unelected technocrats – scientists, engineers, technologists and bureaucrats. Cult-owned-and-controlled Silicon Valley giants are examples of technocracy and they already have far more power to direct world events than governments. They are with their censorship *selecting* governments. I know that some are calling the 'Great Reset' a Marxist communist takeover, but fascism and Marxism are different labels for the same tyranny. Tell those who lived in fascist Germany and Stalinist Russia that there was a difference in the way their freedom was deleted and their lives controlled. I could call it a fascist technocracy or a Marxist technocracy and they would be equally accurate. The Hunger Games society with its world government structure would oversee a world army, world central bank and single world cashless currency imposing its will on a microchipped population ([Fig 5](#)). Scan its different elements and see how the illusory pandemic is forcing society in this very direction at great speed. Leaders of 23 countries and the World Health Organization (WHO) backed the idea in March, 2021, of a global treaty for 'international cooperation' in 'health emergencies' and nations should 'come together as a global community for peaceful cooperation that extends beyond this crisis'. Cut the Orwellian bullshit and this means another step towards global government. The plan includes a cashless digital money system that I first warned about in 1993. Right at the start of 'Covid' the deeply corrupt Tedros

Adhanom Ghebreyesus, the crooked and merely gofer 'head' of the World Health Organization, said it was possible to catch the 'virus' by touching cash and it was better to use cashless means. The claim was ridiculous nonsense and like the whole 'Covid' mind-trick it was nothing to do with 'health' and everything to do with pushing every aspect of the Cult agenda. As a result of the Tedros lie the use of cash has plummeted. The Cult script involves a single world digital currency that would eventually be technologically embedded in the body. China is a massive global centre for the Cult and if you watch what is happening there you will know what is planned for everywhere. The Chinese government is developing a digital currency which would allow fines to be deducted immediately via AI for anyone caught on camera breaking its fantastic list of laws and the money is going to be programmable with an expiry date to ensure that no one can accrue wealth except the Cult and its operatives.



Figure 5: The structure of global control the Cult has been working towards for so long and this has been enormously advanced by the 'Covid' illusion.

Serfdom is so smart

The Cult plan is far wider, extreme, and more comprehensive than even most conspiracy researchers appreciate and I will come to the true depths of deceit and control in the chapters 'Who controls the

Cult?’ and ‘Escaping Wetiko’. Even the world that we know is crazy enough. We are being deluged with ever more sophisticated and controlling technology under the heading of ‘smart’. We have smart televisions, smart meters, smart cards, smart cars, smart driving, smart roads, smart pills, smart patches, smart watches, smart skin, smart borders, smart pavements, smart streets, smart cities, smart communities, smart environments, smart growth, smart planet ... smart *everything* around us. Smart technologies and methods of operation are designed to interlock to create a global Smart Grid connecting the entirety of human society including human minds to create a centrally-dictated ‘hive’ mind. ‘Smart cities’ is code for densely-occupied megacities of total surveillance and control through AI. Ever more destructive frequency communication systems like 5G have been rolled out without any official testing for health and psychological effects (colossal). 5G/6G/7G systems are needed to run the Smart Grid and each one becomes more destructive of body and mind. Deleting independent income is crucial to forcing people into these AI-policed prisons by ending private property ownership (except for the Cult elite). The Cult’s Great Reset now openly foresees a global society in which no one will own any possessions and everything will be rented while the Cult would own literally everything under the guise of government and corporations. The aim has been to use the lockdowns to destroy sources of income on a mass scale and when the people are destitute and in unrepayable amounts of debt (problem) Cult assets come forward with the pledge to write-off debt in return for handing over all property and possessions (solution). Everything – literally everything including people – would be connected to the Internet via AI. I was warning years ago about the coming Internet of Things (IoT) in which all devices and technology from your car to your fridge would be plugged into the Internet and controlled by AI. Now we are already there with much more to come. The next stage is the Internet of Everything (IoE) which is planned to include the connection of AI to the human brain and body to replace the human mind with a centrally-controlled AI mind. Instead of perceptions

being manipulated through control of information and censorship those perceptions would come direct from the Cult through AI. What do you think? You think whatever AI decides that you think. In human terms there would be no individual 'think' any longer. Too incredible? The ravings of a lunatic? Not at all. Cult-owned crazies in Silicon Valley have been telling us the plan for years without explaining the real motivation and calculated implications. These include Google executive and 'futurist' Ray Kurzweil who highlights the year 2030 for when this would be underway. He said:

Our thinking ... will be a hybrid of biological and non-biological thinking ... humans will be able to extend their limitations and 'think in the cloud' ... We're going to put gateways to the cloud in our brains ... We're going to gradually merge and enhance ourselves ... In my view, that's the nature of being human – we transcend our limitations.

As the technology becomes vastly superior to what we are then the small proportion that is still human gets smaller and smaller and smaller until it's just utterly negligible.

The sales-pitch of Kurzweil and Cult-owned Silicon Valley is that this would make us 'super-human' when the real aim is to make us post-human and no longer 'human' in the sense that we have come to know. The entire global population would be connected to AI and become the centrally-controlled 'hive-mind' of externally-delivered perceptions. The Smart Grid being installed to impose the Cult's will on the world is being constructed to allow particular locations – even one location – to control the whole global system. From these prime control centres, which absolutely include China and Israel, anything connected to the Internet would be switched on or off and manipulated at will. Energy systems could be cut, communication via the Internet taken down, computer-controlled driverless autonomous vehicles driven off the road, medical devices switched off, the potential is limitless given how much AI and Internet connections now run human society. We have seen nothing yet if we allow this to continue. Autonomous vehicle makers are working with law enforcement to produce cars designed to automatically pull over if they detect a police or emergency vehicle flashing from up to 100 feet away. At a police stop the car would be unlocked and the

window rolled down automatically. Vehicles would only take you where the computer (the state) allowed. The end of petrol vehicles and speed limiters on all new cars in the UK and EU from 2022 are steps leading to electric computerised transport over which ultimately you have no control. The picture is far bigger even than the Cult global network or web and that will become clear when I get to the nature of the 'spider'. There is a connection between all these happenings and the instigation of DNA-manipulating 'vaccines' (which aren't 'vaccines') justified by the 'Covid' hoax. That connection is the unfolding plan to transform the human body from a biological to a synthetic biological state and this is why synthetic biology is such a fast-emerging discipline of mainstream science. 'Covid vaccines' are infusing self-replicating synthetic genetic material into the cells to cumulatively take us on the Totalitarian Tiptoe from Human 1.0 to the synthetic biological Human 2.0 which will be physically and perceptually attached to the Smart Grid to one hundred percent control every thought, perception and deed. Humanity needs to wake up and *fast*.

This is the barest explanation of where the 'outcome' is planned to go but it's enough to see the journey happening all around us. Those new to this information will already see 'Covid' in a whole new context. I will add much more detail as we go along, but for the minutiae evidence see my mega-works, *The Answer*, *The Trigger* and *Everything You Need to Know But Have Never Been Told*.

Now – how does a Renegade Mind see the 'world'?

CHAPTER TWO

Renegade Perception

It is one thing to be clever and another to be wise

George R.R. Martin

A simple definition of the difference between a programmed mind and a Renegade Mind would be that one sees only dots while the other connects them to see the picture. Reading reality with accuracy requires the observer to (a) know the planned outcome and (b) realise that everything, but *everything*, is connected.

The entirety of infinite reality is connected – that's its very nature – and with human society an expression of infinite reality the same must apply. Simple cause and effect is a connection. The effect is triggered by the cause and the effect then becomes the cause of another effect. Nothing happens in isolation because it *can't*. Life in whatever reality is simple choice and consequence. We make choices and these lead to consequences. If we don't like the consequences we can make different choices and get different consequences which lead to other choices and consequences. The choice and the consequence are not only connected they are indivisible. You can't have one without the other as an old song goes. A few cannot control the world unless those being controlled allow that to happen – cause and effect, choice and consequence. Control – who has it and who doesn't – is a two-way process, a symbiotic relationship, involving the controller and controlled. 'They took my freedom away!!' Well, yes, but you also gave it to them. Humanity is

subjected to mass control because humanity has acquiesced to that control. This is all cause and effect and literally a case of give and take. In the same way world events of every kind are connected and the Cult works incessantly to sell the illusion of the random and coincidental to maintain the essential (to them) perception of dots that hide the picture. Renegade Minds know this and constantly scan the world for patterns of connection. This is absolutely pivotal in understanding the happenings in the world and without that perspective clarity is impossible. First you know the planned outcome and then you identify the steps on the journey – the day-by-day apparently random which, when connected in relation to the outcome, no longer appear as individual events, but as the proverbial *chain* of events leading in the same direction. I'll give you some examples:

Political puppet show

We are told to believe that politics is 'adversarial' in that different parties with different beliefs engage in an endless tussle for power. There may have been some truth in that up to a point – and only a point – but today divisions between 'different' parties are rhetorical not ideological. Even the rhetorical is fusing into one-speak as the parties eject any remaining free thinkers while others succumb to the ever-gathering intimidation of anyone with the 'wrong' opinion. The Cult is not a new phenomenon and can be traced back thousands of years as my books have documented. Its intergenerational initiatives have been manipulating events with increasing effect the more that global power has been centralised. In ancient times the Cult secured control through the system of monarchy in which 'special' bloodlines (of which more later) demanded the right to rule as kings and queens simply by birthright and by vanquishing others who claimed the same birthright. There came a time, however, when people had matured enough to see the unfairness of such tyranny and demanded a say in who governed them. Note the word – *governed* them. Not served them – *governed* them, hence government defined as 'the political direction and control exercised over the

actions of the members, citizens, or inhabitants of communities, societies, and states; direction of the affairs of a state, community, etc.' Governments exercise control over rather than serve just like the monarchies before them. Bizarrely there are still countries like the United Kingdom which are ruled by a monarch *and* a government that officially answers to the monarch. The UK head of state and that of Commonwealth countries such as Canada, Australia and New Zealand is 'selected' by who in a *single family* had unprotected sex with whom and in what order. Pinch me it can't be true. Ouch! Shit, it is. The demise of monarchies in most countries offered a potential vacuum in which some form of free and fair society could arise and the Cult had that base covered. Monarchies had served its interests but they couldn't continue in the face of such widespread opposition and, anyway, replacing a 'royal' dictatorship that people could see with a dictatorship 'of the people' hiding behind the concept of 'democracy' presented far greater manipulative possibilities and ways of hiding coordinated tyranny behind the illusion of 'freedom'.

Democracy is quite wrongly defined as government selected by the population. This is not the case at all. It is government selected by *some* of the population (and then only in theory). This 'some' doesn't even have to be the majority as we have seen so often in first-past-the-post elections in which the so-called majority party wins fewer votes than the 'losing' parties combined. Democracy can give total power to a party in government from a minority of the votes cast. It's a sleight of hand to sell tyranny as freedom. Seventy-four million Trump-supporting Americans didn't vote for the 'Democratic' Party of Joe Biden in the distinctly dodgy election in 2020 and yet far from acknowledging the wishes and feelings of that great percentage of American society the Cult-owned Biden government set out from day one to destroy them and their right to a voice and opinion. Empty shell Biden and his Cult handlers said they were doing this to 'protect democracy'. Such is the level of lunacy and sickness to which politics has descended. Connect the dots and relate them to the desired outcome – a world government run by self-appointed technocrats and no longer even elected

politicians. While operating through its political agents in government the Cult is at the same time encouraging public disdain for politicians by putting idiots and incompetents in theoretical power on the road to deleting them. The idea is to instil a public reaction that says of the technocrats: 'Well, they couldn't do any worse than the pathetic politicians.' It's all about controlling perception and Renegade Minds can see through that while programmed minds cannot when they are ignorant of both the planned outcome and the manipulation techniques employed to secure that end. This knowledge can be learned, however, and fast if people choose to get informed.

Politics may at first sight appear very difficult to control from a central point. I mean look at the 'different' parties and how would you be able to oversee them all and their constituent parts? In truth, it's very straightforward because of their structure. We are back to the pyramid of imposition and acquiescence. Organisations are structured in the same way as the system as a whole. Political parties are not open forums of free expression. They are hierarchies. I was a national spokesman for the British Green Party which claimed to be a different kind of politics in which influence and power was devolved; but I can tell you from direct experience – and it's far worse now – that Green parties are run as hierarchies like all the others however much they may try to hide that fact or kid themselves that it's not true. A very few at the top of all political parties are directing policy and personnel. They decide if you are elevated in the party or serve as a government minister and to do that you have to be a yes man or woman. Look at all the maverick political thinkers who never ascended the greasy pole. If you want to progress within the party or reach 'high-office' you need to fall into line and conform. Exceptions to this are rare indeed. Should you want to run for parliament or Congress you have to persuade the local or state level of the party to select you and for that you need to play the game as dictated by the hierarchy. If you secure election and wish to progress within the greater structure you need to go on conforming to what is acceptable to those running the hierarchy

from the peak of the pyramid. Political parties are perceptual gulags and the very fact that there are party 'Whips' appointed to 'whip' politicians into voting the way the hierarchy demands exposes the ridiculous idea that politicians are elected to serve the people they are supposed to represent. Cult operatives and manipulation has long seized control of major parties that have any chance of forming a government and at least most of those that haven't. A new party forms and the Cult goes to work to infiltrate and direct. This has reached such a level today that you see video compilations of 'leaders' of all parties whether Democrats, Republicans, Conservative, Labour and Green parroting the same Cult mantra of 'Build Back Better' and the 'Great Reset' which are straight off the Cult song-sheet to describe the transformation of global society in response to the Cult-instigated hoaxes of the 'Covid pandemic' and human-caused 'climate change'. To see Caroline Lucas, the Green Party MP that I knew when I was in the party in the 1980s, speaking in support of plans proposed by Cult operative Klaus Schwab representing the billionaire global elite is a real head-shaker.

Many parties – one master

The party system is another mind-trick and was instigated to change the nature of the dictatorship by swapping 'royalty' for dark suits that people believed – though now ever less so – represented their interests. Understanding this trick is to realise that a single force (the Cult) controls all parties either directly in terms of the major ones or through manipulation of perception and ideology with others. You don't need to manipulate Green parties to demand your transformation of society in the name of 'climate change' when they are obsessed with the lie that this is essential to 'save the planet'. You just give them a platform and away they go serving your interests while believing they are being environmentally virtuous. America's political structure is a perfect blueprint for how the two or multi-party system is really a one-party state. The Republican Party is controlled from one step back in the shadows by a group made up of billionaires and their gofers known as neoconservatives or Neocons.

I have exposed them in fine detail in my books and they were the driving force behind the policies of the imbecilic presidency of Boy George Bush which included 9/11 (see *The Trigger* for a comprehensive demolition of the official story), the subsequent 'war on terror' (war of terror) and the invasions of Afghanistan and Iraq. The latter was a No-Problem-Reaction-Solution based on claims by Cult operatives, including Bush and British Prime Minister Tony Blair, about Saddam Hussein's 'weapons of mass destruction' which did not exist as war criminals Bush and Blair well knew.



Figure 6: Different front people, different parties – same control system.

The Democratic Party has its own 'Neocon' group controlling from the background which I call the 'Democons' and here's the penny-drop – the Neocons and Democons answer to the same masters one step further back into the shadows (Fig 6). At that level of the Cult the Republican and Democrat parties are controlled by the same people and no matter which is in power the Cult is in power. This is how it works in almost every country and certainly in Britain with Conservative, Labour, Liberal Democrat and Green parties now all on the same page whatever the rhetoric may be in their feeble attempts to appear different. Neocons operated at the time of Bush through a think tank called The Project for the New American Century which in September, 2000, published a document entitled *Rebuilding America's Defenses: Strategies, Forces, and Resources*

For a New Century demanding that America fight ‘multiple, simultaneous major theatre wars’ as a ‘core mission’ to force regime-change in countries including Iraq, Libya and Syria. Neocons arranged for Bush (‘Republican’) and Blair (‘Labour Party’) to front-up the invasion of Iraq and when they departed the Democons orchestrated the targeting of Libya and Syria through Barack Obama (‘Democrat’) and British Prime Minister David Cameron (‘Conservative Party’). We have ‘different’ parties and ‘different’ people, but the same unfolding script. The more the Cult has seized the reigns of parties and personnel the more their policies have transparently pursued the same agenda to the point where the fascist ‘Covid’ impositions of the Conservative junta of Jackboot Johnson in Britain were opposed by the Labour Party because they were not fascist enough. The Labour Party is likened to the US Democrats while the Conservative Party is akin to a British version of the Republicans and on both sides of the Atlantic they all speak the same language and support the direction demanded by the Cult although some more enthusiastically than others. It’s a similar story in country after country because it’s all centrally controlled. Oh, but what about Trump? I’ll come to him shortly. Political ‘choice’ in the ‘party’ system goes like this: You vote for Party A and they get into government. You don’t like what they do so next time you vote for Party B and they get into government. You don’t like what they do when it’s pretty much the same as Party A and why wouldn’t that be with both controlled by the same force? Given that only two, sometimes three, parties have any chance of forming a government to get rid of Party B that you don’t like you have to vote again for Party A which ... you don’t like. This, ladies and gentlemen, is what they call ‘democracy’ which we are told – wrongly – is a term interchangeable with ‘freedom’.

The cult of cults

At this point I need to introduce a major expression of the Global Cult known as Sabbatian-Frankism. Sabbatian is also spelt as Sabbatean. I will summarise here. I have published major exposés

and detailed background in other works. Sabbatian-Frankism combines the names of two frauds posing as 'Jewish' men, Sabbatai Zevi (1626-1676), a rabbi, black magician and occultist who proclaimed he was the Jewish messiah; and Jacob Frank (1726-1791), the Polish 'Jew', black magician and occultist who said he was the reincarnation of 'messiah' Zevi and biblical patriarch Jacob. They worked across two centuries to establish the Sabbatian-Frankist cult that plays a major, indeed central, role in the manipulation of human society by the Global Cult which has its origins much further back in history than Sabbatai Zevi. I should emphasise two points here in response to the shrill voices that will scream 'anti-Semitism': (1) Sabbatian-Frankists are NOT Jewish and only pose as such to hide their cult behind a Jewish façade; and (2) my information about this cult has come from Jewish sources who have long realised that their society and community has been infiltrated and taken over by interloper Sabbatian-Frankists. Infiltration has been the foundation technique of Sabbatian-Frankism from its official origin in the 17th century. Zevi's Sabbatian sect attracted a massive following described as the biggest messianic movement in Jewish history, spreading as far as Africa and Asia, and he promised a return for the Jews to the 'Promised Land' of Israel. Sabbatianism was not Judaism but an inversion of everything that mainstream Judaism stood for. So much so that this sinister cult would have a feast day when Judaism had a fast day and whatever was forbidden in Judaism the Sabbatians were encouraged and even commanded to do. This included incest and what would be today called Satanism. Members were forbidden to marry outside the sect and there was a system of keeping their children ignorant of what they were part of until they were old enough to be trusted not to unknowingly reveal anything to outsiders. The same system is employed to this day by the Global Cult in general which Sabbatian-Frankism has enormously influenced and now largely controls.

Zevi and his Sabbatians suffered a setback with the intervention by the Sultan of the Islamic Ottoman Empire in the Middle East and what is now the Republic of Turkey where Zevi was located. The

Sultan gave him the choice of proving his 'divinity', converting to Islam or facing torture and death. Funnily enough Zevi chose to convert or at least appear to. Some of his supporters were disillusioned and drifted away, but many did not with 300 families also converting – only in theory – to Islam. They continued behind this Islamic smokescreen to follow the goals, rules and rituals of Sabbatianism and became known as 'crypto-Jews' or the 'Dönme' which means 'to turn'. This is rather ironic because they didn't 'turn' and instead hid behind a fake Islamic persona. The process of appearing to be one thing while being very much another would become the calling card of Sabbatianism especially after Zevi's death and the arrival of the Satanist Jacob Frank in the 18th century when the cult became Sabbatian-Frankism and plumbed still new depths of depravity and infiltration which included – still includes – human sacrifice and sex with children. Wherever Sabbatians go paedophilia and Satanism follow and is it really a surprise that Hollywood is so infested with child abuse and Satanism when it was established by Sabbatian-Frankists and is still controlled by them? Hollywood has been one of the prime vehicles for global perceptual programming and manipulation. How many believe the version of 'history' portrayed in movies when it is a travesty and inversion (again) of the truth? Rabbi Marvin Antelman describes Frankism in his book, *To Eliminate the Opiate*, as 'a movement of complete evil' while Jewish professor Gershom Scholem said of Frank in *The Messianic Idea in Judaism*: 'In all his actions [he was] a truly corrupt and degenerate individual ... one of the most frightening phenomena in the whole of Jewish history.' Frank was excommunicated by traditional rabbis, as was Zevi, but Frank was undeterred and enjoyed vital support from the House of Rothschild, the infamous banking dynasty whose inner-core are Sabbatian-Frankists and not Jews. Infiltration of the Roman Church and Vatican was instigated by Frank with many Dönme 'turning' again to convert to Roman Catholicism with a view to hijacking the reins of power. This was the ever-repeating modus operandi and continues to be so. Pose as an advocate of the religion, culture or country that you want to control and then

manipulate your people into the positions of authority and influence largely as advisers, administrators and Svengalis for those that appear to be in power. They did this with Judaism, Christianity (Christian Zionism is part of this), Islam and other religions and nations until Sabbatian-Frankism spanned the world as it does today.

Sabbatian Saudis and the terror network

One expression of the Sabbatian-Frankist Dönme within Islam is the ruling family of Saudi Arabia, the House of Saud, through which came the vile distortion of Islam known as Wahhabism. This is the violent creed followed by terrorist groups like Al-Qaeda and ISIS or Islamic State. Wahhabism is the hand-chopping, head-chopping 'religion' of Saudi Arabia which is used to keep the people in a constant state of fear so the interloper House of Saud can continue to rule. Al-Qaeda and Islamic State were lavishly funded by the House of Saud while being created and directed by the Sabbatian-Frankist network in the United States that operates through the Pentagon, CIA and the government in general of whichever 'party'. The front man for the establishment of Wahhabism in the middle of the 18th century was a Sabbatian-Frankist 'crypto-Jew' posing as Islamic called Muhammad ibn Abd al-Wahhab. His daughter would marry the son of Muhammad bin Saud who established the first Saudi state before his death in 1765 with support from the British Empire. Bin Saud's successors would establish modern Saudi Arabia in league with the British and Americans in 1932 which allowed them to seize control of Islam's major shrines in Mecca and Medina. They have dictated the direction of Sunni Islam ever since while Iran is the major centre of the Shiite version and here we have the source of at least the public conflict between them. The Sabbatian network has used its Wahhabi extremists to carry out Problem-Reaction-Solution terrorist attacks in the name of 'Al-Qaeda' and 'Islamic State' to justify a devastating 'war on terror', ever-increasing surveillance of the population and to terrify people into compliance. Another insight of the Renegade Mind is the streetwise understanding that

just because a country, location or people are attacked doesn't mean that those apparently representing that country, location or people are not behind the attackers. Often they are *orchestrating* the attacks because of the societal changes that can be then justified in the name of 'saving the population from terrorists'.

I show in great detail in *The Trigger* how Sabbatian-Frankists were the real perpetrators of 9/11 and not '19 Arab hijackers' who were blamed for what happened. Observe what was justified in the name of 9/11 alone in terms of Middle East invasions, mass surveillance and control that fulfilled the demands of the Project for the New American Century document published by the Sabbatian Neocons. What appear to be enemies are on the deep inside players on the same Sabbatian team. Israel and Arab 'royal' dictatorships are all ruled by Sabbatians and the recent peace agreements between Israel and Saudi Arabia, the United Arab Emirates (UAE) and others are only making formal what has always been the case behind the scenes. Palestinians who have been subjected to grotesque tyranny since Israel was bombed and terrorised into existence in 1948 have never stood a chance. Sabbatian-Frankists have controlled Israel (so the constant theme of violence and war which Sabbatians love) and they have controlled the Arab countries that Palestinians have looked to for real support that never comes. 'Royal families' of the Arab world in Saudi Arabia, Bahrain, UAE, etc., are all Sabbatians with allegiance to the aims of the cult and not what is best for their Arabic populations. They have stolen the oil and financial resources from their people by false claims to be 'royal dynasties' with a genetic right to rule and by employing vicious militaries to impose their will.

Satanic 'illumination'

The Satanist Jacob Frank formed an alliance in 1773 with two other Sabbatians, Mayer Amschel Rothschild (1744-1812), founder of the Rothschild banking dynasty, and Jesuit-educated fraudulent Jew, Adam Weishaupt, and this led to the formation of the Bavarian Illuminati, firstly under another name, in 1776. The Illuminati would

be the manipulating force behind the French Revolution (1789-1799) and was also involved in the American Revolution (1775-1783) before and after the Illuminati's official creation. Weishaupt would later become (in public) a Protestant Christian in archetypal Sabbatian style. I read that his name can be decoded as Adam-Weishaupt or 'the first man to lead those who know'. He wasn't a leader in the sense that he was a subordinate, but he did lead those below him in a crusade of transforming human society that still continues today. The theme was confirmed as early as 1785 when a horseman courier called Lanz was reported to be struck by lightning and extensive Illuminati documents were found in his saddlebags. They made the link to Weishaupt and detailed the plan for world takeover. Current events with 'Covid' fascism have been in the making for a very long time. Jacob Frank was jailed for 13 years by the Catholic Inquisition after his arrest in 1760 and on his release he headed for Frankfurt, Germany, home city and headquarters of the House of Rothschild where the alliance was struck with Mayer Amschel Rothschild and Weishaupt. Rothschild arranged for Frank to be given the title of Baron and he became a wealthy nobleman with a big following of Jews in Germany, the Austro-Hungarian Empire and other European countries. Most of them would have believed he was on their side.

The name 'Illuminati' came from the Zohar which is a body of works in the Jewish mystical 'bible' called the Kabbalah. 'Zohar' is the foundation of Sabbatian-Frankist belief and in Hebrew 'Zohar' means 'splendour', 'radiance', 'illuminated', and so we have 'Illuminati'. They claim to be the 'Illuminated Ones' from their knowledge systematically hidden from the human population and passed on through generations of carefully-chosen initiates in the global secret society network or Cult. Hidden knowledge includes an awareness of the Cult agenda for the world and the nature of our collective reality that I will explore later. Cult 'illumination' is symbolised by the torch held by the Statue of Liberty which was gifted to New York by French Freemasons in Paris who knew exactly what it represents. 'Liberty' symbolises the goddess worshipped in

Babylon as Queen Semiramis or Ishtar. The significance of this will become clear. Notice again the ubiquitous theme of inversion with the Statue of 'Liberty' really symbolising mass control (Fig 7). A mirror-image statute stands on an island in the River Seine in Paris from where New York Liberty originated (Fig 8). A large replica of the Liberty flame stands on top of the Pont de l'Alma tunnel in Paris where Princess Diana died in a Cult ritual described in *The Biggest Secret*. Lucifer 'the light bringer' is related to all this (and much more as we'll see) and 'Lucifer' is a central figure in Sabbatian-Frankism and its associated Satanism. Sabbatians reject the Jewish Torah, or Pentateuch, the 'five books of Moses' in the Old Testament known as Genesis, Exodus, Leviticus, Numbers, and Deuteronomy which are claimed by Judaism and Christianity to have been dictated by 'God' to Moses on Mount Sinai. Sabbatians say these do not apply to them and they seek to replace them with the Zohar to absorb Judaism and its followers into their inversion which is an expression of a much greater global inversion. They want to delete all religions and force humanity to worship a one-world religion – Sabbatian Satanism that also includes worship of the Earth goddess. Satanic themes are being more and more introduced into mainstream society and while Christianity is currently the foremost target for destruction the others are planned to follow.



Figure 7: The Cult goddess of Babylon disguised as the Statue of Liberty holding the flame of Lucifer the 'light bringer'.



Figure 8: Liberty's mirror image in Paris where the New York version originated.

Marx brothers

Rabbi Marvin Antelman connects the Illuminati to the Jacobins in *To Eliminate the Opiate* and Jacobins were the force behind the French Revolution. He links both to the Bund der Gerechten, or League of the Just, which was the network that inflicted communism/Marxism on the world. Antelman wrote:

The original inner circle of the Bund der Gerechten consisted of born Catholics, Protestants and Jews [Sabbatian-Frankist infiltrators], and those representatives of respective subdivisions formulated schemes for the ultimate destruction of their faiths. The heretical Catholics laid plans which they felt would take a century or more for the ultimate destruction of the church; the apostate Jews for the ultimate destruction of the Jewish religion.

Sabbatian-created communism connects into this anti-religion agenda in that communism does not allow for the free practice of religion. The Sabbatian 'Bund' became the International Communist Party and Communist League and in 1848 'Marxism' was born with the Communist Manifesto of Sabbatian assets Karl Marx and Friedrich Engels. It is absolutely no coincidence that Marxism, just a different name for fascist and other centrally-controlled tyrannies, is being imposed worldwide as a result of the 'Covid' hoax and nor that Marxist/fascist China was the place where the hoax originated. The reason for this will become very clear in the chapter 'Covid: The calculated catastrophe'. The so-called 'Woke' mentality has hijacked

traditional beliefs of the political left and replaced them with far-right make-believe 'social justice' better known as Marxism. Woke will, however, be swallowed by its own perceived 'revolution' which is really the work of billionaires and billionaire corporations feigning being 'Woke'. Marxism is being touted by Wokers as a replacement for 'capitalism' when we don't have 'capitalism'. We have cartelism in which the market is stitched up by the very Cult billionaires and corporations bankrolling Woke. Billionaires love Marxism which keeps the people in servitude while they control from the top. Terminally naïve Wokers think they are 'changing the world' when it's the Cult that is doing the changing and when they have played their vital part and become surplus to requirements they, too, will be targeted. The Illuminati-Jacobins were behind the period known as 'The Terror' in the French Revolution in 1793 and 1794 when Jacobin Maximillian de Robespierre and his Orwellian 'Committee of Public Safety' killed 17,000 'enemies of the Revolution' who had once been 'friends of the Revolution'. Karl Marx (1818-1883), whose Sabbatian creed of Marxism has cost the lives of at least 100 million people, is a hero once again to Wokers who have been systematically kept ignorant of real history by their 'education' programming. As a result they now promote a Sabbatian 'Marxist' abomination destined at some point to consume them. Rabbi Antelman, who spent decades researching the Sabbatian plot, said of the League of the Just and Karl Marx:

Contrary to popular opinion Karl Marx did not originate the Communist Manifesto. He was paid for his services by the League of the Just, which was known in its country of origin, Germany, as the Bund der Geächteten.

Antelman said the text attributed to Marx was the work of other people and Marx 'was only repeating what others already said'. Marx was 'a hired hack – lackey of the wealthy Illuminists'. Marx famously said that religion was the 'opium of the people' (part of the Sabbatian plan to demonise religion) and Antelman called his books, *To Eliminate the Opiate*. Marx was born Jewish, but his family converted to Christianity (Sabbatian modus operandi) and he

attacked Jews, not least in his book, *A World Without Jews*. In doing so he supported the Sabbatian plan to destroy traditional Jewishness and Judaism which we are clearly seeing today with the vindictive targeting of orthodox Jews by the Sabbatian government of Israel over 'Covid' laws. I don't follow any religion and it has done much damage to the world over centuries and acted as a perceptual straightjacket. Renegade Minds, however, are always asking *why* something is being done. It doesn't matter if they agree or disagree with what is happening – *why* is it happening is the question. The 'why?' can be answered with regard to religion in that religions create interacting communities of believers when the Cult wants to dismantle all discourse, unity and interaction (see 'Covid' lockdowns) and the ultimate goal is to delete all religions for a one-world religion of Cult Satanism worshipping their 'god' of which more later. We see the same 'why?' with gun control in America. I don't have guns and don't want them, but why is the Cult seeking to disarm the population at the same time that law enforcement agencies are armed to their molars and why has every tyrant in history sought to disarm people before launching the final takeover? They include Hitler, Stalin, Pol Pot and Mao who followed confiscation with violent seizing of power. You know it's a Cult agenda by the people who immediately race to the microphones to exploit dead people in multiple shootings. Ultra-Zionist Cult lackey Senator Chuck Schumer was straight on the case after ten people were killed in Boulder, Colorado in March, 2121. Simple rule ... if Schumer wants it the Cult wants it and the same with his ultra-Zionist mate the wild-eyed Senator Adam Schiff. At the same time they were calling for the disarmament of Americans, many of whom live a long way from a police response, Schumer, Schiff and the rest of these pampered clowns were sitting on Capitol Hill behind a razor-wired security fence protected by thousands of armed troops in addition to their own armed bodyguards. Mom and pop in an isolated home? They're just potential mass shooters.

Zion Mainframe

Sabbatian-Frankists and most importantly the Rothschilds were behind the creation of 'Zionism', a political movement that demanded a Jewish homeland in Israel as promised by Sabbatai Zevi. The very symbol of Israel comes from the German meaning of the name Rothschild. Dynasty founder Mayer Amschel Rothschild changed the family name from Bauer to Rothschild, or 'Red-Shield' in German, in deference to the six-pointed 'Star of David' hexagram displayed on the family's home in Frankfurt. The symbol later appeared on the flag of Israel after the Rothschilds were centrally involved in its creation. Hexagrams are not a uniquely Jewish symbol and are widely used in occult ('hidden') networks often as a symbol for Saturn (see my other books for why). Neither are Zionism and Jewishness interchangeable. Zionism is a political movement and philosophy and not a 'race' or a people. Many Jews oppose Zionism and many non-Jews, including US President Joe Biden, call themselves Zionists as does Israel-centric Donald Trump. America's support for the Israel government is pretty much a gimme with ultra-Zionist billionaires and corporations providing fantastic and dominant funding for both political parties. Former Congresswoman Cynthia McKinney has told how she was approached immediately she ran for office to 'sign the pledge' to Israel and confirm that she would always vote in that country's best interests. All American politicians are approached in this way. Anyone who refuses will get no support or funding from the enormous and all-powerful Zionist lobby that includes organisations like mega-lobby group AIPAC, the American Israel Public Affairs Committee. Trump's biggest funder was ultra-Zionist casino and media billionaire Sheldon Adelson while major funders of the Democratic Party include ultra-Zionist George Soros and ultra-Zionist financial and media mogul, Haim Saban. Some may reel back at the suggestion that Soros is an Israel-firster (Sabbatian-controlled Israel-firster), but Renegade Minds watch the actions not the words and everywhere Soros donates his billions the Sabbatian agenda benefits. In the spirit of Sabbatian inversion Soros pledged \$1 billion for a new university network to promote 'liberal values and tackle intolerance'. He made the announcement during his annual speech

at the Cult-owned World Economic Forum in Davos, Switzerland, in January, 2020, after his 'harsh criticism' of 'authoritarian rulers' around the world. You can only laugh at such brazen mendacity. How *he* doesn't laugh is the mystery. Translated from the Orwellian 'liberal values and tackle intolerance' means teaching non-white people to hate white people and for white people to loathe themselves for being born white. The reason for that will become clear.

The 'Anti-Semitism' fraud

Zionists support the Jewish homeland in the land of Palestine which has been the Sabbatian-Rothschild goal for so long, but not for the benefit of Jews. Sabbatians and their global Anti-Semitism Industry have skewed public and political opinion to equate opposing the violent extremes of Zionism to be a blanket attack and condemnation of all Jewish people. Sabbatians and their global Anti-Semitism Industry have skewed public and political opinion to equate opposing the violent extremes of Zionism to be a blanket attack and condemnation of all Jewish people. This is nothing more than a Sabbatian protection racket to stop legitimate investigation and exposure of their agendas and activities. The official definition of 'anti-Semitism' has more recently been expanded to include criticism of Zionism – a *political movement* – and this was done to further stop exposure of Sabbatian infiltrators who created Zionism as we know it today in the 19th century. Renegade Minds will talk about these subjects when they know the shit that will come their way. People must decide if they want to know the truth or just cower in the corner in fear of what others will say. Sabbatians have been trying to label me as 'anti-Semitic' since the 1990s as I have uncovered more and more about their background and agendas. Useless, gutless, fraudulent 'journalists' then just repeat the smears without question and on the day I was writing this section a pair of unquestioning repeaters called Ben Quinn and Archie Bland (how appropriate) outright called me an 'anti-Semite' in the establishment propaganda sheet, the London *Guardian*, with no supporting evidence. The

Sabbatian Anti-Semitism Industry said so and who are they to question that? They wouldn't dare. Ironically 'Semitic' refers to a group of languages in the Middle East that are almost entirely Arabic. 'Anti-Semitism' becomes 'anti-Arab' which if the consequences of this misunderstanding were not so grave would be hilarious. Don't bother telling Quinn and Bland. I don't want to confuse them, bless 'em. One reason I am dubbed 'anti-Semitic' is that I wrote in the 1990s that Jewish operatives (Sabbatians) were heavily involved in the Russian Revolution when Sabbatians overthrew the Romanov dynasty. This apparently made me 'anti-Semitic'. Oh, really? Here is a section from *The Trigger*:

British journalist Robert Wilton confirmed these themes in his 1920 book *The Last Days of the Romanovs* when he studied official documents from the Russian government to identify the members of the Bolshevik ruling elite between 1917 and 1919. The Central Committee included 41 Jews among 62 members; the Council of the People's Commissars had 17 Jews out of 22 members; and 458 of the 556 most important Bolshevik positions between 1918 and 1919 were occupied by Jewish people. Only 17 were Russian. Then there were the 23 Jews among the 36 members of the vicious Cheka Soviet secret police established in 1917 who would soon appear all across the country.

Professor Robert Service of Oxford University, an expert on 20th century Russian history, found evidence that ['Jewish'] Leon Trotsky had sought to make sure that Jews were enrolled in the Red Army and were disproportionately represented in the Soviet civil bureaucracy that included the Cheka which performed mass arrests, imprisonment and executions of 'enemies of the people'. A US State Department Decimal File (861.00/5339) dated November 13th, 1918, names [Rothschild banking agent in America] Jacob Schiff and a list of ultra-Zionists as funders of the Russian Revolution leading to claims of a 'Jewish plot', but the key point missed by all is they were not 'Jews' – they were Sabbatian-Frankists.

Britain's Winston Churchill made the same error by mistake or otherwise. He wrote in a 1920 edition of the *Illustrated Sunday Herald* that those behind the Russian revolution were part of a 'worldwide conspiracy for the overthrow of civilisation and for the reconstitution of society on the basis of arrested development, of envious malevolence, and impossible equality' (see 'Woke' today because that has been created by the same network). Churchill said there was no need to exaggerate the part played in the creation of Bolshevism and in the actual bringing about of the Russian

Revolution 'by these international and for the most part atheistical Jews' ['atheistical Jews' = Sabbatians]. Churchill said it is certainly a very great one and probably outweighs all others: 'With the notable exception of Lenin, the majority of the leading figures are Jews.' He went on to describe, knowingly or not, the Sabbatian modus operandi of placing puppet leaders nominally in power while they control from the background:

Moreover, the principal inspiration and driving power comes from the Jewish leaders. Thus Tchitcherin, a pure Russian, is eclipsed by his nominal subordinate, Litvinoff, and the influence of Russians like Bukharin or Lunacharski cannot be compared with the power of Trotsky, or of Zinovieff, the Dictator of the Red Citadel (Petrograd), or of Krassin or Radek – all Jews. In the Soviet institutions the predominance of Jews is even more astonishing. And the prominent, if not indeed the principal, part in the system of terrorism applied by the Extraordinary Commissions for Combatting Counter-Revolution has been taken by Jews, and in some notable cases by Jewesses.

What I said about seriously disproportionate involvement in the Russian Revolution by Jewish 'revolutionaries' (Sabbatians) is provable fact, but truth is no defence against the Sabbatian Anti-Semitism Industry, its repeater parrots like Quinn and Bland, and the now breathtaking network of so-called 'Woke' 'anti-hate' groups with interlocking leaderships and funding which have the role of discrediting and silencing anyone who gets too close to exposing the Sabbatians. We have seen 'truth is no defence' confirmed in legal judgements with the Saskatchewan Human Rights Commission in Canada decreeing this: 'Truthful statements can be presented in a manner that would meet the definition of hate speech, and not all truthful statements must be free from restriction.' Most 'anti-hate' activists, who are themselves consumed by hatred, are too stupid and ignorant of the world to know how they are being used. They are far too far up their own virtue-signalling arses and it's far too dark for them to see anything.

The 'revolution' game

The background and methods of the 'Russian' Revolution are straight from the Sabbatian playbook seen in the French Revolution

and endless others around the world that appear to start as a revolution of the people against tyrannical rule and end up with a regime change to more tyrannical rule overtly or covertly. Wars, terror attacks and regime overthrows follow the Sabbatian cult through history with its agents creating them as Problem-Reaction-Solutions to remove opposition on the road to world domination. Sabbatian dots connect the Rothschilds with the Illuminati, Jacobins of the French Revolution, the 'Bund' or League of the Just, the International Communist Party, Communist League and the Communist Manifesto of Karl Marx and Friedrich Engels that would lead to the Rothschild-funded Russian Revolution. The sequence comes under the heading of 'creative destruction' when you advance to your global goal by continually destroying the status quo to install a new status quo which you then also destroy. The two world wars come to mind. With each new status quo you move closer to your planned outcome. Wars and mass murder are to Sabbatians a collective blood sacrifice ritual. They are obsessed with death for many reasons and one is that death is an inversion of life. Satanists and Sabbatians are obsessed with death and often target churches and churchyards for their rituals. Inversion-obsessed Sabbatians explain the use of inverted symbolism including the *inverted* pentagram and *inverted* cross. The inversion of the cross has been related to targeting Christianity, but the cross was a religious symbol long before Christianity and its inversion is a statement about the Sabbatian mentality and goals more than any single religion.

Sabbatians operating in Germany were behind the rise of the occult-obsessed Nazis and the subsequent Jewish exodus from Germany and Europe to Palestine and the United States after World War Two. The Rothschild dynasty was at the forefront of this both as political manipulators and by funding the operation. Why would Sabbatians help to orchestrate the horrors inflicted on Jews by the Nazis and by Stalin after they organised the Russian Revolution? Sabbatians hate Jews and their religion, that's why. They pose as Jews and secure positions of control within Jewish society and play the 'anti-Semitism' card to protect themselves from exposure

through a global network of organisations answering to the Sabbatian-created-and-controlled globe-spanning intelligence network that involves a stunning web of military-intelligence operatives and operations for a tiny country of just nine million. Among them are Jewish assets who are not Sabbatians but have been convinced by them that what they are doing is for the good of Israel and the Jewish community to protect them from what they have been programmed since childhood to believe is a Jew-hating hostile world. The Jewish community is just a highly convenient cover to hide the true nature of Sabbatians. Anyone getting close to exposing their game is accused by Sabbatian place-people and gofers of 'anti-Semitism' and claiming that all Jews are part of a plot to take over the world. I am not saying that. I am saying that Sabbatians – the *real* Jew-haters – have infiltrated the Jewish community to use them both as a cover and an 'anti-Semitic' defence against exposure. Thus we have the Anti-Semitism Industry targeted researchers in this way and most Jewish people think this is justified and genuine. They don't know that their 'Jewish' leaders and institutions of state, intelligence and military are not controlled by Jews at all, but cultists and stooges of Sabbatian-Frankism. I once added my name to a pro-Jewish freedom petition online and the next time I looked my name was gone and text had been added to the petition blurb to attack me as an 'anti-Semite' such is the scale of perceptual programming.

Moving on America

I tell the story in *The Trigger* and a chapter called 'Atlantic Crossing' how particularly after Israel was established the Sabbatians moved in on the United States and eventually grasped control of government administration, the political system via both Democrats and Republicans, the intelligence community like the CIA and National Security Agency (NSA), the Pentagon and mass media. Through this seriously compartmentalised network Sabbatians and their operatives in Mossad, Israeli Defense Forces (IDF) and US agencies pulled off 9/11 and blamed it on 19 'Al-Qaeda hijackers' dominated by men from, or connected to, Sabbatian-ruled Saudi

Arabia. The '19' were not even on the planes let alone flew those big passenger jets into buildings while being largely incompetent at piloting one-engine light aircraft. 'Hijacker' Hani Hanjour who is said to have flown American Airlines Flight 77 into the Pentagon with a turn and manoeuvre most professional pilots said they would have struggled to do was banned from renting a small plane by instructors at the Freeway Airport in Bowie, Maryland, just *six weeks* earlier on the grounds that he was an incompetent pilot. The Jewish population of the world is just 0.2 percent with even that almost entirely concentrated in Israel (75 percent Jewish) and the United States (around two percent). This two percent and globally 0.2 percent refers to *Jewish* people and not Sabbatian interlopers who are a fraction of that fraction. What a sobering thought when you think of the fantastic influence on world affairs of tiny Israel and that the Project for the New America Century (PNAC) which laid out the blueprint in September, 2000, for America's war on terror and regime change wars in Iraq, Libya and Syria was founded and dominated by Sabbatians known as 'Neocons'. The document conceded that this plan would not be supported politically or publicly without a major attack on American soil and a Problem-Reaction-Solution excuse to send troops to war across the Middle East. Sabbatian Neocons said:

... [The] process of transformation ... [war and regime change] ... is likely to be a long one, absent some catastrophic and catalysing event – like a new Pearl Harbor.

Four months later many of those who produced that document came to power with their inane puppet George Bush from the long-time Sabbatian Bush family. They included Sabbatian Dick Cheney who was officially vice-president, but really de-facto president for the entirety of the 'Bush' government. Nine months after the 'Bush' inauguration came what Bush called at the time 'the Pearl Harbor of the 21st century' and with typical Sabbatian timing and symbolism 2001 was the 60th anniversary of the attack in 1941 by the Japanese Air Force on Pearl Harbor, Hawaii, which allowed President Franklin Delano Roosevelt to take the United States into a Sabbatian-

instigated Second World War that he said in his election campaign that he never would. The evidence is overwhelming that Roosevelt and his military and intelligence networks knew the attack was coming and did nothing to stop it, but they did make sure that America's most essential naval ships were not in Hawaii at the time. Three thousand Americans died in the Pearl Harbor attacks as they did on September 11th. By the 9/11 year of 2001 Sabbatians had widely infiltrated the US government, military and intelligence operations and used their compartmentalised assets to pull off the 'Al-Qaeda' attacks. If you read *The Trigger* it will blow your mind to see the utterly staggering concentration of 'Jewish' operatives (Sabbatian infiltrators) in essential positions of political, security, legal, law enforcement, financial and business power before, during, and after the attacks to make them happen, carry them out, and then cover their tracks – and I do mean *staggering* when you think of that 0.2 percent of the world population and two percent of Americans which are Jewish while Sabbatian infiltrators are a fraction of that. A central foundation of the 9/11 conspiracy was the hijacking of government, military, Air Force and intelligence computer systems in real time through 'back-door' access made possible by Israeli (Sabbatian) 'cyber security' software. Sabbatian-controlled Israel is on the way to rivalling Silicon Valley for domination of cyberspace and is becoming the dominant force in cyber-security which gives them access to entire computer systems and their passcodes across the world. Then add to this that Zionists head (officially) Silicon Valley giants like Google (Larry Page and Sergey Brin), Google-owned YouTube (Susan Wojcicki), Facebook (Mark Zuckerberg and Sheryl Sandberg), and Apple (Chairman Arthur D. Levinson), and that ultra-Zionist hedge fund billionaire Paul Singer has a \$1 billion stake in Twitter which is only nominally headed by 'CEO' pothead Jack Dorsey. As cable news host Tucker Carlson said of Dorsey: 'There used to be debate in the medical community whether dropping a ton of acid had permanent effects and I think that debate has now ended.' Carlson made the comment after Dorsey told a hearing on Capitol Hill (if you cut through his bullshit) that he

believed in free speech so long as he got to decide what you can hear and see. These 'big names' of Silicon Valley are only front men and women for the Global Cult, not least the Sabbatians, who are the true controllers of these corporations. Does anyone still wonder why these same people and companies have been ferociously censoring and banning people (like me) for exposing any aspect of the Cult agenda and especially the truth about the 'Covid' hoax which Sabbatians have orchestrated?

The Jeffrey Epstein paedophile ring was a Sabbatian operation. He was officially 'Jewish' but he was a Sabbatian and women abused by the ring have told me about the high number of 'Jewish' people involved. The Epstein horror has Sabbatian written all over it and matches perfectly their *modus operandi* and obsession with sex and ritual. Epstein was running a Sabbatian blackmail ring in which famous people with political and other influence were provided with young girls for sex while everything was being filmed and recorded on hidden cameras and microphones at his New York house, Caribbean island and other properties. Epstein survivors have described this surveillance system to me and some have gone public. Once the famous politician or other figure knew he or she was on video they tended to do whatever they were told. Here we go again ...when you've got them by the balls their hearts and minds will follow. Sabbatians use this blackmail technique on a wide scale across the world to entrap politicians and others they need to act as demanded. Epstein's private plane, the infamous 'Lolita Express', had many well-known passengers including Bill Clinton while Bill Gates has flown on an Epstein plane and met with him four years after Epstein had been jailed for paedophilia. They subsequently met many times at Epstein's home in New York according to a witness who was there. Epstein's infamous side-kick was Ghislaine Maxwell, daughter of Mossad agent and ultra-Zionist mega-crooked British businessman, Bob Maxwell, who at one time owned the *Daily Mirror* newspaper. Maxwell was murdered at sea on his boat in 1991 by Sabbatian-controlled Mossad when he became a liability with his

business empire collapsing as a former Mossad operative has confirmed (see *The Trigger*).

Money, money, money, funny money ...

Before I come to the Sabbatian connection with the last three US presidents I will lay out the crucial importance to Sabbatians of controlling banking and finance. Sabbatian Mayer Amschel Rothschild set out to dominate this arena in his family's quest for total global control. What is freedom? It is, in effect, choice. The more choices you have the freer you are and the fewer your choices the more you are enslaved. In the global structure created over centuries by Sabbatians the biggest decider and restrictor of choice is ... money. Across the world if you ask people what they would like to do with their lives and why they are not doing that they will reply 'I don't have the money'. This is the idea. A global elite of multi-billionaires are described as 'greedy' and that is true on one level; but control of money – who has it and who doesn't – is not primarily about greed. It's about control. Sabbatians have seized ever more control of finance and sucked the wealth of the world out of the hands of the population. We talk now, after all, about the 'One-percent' and even then the wealthiest are a lot fewer even than that. This has been made possible by a money scam so outrageous and so vast it could rightly be called the scam of scams founded on creating 'money' out of nothing and 'loaning' that with interest to the population. Money out of nothing is called 'credit'. Sabbatians have asserted control over governments and banking ever more completely through the centuries and secured financial laws that allow banks to lend hugely more than they have on deposit in a confidence trick known as fractional reserve lending. Imagine if you could lend money that doesn't exist and charge the recipient interest for doing so. You would end up in jail. Bankers by contrast end up in mansions, private jets, Malibu and Monaco.

Banks are only required to keep a fraction of their deposits and wealth in their vaults and they are allowed to lend 'money' they don't have called 'credit'. Go into a bank for a loan and if you succeed

the banker will not move any real wealth into your account. They will type into your account the amount of the agreed 'loan' – say £100,000. This is not wealth that really exists; it is non-existent, fresh-air, created-out-of-nothing 'credit' which has never, does not, and will never exist except in theory. Credit is backed by nothing except wind and only has buying power because people think that it has buying power and accept it in return for property, goods and services. I have described this situation as like those cartoon characters you see chasing each other and when they run over the edge of a cliff they keep running forward on fresh air until one of them looks down, realises what's happened, and they all crash into the ravine. The whole foundation of the Sabbatian financial system is to stop people looking down except for periodic moments when they want to crash the system (as in 2008 and 2020 ongoing) and reap the rewards from all the property, businesses and wealth their borrowers had signed over as 'collateral' in return for a 'loan' of fresh air. Most people think that money is somehow created by governments when it comes into existence from the start as a debt through banks 'lending' illusory money called credit. Yes, the very currency of exchange is a *debt* from day one issued as an interest-bearing loan. Why don't governments create money interest-free and lend it to their people interest-free? Governments are controlled by Sabbatians and the financial system is controlled by Sabbatians for whom interest-free money would be a nightmare come true. Sabbatians underpin their financial domination through their global network of central banks, including the privately-owned US Federal Reserve and Britain's Bank of England, and this is orchestrated by a privately-owned central bank coordination body called the Bank for International Settlements in Basle, Switzerland, created by the usual suspects including the Rockefellers and Rothschilds. Central bank chiefs don't answer to governments or the people. They answer to the Bank for International Settlements or, in other words, the Global Cult which is dominated today by Sabbatians.

Built-in disaster

There are so many constituent scams within the overall banking scam. When you take out a loan of thin-air credit only the amount of that loan is theoretically brought into circulation to add to the amount in circulation; but you are paying back the principle plus interest. The additional interest is not created and this means that with every 'loan' there is a shortfall in the money in circulation between what is borrowed and what has to be paid back. There is never even close to enough money in circulation to repay all outstanding public and private debt including interest. Coldly weaved in the very fabric of the system is the certainty that some will lose their homes, businesses and possessions to the banking 'lender'. This is less obvious in times of 'boom' when the amount of money in circulation (and the debt) is expanding through more people wanting and getting loans. When a downturn comes and the money supply contracts it becomes painfully obvious that there is not enough money to service all debt and interest. This is less obvious in times of 'boom' when the amount of money in circulation (and the debt) is expanding through more people wanting and getting loans. When a downturn comes and the money supply contracts and it becomes painfully obvious – as in 2008 and currently – that there is not enough money to service all debt and interest. Sabbatian banksters have been leading the human population through a calculated series of booms (more debt incurred) and busts (when the debt can't be repaid and the banks get the debtor's tangible wealth in exchange for non-existent 'credit'). With each 'bust' Sabbatian bankers have absorbed more of the world's tangible wealth and we end up with the One-percent. Governments are in bankruptcy levels of debt to the same system and are therefore owned by a system they do not control. The Federal Reserve, 'America's central bank', is privately-owned and American presidents only nominally appoint its chairman or woman to maintain the illusion that it's an arm of government. It's not. The 'Fed' is a cartel of private banks which handed billions to its associates and friends after the crash of 2008 and has been Sabbatian-controlled since it was manipulated into being in 1913 through the covert trickery of Rothschild banking agents Jacob Schiff and Paul

Warburg, and the Sabbatian Rockefeller family. Somehow from a Jewish population of two-percent and globally 0.2 percent (Sabbatian interlopers remember are far smaller) ultra-Zionists headed the Federal Reserve for 31 years between 1987 and 2018 in the form of Alan Greenspan, Bernard Bernanke and Janet Yellen (now Biden's Treasury Secretary) with Yellen's deputy chairman a Israeli-American dual citizen and ultra-Zionist Stanley Fischer, a former governor of the Bank of Israel. Ultra-Zionist Fed chiefs spanned the presidencies of Ronald Reagan ('Republican'), Father George Bush ('Republican'), Bill Clinton ('Democrat'), Boy George Bush ('Republican') and Barack Obama ('Democrat'). We should really add the pre-Greenspan chairman, Paul Adolph Volcker, 'appointed' by Jimmy Carter ('Democrat') who ran the Fed between 1979 and 1987 during the Carter and Reagan administrations before Greenspan took over. Volcker was a long-time associate and business partner of the Rothschilds. No matter what the 'party' officially in power the United States economy was directed by the same force. Here are members of the Obama, Trump and Biden administrations and see if you can make out a common theme.

Barack Obama ('Democrat')

Ultra-Zionists Robert Rubin, Larry Summers, and Timothy Geithner ran the US Treasury in the Clinton administration and two of them reappeared with Obama. Ultra-Zionist Fed chairman Alan Greenspan had manipulated the crash of 2008 through deregulation and jumped ship just before the disaster to make way for ultra-Zionist Bernard Bernanke to hand out trillions to Sabbatian 'too big to fail' banks and businesses, including the ubiquitous ultra-Zionist Goldman Sachs which has an ongoing staff revolving door operation between itself and major financial positions in government worldwide. Obama inherited the fallout of the crash when he took office in January, 2009, and fortunately he had the support of his ultra-Zionist White House Chief of Staff Rahm Emmanuel, son of a terrorist who helped to bomb Israel into being in 1948, and his ultra-Zionist senior adviser David Axelrod, chief strategist in Obama's two

successful presidential campaigns. Emmanuel, later mayor of Chicago and former senior fundraiser and strategist for Bill Clinton, is an example of the Sabbatian policy after Israel was established of migrating insider families to America so their children would be born American citizens. 'Obama' chose this financial team throughout his administration to respond to the Sabbatian-instigated crisis:

Timothy Geithner (ultra-Zionist) Treasury Secretary; Jacob J. Lew, Treasury Secretary; Larry Summers (ultra-Zionist), director of the White House National Economic Council; Paul Adolph Volcker (Rothschild business partner), chairman of the Economic Recovery Advisory Board; Peter Orszag (ultra-Zionist), director of the Office of Management and Budget overseeing all government spending; Penny Pritzker (ultra-Zionist), Commerce Secretary; Jared Bernstein (ultra-Zionist), chief economist and economic policy adviser to Vice President Joe Biden; Mary Schapiro (ultra-Zionist), chair of the Securities and Exchange Commission (SEC); Gary Gensler (ultra-Zionist), chairman of the Commodity Futures Trading Commission (CFTC); Sheila Bair (ultra-Zionist), chair of the Federal Deposit Insurance Corporation (FDIC); Karen Mills (ultra-Zionist), head of the Small Business Administration (SBA); Kenneth Feinberg (ultra-Zionist), Special Master for Executive [bail-out] Compensation. Feinberg would be appointed to oversee compensation (with strings) to 9/11 victims and families in a campaign to stop them having their day in court to question the official story. At the same time ultra-Zionist Bernard Bernanke was chairman of the Federal Reserve and these are only some of the ultra-Zionists with allegiance to Sabbatian-controlled Israel in the Obama government. Obama's biggest corporate donor was ultra-Zionist Goldman Sachs which had employed many in his administration.

Donald Trump ('Republican')

Trump claimed to be an outsider (he wasn't) who had come to 'drain the swamp'. He embarked on this goal by immediately appointing ultra-Zionist Steve Mnuchin, a Goldman Sachs employee for 17

years, as his Treasury Secretary. Others included Gary Cohn (ultra-Zionist), chief operating officer of Goldman Sachs, his first Director of the National Economic Council and chief economic adviser, who was later replaced by Larry Kudlow (ultra-Zionist). Trump's senior adviser throughout his four years in the White House was his sinister son-in-law Jared Kushner, a life-long friend of Israel Prime Minister Benjamin Netanyahu. Kushner is the son of a convicted crook who was pardoned by Trump in his last days in office. Other ultra-Zionists in the Trump administration included: Stephen Miller, Senior Policy Adviser; Avrahm Berkowitz, Deputy Adviser to Trump and his Senior Adviser Jared Kushner; Ivanka Trump, Adviser to the President, who converted to Judaism when she married Jared Kushner; David Friedman, Trump lawyer and Ambassador to Israel; Jason Greenblatt, Trump Organization executive vice president and chief legal officer, who was made Special Representative for International Negotiations and the Israeli-Palestinian Conflict; Rod Rosenstein, Deputy Attorney General; Elliot Abrams, Special Representative for Venezuela, then Iran; John Eisenberg, National Security Council Legal Adviser and Deputy Council to the President for National Security Affairs; Anne Neuberger, Deputy National Manager, National Security Agency; Ezra Cohen-Watnick, Acting Under Secretary of Defense for Intelligence; Elan Carr, Special Envoy to monitor and combat anti-Semitism; Len Khodorkovsky, Deputy Special Envoy to monitor and combat anti-Semitism; Reed Cordish, Assistant to the President, Intragovernmental and Technology Initiatives. Trump Vice President Mike Pence and Secretary of State Mike Pompeo, both Christian Zionists, were also vehement supporters of Israel and its goals and ambitions.

Donald 'free-speech believer' Trump pardoned a number of financial and violent criminals while ignoring calls to pardon Julian Assange and Edward Snowden whose crimes are revealing highly relevant information about government manipulation and corruption and the widespread illegal surveillance of the American people by US 'security' agencies. It's so good to know that Trump is on the side of freedom and justice and not mega-criminals with

allegiance to Sabbatian-controlled Israel. These included a pardon for Israeli spy Jonathan Pollard who was jailed for life in 1987 under the Espionage Act. Aviem Sella, the Mossad agent who recruited Pollard, was also pardoned by Trump while Assange sat in jail and Snowden remained in exile in Russia. Sella had 'fled' (was helped to escape) to Israel in 1987 and was never extradited despite being charged under the Espionage Act. A Trump White House statement said that Sella's clemency had been 'supported by Benjamin Netanyahu, Ron Dermer, Israel's US Ambassador, David Friedman, US Ambassador to Israel and Miriam Adelson, wife of leading Trump donor Sheldon Adelson who died shortly before. Other friends of Jared Kushner were pardoned along with Sholom Weiss who was believed to be serving the longest-ever white-collar prison sentence of more than 800 years in 2000. The sentence was commuted of Ponzi-schemer Eliyahu Weinstein who defrauded Jews and others out of \$200 million. I did mention that Assange and Snowden were ignored, right? Trump gave Sabbatians almost everything they asked for in military and political support, moving the US Embassy from Tel Aviv to Jerusalem with its critical symbolic and literal implications for Palestinian statehood, and the 'deal of the Century' designed by Jared Kushner and David Friedman which gave the Sabbatian Israeli government the green light to substantially expand its already widespread program of building illegal Jewish-only settlements in the occupied land of the West Bank. This made a two-state 'solution' impossible by seizing all the land of a potential Palestinian homeland and that had been the plan since 1948 and then 1967 when the Arab-controlled Gaza Strip, West Bank, Sinai Peninsula and Syrian Golan Heights were occupied by Israel. All the talks about talks and road maps and delays have been buying time until the West Bank was physically occupied by Israeli real estate. Trump would have to be a monumentally ill-informed idiot not to see that this was the plan he was helping to complete. The Trump administration was in so many ways the Kushner administration which means the Netanyahu administration which means the Sabbatian administration. I understand why many opposing Cult fascism in all its forms gravitated to Trump, but he

was a crucial part of the Sabbatian plan and I will deal with this in the next chapter.

Joe Biden ('Democrat')

A barely cognitive Joe Biden took over the presidency in January, 2021, along with his fellow empty shell, Vice-President Kamala Harris, as the latest Sabbatian gofers to enter the White House. Names on the door may have changed and the 'party' – the force behind them remained the same as Zionists were appointed to a stream of pivotal areas relating to Sabbatian plans and policy. They included: Janet Yellen, Treasury Secretary, former head of the Federal Reserve, and still another ultra-Zionist running the US Treasury after Mnuchin (Trump), Lew and Geithner (Obama), and Summers and Rubin (Clinton); Anthony Blinken, Secretary of State; Wendy Sherman, Deputy Secretary of State (so that's 'Biden's' Sabbatian foreign policy sorted); Jeff Zients, White House coronavirus coordinator; Rochelle Walensky, head of the Centers for Disease Control; Rachel Levine, transgender deputy health secretary (that's 'Covid' hoax policy under control); Merrick Garland, Attorney General; Alejandro Mayorkas, Secretary of Homeland Security; Cass Sunstein, Homeland Security with responsibility for new immigration laws; Avril Haines, Director of National Intelligence; Anne Neuberger, National Security Agency cybersecurity director (note, cybersecurity); David Cohen, CIA Deputy Director; Ronald Klain, Biden's Chief of Staff (see Rahm Emanuel); Eric Lander, a 'leading geneticist', Office of Science and Technology Policy director (see Smart Grid, synthetic biology agenda); Jessica Rosenworcel, acting head of the Federal Communications Commission (FCC) which controls Smart Grid technology policy and electromagnetic communication systems including 5G. How can it be that so many pivotal positions are held by two-percent of the American population and 0.2 percent of the world population administration after administration no matter who is the president and what is the party? It's a coincidence? Of course it's not and this is why Sabbatians have built their colossal global web of interlocking 'anti-

hate' hate groups to condemn anyone who asks these glaring questions as an 'anti-Semite'. The way that Jewish people horrifically abused in Sabbatian-backed Nazi Germany are exploited to this end is stomach-turning and disgusting beyond words.

Political fusion

Sabbatian manipulation has reversed the roles of Republicans and Democrats and the same has happened in Britain with the Conservative and Labour Parties. Republicans and Conservatives were always labelled the 'right' and Democrats and Labour the 'left', but look at the policy positions now and the Democrat-Labour 'left' has moved further to the 'right' than Republicans and Conservatives under the banner of 'Woke', the Cult-created far-right tyranny. Where once the Democrat-Labour 'left' defended free speech and human rights they now seek to delete them and as I said earlier despite the 'Covid' fascism of the Jackboot Johnson Conservative government in the UK the Labour Party of leader Keir Starmer demanded even more extreme measures. The Labour Party has been very publicly absorbed by Sabbatians after a political and media onslaught against the previous leader, the weak and inept Jeremy Corbyn, over made-up allegations of 'anti-Semitism' both by him and his party. The plan was clear with this 'anti-Semite' propaganda and what was required in response was a swift and decisive 'fuck off' from Corbyn and a statement to expose the Anti-Semitism Industry (Sabbatian) attempt to silence Labour criticism of the Israeli government (Sabbatians) and purge the party of all dissent against the extremes of ultra-Zionism (Sabbatians). Instead Corbyn and his party fell to their knees and appeased the abusers which, by definition, is impossible. Appeasing one demand leads only to a new demand to be appeased until takeover is complete. Like I say – 'fuck off' would have been a much more effective policy and I have used it myself with great effect over the years when Sabbatians are on my case which is most of the time. I consider that fact a great compliment, by the way. The outcome of the Labour Party capitulation is that we now have a Sabbatian-controlled

Conservative Party 'opposed' by a Sabbatian-controlled Labour Party in a one-party Sabbatian state that hurtles towards the extremes of tyranny (the Sabbatian cult agenda). In America the situation is the same. Labour's Keir Starmer spends his days on his knees with his tongue out pointing to Tel Aviv, or I guess now Jerusalem, while Boris Johnson has an 'anti-Semitism czar' in the form of former Labour MP John Mann who keeps Starmer company on his prayer mat.

Sabbatian influence can be seen in Jewish members of the Labour Party who have been ejected for criticism of Israel including those from families that suffered in Nazi Germany. Sabbatians despise real Jewish people and target them even more harshly because it is so much more difficult to dub them 'anti-Semitic' although in their desperation they do try.

CHAPTER THREE

The Pushbacker sting

*Until you realize how easy it is for your mind to be manipulated, you
remain the puppet of someone else's game*

Evita Ochel

I will use the presidencies of Trump and Biden to show how the manipulation of the one-party state plays out behind the illusion of political choice across the world. No two presidencies could – on the face of it – be more different and apparently at odds in terms of direction and policy.

A Renegade Mind sees beyond the obvious and focuses on outcomes and consequences and not image, words and waffle. The Cult embarked on a campaign to divide America between those who blindly support its agenda (the mentality known as 'Woke') and those who are pushing back on where the Cult and its Sabbatians want to go. This presents infinite possibilities for dividing and ruling the population by setting them at war with each other and allows a perceptual ring fence of demonisation to encircle the Pushbackers in a modern version of the Little Big Horn in 1876 when American cavalry led by Lieutenant Colonel George Custer were drawn into a trap, surrounded and killed by Native American tribes defending their land of thousands of years from being seized by the government. In this modern version the roles are reversed and it's those defending themselves from the Sabbatian government who are surrounded and the government that's seeking to destroy them. This trap was set years ago and to explain how we must return to 2016

and the emergence of Donald Trump as a candidate to be President of the United States. He set out to overcome the best part of 20 other candidates in the Republican Party before and during the primaries and was not considered by many in those early stages to have a prayer of living in the White House. The Republican Party was said to have great reservations about Trump and yet somehow he won the nomination. When you know how American politics works – politics in general – there is no way that Trump could have become the party's candidate unless the Sabbatian-controlled 'Neocons' that run the Republican Party wanted that to happen. We saw the proof in emails and documents made public by WikiLeaks that the Democratic Party hierarchy, or Democons, systematically undermined the campaign of Bernie Sanders to make sure that Sabbatian gofer Hillary Clinton won the nomination to be their presidential candidate. If the Democons could do that then the Neocons in the Republican Party could have derailed Trump in the same way. But they didn't and at that stage I began to conclude that Trump could well be the one chosen to be president. If that was the case the 'why' was pretty clear to see – the goal of dividing America between Cult agenda-supporting Wokers and Pushbackers who gravitated to Trump because he was telling them what they wanted to hear. His constituency of support had been increasingly ignored and voiceless for decades and profoundly through the eight years of Sabbatian puppet Barack Obama. Now here was someone speaking their language of pulling back from the incessant globalisation of political and economic power, the exporting of American jobs to China and elsewhere by 'American' (Sabbatian) corporations, the deletion of free speech, and the mass immigration policies that had further devastated job opportunities for the urban working class of all races and the once American heartlands of the Midwest.

Beware the forked tongue

Those people collectively sighed with relief that at last a political leader was apparently on their side, but another trait of the Renegade Mind is that you look even harder at people telling you

what you want to hear than those who are telling you otherwise. Obviously as I said earlier people wish what they want to hear to be true and genuine and they are much more likely to believe that than someone saying what they don't want to hear and don't want to be true. Sales people are taught to be skilled in eliciting by calculated questioning what their customers want to hear and repeating that back to them as their own opinion to get their targets to like and trust them. Assets of the Cult are also sales people in the sense of selling perception. To read Cult manipulation you have to play the long and expanded game and not fall for the Vaudeville show of party politics. Both American parties are vehicles for the Cult and they exploit them in different ways depending on what the agenda requires at that moment. Trump and the Republicans were used to be the focus of dividing America and isolating Pushbackers to open the way for a Biden presidency to become the most extreme in American history by advancing the full-blown Woke (Cult) agenda with the aim of destroying and silencing Pushbackers now labelled Nazi Trump supporters and white supremacists.

Sabbatians wanted Trump in office for the reasons described by ultra-Zionist Saul Alinsky (1909-1972) who was promoting the Woke philosophy through 'community organising' long before anyone had heard of it. In those days it still went by its traditional name of Marxism. The reason for the manipulated Trump phenomenon was laid out in Alinsky's 1971 book, *Rules for Radicals*, which was his blueprint for overthrowing democratic and other regimes and replacing them with Sabbatian Marxism. Not surprisingly his to-do list was evident in the Sabbatian French and Russian 'Revolutions' and that in China which will become very relevant in the next chapter about the 'Covid' hoax. Among Alinsky's followers have been the deeply corrupt Barack Obama, House Speaker Nancy Pelosi and Hillary Clinton who described him as a 'hero'. All three are Sabbatian stooges with Pelosi personifying the arrogant corrupt idiocy that so widely fronts up for the Cult inner core. Predictably as a Sabbatian advocate of the 'light-bringer' Alinsky features Lucifer on the dedication page of his book as the original radical who gained

his own kingdom ('Earth' as we shall see). One of Alinsky's golden radical rules was to pick an individual and focus all attention, hatred and blame on them and not to target faceless bureaucracies and corporations. *Rules for Radicals* is really a Sabbatian handbook with its contents repeatedly employed all over the world for centuries and why wouldn't Sabbatians bring to power their designer-villain to be used as the individual on which all attention, hatred and blame was bestowed? This is what they did and the only question for me is how much Trump knew that and how much he was manipulated. A bit of both, I suspect. This was Alinsky's Trump technique from a man who died in 1972. The technique has spanned history:

Pick the target, freeze it, personalize it, polarize it. Don't try to attack abstract corporations or bureaucracies. Identify a responsible individual. Ignore attempts to shift or spread the blame.

From the moment Trump came to illusory power everything was about him. It wasn't about Republican policy or opinion, but all about Trump. Everything he did was presented in negative, derogatory and abusive terms by the Sabbatian-dominated media led by Cult operations such as CNN, MSNBC, *The New York Times* and the Jeff Bezos-owned *Washington Post* – 'Pick the target, freeze it, personalize it, polarize it.' Trump was turned into a demon to be vilified by those who hated him and a demi-god loved by those who worshipped him. This, in turn, had his supporters, too, presented as equally demonic in preparation for the punchline later down the line when Biden was about to take office. It was here's a Trump, there's a Trump, everywhere a Trump, Trump. Virtually every news story or happening was filtered through the lens of 'The Donald'. You loved him or hated him and which one you chose was said to define you as Satan's spawn or a paragon of virtue. Even supporting some Trump policies or statements and not others was enough for an assault on your character. No shades of grey were or are allowed. Everything is black and white (literally and figuratively). A Californian I knew had her head utterly scrambled by her hatred for Trump while telling people they should love each other. She was so totally consumed by

Trump Derangement Syndrome as it became to be known that this glaring contradiction would never have occurred to her. By definition anyone who criticised Trump or praised his opponents was a hero and this lady described Joe Biden as 'a kind, honest gentleman' when he's a provable liar, mega-crook and vicious piece of work to boot. Sabbatians had indeed divided America using Trump as the fall-guy and all along the clock was ticking on the consequences for his supporters.

In hock to his masters

Trump gave Sabbatians via Israel almost everything they wanted in his four years. Ask and you shall receive was the dynamic between himself and Benjamin Netanyahu orchestrated by Trump's ultra-Zionist son-in-law Jared Kushner, his ultra-Zionist Ambassador to Israel, David Friedman, and ultra-Zionist 'Israel adviser', Jason Greenblatt. The last two were central to the running and protecting from collapse of his business empire, the Trump Organisation, and colossal business failures made him forever beholding to Sabbatian networks that bailed him out. By the start of the 1990s Trump owed \$4 billion to banks that he couldn't pay and almost \$1 billion of that was down to him personally and not his companies. This mega-disaster was the result of building two new casinos in Atlantic City and buying the enormous Taj Mahal operation which led to crippling debt payments. He had borrowed fantastic sums from 72 banks with major Sabbatian connections and although the scale of debt should have had him living in a tent alongside the highway they never foreclosed. A plan was devised to lift Trump from the mire by BT Securities Corporation and Rothschild Inc. and the case was handled by Wilber Ross who had worked for the Rothschilds for 27 years. Ross would be named US Commerce Secretary after Trump's election. Another crucial figure in saving Trump was ultra-Zionist 'investor' Carl Icahn who bought the Taj Mahal casino. Icahn was made special economic adviser on financial regulation in the Trump administration. He didn't stay long but still managed to find time to make a tidy sum of a reported \$31.3 million when he sold his

holdings affected by the price of steel three days before Trump imposed a 235 percent tariff on steel imports. What amazing bits of luck these people have. Trump and Sabbatian operatives have long had a close association and his mentor and legal adviser from the early 1970s until 1986 was the dark and genetically corrupt ultra-Zionist Roy Cohn who was chief counsel to Senator Joseph McCarthy's 'communist' witch-hunt in the 1950s. *Esquire* magazine published an article about Cohn with the headline 'Don't mess with Roy Cohn'. He was described as the most feared lawyer in New York and 'a ruthless master of dirty tricks ... [with] ... more than one Mafia Don on speed dial'. Cohn's influence, contacts, support and protection made Trump a front man for Sabbatians in New York with their connections to one of Cohn's many criminal employers, the 'Russian' Sabbatian Mafia. Israel-centric media mogul Rupert Murdoch was introduced to Trump by Cohn and they started a long friendship. Cohn died in 1986 weeks after being disbarred for unethical conduct by the Appellate Division of the New York State Supreme Court. The wheels of justice do indeed run slow given the length of Cohn's crooked career.

QAnon-sense

We are asked to believe that Donald Trump with his fundamental connections to Sabbatian networks and operatives has been leading the fight to stop the Sabbatian agenda for the fascistic control of America and the world. Sure he has. A man entrapped during his years in the White House by Sabbatian operatives and whose biggest financial donor was casino billionaire Sheldon Adelson who was Sabbatian to his DNA?? Oh, do come on. Trump has been used to divide America and isolate Pushbackers on the Cult agenda under the heading of 'Trump supporters', 'insurrectionists' and 'white supremacists'. The US Intelligence/Mossad Psyop or psychological operation known as QAnon emerged during the Trump years as a central pillar in the Sabbatian campaign to lead Pushbackers into the trap set by those that wished to destroy them. I knew from the start that QAnon was a scam because I had seen the same scenario many

times before over 30 years under different names and I had written about one in particular in the books. 'Not again' was my reaction when QAnon came to the fore. The same script is pulled out every few years and a new name added to the letterhead. The story always takes the same form: 'Insiders' or 'the good guys' in the government-intelligence-military 'Deep State' apparatus were going to instigate mass arrests of the 'bad guys' which would include the Rockefellers, Rothschilds, Barack Obama, Hillary Clinton, George Soros, etc., etc. Dates are given for when the 'good guys' are going to move in, but the dates pass without incident and new dates are given which pass without incident. The central message to Pushbackers in each case is that they don't have to do anything because there is 'a plan' and it is all going to be sorted by the 'good guys' on the inside. 'Trust the plan' was a QAnon mantra when the only plan was to misdirect Pushbackers into putting their trust in a Psyop they believed to be real. Beware, beware, those who tell you what you want to hear and always check it out. Right up to Biden's inauguration QAnon was still claiming that 'the Storm' was coming and Trump would stay on as president when Biden and his cronies were arrested and jailed. It was never going to happen and of course it didn't, but what did happen as a result provided that punchline to the Sabbatian Trump/QAnon Psyop.

On January 6th, 2021, a very big crowd of Trump supporters gathered in the National Mall in Washington DC down from the Capitol Building to protest at what they believed to be widespread corruption and vote fraud that stopped Trump being re-elected for a second term as president in November, 2020. I say as someone that does not support Trump or Biden that the evidence is clear that major vote-fixing went on to favour Biden, a man with cognitive problems so advanced he can often hardly string a sentence together without reading the words written for him on the Teleprompter. Glaring ballot discrepancies included serious questions about electronic voting machines that make vote rigging a comparative cinch and hundreds of thousands of paper votes that suddenly appeared during already advanced vote counts and virtually all of

them for Biden. Early Trump leads in crucial swing states suddenly began to close and disappear. The pandemic hoax was used as the excuse to issue almost limitless numbers of mail-in ballots with no checks to establish that the recipients were still alive or lived at that address. They were sent to streams of people who had not even asked for them. Private organisations were employed to gather these ballots and who knows what they did with them before they turned up at the counts. The American election system has been manipulated over decades to become a sick joke with more holes than a Swiss cheese for the express purpose of dictating the results. Then there was the criminal manipulation of information by Sabbatian tech giants like Facebook, Twitter and Google-owned YouTube which deleted pro-Trump, anti-Biden accounts and posts while everything in support of Biden was left alone. Sabbatians wanted Biden to win because after the dividing of America it was time for full-on Woke and every aspect of the Cult agenda to be unleashed.

Hunter gatherer

Extreme Silicon Valley bias included blocking information by the *New York Post* exposing a Biden scandal that should have ended his bid for president in the final weeks of the campaign. Hunter Biden, his monumentally corrupt son, is reported to have sent a laptop to be repaired at a local store and failed to return for it. Time passed until the laptop became the property of the store for non-payment of the bill. When the owner saw what was on the hard drive he gave a copy to the FBI who did nothing even though it confirmed widespread corruption in which the Joe Biden family were using his political position, especially when he was vice president to Obama, to make multiple millions in countries around the world and most notably Ukraine and China. Hunter Biden's one-time business partner Tony Bobulinski went public when the story broke in the *New York Post* to confirm the corruption he saw and that Joe Biden not only knew what was going on he also profited from the spoils. Millions were handed over by a Chinese company with close

connections – like all major businesses in China – to the Chinese communist party of President Xi Jinping. Joe Biden even boasted at a meeting of the Cult's World Economic Forum that as vice president he had ordered the government of Ukraine to fire a prosecutor. What he didn't mention was that the same man just happened to be investigating an energy company which was part of Hunter Biden's corrupt portfolio. The company was paying him big bucks for no other reason than the influence his father had. Overnight Biden's presidential campaign should have been over given that he had lied publicly about not knowing what his son was doing. Instead almost the entire Sabbatian-owned mainstream media and Sabbatian-owned Silicon Valley suppressed circulation of the story. This alone went a mighty way to rigging the election of 2020. Cult assets like Mark Zuckerberg at Facebook also spent hundreds of millions to be used in support of Biden and vote 'administration'.

The Cult had used Trump as the focus to divide America and was now desperate to bring in moronic, pliable, corrupt Biden to complete the double-whammy. No way were they going to let little things like the will of the people thwart their plan. Silicon Valley widely censored claims that the election was rigged because it *was* rigged. For the same reason anyone claiming it was rigged was denounced as a 'white supremacist' including the pathetically few Republican politicians willing to say so. Right across the media where the claim was mentioned it was described as a 'false claim' even though these excuses for 'journalists' would have done no research into the subject whatsoever. Trump won seven million more votes than any sitting president had ever achieved while somehow a cognitively-challenged soon to be 78-year-old who was hidden away from the public for most of the campaign managed to win more votes than any presidential candidate in history. It makes no sense. You only had to see election rallies for both candidates to witness the enthusiasm for Trump and the apathy for Biden. Tens of thousands would attend Trump events while Biden was speaking in empty car parks with often only television crews attending and framing their shots to hide the fact that no one was there. It was pathetic to see

footage come to light of Biden standing at a podium making speeches only to TV crews and party fixers while reading the words written for him on massive Teleprompter screens. So, yes, those protestors on January 6th had a point about election rigging, but some were about to walk into a trap laid for them in Washington by the Cult Deep State and its QAnon Psyop. This was the Capitol Hill riot ludicrously dubbed an 'insurrection'.

The spider and the fly

Renegade Minds know there are not two 'sides' in politics, only one side, the Cult, working through all 'sides'. It's a stage show, a puppet show, to direct the perceptions of the population into focusing on diversions like parties and candidates while missing the puppeteers with their hands holding all the strings. The Capitol Hill 'insurrection' brings us back to the Little Big Horn. Having created two distinct opposing groupings – Woke and Pushbackers – the trap was about to be sprung. Pushbackers were to be encircled and isolated by associating them all in the public mind with Trump and then labelling Trump as some sort of Confederate leader. I knew immediately that the Capitol riot was a set-up because of two things. One was how easy the rioters got into the building with virtually no credible resistance and secondly I could see – as with the 'Covid' hoax in the West at the start of 2020 – how the Cult could exploit the situation to move its agenda forward with great speed. My experience of Cult techniques and activities over more than 30 years has showed me that while they do exploit situations they haven't themselves created this never happens with events of fundamental agenda significance. Every time major events giving cultists the excuse to rapidly advance their plan you find they are manipulated into being for the specific reason of providing that excuse – Problem-Reaction-Solution. Only a tiny minority of the huge crowd of Washington protestors sought to gain entry to the Capitol by smashing windows and breaching doors. That didn't matter. The whole crowd and all Pushbackers, even if they did not support Trump, were going to be lumped together as dangerous

insurrectionists and conspiracy theorists. The latter term came into widespread use through a CIA memo in the 1960s aimed at discrediting those questioning the nonsensical official story of the Kennedy assassination and it subsequently became widely employed by the media. It's still being used by inept 'journalists' with no idea of its origin to discredit anyone questioning anything that authority claims to be true. When you are perpetrating a conspiracy you need to discredit the very word itself even though the dictionary definition of conspiracy is merely 'the activity of secretly planning with other people to do something bad or illegal' and 'a general agreement to keep silent about a subject for the purpose of keeping it secret'. On that basis there are conspiracies almost wherever you look. For obvious reasons the Cult and its lapdog media have to claim there are no conspiracies even though the word appears in state laws as with conspiracy to defraud, to murder, and to corrupt public morals.

Agent provocateurs are widely used by the Cult Deep State to manipulate genuine people into acting in ways that suit the desired outcome. By genuine in this case I mean protestors genuinely supporting Trump and claims that the election was stolen. In among them, however, were agents of the state wearing the garb of Trump supporters and QAnon to pump-prime the Capital riot which some genuine Trump supporters naively fell for. I described the situation as 'Come into my parlour said the spider to the fly'. Leaflets appeared through the Woke paramilitary arm Antifa, the anti-fascist fascists, calling on supporters to turn up in Washington looking like Trump supporters even though they hated him. Some of those arrested for breaching the Capitol Building were sourced to Antifa and its stable mate Black Lives Matter. Both organisations are funded by Cult billionaires and corporations. One man charged for the riot was according to his lawyer a former FBI agent who had held top secret security clearance for 40 years. Attorney Thomas Plofchan said of his client, 66-year-old Thomas Edward Caldwell:

He has held a Top Secret Security Clearance since 1979 and has undergone multiple Special Background Investigations in support of his clearances. After retiring from the Navy, he

worked as a section chief for the Federal Bureau of Investigation from 2009-2010 as a GS-12 [mid-level employee].

He also formed and operated a consulting firm performing work, often classified, for U.S government customers including the US. Drug Enforcement Agency, Department of Housing and Urban Development, the US Coast Guard, and the US Army Personnel Command.

A judge later released Caldwell pending trial in the absence of evidence about a conspiracy or that he tried to force his way into the building. *The New York Post* reported a 'law enforcement source' as saying that 'at least two known Antifa members were spotted' on camera among Trump supporters during the riot while one of the rioters arrested was John Earle Sullivan, a seriously extreme Black Lives Matter Trump-hater from Utah who was previously arrested and charged in July, 2020, over a BLM-Antifa riot in which drivers were threatened and one was shot. Sullivan is the founder of Utah-based Insurgence USA which is an affiliate of the Cult-created-and-funded Black Lives Matter movement. Footage appeared and was then deleted by Twitter of Trump supporters calling out Antifa infiltrators and a group was filmed changing into pro-Trump clothing before the riot. Security at the building was *pathetic* – as planned. Colonel Leroy Fletcher Prouty, a man with long experience in covert operations working with the US security apparatus, once described the tell-tale sign to identify who is involved in an assassination. He said:

No one has to direct an assassination – it happens. The active role is played secretly by permitting it to happen. This is the greatest single clue. Who has the power to call off or reduce the usual security precautions?

This principle applies to many other situations and certainly to the Capitol riot of January 6th, 2021.

The sting

With such a big and potentially angry crowd known to be gathering near the Capitol the security apparatus would have had a major police detail to defend the building with National Guard troops on

standby given the strength of feeling among people arriving from all over America encouraged by the QAnon Psyop and statements by Donald Trump. Instead Capitol Police 'security' was flimsy, weak, and easily breached. The same number of officers was deployed as on a regular day and that is a blatant red flag. They were not staffed or equipped for a possible riot that had been an obvious possibility in the circumstances. No protective and effective fencing worth the name was put in place and there were no contingency plans. The whole thing was basically a case of standing aside and waving people in. Once inside police mostly backed off apart from one Capitol police officer who ridiculously shot dead unarmed Air Force veteran protestor Ashli Babbitt without a warning as she climbed through a broken window. The 'investigation' refused to name or charge the officer after what must surely be considered a murder in the circumstances. They just lifted a carpet and swept. The story was endlessly repeated about five people dying in the 'armed insurrection' when there was no report of rioters using weapons. Apart from Babbitt the other four died from a heart attack, strokes and apparently a drug overdose. Capitol police officer Brian Sicknick was reported to have died after being bludgeoned with a fire extinguisher when he was alive after the riot was over and died later of what the Washington Medical Examiner's Office said was a stroke. Sicknick had no external injuries. The lies were delivered like rapid fire. There was a narrative to build with incessant repetition of the lie until the lie became the accepted 'everybody knows that' truth. The 'Big Lie' technique of Nazi Propaganda Minister Joseph Goebbels is constantly used by the Cult which was behind the Nazis and is today behind the 'Covid' and 'climate change' hoaxes. Goebbels said:

If you tell a lie big enough and keep repeating it, people will eventually come to believe it. The lie can be maintained only for such time as the State can shield the people from the political, economic and/or military consequences of the lie. It thus becomes vitally important for the State to use all of its powers to repress dissent, for the truth is the mortal enemy of the lie, and thus by extension, the truth is the greatest enemy of the State.

Most protestors had a free run of the Capitol Building. This allowed pictures to be taken of rioters in iconic parts of the building including the Senate chamber which could be used as propaganda images against all Pushbackers. One Congresswoman described the scene as 'the worst kind of non-security anybody could ever imagine'. Well, the first part was true, but someone obviously did imagine it and made sure it happened. Some photographs most widely circulated featured people wearing QAnon symbols and now the Psyop would be used to dub all QAnon followers with the ubiquitous fit-all label of 'white supremacist' and 'insurrectionists'. When a Muslim extremist called Noah Green drove his car at two police officers at the Capitol Building killing one in April, 2021, there was no such political and media hysteria. They were just disappointed he wasn't white.

The witch-hunt

Government prosecutor Michael Sherwin, an aggressive, dark-eyed, professional Rottweiler led the 'investigation' and to call it over the top would be to understate reality a thousand fold. Hundreds were tracked down and arrested for the crime of having the wrong political views and people were jailed who had done nothing more than walk in the building, committed no violence or damage to property, took a few pictures and left. They were labelled a 'threat to the Republic' while Biden sat in the White House signing executive orders written for him that were dismantling 'the Republic'. Even when judges ruled that a mother and son should not be in jail the government kept them there. Some of those arrested have been badly beaten by prison guards in Washington and lawyers for one man said he suffered a fractured skull and was made blind in one eye. Meanwhile a woman is shot dead for no reason by a Capitol Police officer and we are not allowed to know who he is never mind what has happened to him although that will be *nothing*. The Cult's QAnon/Trump sting to identify and isolate Pushbackers and then target them on the road to crushing and deleting them was a resounding success. You would have thought the Russians had

invaded the building at gunpoint and lined up senators for a firing squad to see the political and media reaction. Congresswoman Alexandria Ocasio-Cortez is a child in a woman's body, a terrible-tuos, me, me, me, Woker narcissist of such proportions that words have no meaning. She said she thought she was going to die when 'insurrectionists' banged on her office door. It turned out she wasn't even in the Capitol Building when the riot was happening and the 'banging' was a Capitol Police officer. She referred to herself as a 'survivor' which is an insult to all those true survivors of violent and sexual abuse while she lives her pampered and privileged life talking drivel for a living. Her Woke colleague and fellow mega-narcissist Rashida Tlaib broke down describing the devastating effect on her, too, of *not being* in the building when the rioters were there. Ocasio-Cortez and Tlaib are members of a fully-Woke group of Congresswomen known as 'The Squad' along with Ilhan Omar and Ayanna Pressley. The Squad from what I can see can be identified by its vehement anti-white racism, anti-white men agenda, and, as always in these cases, the absence of brain cells on active duty.

The usual suspects were on the riot case immediately in the form of Democrat ultra-Zionist senators and operatives Chuck Schumer and Adam Schiff demanding that Trump be impeached for 'his part in the insurrection'. The same pair of prats had led the failed impeachment of Trump over the invented 'Russia collusion' nonsense which claimed Russia had helped Trump win the 2016 election. I didn't realise that Tel Aviv had been relocated just outside Moscow. I must find an up-to-date map. The Russia hoax was a Sabbatian operation to keep Trump occupied and impotent and to stop any rapport with Russia which the Cult wants to retain as a perceptual enemy to be pulled out at will. Puppet Biden began attacking Russia when he came to office as the Cult seeks more upheaval, division and war across the world. A two-year stage show 'Russia collusion inquiry' headed by the not-very-bright former 9/11 FBI chief Robert Mueller, with support from 19 lawyers, 40 FBI agents plus intelligence analysts, forensic accountants and other

staff, devoured tens of millions of dollars and found no evidence of Russia collusion which a ten-year-old could have told them on day one. Now the same moronic Schumer and Schiff wanted a second impeachment of Trump over the Capitol 'insurrection' (riot) which the arrested development of Schumer called another 'Pearl Harbor' while others compared it with 9/11 in which 3,000 died and, in the case of CNN, with the Rwandan genocide in the 1990s in which an estimated 500,000 to 600,000 were murdered, between 250, 000 and 500,000 women were raped, and populations of whole towns were hacked to death with machetes. To make those comparisons purely for Cult political reasons is beyond insulting to those that suffered and lost their lives and confirms yet again the callous inhumanity that we are dealing with. Schumer is a monumental idiot and so is Schiff, but they serve the Cult agenda and do whatever they're told so they get looked after. Talking of idiots – another inane man who spanned the Russia and Capitol impeachment attempts was Senator Eric Swalwell who had the nerve to accuse Trump of collusion with the Russians while sleeping with a Chinese spy called Christine Fang or 'Fang Fang' which is straight out of a Bond film no doubt starring Klaus Schwab as the bloke living on a secret island and controlling laser weapons positioned in space and pointing at world capitals. Fang Fang plays the part of Bond's infiltrator girlfriend which I'm sure she would enjoy rather more than sharing a bed with the brainless Swalwell, lying back and thinking of China. The FBI eventually warned Swalwell about Fang Fang which gave her time to escape back to the Chinese dictatorship. How very thoughtful of them. The second Trump impeachment also failed and hardly surprising when an impeachment is supposed to remove a sitting president and by the time it happened Trump was no longer president. These people are running your country America, well, officially anyway. Terrifying isn't it?

Outcomes tell the story - always

The outcome of all this – and it's the *outcome* on which Renegade Minds focus, not the words – was that a vicious, hysterical and

obviously pre-planned assault was launched on Pushbackers to censor, silence and discredit them and even targeted their right to earn a living. They have since been condemned as 'domestic terrorists' that need to be treated like Al-Qaeda and Islamic State. 'Domestic terrorists' is a label the Cult has been trying to make stick since the period of the Oklahoma bombing in 1995 which was blamed on 'far-right domestic terrorists'. If you read *The Trigger* you will see that the bombing was clearly a Problem-Reaction-Solution carried out by the Deep State during a Bill Clinton administration so corrupt that no dictionary definition of the term would even nearly suffice. Nearly 30, 000 troops were deployed from all over America to the empty streets of Washington for Biden's inauguration. Ten thousand of them stayed on with the pretext of protecting the capital from insurrectionists when it was more psychological programming to normalise the use of the military in domestic law enforcement in support of the Cult plan for a police-military state. Biden's fascist administration began a purge of 'wrong-thinkers' in the military which means anyone that is not on board with Woke. The Capitol Building was surrounded by a fence with razor wire and the Land of the Free was further symbolically and literally dismantled. The circle was completed with the installation of Biden and the exploitation of the QAnon Psyop.

America had never been so divided since the civil war of the 19th century, Pushbackers were isolated and dubbed terrorists and now, as was always going to happen, the Cult immediately set about deleting what little was left of freedom and transforming American society through a swish of the hand of the most controlled 'president' in American history leading (officially at least) the most extreme regime since the country was declared an independent state on July 4th, 1776. Biden issued undebated, dictatorial executive orders almost by the hour in his opening days in office across the whole spectrum of the Cult wish-list including diluting controls on the border with Mexico allowing thousands of migrants to illegally enter the United States to transform the demographics of America and import an election-changing number of perceived Democrat

voters. Then there were Biden deportation amnesties for the already illegally resident (estimated to be as high as 20 or even 30 million). A bill before Congress awarded American citizenship to anyone who could prove they had worked in agriculture for just 180 days in the previous two years as 'Big Ag' secured its slave labour long-term. There were the plans to add new states to the union such as Puerto Rico and making Washington DC a state. They are all parts of a plan to ensure that the Cult-owned Woke Democrats would be permanently in power.

Border – what border?

I have exposed in detail in other books how mass immigration into the United States and Europe is the work of Cult networks fuelled by the tens of billions spent to this and other ends by George Soros and his global Open Society (open borders) Foundations. The impact can be seen in America alone where the population has increased by *100 million* in little more than 30 years mostly through immigration. I wrote in *The Answer* that the plan was to have so many people crossing the southern border that the numbers become unstoppable and we are now there under Cult-owned Biden. El Salvador in Central America puts the scale of what is happening into context. A third of the population now lives in the United States, much of it illegally, and many more are on the way. The methodology is to crush Central and South American countries economically and spread violence through machete-wielding psychopathic gangs like MS-13 based in El Salvador and now operating in many American cities. Biden-imposed lax security at the southern border means that it is all but open. He said before his 'election' that he wanted to see a surge towards the border if he became president and that was the green light for people to do just that after election day to create the human disaster that followed for both America and the migrants. When that surge came the imbecilic Alexandria Ocasio-Cortez said it wasn't a 'surge' because they are 'children, not insurgents' and the term 'surge' (used by Biden) was a claim of 'white supremacists'.

This disingenuous lady may one day enter the realm of the most basic intelligence, but it won't be any time soon.

Sabbatians and the Cult are in the process of destroying America by importing violent people and gangs in among the genuine to terrorise American cities and by overwhelming services that cannot cope with the sheer volume of new arrivals. Something similar is happening in Europe as Western society in general is targeted for demographic and cultural transformation and upheaval. The plan demands violence and crime to create an environment of intimidation, fear and division and Soros has been funding the election of district attorneys across America who then stop prosecuting many crimes, reduce sentences for violent crimes and free as many violent criminals as they can. Sabbatians are creating the chaos from which order – their order – can respond in a classic Problem-Reaction-Solution. A Freemasonic moto says 'Ordo Ab Chao' (Order out of Chaos) and this is why the Cult is constantly creating chaos to impose a new 'order'. Here you have the reason the Cult is constantly creating chaos. The 'Covid' hoax can be seen with those entering the United States by plane being forced to take a 'Covid' test while migrants flooding through southern border processing facilities do not. Nothing is put in the way of mass migration and if that means ignoring the government's own 'Covid' rules then so be it. They know it's all bullshit anyway. Any pushback on this is denounced as 'racist' by Wokers and Sabbatian fronts like the ultra-Zionist Anti-Defamation League headed by the appalling Jonathan Greenblatt which at the same time argues that Israel should not give citizenship and voting rights to more Palestinian Arabs or the 'Jewish population' (in truth the Sabbatian network) will lose control of the country.

Society-changing numbers

Biden's masters have declared that countries like El Salvador are so dangerous that their people must be allowed into the United States for humanitarian reasons when there are fewer murders in large parts of many Central American countries than in US cities like

Baltimore. That is not to say Central America cannot be a dangerous place and Cult-controlled American governments have been making it so since way back, along with the dismantling of economies, in a long-term plan to drive people north into the United States. Parts of Central America are very dangerous, but in other areas the story is being greatly exaggerated to justify relaxing immigration criteria. Migrants are being offered free healthcare and education in the United States as another incentive to head for the border and there is no requirement to be financially independent before you can enter to prevent the resources of America being drained. You can't blame migrants for seeking what they believe will be a better life, but they are being played by the Cult for dark and nefarious ends. The numbers since Biden took office are huge. In February, 2021, more than 100,000 people were known to have tried to enter the US illegally through the southern border (it was 34,000 in the same month in 2020) and in March it was 170,000 – a 418 percent increase on March, 2020. These numbers are only known people, not the ones who get in unseen. The true figure for migrants illegally crossing the border in a single month was estimated by one congressman at 250,000 and that number will only rise under Biden's current policy. Gangs of murdering drug-running thugs that control the Mexican side of the border demand money – thousands of dollars – to let migrants cross the Rio Grande into America. At the same time gun battles are breaking out on the border several times a week between rival Mexican drug gangs (which now operate globally) who are equipped with sophisticated military-grade weapons, grenades and armoured vehicles. While the Capitol Building was being 'protected' from a non-existent 'threat' by thousands of troops, and others were still deployed at the time in the Cult Neocon war in Afghanistan, the southern border of America was left to its fate. This is not incompetence, it is cold calculation.

By March, 2021, there were 17,000 unaccompanied children held at border facilities and many of them are ensnared by people traffickers for paedophile rings and raped on their journey north to America. This is not conjecture – this is fact. Many of those designated

children are in reality teenage boys or older. Meanwhile Wokers posture their self-purity for encouraging poor and tragic people to come to America and face this nightmare both on the journey and at the border with the disgusting figure of House Speaker Nancy Pelosi giving disingenuous speeches about caring for migrants. The woman's evil. Wokers condemned Trump for having children in cages at the border (so did Obama, *Shhhh*), but now they are sleeping on the floor without access to a shower with one border facility 729 percent over capacity. The Biden insanity even proposed flying migrants from the southern border to the northern border with Canada for 'processing'. The whole shambles is being overseen by ultra-Zionist Secretary of Homeland Security, the moronic liar Alejandro Mayorkas, who banned news cameras at border facilities to stop Americans seeing what was happening. Mayorkas said there was not a ban on news crews; it was just that they were not allowed to film. Alongside him at Homeland Security is another ultra-Zionist Cass Sunstein appointed by Biden to oversee new immigration laws. Sunstein despises conspiracy researchers to the point where he suggests they should be banned or *taxed* for having such views. The man is not bonkers or anything. He's perfectly well-adjusted, but adjusted to what is the question. Criticise what is happening and you are a 'white supremacist' when earlier non-white immigrants also oppose the numbers which effect their lives and opportunities. Black people in poor areas are particularly damaged by uncontrolled immigration and the increased competition for work opportunities with those who will work for less. They are also losing voting power as Hispanics become more dominant in former black areas. It's a downward spiral for them while the billionaires behind the policy drone on about how much they care about black people and 'racism'. None of this is about compassion for migrants or black people – that's just wind and air. Migrants are instead being mercilessly exploited to transform America while the countries they leave are losing their future and the same is true in Europe. Mass immigration may now be the work of Woke Democrats, but it can be traced back to the 1986 Immigration Reform and Control Act (it

wasn't) signed into law by Republican hero President Ronald Reagan which gave amnesty to millions living in the United States illegally and other incentives for people to head for the southern border. Here we have the one-party state at work again.

Save me syndrome

Almost every aspect of what I have been exposing as the Cult agenda was on display in even the first days of 'Biden' with silencing of Pushbackers at the forefront of everything. A Renegade Mind will view the Trump years and QAnon in a very different light to their supporters and advocates as the dots are connected. The QAnon/Trump Psyop has given the Cult all it was looking for. We may not know how much, or little, that Trump realised he was being used, but that's a side issue. This pincer movement produced the desired outcome of dividing America and having Pushbackers isolated. To turn this around we have to look at new routes to empowerment which do not include handing our power to other people and groups through what I will call the 'Save Me Syndrome' – 'I want someone else to do it so that I don't have to'. We have seen this at work throughout human history and the QAnon/Trump Psyop is only the latest incarnation alongside all the others. Religion is an obvious expression of this when people look to a 'god' or priest to save them or tell them how to be saved and then there are 'save me' politicians like Trump. Politics is a diversion and not a 'saviour'. It is a means to block positive change, not make it possible.

Save Me Syndrome always comes with the same repeating theme of handing your power to whom or what you believe will save you while your real 'saviour' stares back from the mirror every morning. Renegade Minds are constantly vigilant in this regard and always asking the question 'What can I do?' rather than 'What can someone else do for me?' Gandhi was right when he said: 'You must be the change you want to see in the world.' We are indeed the people we have been waiting for. We are presented with a constant raft of reasons to concede that power to others and forget where the real power is. Humanity has the numbers and the Cult does not. It has to

use diversion and division to target the unstoppable power that comes from unity. Religions, governments, politicians, corporations, media, QAnon, are all different manifestations of this power-diversion and dilution. Refusing to give your power to governments and instead handing it to Trump and QAnon is not to take a new direction, but merely to recycle the old one with new names on the posters. I will explore this phenomenon as we proceed and how to break the cycles and recycles that got us here through the mists of repeating perception and so repeating history.

For now we shall turn to the most potent example in the entire human story of the consequences that follow when you give your power away. I am talking, of course, of the 'Covid' hoax.

CHAPTER FOUR

'Covid': Calculated catastrophe

Facts are threatening to those invested in fraud
DaShanne Stokes

We can easily unravel the real reason for the 'Covid pandemic' hoax by employing the Renegade Mind methodology that I have outlined this far. We'll start by comparing the long-planned Cult outcome with the 'Covid pandemic' outcome. Know the outcome and you'll see the journey.

I have highlighted the plan for the Hunger Games Society which has been in my books for so many years with the very few controlling the very many through ongoing dependency. To create this dependency it is essential to destroy independent livelihoods, businesses and employment to make the population reliant on the state (the Cult) for even the basics of life through a guaranteed pittance income. While independence of income remained these Cult ambitions would be thwarted. With this knowledge it was easy to see where the 'pandemic' hoax was going once talk of 'lockdowns' began and the closing of all but perceived 'essential' businesses to 'save' us from an alleged 'deadly virus'. Cult corporations like Amazon and Walmart were naturally considered 'essential' while mom and pop shops and stores had their doors closed by fascist decree. As a result with every new lockdown and new regulation more small and medium, even large businesses not owned by the Cult, went to the wall while Cult giants and their frontmen and women grew financially fatter by the second. Mom and pop were

denied an income and the right to earn a living and the wealth of people like Jeff Bezos (Amazon), Mark Zuckerberg (Facebook) and Sergei Brin and Larry Page (Google/Alphabet) have reached record levels. The Cult was increasing its own power through further dramatic concentrations of wealth while the competition was being destroyed and brought into a state of dependency. Lockdowns have been instigated to secure that very end and were never anything to do with health. My brother Paul spent 45 years building up a bus repair business, but lockdowns meant buses were running at a fraction of normal levels for months on end. Similar stories can be told in their hundreds of millions worldwide. Efforts of a lifetime coldly destroyed by Cult multi-billionaires and their lackeys in government and law enforcement who continued to earn their living from the taxation of the people while denying the right of the same people to earn theirs. How different it would have been if those making and enforcing these decisions had to face the same financial hardships of those they affected, but they never do.

Gates of Hell

Behind it all in the full knowledge of what he is doing and why is the psychopathic figure of Cult operative Bill Gates. His puppet Tedros at the World Health Organization declared 'Covid' a pandemic in March, 2020. The WHO had changed the definition of a 'pandemic' in 2009 just a month before declaring the 'swine flu pandemic' which would not have been so under the previous definition. The same applies to 'Covid'. The definition had included... 'an infection by an infectious agent, occurring simultaneously in different countries, with a significant mortality rate relative to the proportion of the population infected'. The new definition removed the need for 'significant mortality'. The 'pandemic' has been fraudulent even down to the definition, but Gates demanded economy-destroying lockdowns, school closures, social distancing, mandatory masks, a 'vaccination' for every man, woman and child on the planet and severe consequences and restrictions for those that refused. Who gave him this power? The

Cult did which he serves like a little boy in short trousers doing what his daddy tells him. He and his psychopathic missus even smiled when they said that much worse was to come (what they knew was planned to come). Gates responded in the matter-of-fact way of all psychopaths to a question about the effect on the world economy of what he was doing:

Well, it won't go to zero but it will shrink. Global GDP is probably going to take the biggest hit ever [Gates was smiling as he said this] ... in my lifetime this will be the greatest economic hit. But you don't have a choice. People act as if you have a choice. People don't feel like going to the stadium when they might get infected ... People are deeply affected by seeing these stats, by knowing they could be part of the transmission chain, old people, their parents and grandparents, could be affected by this, and so you don't get to say ignore what is going on here.

There will be the ability to open up, particularly in rich countries, if things are done well over the next few months, but for the world at large normalcy only returns when we have largely vaccinated the entire population.

The man has no compassion or empathy. How could he when he's a psychopath like all Cult players? My own view is that even beyond that he is very seriously mentally ill. Look in his eyes and you can see this along with his crazy flailing arms. You don't do what he has done to the world population since the start of 2020 unless you are mentally ill and at the most extreme end of psychopathic. You especially don't do it when to you know, as we shall see, that cases and deaths from 'Covid' are fakery and a product of monumental figure massaging. 'These stats' that Gates referred to are based on a 'test' that's not testing for the 'virus' as he has known all along. He made his fortune with big Cult support as an infamously ruthless software salesman and now buys global control of 'health' (death) policy without the population he affects having any say. It's a breathtaking outrage. Gates talked about people being deeply affected by fear of 'Covid' when that was because of *him* and his global network lying to them minute-by-minute supported by a lying media that he seriously influences and funds to the tune of hundreds of millions. He's handed big sums to media operations including the BBC, NBC, Al Jazeera, Univision, *PBS NewsHour*,

ProPublica, National Journal, The Guardian, The Financial Times, The Atlantic, Texas Tribune, USA Today publisher Gannett, Washington Monthly, Le Monde, Center for Investigative Reporting, Pulitzer Center on Crisis Reporting, National Press Foundation, International Center for Journalists, Solutions Journalism Network, the Poynter Institute for Media Studies, and many more. Gates is everywhere in the 'Covid' hoax and the man must go to prison – or a mental facility – for the rest of his life and his money distributed to those he has taken such enormous psychopathic pleasure in crushing.

The Muscle

The Hunger Games global structure demands a police-military state – a fusion of the two into one force – which viciously imposes the will of the Cult on the population and protects the Cult from public rebellion. In that regard, too, the 'Covid' hoax just keeps on giving. Often unlawful, ridiculous and contradictory 'Covid' rules and regulations have been policed across the world by moronic automatons and psychopaths made faceless by face-nappy masks and acting like the Nazi SS and fascist blackshirts and brownshirts of Hitler and Mussolini. The smallest departure from the rules decreed by the psychos in government and their clueless gofers were jumped upon by the face-nappy fascists. Brutality against public protestors soon became commonplace even on girls, women and old people as the brave men with the batons – the Face-Nappies as I call them – broke up peaceful protests and handed out fines like confetti to people who couldn't earn a living let alone pay hundreds of pounds for what was once an accepted human right. Robot Face-Nappies of Nottingham police in the English East Midlands fined one group £11,000 for attending a child's birthday party. For decades I charted the transformation of law enforcement as genuine, decent officers were replaced with psychopaths and the brain dead who would happily and brutally do whatever their masters told them. Now they were let loose on the public and I would emphasise the point that none of this just happened. The step-by-step change in the dynamic between police and public was orchestrated from the shadows by

those who knew where this was all going and the same with the perceptual reframing of those in all levels of authority and official administration through 'training courses' by organisations such as Common Purpose which was created in the late 1980s and given a massive boost in Blair era Britain until it became a global phenomenon. Supposed public 'servants' began to view the population as the enemy and the same was true of the police. This was the start of the explosion of behaviour manipulation organisations and networks preparing for the all-war on the human psyche unleashed with the dawn of 2020. I will go into more detail about this later in the book because it is a core part of what is happening.

Police desecrated beauty spots to deter people gathering and arrested women for walking in the countryside alone 'too far' from their homes. We had arrogant, clueless sergeants in the Isle of Wight police where I live posting on Facebook what they insisted the population must do or else. A schoolmaster sergeant called Radford looked young enough for me to ask if his mother knew he was out, but he was posting what he *expected* people to do while a Sergeant Wilkinson boasted about fining lads for meeting in a McDonald's car park where they went to get a lockdown takeaway. Wilkinson added that he had even cancelled their order. What a pair of prats these people are and yet they have increasingly become the norm among Jackboot Johnson's Yellowshirts once known as the British police. This was the theme all over the world with police savagery common during lockdown protests in the United States, the Netherlands, and the fascist state of Victoria in Australia under its tyrannical and again moronic premier Daniel Andrews. Amazing how tyrannical and moronic tend to work as a team and the same combination could be seen across America as arrogant, narcissistic Woke governors and mayors such as Gavin Newsom (California), Andrew Cuomo (New York), Gretchen Whitmer (Michigan), Lori Lightfoot (Chicago) and Eric Garcetti (Los Angeles) did their Nazi and Stalin impressions with the full support of the compliant brutality of their enforcers in uniform as they arrested small business owners defying

fascist shutdown orders and took them to jail in ankle shackles and handcuffs. This happened to bistro owner Marlena Pavlos-Hackney in Gretchen Whitmer's fascist state of Michigan when police arrived to enforce an order by a state-owned judge for 'putting the community at risk' at a time when other states like Texas were dropping restrictions and migrants were pouring across the southern border without any 'Covid' questions at all. I'm sure there are many officers appalled by what they are ordered to do, but not nearly enough of them. If they were truly appalled they would not do it. As the months passed every opportunity was taken to have the military involved to make their presence on the streets ever more familiar and 'normal' for the longer-term goal of police-military fusion.

Another crucial element to the Hunger Games enforcement network has been encouraging the public to report neighbours and others for 'breaking the lockdown rules'. The group faced with £11,000 in fines at the child's birthday party would have been dobbed-in by a neighbour with a brain the size of a pea. The technique was most famously employed by the Stasi secret police in communist East Germany who had public informants placed throughout the population. A police chief in the UK says his force doesn't need to carry out 'Covid' patrols when they are flooded with so many calls from the public reporting other people for visiting the beach. Dorset police chief James Vaughan said people were so enthusiastic about snitching on their fellow humans they were now operating as an auxiliary arm of the police: 'We are still getting around 400 reports a week from the public, so we will respond to reports ... We won't need to be doing hotspot patrols because people are very quick to pick the phone up and tell us.' Vaughan didn't say that this is a pillar of all tyrannies of whatever complexion and the means to hugely extend the reach of enforcement while spreading distrust among the people and making them wary of doing anything that might get them reported. Those narcissistic Isle of Wight sergeants Radford and Wilkinson never fail to add a link to their Facebook posts where the public can inform on their fellow slaves.

Neither would be self-aware enough to realise they were imitating the Stasi which they might well never have heard of. Government psychologists that I will expose later laid out a policy to turn communities against each other in the same way.

A coincidence? Yep, and I can knit fog

I knew from the start of the alleged pandemic that this was a Cult operation. It presented limitless potential to rapidly advance the Cult agenda and exploit manipulated fear to demand that every man, woman and child on the planet was 'vaccinated' in a process never used on humans before which infuses self-replicating *synthetic* material into human cells. Remember the plan to transform the human body from a biological to a synthetic biological state. I'll deal with the 'vaccine' (that's not actually a vaccine) when I focus on the genetic agenda. Enough to say here that mass global 'vaccination' justified by this 'new virus' set alarms ringing after 30 years of tracking these people and their methods. The 'Covid' hoax officially beginning in China was also a big red flag for reasons I will be explaining. The agenda potential was so enormous that I could dismiss any idea that the 'virus' appeared naturally. Major happenings with major agenda implications never occur without Cult involvement in making them happen. My questions were twofold in early 2020 as the media began its campaign to induce global fear and hysteria: Was this alleged infectious agent released on purpose by the Cult or did it even exist at all? I then did what I always do in these situations. I sat, observed and waited to see where the evidence and information would take me. By March and early April synchronicity was strongly – and ever more so since then – pointing me in the direction of *there is no 'virus'*. I went public on that with derision even from swathes of the alternative media that voiced a scenario that the Chinese government released the 'virus' in league with Deep State elements in the United States from a top-level bio-lab in Wuhan where the 'virus' is said to have first appeared. I looked at that possibility, but I didn't buy it for several reasons. Deaths from the 'virus' did not in any way match what they

would have been with a 'deadly bioweapon' and it is much more effective if you sell the *illusion* of an infectious agent rather than having a real one unless you can control through injection who has it and who doesn't. Otherwise you lose control of events. A made-up 'virus' gives you a blank sheet of paper on which you can make it do whatever you like and have any symptoms or mutant 'variants' you choose to add while a real infectious agent would limit you to what it actually does. A phantom disease allows you to have endless ludicrous 'studies' on the 'Covid' dollar to widen the perceived impact by inventing ever more 'at risk' groups including one study which said those who walk slowly may be almost four times more likely to die from the 'virus'. People are in psychiatric wards for less.

A real 'deadly bioweapon' can take out people in the hierarchy that are not part of the Cult, but essential to its operation. Obviously they don't want that. Releasing a real disease means you immediately lose control of it. Releasing an illusory one means you don't. Again it's vital that people are extra careful when dealing with what they want to hear. A bioweapon unleashed from a Chinese laboratory in collusion with the American Deep State may fit a conspiracy narrative, but is it true? Would it not be far more effective to use the excuse of a 'virus' to justify the real bioweapon – the 'vaccine'? That way your disease agent does not have to be transmitted and arrives directly through a syringe. I saw a French virologist Luc Montagnier quoted in the alternative media as saying he had discovered that the alleged 'new' severe acute respiratory syndrome coronavirus , or SARS-CoV-2, was made artificially and included elements of the human immunodeficiency 'virus' (HIV) and a parasite that causes malaria. SARS-CoV-2 is alleged to trigger an alleged illness called Covid-19. I remembered Montagnier's name from my research years before into claims that an HIV 'retrovirus' causes AIDs – claims that were demolished by Berkeley virologist Peter Duesberg who showed that no one had ever proved that HIV causes acquired immunodeficiency syndrome or AIDS. Claims that become accepted as fact, publicly and medically, with no proof whatsoever are an ever-recurring story that profoundly applies to

‘Covid’. Nevertheless, despite the lack of proof, Montagnier’s team at the Pasteur Institute in Paris had a long dispute with American researcher Robert Gallo over which of them discovered and isolated the HIV ‘virus’ and with *no evidence* found it to cause AIDS. You will see later that there is also no evidence that any ‘virus’ causes any disease or that there is even such a thing as a ‘virus’ in the way it is said to exist. The claim to have ‘isolated’ the HIV ‘virus’ will be presented in its real context as we come to the shocking story – and it is a story – of SARS-CoV-2 and so will Montagnier’s assertion that he identified the full SARS-CoV-2 genome.

Hoax in the making

We can pick up the ‘Covid’ story in 2010 and the publication by the Rockefeller Foundation of a document called ‘Scenarios for the Future of Technology and International Development’. The inner circle of the Rockefeller family has been serving the Cult since John D. Rockefeller (1839-1937) made his fortune with Standard Oil. It is less well known that the same Rockefeller – the Bill Gates of his day – was responsible for establishing what is now referred to as ‘Big Pharma’, the global network of pharmaceutical companies that make outrageous profits dispensing scalpel and drug ‘medicine’ and are obsessed with pumping vaccines in ever-increasing number into as many human arms and backsides as possible. John D. Rockefeller was the driving force behind the creation of the ‘education’ system in the United States and elsewhere specifically designed to program the perceptions of generations thereafter. The Rockefeller family donated exceptionally valuable land in New York for the United Nations building and were central in establishing the World Health Organization in 1948 as an agency of the UN which was created from the start as a Trojan horse and stalking horse for world government. Now enter Bill Gates. His family and the Rockefellers have long been extremely close and I have seen genealogy which claims that if you go back far enough the two families fuse into the same bloodline. Gates has said that the Bill and Melinda Gates Foundation was inspired by the Rockefeller Foundation and why not

when both are serving the same Cult? Major tax-exempt foundations are overwhelmingly criminal enterprises in which Cult assets fund the Cult agenda in the guise of 'philanthropy' while avoiding tax in the process. Cult operatives can become mega-rich in their role of front men and women for the psychopaths at the inner core and they, too, have to be psychopaths to knowingly serve such evil. Part of the deal is that a big percentage of the wealth gleaned from representing the Cult has to be spent advancing the ambitions of the Cult and hence you have the Rockefeller Foundation, Bill and Melinda Gates Foundation (and *so* many more) and people like George Soros with his global Open Society Foundations spending their billions in pursuit of global Cult control. Gates is a global public face of the Cult with his interventions in world affairs including Big Tech influence; a central role in the 'Covid' and 'vaccine' scam; promotion of the climate change shakedown; manipulation of education; geoengineering of the skies; and his food-control agenda as the biggest owner of farmland in America, his GMO promotion and through other means. As one writer said: 'Gates monopolizes or wields disproportionate influence over the tech industry, global health and vaccines, agriculture and food policy (including biopiracy and fake food), weather modification and other climate technologies, surveillance, education and media.' The almost limitless wealth secured through Microsoft and other not-allowed-to-fail ventures (including vaccines) has been ploughed into a long, long list of Cult projects designed to enslave the entire human race. Gates and the Rockefellers have been working as one unit with the Rockefeller-established World Health Organization leading global 'Covid' policy controlled by Gates through his mouth-piece Tedros. Gates became the WHO's biggest funder when Trump announced that the American government would cease its donations, but Biden immediately said he would restore the money when he took office in January, 2021. The Gates Foundation (the Cult) owns through limitless funding the world health system and the major players across the globe in the 'Covid' hoax.

Okay, with that background we return to that Rockefeller Foundation document of 2010 headed 'Scenarios for the Future of Technology and International Development' and its 'imaginary' epidemic of a virulent and deadly influenza strain which infected 20 percent of the global population and killed eight million in seven months. The Rockefeller scenario was that the epidemic destroyed economies, closed shops, offices and other businesses and led to governments imposing fierce rules and restrictions that included mandatory wearing of face masks and body-temperature checks to enter communal spaces like railway stations and supermarkets. The document predicted that even after the height of the Rockefeller-envisaged epidemic the authoritarian rule would continue to deal with further pandemics, transnational terrorism, environmental crises and rising poverty. Now you may think that the Rockefellers are our modern-day seers or alternatively, and rather more likely, that they well knew what was planned a few years further on. Fascism had to be imposed, you see, to 'protect citizens from risk and exposure'. The Rockefeller scenario document said:

During the pandemic, national leaders around the world flexed their authority and imposed airtight rules and restrictions, from the mandatory wearing of face masks to body-temperature checks at the entries to communal spaces like train stations and supermarkets. Even after the pandemic faded, this more authoritarian control and oversight of citizens and their activities stuck and even intensified. In order to protect themselves from the spread of increasingly global problems – from pandemics and transnational terrorism to environmental crises and rising poverty – leaders around the world took a firmer grip on power.

At first, the notion of a more controlled world gained wide acceptance and approval. Citizens willingly gave up some of their sovereignty – and their privacy – to more paternalistic states in exchange for greater safety and stability. Citizens were more tolerant, and even eager, for top-down direction and oversight, and national leaders had more latitude to impose order in the ways they saw fit.

In developed countries, this heightened oversight took many forms: biometric IDs for all citizens, for example, and tighter regulation of key industries whose stability was deemed vital to national interests. In many developed countries, enforced cooperation with a suite of new regulations and agreements slowly but steadily restored both order and, importantly, economic growth.

There we have the prophetic Rockefellers in 2010 and three years later came their paper for the Global Health Summit in Beijing, China, when government representatives, the private sector, international organisations and groups met to discuss the next 100 years of 'global health'. The Rockefeller Foundation-funded paper was called 'Dreaming the Future of Health for the Next 100 Years and more prophecy ensued as it described a dystopian future: 'The abundance of data, digitally tracking and linking people may mean the 'death of privacy' and may replace physical interaction with transient, virtual connection, generating isolation and raising questions of how values are shaped in virtual networks.' Next in the 'Covid' hoax preparation sequence came a 'table top' simulation in 2018 for another 'imaginary' pandemic of a disease called Clade X which was said to kill 900 million people. The exercise was organised by the Gates-funded Johns Hopkins University's Center for Health Security in the United States and this is the very same university that has been compiling the disgustingly and systematically erroneous global figures for 'Covid' cases and deaths. Similar Johns Hopkins health crisis scenarios have included the Dark Winter exercise in 2001 and Atlantic Storm in 2005.

Nostradamus 201

For sheer predictive genius look no further prophecy-watchers than the Bill Gates-funded Event 201 held only six weeks before the 'coronavirus pandemic' is supposed to have broken out in China and Event 201 was based on a scenario of a global 'coronavirus pandemic'. Melinda Gates, the great man's missus, told the BBC that he had 'prepared for years' for a coronavirus pandemic which told us what we already knew. Nostradamugates had predicted in a TED talk in 2015 that a pandemic was coming that would kill a lot of people and demolish the world economy. My god, the man is a machine – possibly even literally. Now here he was only weeks before the real thing funding just such a simulated scenario and involving his friends and associates at Johns Hopkins, the World Economic Forum Cult-front of Klaus Schwab, the United Nations,

Johnson & Johnson, major banks, and officials from China and the Centers for Disease Control in the United States. What synchronicity – Johns Hopkins would go on to compile the fraudulent ‘Covid’ figures, the World Economic Forum and Schwab would push the ‘Great Reset’ in response to ‘Covid’, the Centers for Disease Control would be at the forefront of ‘Covid’ policy in the United States, Johnson & Johnson would produce a ‘Covid vaccine’, and everything would officially start just weeks later in China. Spooky, eh? They were even accurate in creating a simulation of a ‘virus’ pandemic because the ‘real thing’ would also be a simulation. Event 201 was not an exercise preparing for something that might happen; it was a rehearsal for what those in control knew was *going* to happen and very shortly. Hours of this simulation were posted on the Internet and the various themes and responses mirrored what would soon be imposed to transform human society. News stories were inserted and what they said would be commonplace a few weeks later with still more prophecy perfection. Much discussion focused on the need to deal with misinformation and the ‘anti-vax movement’ which is exactly what happened when the ‘virus’ arrived – was said to have arrived – in the West.

Cult-owned social media banned criticism and exposure of the official ‘virus’ narrative and when I said there *was* no ‘virus’ in early April, 2020, I was banned by one platform after another including YouTube, Facebook and later Twitter. The mainstream broadcast media in Britain was in effect banned from interviewing me by the Tony-Blair-created government broadcasting censor Ofcom headed by career government bureaucrat Melanie Dawes who was appointed just as the ‘virus’ hoax was about to play out in January, 2020. At the same time the Ickonic media platform was using Vimeo, another ultra-Zionist-owned operation, while our own player was being created and they deleted in an instant hundreds of videos, documentaries, series and shows to confirm their unbelievable vindictiveness. We had copies, of course, and they had to be restored one by one when our player was ready. These people have no class. Sabbatian Facebook promised free advertisements for the Gates-

controlled World Health Organization narrative while deleting ‘false claims and conspiracy theories’ to stop ‘misinformation’ about the alleged coronavirus. All these responses could be seen just a short while earlier in the scenarios of Event 201. Extreme censorship was absolutely crucial for the Cult because the official story was so ridiculous and unsupportable by the evidence that it could never survive open debate and the free-flow of information and opinion. If you can’t win a debate then don’t have one is the Cult’s approach throughout history. Facebook’s little boy front man – front boy – Mark Zuckerberg equated ‘credible and accurate information’ with official sources and exposing their lies with ‘misinformation’.

Silencing those that can see

The censorship dynamic of Event 201 is now the norm with an army of narrative-supporting ‘fact-checker’ organisations whose entire reason for being is to tell the public that official narratives are true and those exposing them are lying. One of the most appalling of these ‘fact-checkers’ is called NewsGuard founded by ultra-Zionist Americans Gordon Crovitz and Steven Brill. Crovitz is a former publisher of *The Wall Street Journal*, former Executive Vice President of Dow Jones, a member of the Council on Foreign Relations (CFR), and on the board of the American Association of Rhodes Scholars. The CFR and Rhodes Scholarships, named after Rothschild agent Cecil Rhodes who plundered the gold and diamonds of South Africa for his masters and the Cult, have featured widely in my books. NewsGuard don’t seem to like me for some reason – I really can’t think why – and they have done all they can to have me censored and discredited which is, to quote an old British politician, like being savaged by a dead sheep. They are, however, like all in the censorship network, very well connected and funded by organisations themselves funded by, or connected to, Bill Gates. As you would expect with anything associated with Gates NewsGuard has an offshoot called HealthGuard which ‘fights online health care hoaxes’. How very kind. Somehow the NewsGuard European Managing Director Anna-Sophie Harling, a remarkably young-

looking woman with no broadcasting experience and little hands-on work in journalism, has somehow secured a position on the 'Content Board' of UK government broadcast censor Ofcom. An executive of an organisation seeking to discredit dissidents of the official narratives is making decisions for the government broadcast 'regulator' about content?? Another appalling 'fact-checker' is Full Fact funded by George Soros and global censors Google and Facebook.

It's amazing how many activists in the 'fact-checking', 'anti-hate', arena turn up in government-related positions – people like UK Labour Party activist Imran Ahmed who heads the Center for Countering Digital Hate founded by people like Morgan McSweeney, now chief of staff to the Labour Party's hapless and useless 'leader' Keir Starmer. Digital Hate – which is what it really is – uses the American spelling of Center to betray its connection to a transatlantic network of similar organisations which in 2020 shapeshifted from attacking people for 'hate' to attacking them for questioning the 'Covid' hoax and the dangers of the 'Covid vaccine'. It's just a coincidence, you understand. This is one of Imran Ahmed's hysterical statements: 'I would go beyond calling anti-vaxxers conspiracy theorists to say they are an extremist group that pose a national security risk.' No one could ever accuse this prat of understatement and he's including in that those parents who are now against vaccines after their children were damaged for life or killed by them. He's such a nice man. Ahmed does the rounds of the Woke media getting soft-ball questions from spineless 'journalists' who never ask what right he has to campaign to destroy the freedom of speech of others while he demands it for himself. There also seems to be an overrepresentation in Ofcom of people connected to the narrative-worshipping BBC. This incredible global network of narrative-support was super-vital when the 'Covid' hoax was played in the light of the mega-whopper lies that have to be defended from the spotlight cast by the most basic intelligence.

Setting the scene

The Cult plays the long game and proceeds step-by-step ensuring that everything is in place before major cards are played and they don't come any bigger than the 'Covid' hoax. The psychopaths can't handle events where the outcome isn't certain and as little as possible – preferably nothing – is left to chance. Politicians, government and medical officials who would follow direction were brought to illusory power in advance by the Cult web whether on the national stage or others like state governors and mayors of America. For decades the dynamic between officialdom, law enforcement and the public was changed from one of service to one of control and dictatorship. Behaviour manipulation networks established within government were waiting to impose the coming 'Covid' rules and regulations specifically designed to subdue and rewire the psyche of the people in the guise of protecting health. These included in the UK the Behavioural Insights Team part-owned by the British government Cabinet Office; the Scientific Pandemic Insights Group on Behaviours (SPI-B); and a whole web of intelligence and military groups seeking to direct the conversation on social media and control the narrative. Among them are the cyberwarfare (on the people) 77th Brigade of the British military which is also coordinated through the Cabinet Office as civilian and military leadership continues to combine in what they call the Fusion Doctrine. The 77th Brigade is a British equivalent of the infamous Israeli (Sabbatian) military cyberwarfare and Internet manipulation operation Unit 8200 which I expose at length in *The Trigger*. Also carefully in place were the medical and science advisers to government – many on the payroll past or present of Bill Gates – and a whole alternative structure of unelected government stood by to take control when elected parliaments were effectively closed down once the 'Covid' card was slammed on the table. The structure I have described here and so much more was installed in every major country through the Cult networks. The top-down control hierarchy looks like this: The Cult – Cult-owned Gates – the World Health Organization and Tedros – Gates-funded or controlled chief medical officers and science 'advisers' (dictators) in each country –

political 'leaders' – law enforcement – The People. Through this simple global communication and enforcement structure the policy of the Cult could be imposed on virtually the entire human population so long as they acquiesced to the fascism. With everything in place it was time for the button to be pressed in late 2019/early 2020.

These were the prime goals the Cult had to secure for its will to prevail:

1) Locking down economies, closing all but designated 'essential' businesses (Cult-owned corporations were 'essential'), and putting the population under house arrest was an imperative to destroy independent income and employment and ensure dependency on the Cult-controlled state in the Hunger Games Society. Lockdowns had to be established as the global blueprint from the start to respond to the 'virus' and followed by pretty much the entire world.

2) The global population had to be terrified into believing in a deadly 'virus' that didn't actually exist so they would unquestioningly obey authority in the belief that authority must know how best to protect them and their families. Software salesman Gates would suddenly morph into the world's health expert and be promoted as such by the Cult-owned media.

3) A method of testing that wasn't testing for the 'virus', but was only claimed to be, had to be in place to provide the illusion of 'cases' and subsequent 'deaths' that had a very different cause to the 'Covid-19' that would be scribbled on the death certificate.

4) Because there was no 'virus' and the great majority testing positive with a test not testing for the 'virus' would have no symptoms of anything the lie had to be sold that people without symptoms (without the 'virus') could still pass it on to others. This was crucial to justify for the first time quarantining – house arresting – healthy people. Without this the economy-destroying lockdown of *everybody* could not have been credibly sold.

5) The 'saviour' had to be seen as a vaccine which beyond evil drug companies were working like angels of mercy to develop as quickly as possible, with all corners cut, to save the day. The public must absolutely not know that the 'vaccine' had nothing to do with a 'virus' or that the contents were ready and waiting with a very different motive long before the 'Covid' card was even lifted from the pack.

I said in March, 2020, that the 'vaccine' would have been created way ahead of the 'Covid' hoax which justified its use and the following December an article in the New York *Intelligencer* magazine said the Moderna 'vaccine' had been 'designed' by

January, 2020. This was 'before China had even acknowledged that the disease could be transmitted from human to human, more than a week before the first confirmed coronavirus case in the United States'. The article said that by the time the first American death was announced a month later 'the vaccine had already been manufactured and shipped to the National Institutes of Health for the beginning of its Phase I clinical trial'. The 'vaccine' was actually 'designed' long before that although even with this timescale you would expect the article to ask how on earth it could have been done that quickly. Instead it asked why the 'vaccine' had not been rolled out then and not months later. Journalism in the mainstream is truly dead. I am going to detail in the next chapter why the 'virus' has never existed and how a hoax on that scale was possible, but first the foundation on which the Big Lie of 'Covid' was built.

The test that doesn't test

Fraudulent 'testing' is the bottom line of the whole 'Covid' hoax and was the means by which a 'virus' that did not exist *appeared* to exist. They could only achieve this magic trick by using a test not testing for the 'virus'. To use a test that *was* testing for the 'virus' would mean that every test would come back negative given there was no 'virus'. They chose to exploit something called the RT-PCR test invented by American biochemist Kary Mullis in the 1980s who said publicly that his PCR test ... *cannot detect infectious disease*. Yes, the 'test' used worldwide to detect infectious 'Covid' to produce all the illusory 'cases' and 'deaths' compiled by Johns Hopkins and others *cannot detect infectious disease*. This fact came from the mouth of the man who invented PCR and was awarded the Nobel Prize in Chemistry in 1993 for doing so. Sadly, and incredibly conveniently for the Cult, Mullis died in August, 2019, at the age of 74 just before his test would be fraudulently used to unleash fascism on the world. He was said to have died from pneumonia which was an irony in itself. A few months later he would have had 'Covid-19' on his death certificate. I say the timing of his death was convenient because had he lived Mullis, a brilliant, honest and decent man, would have been

vociferously speaking out against the use of his test to detect 'Covid' when it was never designed, or able, to do that. I know that to be true given that Mullis made the same point when his test was used to 'detect' – not detect – HIV. He had been seriously critical of the Gallo/Montagnier claim to have isolated the HIV 'virus' and shown it to cause AIDS for which Mullis said there was no evidence. AIDS is actually not a disease but a series of diseases from which people die all the time. When they die from those *same diseases* after a positive 'test' for HIV then AIDS goes on their death certificate. I think I've heard that before somewhere. Countries instigated a policy with 'Covid' that anyone who tested positive with a test not testing for the 'virus' and died of any other cause within 28 days and even longer 'Covid-19' had to go on the death certificate. Cases have come from the test that can't test for infectious disease and the deaths are those who have died of *anything* after testing positive with a test not testing for the 'virus'. I'll have much more later about the death certificate scandal.

Mullis was deeply dismissive of the now US 'Covid' star Anthony Fauci who he said was a liar who didn't know anything about anything – 'and I would say that to his face – nothing.' He said of Fauci: 'The man thinks he can take a blood sample, put it in an electron microscope and if it's got a virus in there you'll know it – he doesn't understand electron microscopy and he doesn't understand medicine and shouldn't be in a position like he's in.' That position, terrifyingly, has made him the decider of 'Covid' fascism policy on behalf of the Cult in his role as director since 1984 of the National Institute of Allergy and Infectious Diseases (NIAID) while his record of being wrong is laughable; but being wrong, so long as it's the *right kind* of wrong, is why the Cult loves him. He'll say anything the Cult tells him to say. Fauci was made Chief Medical Adviser to the President immediately Biden took office. Biden was installed in the White House by Cult manipulation and one of his first decisions was to elevate Fauci to a position of even more control. This is a coincidence? Yes, and I identify as a flamenco dancer called Lola. How does such an incompetent criminal like Fauci remain in that

pivotal position in American health since *the 1980s*? When you serve the Cult it looks after you until you are surplus to requirements. Kary Mullis said prophetically of Fauci and his like: 'Those guys have an agenda and it's not an agenda we would like them to have ... they make their own rules, they change them when they want to, and Tony Fauci does not mind going on television in front of the people who pay his salary and lie directly into the camera.' Fauci has done that almost daily since the 'Covid' hoax began. Lying is in Fauci's DNA. To make the situation crystal clear about the PCR test this is a direct quote from its inventor Kary Mullis:

It [the PCR test] doesn't tell you that you're sick and doesn't tell you that the thing you ended up with was really going to hurt you ...'

Ask yourself why governments and medical systems the world over have been using this very test to decide who is 'infected' with the SARS-CoV-2 'virus' and the alleged disease it allegedly causes, 'Covid-19'. The answer to that question will tell you what has been going on. By the way, here's a little show-stopper – the 'new' SARS-CoV-2 'virus' was 'identified' as such right from the start using ... *the PCR test not testing for the 'virus'*. If you are new to this and find that shocking then stick around. I have hardly started yet. Even worse, other 'tests', like the 'Lateral Flow Device' (LFD), are considered so useless that they have to be *confirmed* by the PCR test! Leaked emails written by Ben Dyson, adviser to UK 'Health' Secretary Matt Hancock, said they were 'dangerously unreliable'. Dyson, executive director of strategy at the Department of Health, wrote: 'As of today, someone who gets a positive LFD result in (say) London has at best a 25 per cent chance of it being a true positive, but if it is a self-reported test potentially as low as 10 per cent (on an optimistic assumption about specificity) or as low as 2 per cent (on a more pessimistic assumption).' These are the 'tests' that schoolchildren and the public are being urged to have twice a week or more and have to isolate if they get a positive. Each fake positive goes in the statistics as a 'case' no matter how ludicrously inaccurate and the

'cases' drive lockdown, masks and the pressure to 'vaccinate'. The government said in response to the email leak that the 'tests' were accurate which confirmed yet again what shocking bloody liars they are. The real false positive rate is *100 percent* as we'll see. In another 'you couldn't make it up' the UK government agreed to pay £2.8 billion to California's Innova Medical Group to supply the irrelevant lateral flow tests. The company's primary test-making centre is in China. Innova Medical Group, established in March, 2020, is owned by Pasaca Capital Inc, chaired by Chinese-American millionaire Charles Huang who was born in Wuhan.

How it works – and how it doesn't

The RT-PCR test, known by its full title of Polymerase chain reaction, is used across the world to make millions, even billions, of copies of a DNA/RNA genetic information sample. The process is called 'amplification' and means that a tiny sample of genetic material is amplified to bring out the detailed content. I stress that it is not testing for an infectious disease. It is simply amplifying a sample of genetic material. In the words of Kary Mullis: 'PCR is ... just a process that's used to make a whole lot of something out of something.' To emphasise the point companies that make the PCR tests circulated around the world to 'test' for 'Covid' warn on the box that it can't be used to detect 'Covid' or infectious disease and is for research purposes only. It's okay, rest for a minute and you'll be fine. This is the test that produces the 'cases' and 'deaths' that have been used to destroy human society. All those global and national medical and scientific 'experts' demanding this destruction to 'save us' *KNOW* that the test is not testing for the 'virus' and the cases and deaths they claim to be real are an almost unimaginable fraud. Every one of them and so many others including politicians and psychopaths like Gates and Tedros must be brought before Nuremburg-type trials and jailed for the rest of their lives. The more the genetic sample is amplified by PCR the more elements of that material become sensitive to the test and by that I don't mean sensitive for a 'virus' but for elements of the genetic material which

is *naturally* in the body or relates to remnants of old conditions of various kinds lying dormant and causing no disease. Once the amplification of the PCR reaches a certain level *everyone* will test positive. So much of the material has been made sensitive to the test that everyone will have some part of it in their body. Even lying criminals like Fauci have said that once PCR amplifications pass 35 cycles everything will be a false positive that cannot be trusted for the reasons I have described. I say, like many proper doctors and scientists, that 100 percent of the 'positives' are false, but let's just go with Fauci for a moment.

He says that any amplification over 35 cycles will produce false positives and yet the US Centers for Disease Control (CDC) and Food and Drug Administration (FDA) have recommended up to 40 *cycles* and the National Health Service (NHS) in Britain admitted in an internal document for staff that it was using 45 *cycles* of amplification. A long list of other countries has been doing the same and at least one 'testing' laboratory has been using 50 *cycles*. Have you ever heard a doctor, medical 'expert' or the media ask what level of amplification has been used to claim a 'positive'. The 'test' comes back 'positive' and so you have the 'virus', end of story. Now we can see how the government in Tanzania could send off samples from a goat and a pawpaw fruit under human names and both came back positive for 'Covid-19'. Tanzania president John Magufuli mocked the 'Covid' hysteria, the PCR test and masks and refused to import the DNA-manipulating 'vaccine'. The Cult hated him and an article sponsored by the Bill Gates Foundation appeared in the London *Guardian* in February, 2021, headed 'It's time for Africa to rein in Tanzania's anti-vaxxer president'. Well, 'reined in' he shortly was. Magufuli appeared in good health, but then, in March, 2021, he was dead at 61 from 'heart failure'. He was replaced by Samia Hassan Suhulu who is connected to Klaus Schwab's World Economic Forum and she immediately reversed Magufuli's 'Covid' policy. A sample of cola tested positive for 'Covid' with the PCR test in Germany while American actress and singer-songwriter Erykah Badu tested positive in one nostril and negative in the other. Footballer Ronaldo called

the PCR test 'bullshit' after testing positive three times and being forced to quarantine and miss matches when there was nothing wrong with him. The mantra from Tedros at the World Health Organization and national governments (same thing) has been test, test, test. They know that the more tests they can generate the more fake 'cases' they have which go on to become 'deaths' in ways I am coming to. The UK government has its Operation Moonshot planned to test multiple millions every day in workplaces and schools with free tests for everyone to use twice a week at home in line with the Cult plan from the start to make testing part of life. A government advertisement for an 'Interim Head of Asymptomatic Testing Communication' said the job included responsibility for delivering a 'communications strategy' (propaganda) 'to support the expansion of asymptomatic testing that *'normalises testing as part of everyday life'*'. More tests means more fake 'cases', 'deaths' and fascism. I have heard of, and from, many people who booked a test, couldn't turn up, and yet got a positive result through the post for a test they'd never even had. The whole thing is crazy, but for the Cult there's method in the madness. Controlling and manipulating the level of amplification of the test means the authorities can control whenever they want the number of apparent 'cases' and 'deaths'. If they want to justify more fascist lockdown and destruction of livelihoods they keep the amplification high. If they want to give the illusion that lockdowns and the 'vaccine' are working then they lower the amplification and 'cases' and 'deaths' will appear to fall. In January, 2021, the Cult-owned World Health Organization suddenly warned laboratories about over-amplification of the test and to lower the threshold. Suddenly headlines began appearing such as: 'Why ARE "Covid" cases plummeting?' This was just when the vaccine rollout was underway and I had predicted months before they would make cases appear to fall through amplification tampering when the 'vaccine' came. These people are so predictable.

Cow vaccines?

The question must be asked of what is on the test swabs being poked far up the nose of the population to the base of the brain? A nasal swab punctured one woman's brain and caused it to leak fluid. Most of these procedures are being done by people with little training or medical knowledge. Dr Lorraine Day, former orthopaedic trauma surgeon and Chief of Orthopaedic Surgery at San Francisco General Hospital, says the tests are really a '*vaccine*'. Cows have long been vaccinated this way. She points out that masks have to cover the nose and the mouth where it is claimed the '*virus*' exists in saliva. Why then don't they take saliva from the mouth as they do with a DNA test instead of pushing a long swab up the nose towards the brain? The ethmoid bone separates the nasal cavity from the brain and within that bone is the cribriform plate. Dr Day says that when the swab is pushed up against this plate and twisted the procedure is '*depositing things back there*'. She claims that among these '*things*' are nanoparticles that can enter the brain. Researchers have noted that a team at the Gates-funded Johns Hopkins have designed tiny, star-shaped micro-devices that can latch onto intestinal mucosa and release drugs into the body. Mucosa is the thin skin that covers the inside surface of parts of the body such as *the nose* and mouth and produces mucus to protect them. The Johns Hopkins micro-devices are called '*theragrippers*' and were '*inspired*' by a parasitic worm that digs its sharp teeth into a host's intestines. Nasal swabs are also coated in the sterilisation agent ethylene oxide. The US National Cancer Institute posts this explanation on its website:

At room temperature, ethylene oxide is a flammable colorless gas with a sweet odor. It is used primarily to produce other chemicals, including antifreeze. In smaller amounts, ethylene oxide is used as a pesticide and a sterilizing agent. The ability of ethylene oxide to damage DNA makes it an effective sterilizing agent but also accounts for its cancer-causing activity.

The Institute mentions lymphoma and leukaemia as cancers most frequently reported to be associated with occupational exposure to ethylene oxide along with stomach and breast cancers. How does anyone think this is going to work out with the constant testing

regime being inflicted on adults and children at home and at school that will accumulate in the body anything that's on the swab?

Doctors know best

It is vital for people to realise that 'hero' doctors 'know' only what the Big Pharma-dominated medical authorities tell them to 'know' and if they refuse to 'know' what they are told to 'know' they are out the door. They are mostly not physicians or healers, but repeaters of the official narrative – or else. I have seen alleged professional doctors on British television make shocking statements that we are supposed to take seriously. One called 'Dr' Amir Khan, who is actually telling patients how to respond to illness, said that men could take the birth pill to 'help slow down the effects of Covid-19'. In March, 2021, another ridiculous 'Covid study' by an American doctor proposed injecting men with the female sex hormone progesterone as a 'Covid' treatment. British doctor Nighat Arif told the BBC that face coverings were now going to be part of ongoing normal. Yes, the vaccine protects you, she said (evidence?) ... but the way to deal with viruses in the community was always going to come down to hand washing, face covering and keeping a physical distance. That's not what we were told before the 'vaccine' was circulating. Arif said she couldn't imagine ever again going on the underground or in a lift without a mask. I was just thanking my good luck that she was not my doctor when she said – in March, 2021 – that if 'we are *behaving* and we are doing all the right things' she thought we could 'have our nearest and dearest around us at home ... around *Christmas* and *New Year*! Her patronising delivery was the usual school teacher talking to six-year-olds as she repeated every government talking point and probably believed them all. If we have learned anything from the 'Covid' experience surely it must be that humanity's perception of doctors needs a fundamental rethink. NHS 'doctor' Sara Kayat told her television audience that the 'Covid vaccine' would '100 percent prevent hospitalisation and death'. Not even Big Pharma claimed that. We have to stop taking 'experts' at their word without question when so many of them are

clueless and only repeating the party line on which their careers depend. That is not to say there are not brilliant doctors – there are and I have spoken to many of them since all this began – but you won't see them in the mainstream media or quoted by the psychopaths and yes-people in government.

Remember the name – Christian Drosten

German virologist Christian Drosten, Director of Charité Institute of Virology in Berlin, became a national star after the pandemic hoax began. He was feted on television and advised the German government on 'Covid' policy. Most importantly to the wider world Drosten led a group that produced the 'Covid' testing protocol for the PCR test. What a remarkable feat given the PCR cannot test for infectious disease and even more so when you think that Drosten said that his method of testing for SARS-CoV-2 was developed 'without having virus material available'. *He developed a test for a 'virus' that he didn't have and had never seen.* Let that sink in as you survey the global devastation that came from what he did. The whole catastrophe of Drosten's 'test' was based on the alleged genetic sequence published by Chinese scientists on the Internet. We will see in the next chapter that this alleged 'genetic sequence' has never been produced by China or anyone and cannot be when there *is no* SARS-CoV-2. Drosten, however, doesn't seem to let little details like that get in the way. He was the lead author with Victor Corman from the same Charité Hospital of the paper 'Detection of 2019 novel coronavirus (2019-nCoV) by real-time PCR' published in a magazine called *Eurosurveillance*. This became known as the Corman-Drosten paper. In November, 2020, with human society devastated by the effects of the Corman-Drosten test baloney, the protocol was publicly challenged by 22 international scientists and independent researchers from Europe, the United States, and Japan. Among them were senior molecular geneticists, biochemists, immunologists, and microbiologists. They produced a document headed 'External peer review of the RTPCR test to detect SARS-Cov-2 Reveals 10 Major Flaws At The Molecular and Methodological Level: Consequences

For False-Positive Results'. The flaws in the Corman-Drosten test included the following:

- The test is non-specific because of erroneous design
- Results are enormously variable
- The test is unable to discriminate between the whole 'virus' and viral fragments
- It doesn't have positive or negative controls
- The test lacks a standard operating procedure
- It is unsupported by proper peer view

The scientists said the PCR 'Covid' testing protocol was not founded on science and they demanded the Corman-Drosten paper be retracted by *Eurosurveillance*. They said all present and previous Covid deaths, cases, and 'infection rates' should be subject to a massive retroactive inquiry. Lockdowns and travel restrictions should be reviewed and relaxed and those diagnosed through PCR to have 'Covid-19' should not be forced to isolate. Dr Kevin Corbett, a health researcher and nurse educator with a long academic career producing a stream of peer-reviewed publications at many UK universities, made the same point about the PCR test debacle. He said of the scientists' conclusions: 'Every scientific rationale for the development of that test has been totally destroyed by this paper. It's like Hiroshima/Nagasaki to the Covid test.' He said that China hadn't given them an isolated 'virus' when Drosten developed the test. Instead they had developed the test from *a sequence in a gene bank*.' Put another way ... *they made it up!* The scientists were supported in this contention by a Portuguese appeals court which ruled in November, 2020, that PCR tests are unreliable and it is unlawful to quarantine people based solely on a PCR test. The point about China not providing an isolated virus must be true when the 'virus' has never been isolated to this day and the consequences of that will become clear. Drosten and company produced this useless 'protocol' right on cue in January, 2020, just as the 'virus' was said to

be moving westward and it somehow managed to successfully pass a peer-review in 24 hours. In other words there was no peer-review for a test that would be used to decide who had 'Covid' and who didn't across the world. The Cult-created, Gates-controlled World Health Organization immediately recommended all its nearly 200 member countries to use the Drosten PCR protocol to detect 'cases' and 'deaths'. The sting was underway and it continues to this day.

So who is this Christian Drosten that produced the means through which death, destruction and economic catastrophe would be justified? His education background, including his doctoral thesis, would appear to be somewhat shrouded in mystery and his track record is dire as with another essential player in the 'Covid' hoax, the Gates-funded Professor Neil Ferguson at the Gates-funded Imperial College in London of whom more shortly. Drosten predicted in 2003 that the alleged original SARS 'virus' (SARS-1) was an epidemic that could have serious effects on economies and an effective vaccine would take at least two years to produce. Drosten's answer to every alleged 'outbreak' is a vaccine which you won't be shocked to know. What followed were just 774 official deaths worldwide and none in Germany where there were only nine cases. That is even if you believe there ever was a SARS 'virus' when the evidence is zilch and I will expand on this in the next chapter. Drosten claims to be co-discoverer of 'SARS-1' and developed a test for it in 2003. He was screaming warnings about 'swine flu' in 2009 and how it was a widespread infection far more severe than any dangers from a vaccine could be and people should get vaccinated. It would be helpful for Drosten's vocal chords if he simply recorded the words 'the virus is deadly and you need to get vaccinated' and copies could be handed out whenever the latest made-up threat comes along. Drosten's swine flu epidemic never happened, but Big Pharma didn't mind with governments spending hundreds of millions on vaccines that hardly anyone bothered to use and many who did wished they hadn't. A study in 2010 revealed that the risk of dying from swine flu, or H1N1, was no higher than that of the annual seasonal flu which is what at least most of 'it' really was as in

the case of 'Covid-19'. A media investigation into Drosten asked how with such a record of inaccuracy he could be *the* government adviser on these issues. The answer to that question is the same with Drosten, Ferguson and Fauci – they keep on giving the authorities the 'conclusions' and 'advice' they want to hear. Drosten certainly produced the goods for them in January, 2020, with his PCR protocol garbage and provided the foundation of what German internal medicine specialist Dr Claus Köhnlein, co-author of *Virus Mania*, called the 'test pandemic'. The 22 scientists in the *Eurosurveillance* challenge called out conflicts of interest within the Drosten 'protocol' group and with good reason. Olfert Landt, a regular co-author of Drosten 'studies', owns the biotech company TIB Molbiol Syntheselabor GmbH in Berlin which manufactures and sells the tests that Drosten and his mates come up with. They have done this with SARS, Enterotoxigenic E. coli (ETEC), MERS, Zika 'virus', yellow fever, and now 'Covid'. Landt told the *Berliner Zeitung* newspaper:

The testing, design and development came from the Charité [Drosten and Corman]. We simply implemented it immediately in the form of a kit. And if we don't have the virus, which originally only existed in Wuhan, we can make a synthetic gene to simulate the genome of the virus. That's what we did very quickly.

This is more confirmation that the Drosten test was designed without access to the 'virus' and only a synthetic simulation which is what SARS-CoV-2 really is – a computer-generated synthetic fiction. It's quite an enterprise they have going here. A Drosten team decides what the test for something should be and Landt's biotech company flogs it to governments and medical systems across the world. His company must have made an absolute fortune since the 'Covid' hoax began. Dr Reiner Fuellmich, a prominent German consumer protection trial lawyer in Germany and California, is on Drosten's case and that of Tedros at the World Health Organization for crimes against humanity with a class-action lawsuit being prepared in the United States and other legal action in Germany.

Why China?

Scamming the world with a 'virus' that doesn't exist would seem impossible on the face of it, but not if you have control of the relatively few people that make policy decisions and the great majority of the global media. Remember it's not about changing 'real' reality it's about controlling *perception* of reality. You don't have to make something happen you only have to make people *believe* that it's happening. Renegade Minds understand this and are therefore much harder to swindle. 'Covid-19' is not a 'real' 'virus'. It's a mind virus, like a computer virus, which has infected the minds, not the bodies, of billions. It all started, publically at least, in China and that alone is of central significance. The Cult was behind the revolution led by its asset Mao Zedong, or Chairman Mao, which established the People's Republic of China on October 1st, 1949. It should have been called The Cult's Republic of China, but the name had to reflect the recurring illusion that vicious dictatorships are run by and for the people (see all the 'Democratic Republics' controlled by tyrants). In the same way we have the 'Biden' Democratic Republic of America officially ruled by a puppet tyrant (at least temporarily) on behalf of Cult tyrants. The creation of Mao's merciless communist/fascist dictatorship was part of a frenzy of activity by the Cult at the conclusion of World War Two which, like the First World War, it had instigated through its assets in Germany, Britain, France, the United States and elsewhere. Israel was formed in 1948; the Soviet Union expanded its 'Iron Curtain' control, influence and military power with the Warsaw Pact communist alliance in 1955; the United Nations was formed in 1945 as a Cult precursor to world government; and a long list of world bodies would be established including the World Health Organization (1948), World Trade Organization (1948 under another name until 1995), International Monetary Fund (1945) and World Bank (1944). Human society was redrawn and hugely centralised in the global Problem-Reaction-Solution that was World War Two. All these changes were significant. Israel would become the headquarters of the Sabbatians

and the revolution in China would prepare the ground and control system for the events of 2019/2020.

Renegade Minds know there are no borders except for public consumption. The Cult is a seamless, borderless global entity and to understand the game we need to put aside labels like borders, nations, countries, communism, fascism and democracy. These delude the population into believing that countries are ruled within their borders by a government of whatever shade when these are mere agencies of a global power. America's illusion of democracy and China's communism/fascism are subsidiaries – vehicles – for the same agenda. We may hear about conflict and competition between America and China and on the lower levels that will be true; but at the Cult level they are branches of the same company in the way of the McDonald's example I gave earlier. I have tracked in the books over the years support by US governments of both parties for Chinese Communist Party infiltration of American society through allowing the sale of land, even military facilities, and the acquisition of American business and university influence. All this is underpinned by the infamous stealing of intellectual property and technological know-how. Cult-owned Silicon Valley corporations waive their fraudulent 'morality' to do business with human-rights-free China; Cult-controlled Disney has become China's PR department; and China in effect owns 'American' sports such as basketball which depends for much of its income on Chinese audiences. As a result any sports player, coach or official speaking out against China's horrific human rights record is immediately condemned or fired by the China-worshipping National Basketball Association. One of the first acts of China-controlled Biden was to issue an executive order telling federal agencies to stop making references to the 'virus' by the 'geographic location of its origin'. Long-time Congressman Jerry Nadler warned that criticising China, America's biggest rival, leads to hate crimes against Asian people in the United States. So shut up you bigot. China is fast closing in on Israel as a country that must not be criticised which is apt, really, given that Sabbatians control them both. The two countries have

developed close economic, military, technological and strategic ties which include involvement in China's 'Silk Road' transport and economic initiative to connect China with Europe. Israel was the first country in the Middle East to recognise the establishment of Mao's tyranny in 1950 months after it was established.

Project Wuhan – the 'Covid' Psyop

I emphasise again that the Cult plays the long game and what is happening to the world today is the result of centuries of calculated manipulation following a script to take control step-by-step of every aspect of human society. I will discuss later the common force behind all this that has spanned those centuries and thousands of years if the truth be told. Instigating the Mao revolution in China in 1949 with a 2020 'pandemic' in mind is not only how they work – the 71 years between them is really quite short by the Cult's standards of manipulation preparation. The reason for the Cult's Chinese revolution was to create a fiercely-controlled environment within which an extreme structure for human control could be incubated to eventually be unleashed across the world. We have seen this happen since the 'pandemic' emerged from China with the Chinese control-structure founded on AI technology and tyrannical enforcement sweep across the West. Until the moment when the Cult went for broke in the West and put its fascism on public display Western governments had to pay some lip-service to freedom and democracy to not alert too many people to the tyranny-in-the-making. Freedoms were more subtly eroded and power centralised with covert government structures put in place waiting for the arrival of 2020 when that smokescreen of 'freedom' could be dispensed with. The West was not able to move towards tyranny before 2020 anything like as fast as China which was created as a tyranny and had no limits on how fast it could construct the Cult's blueprint for global control. When the time came to impose that structure on the world it was the same Cult-owned Chinese communist/fascist government that provided the excuse – the 'Covid pandemic'. It was absolutely crucial to the Cult plan for the Chinese response to the 'pandemic' –

draconian lockdowns of the entire population – to become the blueprint that Western countries would follow to destroy the livelihoods and freedom of their people. This is why the Cult-owned, Gates-owned, WHO Director-General Tedros said early on:

The Chinese government is to be congratulated for the extraordinary measures it has taken to contain the outbreak. China is actually setting a new standard for outbreak response and it is not an exaggeration.

Forbes magazine said of China: ‘... those measures protected untold millions from getting the disease’. The Rockefeller Foundation ‘epidemic scenario’ document in 2010 said ‘prophetically’:

However, a few countries did fare better – China in particular. The Chinese government’s quick imposition and enforcement of mandatory quarantine for all citizens, as well as its instant and near-hermetic sealing off of all borders, saved millions of lives, stopping the spread of the virus far earlier than in other countries and enabling a swifter post-pandemic recovery.

Once again – *spooky*.

The first official story was the ‘bat theory’ or rather the bat diversion. The source of the ‘virus outbreak’ we were told was a ‘wet market’ in Wuhan where bats and other animals are bought and eaten in horrifically unhygienic conditions. Then another story emerged through the alternative media that the ‘virus’ had been released on purpose or by accident from a BSL-4 (biosafety level 4) laboratory in Wuhan not far from the wet market. The lab was reported to create and work with lethal concoctions and bioweapons. Biosafety level 4 is the highest in the World Health Organization system of safety and containment. Renegade Minds are aware of what I call designer manipulation. The ideal for the Cult is for people to buy its prime narrative which in the opening salvos of the ‘pandemic’ was the wet market story. It knows, however, that there is now a considerable worldwide alternative media of researchers sceptical of anything governments say and they are often given a version of events in a form they can perceive as credible while misdirecting them from the real truth. In this case let them

think that the conspiracy involved is a 'bioweapon virus' released from the Wuhan lab to keep them from the real conspiracy – *there is no 'virus'*. The WHO's current position on the source of the outbreak at the time of writing appears to be: 'We haven't got a clue, mate.' This is a good position to maintain mystery and bewilderment. The inner circle will know where the 'virus' came from – *nowhere*. The bottom line was to ensure the public believed there *was* a 'virus' and it didn't much matter if they thought it was natural or had been released from a lab. The belief that there was a 'deadly virus' was all that was needed to trigger global panic and fear. The population was terrified into handing their power to authority and doing what they were told. They had to or they were 'all gonna die'.

In March, 2020, information began to come my way from real doctors and scientists and my own additional research which had my intuition screaming: 'Yes, that's it! *There is no virus.*' The 'bioweapon' was not the 'virus'; it was the '*vaccine*' already being talked about that would be the bioweapon. My conclusion was further enhanced by happenings in Wuhan. The 'virus' was said to be sweeping the city and news footage circulated of people collapsing in the street (which they've never done in the West with the same 'virus'). The Chinese government was building 'new hospitals' in a matter of ten days to 'cope with demand' such was the virulent nature of the 'virus'. Yet in what seemed like no time the 'new hospitals' closed – even if they even opened – and China declared itself 'virus-free'. It was back to business as usual. This was more propaganda to promote the Chinese draconian lockdowns in the West as the way to 'beat the virus'. Trouble was that we subsequently had lockdown after lockdown, but never business as usual. As the people of the West and most of the rest of the world were caught in an ever-worsening spiral of lockdown, social distancing, masks, isolated old people, families forced apart, and livelihood destruction, it was party-time in Wuhan. Pictures emerged of thousands of people enjoying pool parties and concerts. It made no sense until you realised there never was a 'virus' and the

whole thing was a Cult set-up to transform human society out of one of its major global strongholds – China.

How is it possible to deceive virtually the entire world population into believing there is a deadly virus when there is not even a 'virus' let alone a deadly one? It's nothing like as difficult as you would think and that's clearly true because it happened.

Postscript: See end of book Postscript for more on the 'Wuhan lab virus release' story which the authorities and media were pushing heavily in the summer of 2021 to divert attention from the truth that the 'Covid virus' is pure invention.

CHAPTER FIVE

There is no 'virus'

You can fool some of the people all of the time, and all of the people some of the time, but you cannot fool all of the people all of the time
Abraham Lincoln

The greatest form of mind control is repetition. The more you repeat the same mantra of alleged 'facts' the more will accept them to be true. It becomes an 'everyone knows that, mate'. If you can also censor any other version or alternative to your alleged 'facts' you are pretty much home and cooking.

By the start of 2020 the Cult owned the global mainstream media almost in its entirety to spew out its 'Covid' propaganda and ignore or discredit any other information and view. Cult-owned social media platforms in Cult-owned Silicon Valley were poised and ready to unleash a campaign of ferocious censorship to obliterate all but the official narrative. To complete the circle many demands for censorship by Silicon Valley were led by the mainstream media as 'journalists' became full-out enforcers for the Cult both as propagandists and censors. Part of this has been the influx of young people straight out of university who have become 'journalists' in significant positions. They have no experience and a headful of programmed perceptions from their years at school and university at a time when today's young are the most perceptually-targeted generations in known human history given the insidious impact of technology. They enter the media perceptually prepared and ready to repeat the narratives of the system that programmed them to

repeat its narratives. The BBC has a truly pathetic 'specialist disinformation reporter' called Marianna Spring who fits this bill perfectly. She is clueless about the world, how it works and what is really going on. Her role is to discredit anyone doing the job that a proper journalist would do and system-serving hacks like Spring wouldn't dare to do or even see the need to do. They are too busy licking the arse of authority which can never be wrong and, in the case of the BBC propaganda programme, *Panorama*, contacting payments systems such as PayPal to have a donations page taken down for a film company making documentaries questioning vaccines. Even the BBC soap opera *EastEnders* included a disgracefully biased scene in which an inarticulate white working class woman was made to look foolish for questioning the 'vaccine' while a well-spoken black man and Asian woman promoted the government narrative. It ticked every BBC box and the fact that the black and minority community was resisting the 'vaccine' had nothing to do with the way the scene was written. The BBC has become a disgusting tyrannical propaganda and censorship operation that should be defunded and disbanded and a free media take its place with a brief to stop censorship instead of demanding it. A BBC 'interview' with Gates goes something like: 'Mr Gates, sir, if I can call you sir, would you like to tell our audience why you are such a great man, a wonderful humanitarian philanthropist, and why you should absolutely be allowed as a software salesman to decide health policy for approaching eight billion people? Thank you, sir, please sir.' Propaganda programming has been incessant and merciless and when all you hear is the same story from the media, repeated by those around you who have only heard the same story, is it any wonder that people on a grand scale believe absolute mendacious garbage to be true? You are about to see, too, why this level of information control is necessary when the official 'Covid' narrative is so nonsensical and unsupportable by the evidence.

Structure of Deceit

The pyramid structure through which the 'Covid' hoax has been manifested is very simple and has to be to work. As few people as possible have to be involved with full knowledge of what they are doing – and why – or the real story would get out. At the top of the pyramid are the inner core of the Cult which controls Bill Gates who, in turn, controls the World Health Organization through his pivotal funding and his puppet Director-General mouthpiece, Tedros. Before he was appointed Tedros was chair of the Gates-founded Global Fund to 'fight against AIDS, tuberculosis and malaria', a board member of the Gates-funded 'vaccine alliance' GAVI, and on the board of another Gates-funded organisation. Gates owns him and picked him for a specific reason – Tedros is a crook and worse. 'Dr' Tedros (he's not a medical doctor, the first WHO chief not to be) was a member of the tyrannical Marxist government of Ethiopia for decades with all its human rights abuses. He has faced allegations of corruption and misappropriation of funds and was exposed three times for covering up cholera epidemics while Ethiopia's health minister. Tedros appointed the mass-murdering genocidal Zimbabwe dictator Robert Mugabe as a WHO goodwill ambassador for public health which, as with Tedros, is like appointing a psychopath to run a peace and love campaign. The move was so ridiculous that he had to drop Mugabe in the face of widespread condemnation. American economist David Steinman, a Nobel peace prize nominee, lodged a complaint with the International Criminal Court in The Hague over alleged genocide by Tedros when he was Ethiopia's foreign minister. Steinman says Tedros was a 'crucial decision maker' who directed the actions of Ethiopia's security forces from 2013 to 2015 and one of three officials in charge when those security services embarked on the 'killing' and 'torturing' of Ethiopians. You can see where Tedros is coming from and it's sobering to think that he has been the vehicle for Gates and the Cult to direct the global response to 'Covid'. Think about that. A psychopathic Cult dictates to psychopath Gates who dictates to psychopath Tedros who dictates how countries of the world must respond to a 'Covid virus' never scientifically shown to exist. At the same time psychopathic Cult-owned Silicon Valley information

giants like Google, YouTube, Facebook and Twitter announced very early on that they would give the Cult/Gates/Tedros/WHO version of the narrative free advertising and censor those who challenged their intelligence-insulting, mendacious story.

The next layer in the global 'medical' structure below the Cult, Gates and Tedros are the chief medical officers and science 'advisers' in each of the WHO member countries which means virtually all of them. Medical officers and arbiters of science (they're not) then take the WHO policy and recommended responses and impose them on their country's population while the political 'leaders' say they are deciding policy (they're clearly not) by 'following the science' on the advice of the 'experts' – the same medical officers and science 'advisers' (dictators). In this way with the rarest of exceptions the entire world followed the same policy of lockdown, people distancing, masks and 'vaccines' dictated by the psychopathic Cult, psychopathic Gates and psychopathic Tedros who we are supposed to believe give a damn about the health of the world population they are seeking to enslave. That, amazingly, is all there is to it in terms of crucial decision-making. Medical staff in each country then follow like sheep the dictates of the shepherds at the top of the national medical hierarchies – chief medical officers and science 'advisers' who themselves follow like sheep the shepherds of the World Health Organization and the Cult. Shepherds at the national level often have major funding and other connections to Gates and his Bill and Melinda Gates Foundation which carefully hands out money like confetti at a wedding to control the entire global medical system from the WHO down.

Follow the money

Christopher Whitty, Chief Medical Adviser to the UK Government at the centre of 'virus' policy, a senior adviser to the government's Scientific Advisory Group for Emergencies (SAGE), and Executive Board member of the World Health Organization, was gifted a grant of \$40 million by the Bill and Melinda Gates Foundation for malaria research in Africa. The BBC described the unelected Whitty as 'the

official who will probably have the greatest impact on our everyday lives of any individual policymaker in modern times' and so it turned out. What Gates and Tedros have said Whitty has done like his equivalents around the world. Patrick Vallance, co-chair of SAGE and the government's Chief Scientific Adviser, is a former executive of Big Pharma giant GlaxoSmithKline with its fundamental financial and business connections to Bill Gates. In September, 2020, it was revealed that Vallance owned a deferred bonus of shares in GlaxoSmithKline worth £600,000 while the company was 'developing' a 'Covid vaccine'. Move along now – nothing to see here – what could possibly be wrong with that? Imperial College in London, a major player in 'Covid' policy in Britain and elsewhere with its 'Covid-19' Response Team, is funded by Gates and has big connections to China while the now infamous Professor Neil Ferguson, the useless 'computer modeller' at Imperial College is also funded by Gates. Ferguson delivered the dramatically inaccurate excuse for the first lockdowns (much more in the next chapter). The Institute for Health Metrics and Evaluation (IHME) in the United States, another source of outrageously false 'Covid' computer models to justify lockdowns, is bankrolled by Gates who is a vehement promotor of lockdowns. America's version of Whitty and Vallance, the again now infamous Anthony Fauci, has connections to 'Covid vaccine' maker Moderna as does Bill Gates through funding from the Bill and Melinda Gates Foundation. Fauci is director of the National Institute of Allergy and Infectious Diseases (NIAID), a major recipient of Gates money, and they are very close. Deborah Birx who was appointed White House Coronavirus Response Coordinator in February, 2020, is yet another with ties to Gates. Everywhere you look at the different elements around the world behind the coordination and decision making of the 'Covid' hoax there is Bill Gates and his money. They include the World Health Organization; Centers for Disease Control (CDC) in the United States; National Institutes of Health (NIH) of Anthony Fauci; Imperial College and Neil Ferguson; the London School of Hygiene where Chris Whitty worked; Regulatory agencies like the UK Medicines & Healthcare products Regulatory Agency (MHRA)

which gave emergency approval for 'Covid vaccines'; Wellcome Trust; GAVI, the Vaccine Alliance; the Coalition for Epidemic Preparedness Innovations (CEPI); Johns Hopkins University which has compiled the false 'Covid' figures; and the World Economic Forum. A [Nationalfile.com](https://www.nationalfile.com) article said:

Gates has a lot of pull in the medical world, he has a multi-million dollar relationship with Dr. Fauci, and Fauci originally took the Gates line supporting vaccines and casting doubt on [the drug hydroxychloroquine]. Coronavirus response team member Dr. Deborah Birx, appointed by former president Obama to serve as United States Global AIDS Coordinator, also sits on the board of a group that has received billions from Gates' foundation, and Birx reportedly used a disputed Bill Gates-funded model for the White House's Coronavirus effort. Gates is a big proponent for a population lockdown scenario for the Coronavirus outbreak.

Another funder of Moderna is the Defense Advanced Research Projects Agency (DARPA), the technology-development arm of the Pentagon and one of the most sinister organisations on earth. DARPA had a major role with the CIA covert technology-funding operation In-Q-Tel in the development of Google and social media which is now at the centre of global censorship. Fauci and Gates are extremely close and openly admit to talking regularly about 'Covid' policy, but then why wouldn't Gates have a seat at every national 'Covid' table after his Foundation committed \$1.75 billion to the 'fight against Covid-19'. When passed through our Orwellian Translation Unit this means that he has bought and paid for the Cult-driven 'Covid' response worldwide. Research the major 'Covid' response personnel in your own country and you will find the same Gates funding and other connections again and again. Medical and science chiefs following World Health Organization 'policy' sit atop a medical hierarchy in their country of administrators, doctors and nursing staff. These 'subordinates' are told they must work and behave in accordance with the policy delivered from the 'top' of the national 'health' pyramid which is largely the policy delivered by the WHO which is the policy delivered by Gates and the Cult. The whole 'Covid' narrative has been imposed on medical staff by a climate of fear although great numbers don't even need that to comply. They do so through breathtaking levels of ignorance and

include doctors who go through life simply repeating what Big Pharma and their hierarchical masters tell them to say and believe. No wonder Big Pharma 'medicine' is one of the biggest killers on Planet Earth.

The same top-down system of intimidation operates with regard to the Cult Big Pharma cartel which also dictates policy through national and global medical systems in this way. The Cult and Big Pharma agendas are the same because the former controls and owns the latter. 'Health' administrators, doctors, and nursing staff are told to support and parrot the dictated policy or they will face consequences which can include being fired. How sad it's been to see medical staff meekly repeating and imposing Cult policy without question and most of those who can see through the deceit are only willing to speak anonymously off the record. They know what will happen if their identity is known. This has left the courageous few to expose the lies about the 'virus', face masks, overwhelmed hospitals that aren't, and the dangers of the 'vaccine' that isn't a vaccine. When these medical professionals and scientists, some renowned in their field, have taken to the Internet to expose the truth their articles, comments and videos have been deleted by Cult-owned Facebook, Twitter and YouTube. What a real head-shaker to see YouTube videos with leading world scientists and highly qualified medical specialists with an added link underneath to the notorious Cult propaganda website *Wikipedia* to find the 'facts' about the same subject.

HIV – the 'Covid' trial-run

I'll give you an example of the consequences for health and truth that come from censorship and unquestioning belief in official narratives. The story was told by PCR inventor Kary Mullis in his book *Dancing Naked in the Mind Field*. He said that in 1984 he accepted as just another scientific fact that Luc Montagnier of France's Pasteur Institute and Robert Gallo of America's National Institutes of Health had independently discovered that a 'retrovirus' dubbed HIV (human immunodeficiency virus) caused AIDS. They

were, after all, Mullis writes, specialists in retroviruses. This is how the medical and science pyramids work. Something is announced or *assumed* and then becomes an everybody-knows-that purely through repetition of the assumption as if it is fact. Complete crap becomes accepted truth with no supporting evidence and only repetition of the crap. This is how a 'virus' that doesn't exist became the 'virus' that changed the world. The HIV-AIDS fairy story became a multi-billion pound industry and the media poured out propaganda terrifying the world about the deadly HIV 'virus' that caused the lethal AIDS. By then Mullis was working at a lab in Santa Monica, California, to detect retroviruses with his PCR test in blood donations received by the Red Cross. In doing so he asked a virologist where he could find a reference for HIV being the cause of AIDS. 'You don't need a reference,' the virologist said ... '*Everybody knows it.*' Mullis said he wanted to quote a reference in the report he was doing and he said he felt a little funny about not knowing the source of such an important discovery when everyone else seemed to. The virologist suggested he cite a report by the Centers for Disease Control and Prevention (CDC) on morbidity and mortality. Mullis read the report, but it only said that an organism had been identified and did not say how. The report did not identify the original scientific work. Physicians, however, *assumed* (key recurring theme) that if the CDC was convinced that HIV caused AIDS then proof must exist. Mullis continues:

I did computer searches. Neither Montagnier, Gallo, nor anyone else had published papers describing experiments which led to the conclusion that HIV probably caused AIDS. I read the papers in *Science* for which they had become well known as AIDS doctors, but all they had said there was that they had found evidence of a past infection by something which was probably HIV in some AIDS patients.

They found antibodies. Antibodies to viruses had always been considered evidence of past disease, not present disease. Antibodies signaled that the virus had been defeated. The patient had saved himself. There was no indication in these papers that this virus caused a disease. They didn't show that everybody with the antibodies had the disease. In fact they found some healthy people with antibodies.

Mullis asked why their work had been published if Montagnier and Gallo hadn't really found this evidence, and why had they been fighting so hard to get credit for the discovery? He says he was hesitant to write 'HIV is the probable cause of AIDS' until he found published evidence to support that. 'Tens of thousands of scientists and researchers were spending billions of dollars a year doing research based on this idea,' Mullis writes. 'The reason had to be there somewhere; otherwise these people would not have allowed their research to settle into one narrow channel of investigation.' He said he lectured about PCR at numerous meetings where people were always talking about HIV and he asked them how they knew that HIV was the cause of AIDS:

Everyone said something. Everyone had the answer at home, in the office, in some drawer. They all knew, and they would send me the papers as soon as they got back. But I never got any papers. Nobody ever sent me the news about how AIDS was caused by HIV.

Eventually Mullis was able to ask Montagnier himself about the reference proof when he lectured in San Diego at the grand opening of the University of California AIDS Research Center. Mullis says this was the last time he would ask his question without showing anger. Montagnier said he should reference the CDC report. 'I read it', Mullis said, and it didn't answer the question. 'If Montagnier didn't know the answer who the hell did?' Then one night Mullis was driving when an interview came on National Public Radio with Peter Duesberg, a prominent virologist at Berkeley and a California Scientist of the Year. Mullis says he finally understood why he could not find references that connected HIV to AIDS – *there weren't any!* No one had ever proved that HIV causes AIDS even though it had spawned a multi-billion pound global industry and the media was repeating this as fact every day in their articles and broadcasts terrifying the shit out of people about AIDS and giving the impression that a positive test for HIV (see 'Covid') was a death sentence. Duesberg was a threat to the AIDS gravy train and the agenda that underpinned it. He was therefore abused and castigated after he told the Proceedings of the National Academy of Sciences

there was no good evidence implicating the new 'virus'. Editors rejected his manuscripts and his research funds were deleted. Mullis points out that the CDC has defined AIDS as one of more than 30 diseases *if accompanied* by a positive result on a test that detects antibodies to HIV; but those same diseases are not defined as AIDS cases when antibodies are not detected:

If an HIV-positive woman develops uterine cancer, for example, she is considered to have AIDS. If she is not HIV positive, she simply has uterine cancer. An HIV-positive man with tuberculosis has AIDS; if he tests negative he simply has tuberculosis. If he lives in Kenya or Colombia, where the test for HIV antibodies is too expensive, he is simply presumed to have the antibodies and therefore AIDS, and therefore he can be treated in the World Health Organization's clinic. It's the only medical help available in some places. And it's free, because the countries that support WHO are worried about AIDS.

Mullis accuses the CDC of continually adding new diseases (see ever more 'Covid symptoms') to the grand AIDS definition and of virtually doctoring the books to make it appear as if the disease continued to spread. He cites how in 1993 the CDC enormously broadened its AIDS definition and county health authorities were delighted because they received \$2,500 per year from the Federal government for every reported AIDS case. Ladies and gentlemen, I have just described, via Kary Mullis, the 'Covid pandemic' of 2020 and beyond. Every element is the same and it's been pulled off in the same way by the same networks.

The 'Covid virus' exists? Okay – prove it. Er ... still waiting

What Kary Mullis described with regard to 'HIV' has been repeated with 'Covid'. A claim is made that a new, or 'novel', infection has been found and the entire medical system of the world repeats that as fact exactly as they did with HIV and AIDS. No one in the mainstream asks rather relevant questions such as 'How do you know?' and 'Where is your proof?' The SARS-Cov-2 'virus' and the 'Covid-19 disease' became an overnight 'everybody-knows-that'. The origin could be debated and mulled over, but what you could not suggest was that 'SARS-Cov-2' didn't exist. That would be

ridiculous. 'Everybody knows' the 'virus' exists. Well, I didn't for one along with American proper doctors like Andrew Kaufman and Tom Cowan and long-time American proper journalist Jon Rappaport. We dared to pursue the obvious and simple question: 'Where's the evidence?' The overwhelming majority in medicine, journalism and the general public did not think to ask that. After all, *everyone knew* there was a new 'virus'. Everyone was saying so and I heard it on the BBC. Some would eventually argue that the 'deadly virus' was nothing like as deadly as claimed, but few would venture into the realms of its very existence. Had they done so they would have found that the evidence for that claim had gone AWOL as with HIV causes AIDS. In fact, not even that. For something to go AWOL it has to exist in the first place and scientific proof for a 'SARS-Cov-2' can be filed under nothing, nowhere and zilch.

Dr Andrew Kaufman is a board-certified forensic psychiatrist in New York State, a Doctor of Medicine and former Assistant Professor and Medical Director of Psychiatry at SUNY Upstate Medical University, and Medical Instructor of Hematology and Oncology at the Medical School of South Carolina. He also studied biology at the Massachusetts Institute of Technology (MIT) and trained in Psychiatry at Duke University. Kaufman is retired from allopathic medicine, but remains a consultant and educator on natural healing. I saw a video of his very early on in the 'Covid' hoax in which he questioned claims about the 'virus' in the absence of any supporting evidence and with plenty pointing the other way. I did everything I could to circulate his work which I felt was asking the pivotal questions that needed an answer. I can recommend an excellent pull-together interview he did with the website The Last Vagabond entitled *Dr Andrew Kaufman: Virus Isolation, Terrain Theory and Covid-19* and his website is andrewkaufmanmd.com. Kaufman is not only a forensic psychiatrist; he is forensic in all that he does. He always reads original scientific papers, experiments and studies instead of second-third-fourth-hand reports about the 'virus' in the media which are repeating the repeated repetition of the narrative. When he did so with the original Chinese 'virus' papers Kaufman

realised that there was no evidence of a 'SARS-Cov-2'. They had never – from the start – shown it to exist and every repeat of this claim worldwide was based on the accepted existence of proof that was nowhere to be found – see Kary Mullis and HIV. Here we go again.

Let's postulate

Kaufman discovered that the Chinese authorities immediately concluded that the cause of an illness that broke out among about 200 initial patients in Wuhan was a 'new virus' when there were no grounds to make that conclusion. The alleged 'virus' was not isolated from other genetic material in their samples and then shown through a system known as Koch's postulates to be the causative agent of the illness. The world was told that the SARS-Cov-2 'virus' caused a disease they called 'Covid-19' which had 'flu-like' symptoms and could lead to respiratory problems and pneumonia. If it wasn't so tragic it would almost be funny. *'Flu-like' symptoms? Pneumonia? Respiratory disease?* What in *CHINA* and particularly in *Wuhan*, one of the most polluted cities in the world with a resulting epidemic of respiratory disease?? Three hundred thousand people get pneumonia in China every year and there are nearly a billion cases worldwide of 'flu-like symptoms'. These have a whole range of causes – including pollution in Wuhan – but no other possibility was credibly considered in late 2019 when the world was told there was a new and deadly 'virus'. The global prevalence of pneumonia and 'flu-like systems' gave the Cult networks unlimited potential to re-diagnose these other causes as the mythical 'Covid-19' and that is what they did from the very start. Kaufman revealed how Chinese medical and science authorities (all subordinates to the Cult-owned communist government) took genetic material from the lungs of only a few of the first patients. The material contained their own cells, bacteria, fungi and other microorganisms living in their bodies. The only way you could prove the existence of the 'virus' and its responsibility for the alleged 'Covid-19' was to isolate the virus from all the other material – a process also known as 'purification' – and

then follow the postulates sequence developed in the late 19th century by German physician and bacteriologist Robert Koch which became the 'gold standard' for connecting an alleged causation agent to a disease:

1. The microorganism (bacteria, fungus, virus, etc.) must be present in every case of the disease and all patients must have the same symptoms. It must also *not be present in healthy individuals*.
2. The microorganism must be isolated from the host with the disease. If the microorganism is a bacteria or fungus it must be grown in a pure culture. If it is a virus, it must be purified (i.e. containing no other material except the virus particles) from a clinical sample.
3. The specific disease, with all of its characteristics, must be reproduced when the infectious agent (the purified virus or a pure culture of bacteria or fungi) is inoculated into a healthy, susceptible host.
4. The microorganism must be recoverable from the experimentally infected host as in step 2.

Not one of these criteria has been met in the case of 'SARS-Cov-2' and 'Covid-19'. Not ONE. EVER. Robert Koch refers to bacteria and not viruses. What are called 'viral particles' are so minute (hence masks are useless by any definition) that they could only be seen after the invention of the electron microscope in the 1930s and can still only be observed through that means. American bacteriologist and virologist Thomas Milton Rivers, the so-called 'Father of Modern Virology' who was very significantly director of the Rockefeller Institute for Medical Research in the 1930s, developed a less stringent version of Koch's postulates to identify 'virus' causation known as 'Rivers criteria'. 'Covid' did not pass that process either. Some even doubt whether any 'virus' can be isolated from other particles containing genetic material in the Koch method. Freedom of Information requests in many countries asking for scientific proof that the 'Covid virus' has been purified and isolated and shown to exist have all come back with a 'we don't have that' and when this happened with a request to the UK Department of Health they added this comment:

However, outside of the scope of the [Freedom of Information Act] and on a discretionary basis, the following information has been advised to us, which may be of interest. Most infectious diseases are caused by viruses, bacteria or fungi. Some bacteria or fungi have the capacity to grow on their own in isolation, for example in colonies on a petri dish. Viruses are different in that they are what we call 'obligate pathogens' – that is, they cannot survive or reproduce without infecting a host ...

... For some diseases, it is possible to establish causation between a microorganism and a disease by isolating the pathogen from a patient, growing it in pure culture and reintroducing it to a healthy organism. These are known as 'Koch's postulates' and were developed in 1882. However, as our understanding of disease and different disease-causing agents has advanced, these are no longer the method for determining causation [Andrew Kaufman asks why in that case are there two published articles falsely claiming to satisfy Koch's postulates].

It has long been known that viral diseases cannot be identified in this way as viruses cannot be grown in 'pure culture'. When a patient is tested for a viral illness, this is normally done by looking for the presence of antigens, or viral genetic code in a host with molecular biology techniques [Kaufman asks how you could know the origin of these chemicals without having a pure culture for comparison].

For the record 'antigens' are defined so:

Invading microorganisms have antigens on their surface that the human body can recognise as being foreign – meaning not belonging to it. When the body recognises a foreign antigen, lymphocytes (white blood cells) produce antibodies, which are complementary in shape to the antigen.

Notwithstanding that this is open to question in relation to 'SARS-Cov-2' the presence of 'antibodies' can have many causes and they are found in people that are perfectly well. Kary Mullis said: 'Antibodies ... had always been considered evidence of past disease, not present disease.'

'Covid' really is a *computer* 'virus'

Where the UK Department of Health statement says 'viruses' are now 'diagnosed' through a 'viral genetic code in a host with molecular biology techniques', they mean ... *the PCR test* which its inventor said cannot test for infectious disease. They have no credible method of connecting a 'virus' to a disease and we will see that there is no scientific proof that any 'virus' causes any disease or there is any such thing as a 'virus' in the way that it is described. Tenacious Canadian researcher Christine Massey and her team made

some 40 Freedom of Information requests to national public health agencies in different countries asking for proof that SARS-CoV-2 has been isolated and not one of them could supply that information. Massey said of her request in Canada: 'Freedom of Information reveals Public Health Agency of Canada has no record of 'SARS-COV-2' isolation performed by anyone, anywhere, ever.' If you accept the comment from the UK Department of Health it's because they can't isolate a 'virus'. Even so many 'science' papers claimed to have isolated the 'Covid virus' until they were questioned and had to admit they hadn't. A reply from the Robert Koch Institute in Germany was typical: 'I am not aware of a paper which purified isolated SARS-CoV-2.' So what the hell was Christian Drosten and his gang using to design the 'Covid' testing protocol that has produced all the illusory Covid' cases and 'Covid' deaths when the head of the Chinese version of the CDC admitted there was a problem right from the start in that the 'virus' had never been isolated/purified? Breathe deeply: What they are calling 'Covid' is actually created by a *computer program* i.e. *they made it up* – er, that's it. They took lung fluid, with many sources of genetic material, from one single person alleged to be infected with Covid-19 by a PCR test which they *claimed*, without clear evidence, contained a 'virus'. They used several computer programs to create a model of a theoretical virus genome sequence from more than fifty-six million small sequences of RNA, each of an unknown source, assembling them like a puzzle with no known solution. The computer filled in the gaps with sequences from bits in the gene bank to make it look like a bat SARS-like coronavirus! A wave of the magic wand and poof, an *in silico* (computer-generated) genome, a scientific fantasy, was created. UK health researcher Dr Kevin Corbett made the same point with this analogy:

... It's like giving you a few bones and saying that's your fish. It could be any fish. Not even a skeleton. Here's a few fragments of bones. That's your fish ... It's all from gene bank and the bits of the virus sequence that weren't there they made up.

They synthetically created them to fill in the blanks. That's what genetics is; it's a code. So it's ABBCCDDDD and you're missing some what you think is EEE so you put it in. It's all

synthetic. You just manufacture the bits that are missing. This is the end result of the geneticization of virology. This is basically a computer virus.

Further confirmation came in an email exchange between British citizen journalist Frances Leader and the government's Medicines & Healthcare Products Regulatory Agency (the Gates-funded MHRA) which gave emergency permission for untested 'Covid vaccines' to be used. The agency admitted that the 'vaccine' is not based on an isolated 'virus', but comes from a *computer-generated model*. Frances Leader was naturally banned from Cult-owned fascist Twitter for making this exchange public. The process of creating computer-generated alleged 'viruses' is called 'in silico' or 'in silicon' – computer chips – and the term 'in silico' is believed to originate with biological experiments using only a computer in 1989. 'Vaccines' involved with 'Covid' are also produced 'in silico' or by computer not a natural process. If the original 'virus' is nothing more than a made-up computer model how can there be 'new variants' of something that never existed in the first place? They are not new 'variants'; they are new *computer models* only minutely different to the original program and designed to further terrify the population into having the 'vaccine' and submitting to fascism. You want a 'new variant'? Click, click, enter – there you go. Tell the medical profession that you have discovered a 'South African variant', 'UK variants' or a 'Brazilian variant' and in the usual HIV-causes-AIDS manner they will unquestioningly repeat it with no evidence whatsoever to support these claims. They will go on television and warn about the dangers of 'new variants' while doing nothing more than repeating what they have been told to be true and knowing that any deviation from that would be career suicide. Big-time insiders will know it's a hoax, but much of the medical community is clueless about the way they are being played and themselves play the public without even being aware they are doing so. What an interesting 'coincidence' that AstraZeneca and Oxford University were conducting 'Covid vaccine trials' in the three countries – the UK, South Africa and Brazil – where the first three 'variants' were claimed to have 'broken out'.

Here's your 'virus' – it's a unicorn

Dr Andrew Kaufman presented a brilliant analysis describing how the 'virus' was imagined into fake existence when he dissected an article published by *Nature* and written by 19 authors detailing *alleged* 'sequencing of a complete viral genome' of the 'new SARS-CoV-2 virus'. This computer-modelled *in silico* genome was used as a template for all subsequent genome sequencing experiments that resulted in the so-called variants which he said now number more than 6,000. The fake genome was constructed from more than 56 million individual short strands of RNA. Those little pieces were assembled into longer pieces by finding areas of overlapping sequences. The computer programs created over two million possible combinations from which the authors simply chose the longest one. They then compared this to a 'bat virus' and the computer 'alignment' rearranged the sequence and filled in the gaps! They called this computer-generated abomination the 'complete genome'. Dr Tom Cowan, a fellow medical author and collaborator with Kaufman, said such computer-generation constitutes scientific fraud and he makes this superb analogy:

Here is an equivalency: A group of researchers claim to have found a unicorn because they found a piece of a hoof, a hair from a tail, and a snippet of a horn. They then add that information into a computer and program it to re-create the unicorn, and they then claim this computer re-creation is the real unicorn. Of course, they had never actually seen a unicorn so could not possibly have examined its genetic makeup to compare their samples with the actual unicorn's hair, hooves and horn.

The researchers claim they decided which is the real genome of SARS-CoV-2 by 'consensus', sort of like a vote. Again, different computer programs will come up with different versions of the imaginary 'unicorn', so they come together as a group and decide which is the real imaginary unicorn.

This is how the 'virus' that has transformed the world was brought into fraudulent 'existence'. Extraordinary, yes, but as the Nazis said the bigger the lie the more will believe it. Cowan, however, wasn't finished and he went on to identify what he called the real blockbuster in the paper. He quotes this section from a paper written

by virologists and published by the CDC and then explains what it means:

Therefore, we examined the capacity of SARS-CoV-2 to infect and replicate in several common primate and human cell lines, including human adenocarcinoma cells (A549), human liver cells (HUH 7.0), and human embryonic kidney cells (HEK-293T). In addition to Vero E6 and Vero CCL81 cells. ... Each cell line was inoculated at high multiplicity of infection and examined 24h post-infection.

No CPE was observed in any of the cell lines except in Vero cells, which grew to greater than 10 to the 7th power at 24 h post-infection. In contrast, HUH 7.0 and 293T showed only modest viral replication, and A549 cells were incompatible with SARS CoV-2 infection.

Cowan explains that when virologists attempt to prove infection they have three possible 'hosts' or models on which they can test. The first was humans. Exposure to humans was generally not done for ethical reasons and has never been done with SARS-CoV-2 or any coronavirus. The second possible host was animals. Cowan said that forgetting for a moment that they never actually use purified virus when exposing animals they do use solutions that they *claim* contain the virus. Exposure to animals has been done with SARS-CoV-2 in an experiment involving mice and this is what they found: *None of the wild (normal) mice got sick*. In a group of genetically-modified mice, a statistically insignificant number lost weight and had slightly bristled fur, but they experienced nothing like the illness called 'Covid-19'. Cowan said the third method – the one they mostly rely on – is to inoculate solutions they *say* contain the virus onto a variety of tissue cultures. This process had never been shown to kill tissue *unless* the sample material was starved of nutrients and poisoned as *part of the process*. Yes, incredibly, in tissue experiments designed to show the 'virus' is responsible for killing the tissue they starve the tissue of nutrients and add toxic drugs including antibiotics and they do not have control studies to see if it's the starvation and poisoning that is degrading the tissue rather than the 'virus' they allege to be in there somewhere. You want me to pinch you? Yep, I understand. Tom Cowan said this about the whole nonsensical farce as he explains what that quote from the CDC paper really means:

The shocking thing about the above quote is that using their own methods, the virologists found that solutions containing SARS-CoV-2 – even in high amounts – were NOT, I repeat NOT, infective to any of the three human tissue cultures they tested. In plain English, this means they proved, on their terms, that this ‘new coronavirus’ is not infectious to human beings. It is ONLY infective to monkey kidney cells, and only then when you add two potent drugs (gentamicin and amphotericin), known to be toxic to kidneys, to the mix.

My friends, read this again and again. These virologists, published by the CDC, performed a clear proof, on their terms, showing that the SARS-CoV-2 virus is harmless to human beings. That is the only possible conclusion, but, unfortunately, this result is not even mentioned in their conclusion. They simply say they can provide virus stocks cultured only on monkey Vero cells, thanks for coming.

Cowan concluded: ‘If people really understood how this “science” was done, I would hope they would storm the gates and demand honesty, transparency and truth.’ Dr Michael Yeadon, former Vice President and Chief Scientific Adviser at drug giant Pfizer has been a vocal critic of the ‘Covid vaccine’ and its potential for multiple harm. He said in an interview in April, 2021, that ‘not one [vaccine] has the virus. He was asked why vaccines normally using a ‘dead’ version of a disease to activate the immune system were not used for ‘Covid’ and instead we had the synthetic methods of the ‘mRNA Covid vaccine’. Yeadon said that to do the former ‘you’d have to have some of [the virus] wouldn’t you?’ He added: ‘No-one’s got any – seriously.’ Yeadon said that surely they couldn’t have fooled the whole world for a year without having a virus, ‘but oddly enough ask around – no one’s got it’. He didn’t know why with all the ‘great labs’ around the world that the virus had not been isolated – ‘Maybe they’ve been too busy running bad PCR tests and vaccines that people don’t need.’ What is today called ‘science’ is not ‘science’ at all. Science is no longer what is, but whatever people can be manipulated to *believe* that it is. Real science has been hijacked by the Cult to dispense and produce the ‘expert scientists’ and contentions that suit the agenda of the Cult. How big-time this has happened with the ‘Covid’ hoax which is entirely based on fake science delivered by fake ‘scientists’ and fake ‘doctors’. The human-caused climate change hoax is also entirely based on fake science delivered by fake ‘scientists’ and fake ‘climate experts’. In both cases real

scientists, climate experts and doctors have their views suppressed and deleted by the Cult-owned science establishment, media and Silicon Valley. This is the 'science' that politicians claim to be 'following' and a common denominator of 'Covid' and climate are Cult psychopaths Bill Gates and his mate Klaus Schwab at the Gates-funded World Economic Forum. But, don't worry, it's all just a coincidence and absolutely nothing to worry about. Zzzzzzzzz.

What is a 'virus' REALLY?

Dr Tom Cowan is one of many contesting the very existence of viruses let alone that they cause disease. This is understandable when there is no scientific evidence for a disease-causing 'virus'. German virologist Dr Stefan Lanka won a landmark case in 2017 in the German Supreme Court over his contention that there is no such thing as a measles virus. He had offered a big prize for anyone who could prove there is and Lanka won his case when someone sought to claim the money. There is currently a prize of more than 225,000 euros on offer from an Isolate Truth Fund for anyone who can prove the isolation of SARS-CoV-2 and its genetic substance. Lanka wrote in an article headed 'The Misconception Called Virus' that scientists think a 'virus' is causing tissue to become diseased and degraded when in fact it is the *processes they are using* which do that – not a 'virus'. Lanka has done an important job in making this point clear as Cowan did in his analysis of the CDC paper. Lanka says that all claims about viruses as disease-causing pathogens are wrong and based on 'easily recognisable, understandable and verifiable misinterpretations.' Scientists believed they were working with 'viruses' in their laboratories when they were really working with 'typical particles of specific dying tissues or cells ...' Lanka said that the tissue decaying process claimed to be caused by a 'virus' still happens when no alleged 'virus' is involved. It's the *process* that does the damage and not a 'virus'. The genetic sample is deprived of nutrients, removed from its energy supply through removal from the body and then doused in toxic antibiotics to remove any bacteria. He confirms again that establishment scientists do not (pinch me)

conduct control experiments to see if this is the case and if they did they would see the claims that 'viruses' are doing the damage is nonsense. He adds that during the measles 'virus' court case he commissioned an independent laboratory to perform just such a control experiment and the result was that the tissues and cells died in the exact same way as with alleged 'infected' material. This is supported by a gathering number of scientists, doctors and researchers who reject what is called 'germ theory' or the belief in the body being infected by contagious sources emitted by other people. Researchers Dawn Lester and David Parker take the same stance in their highly-detailed and sourced book *What Really Makes You Ill – Why everything you thought you knew about disease is wrong* which was recommended to me by a number of medical professionals genuinely seeking the truth. Lester and Parker say there is no provable scientific evidence to show that a 'virus' can be transmitted between people or people and animals or animals and people:

The definition also claims that viruses are the cause of many diseases, as if this has been definitively proven. But this is not the case; there is no original scientific evidence that definitively demonstrates that any virus is the cause of any disease. The burden of proof for any theory lies with those who proposed it; but none of the existing documents provides 'proof' that supports the claim that 'viruses' are pathogens.

Dr Tom Cowan employs one of his clever analogies to describe the process by which a 'virus' is named as the culprit for a disease when what is called a 'virus' is only material released by cells detoxing themselves from infiltration by chemical or radiation poisoning. The tidal wave of technologically-generated radiation in the 'smart' modern world plus all the toxic food and drink are causing this to happen more than ever. Deluded 'scientists' misread this as a gathering impact of what they wrongly label 'viruses'.

Paper can infect houses

Cowan said in an article for davidicke.com – with his tongue only mildly in his cheek – that he believed he had made a tremendous

discovery that may revolutionise science. He had discovered that small bits of paper are alive, 'well alive-ish', can 'infect' houses, and then reproduce themselves inside the house. The result was that this explosion of growth in the paper inside the house causes the house to explode, blowing it to smithereens. His evidence for this new theory is that in the past months he had carefully examined many of the houses in his neighbourhood and found almost no scraps of paper on the lawns and surrounds of the house. There was an occasional stray label, but nothing more. Then he would return to these same houses a week or so later and with a few, not all of them, particularly the old and decrepit ones, he found to his shock and surprise they were littered with stray bits of paper. He knew then that the paper had infected these houses, made copies of itself, and blew up the house. A young boy on a bicycle at one of the sites told him he had seen a demolition crew using dynamite to explode the house the previous week, but Cowan dismissed this as the idle thoughts of silly boys because 'I was on to something big'. He was on to how 'scientists' mistake genetic material in the detoxifying process for something they call a 'virus'. Cowan said of his house and paper story:

If this sounds crazy to you, it's because it should. This scenario is obviously nuts. But consider this admittedly embellished, for effect, current viral theory that all scientists, medical doctors and virologists currently believe.

He takes the example of the 'novel SARS-Cov2' virus to prove the point. First they take someone with an undefined illness called 'Covid-19' and don't even attempt to find any virus in their sputum. Never mind the scientists still describe how this 'virus', which they have not located attaches to a cell receptor, injects its genetic material, in 'Covid's' case, RNA, into the cell. The RNA once inserted exploits the cell to reproduce itself and makes 'thousands, nay millions, of copies of itself ... Then it emerges victorious to claim its next victim':

If you were to look in the scientific literature for proof, actual scientific proof, that uniform SARS-CoV2 viruses have been properly isolated from the sputum of a sick person, that actual spike proteins could be seen protruding from the virus (which has not been found), you would find that such evidence doesn't exist.

If you go looking in the published scientific literature for actual pictures, proof, that these spike proteins or any viral proteins are ever attached to any receptor embedded in any cell membrane, you would also find that no such evidence exists. If you were to look for a video or documented evidence of the intact virus injecting its genetic material into the body of the cell, reproducing itself and then emerging victorious by budding off the cell membrane, you would find that no such evidence exists.

The closest thing you would find is electron micrograph pictures of cellular particles, possibly attached to cell debris, both of which to be seen were stained by heavy metals, a process that completely distorts their architecture within the living organism. This is like finding bits of paper stuck to the blown-up bricks, thereby proving the paper emerged by taking pieces of the bricks on its way out.

The Enders baloney

Cowan describes the 'Covid' story as being just as make-believe as his paper story and he charts back this fantasy to a Nobel Prize winner called John Enders (1897-1985), an American biomedical scientist who has been dubbed 'The Father of Modern Vaccines'. Enders is claimed to have 'discovered' the process of the viral culture which 'proved' that a 'virus' caused measles. Cowan explains how Enders did this 'by using the EXACT same procedure that has been followed by every virologist to find and characterize every new virus since 1954'. Enders took throat swabs from children with measles and immersed them in 2ml of milk. Penicillin (100u/ml) and the antibiotic streptomycin (50,g/ml) were added and the whole mix was centrifuged – rotated at high speed to separate large cellular debris from small particles and molecules as with milk and cream, for example. Cowan says that if the aim is to find little particles of genetic material ('viruses') in the snot from children with measles it would seem that the last thing you would do is mix the snot with other material – milk –that also has genetic material. 'How are you ever going to know whether whatever you found came from the snot or the milk?' He points out that streptomycin is a 'nephrotoxic' or poisonous-to-the-kidney drug. You will see the relevance of that

shortly. Cowan says that it gets worse, much worse, when Enders describes the culture medium upon which the virus 'grows': 'The culture medium consisted of bovine amniotic fluid (90%), beef embryo extract (5%), horse serum (5%), antibiotics and phenol red as an indicator of cell metabolism.' Cowan asks incredulously: 'Did he just say that the culture medium also contained fluids and tissues that are themselves rich sources of genetic material?' The genetic cocktail, or 'medium', is inoculated onto tissue and cells from rhesus monkey *kidney* tissue. This is where the importance of streptomycin comes in and currently-used antimicrobials and other drugs that are *poisonous to kidneys* and used in ALL modern viral cultures (e.g. gentamicin, streptomycin, and amphotericin). Cowan asks: 'How are you ever going to know from this witch's brew where any genetic material comes from as we now have five different sources of rich genetic material in our mix?' Remember, he says, that all genetic material, whether from monkey kidney tissues, bovine serum, milk, etc., is made from the exact same components. The same central question returns: 'How are you possibly going to know that it was the virus that killed the kidney tissue and not the toxic antibiotic and starvation rations on which you are growing the tissue?' John Enders answered the question himself – *you can't*:

A second agent was obtained from an uninoculated culture of monkey kidney cells. The cytopathic changes [death of the cells] it induced in the unstained preparations could not be distinguished with confidence from the viruses isolated from measles.

The death of the cells ('cytopathic changes') happened in exactly the same manner, whether they inoculated the kidney tissue with the measles snot or not, Cowan says. 'This is evidence that the destruction of the tissue, the very proof of viral causation of illness, was not caused by anything in the snot because they saw the same destructive effect when the snot was not even used ... the cytopathic, i.e., cell-killing, changes come from the process of the culture itself, not from any virus in any snot, period.' Enders quotes in his 1957 paper a virologist called Ruckle as reporting similar findings 'and in addition has isolated an agent from monkey kidney tissue that is so

far indistinguishable from human measles virus'. In other words, Cowan says, these particles called 'measles viruses' are simply and clearly breakdown products of the starved and poisoned tissue. For measles 'virus' see all 'viruses' including the so-called 'Covid virus'. Enders, the 'Father of Modern Vaccines', also said:

There is a potential risk in employing cultures of primate cells for the production of vaccines composed of attenuated virus, since the presence of other agents possibly latent in primate tissues cannot be definitely excluded by any known method.

Cowan further quotes from a paper published in the journal *Viruses* in May, 2020, while the 'Covid pandemic' was well underway in the media if not in reality. 'EVs' here refers to particles of genetic debris from our own tissues, such as exosomes of which more in a moment: 'The remarkable resemblance between EVs and viruses has caused quite a few problems in the studies focused on the analysis of EVs released during viral infections.' Later the paper adds that to date a reliable method that can actually guarantee a complete separation (of EVs from viruses) DOES NOT EXIST. This was published at a time when a fairy tale 'virus' was claimed in total certainty to be causing a fairy tale 'viral disease' called 'Covid-19' – a fairy tale that was already well on the way to transforming human society in the image that the Cult has worked to achieve for so long. Cowan concludes his article:

To summarize, there is no scientific evidence that pathogenic viruses exist. What we think of as 'viruses' are simply the normal breakdown products of dead and dying tissues and cells. When we are well, we make fewer of these particles; when we are starved, poisoned, suffocated by wearing masks, or afraid, we make more.

There is no engineered virus circulating and making people sick. People in laboratories all over the world are making genetically modified products to make people sick. These are called vaccines. There is no virome, no 'ecosystem' of viruses, viruses are not 8%, 50% or 100 % of our genetic material. These are all simply erroneous ideas based on the misconception called a virus.

What is 'Covid'? Load of bollocks

The background described here by Cowan and Lanka was emphasised in the first video presentation that I saw by Dr Andrew Kaufman when he asked whether the 'Covid virus' was in truth a natural defence mechanism of the body called 'exosomes'. These are released by cells when in states of toxicity – see the same themes returning over and over. They are released ever more profusely as chemical and radiation toxicity increases and think of the potential effect therefore of 5G alone as its destructive frequencies infest the human energetic information field with a gathering pace (5G went online in Wuhan in 2019 as the 'virus' emerged). I'll have more about this later. Exosomes transmit a warning to the rest of the body that 'Houston, we have a problem'. Kaufman presented images of exosomes and compared them with 'Covid' under an electron microscope and the similarity was remarkable. They both attach to the same cell receptors (*claimed* in the case of 'Covid'), contain the same genetic material in the form of RNA or ribonucleic acid, and both are found in 'viral cell cultures' with damaged or dying cells. James Hildreth MD, President and Chief Executive Officer of the Meharry Medical College at Johns Hopkins, said: 'The virus is fully an exosome in every sense of the word.' Kaufman's conclusion was that there is no 'virus': 'This entire pandemic is a completely manufactured crisis ... there is no evidence of anyone dying from [this] illness.' Dr Tom Cowan and Sally Fallon Morell, authors of *The Contagion Myth*, published a statement with Dr Kaufman in February, 2021, explaining why the 'virus' does not exist and you can read it that in full in the Appendix.

'Virus' theory can be traced to the 'cell theory' in 1858 of German physician Rudolf Virchow (1821-1920) who contended that disease originates from a single cell infiltrated by a 'virus'. Dr Stefan Lanka said that findings and insights with respect to the structure, function and central importance of tissues in the creation of life, which were already known in 1858, comprehensively refute the cell theory. Virchow ignored them. We have seen the part later played by John Enders in the 1950s and Lanka notes that infection theories were only established as a global dogma through the policies and

eugenics of the Third Reich in Nazi Germany (creation of the same Sabbatian cult behind the 'Covid' hoax). Lanka said: 'Before 1933, scientists dared to contradict this theory; after 1933, these critical scientists were silenced'. Dr Tom Cowan's view is that ill-health is caused by too much of something, too little of something, or toxification from chemicals and radiation – not contagion. We must also highlight as a major source of the 'virus' theology a man still called the 'Father of Modern Virology' – Thomas Milton Rivers (1888-1962). There is no way given the Cult's long game policy that it was a coincidence for the 'Father of Modern Virology' to be director of the Rockefeller Institute for Medical Research from 1937 to 1956 when he is credited with making the Rockefeller Institute a leader in 'viral research'. Cult Rockefellerers were the force behind the creation of Big Pharma 'medicine', established the World Health Organisation in 1948, and have long and close associations with the Gates family that now runs the WHO during the pandemic hoax through mega-rich Cult gofer and psychopath Bill Gates.

Only a Renegade Mind can see through all this bullshit by asking the questions that need to be answered, not taking 'no' or prevarication for an answer, and certainly not hiding from the truth in fear of speaking it. Renegade Minds have always changed the world for the better and they will change this one no matter how bleak it may currently appear to be.

CHAPTER SIX

Sequence of deceit

If you tell the truth, you don't have to remember anything
Mark Twain

Against the background that I have laid out this far the sequence that took us from an invented 'virus' in Cult-owned China in late 2019 to the fascist transformation of human society can be seen and understood in a whole new context.

We were told that a deadly disease had broken out in Wuhan and the world media began its campaign (coordinated by behavioural psychologists as we shall see) to terrify the population into unquestioning compliance. We were shown images of Chinese people collapsing in the street which never happened in the West with what was supposed to be the same condition. In the earliest days when alleged cases and deaths were few the fear register was hysterical in many areas of the media and this would expand into the common media narrative across the world. The real story was rather different, but we were never told that. The Chinese government, one of the Cult's biggest centres of global operation, said they had discovered a new illness with flu-like and pneumonia-type symptoms in a city with such toxic air that it is overwhelmed with flu-like symptoms, pneumonia and respiratory disease. Chinese scientists said it was a new – 'novel' – coronavirus which they called Sars-Cov-2 and that it caused a disease they labelled 'Covid-19'. There was no evidence for this and the 'virus' has never to this day been isolated, purified and its genetic code established from that. It

was from the beginning a computer-generated fiction. Stories of Chinese whistleblowers saying the number of deaths was being suppressed or that the 'new disease' was related to the Wuhan bio-lab misdirected mainstream and alternative media into cul-de-sacs to obscure the real truth – there was no 'virus'.

Chinese scientists took genetic material from the lung fluid of just a few people and said they had found a 'new' disease when this material had a wide range of content. There was no evidence for a 'virus' for the very reasons explained in the last two chapters. The 'virus' has never been shown to (a) exist and (b) cause any disease. People were diagnosed on symptoms that are so widespread in Wuhan and polluted China and with a PCR test that can't detect infectious disease. On this farce the whole global scam was sold to the rest of the world which would also diagnose respiratory disease as 'Covid-19' from symptoms alone or with a PCR test not testing for a 'virus'. Flu miraculously disappeared *worldwide* in 2020 and into 2021 as it was redesignated 'Covid-19'. It was really the same old flu with its 'flu-like' symptoms attributed to 'flu-like' 'Covid-19'. At the same time with very few exceptions the Chinese response of draconian lockdown and fascism was the chosen weapon to respond across the West as recommended by the Cult-owned Tedros at the Cult-owned World Health Organization run by the Cult-owned Gates. All was going according to plan. Chinese scientists – everything in China is controlled by the Cult-owned government – compared their contaminated RNA lung-fluid material with other RNA sequences and said it appeared to be just under 80 percent identical to the SARS-CoV-1 'virus' claimed to be the cause of the SARS (severe acute respiratory syndrome) 'outbreak' in 2003. They decreed that because of this the 'new virus' had to be related and they called it SARS-CoV-2. There are some serious problems with this assumption and *assumption* was all it was. Most 'factual' science turns out to be assumptions repeated into everyone-knows-that. A match of under 80-percent is meaningless. Dr Kaufman makes the point that there's a 96 percent genetic correlation between humans and chimpanzees, but 'no one would say our genetic material is part

of the chimpanzee family'. Yet the Chinese authorities were claiming that a much lower percentage, less than 80 percent, proved the existence of a new 'coronavirus'. For goodness sake human DNA is 60 percent similar to a *banana*.

You are feeling sleepy

The entire 'Covid' hoax is a global Psyop, a psychological operation to program the human mind into believing and fearing a complete fantasy. A crucial aspect of this was what *appeared* to happen in Italy. It was all very well streaming out daily images of an alleged catastrophe in Wuhan, but to the Western mind it was still on the other side of the world in a very different culture and setting. A reaction of 'this could happen to me and my family' was still nothing like as intense enough for the mind-doctors. The Cult needed a Western example to push people over that edge and it chose Italy, one of its major global locations going back to the Roman Empire. An Italian 'Covid' crisis was manufactured in a particular area called Lombardy which just happens to be notorious for its toxic air and therefore respiratory disease. Wuhan, China, *déjà vu*. An hysterical media told horror stories of Italians dying from 'Covid' in their droves and how Lombardy hospitals were being overrun by a tidal wave of desperately ill people needing treatment after being struck down by the 'deadly virus'. Here was the psychological turning point the Cult had planned. Wow, if this is happening in Italy, the Western mind concluded, this indeed could happen to me and my family. Another point is that Italian authorities responded by following the Chinese blueprint so vehemently recommended by the Cult-owned World Health Organization. They imposed fascistic lockdowns on the whole country viciously policed with the help of surveillance drones sweeping through the streets seeking out anyone who escaped from mass house arrest. Livelihoods were destroyed and psychology unravelled in the way we have witnessed since in all lockdown countries. Crucial to the plan was that Italy responded in this way to set the precedent of suspending freedom and imposing fascism in a 'Western liberal democracy'. I emphasised in an

animated video explanation on davidicke.com posted in the summer of 2020 how important it was to the Cult to expand the Chinese lockdown model across the West. Without this, and the bare-faced lie that non-symptomatic people could still transmit a 'disease' they didn't have, there was no way locking down the whole population, sick and not sick, could be pulled off. At just the right time and with no evidence Cult operatives and gofers claimed that people without symptoms could pass on the 'disease'. In the name of protecting the 'vulnerable' like elderly people, who lockdowns would kill by the tens of thousands, we had for the first time healthy people told to isolate as well as the sick. The great majority of people who tested positive had no symptoms because there was nothing wrong with them. It was just a trick made possible by a test not testing for the 'virus'.

Months after my animated video the Gates-funded Professor Neil Ferguson at the Gates-funded Imperial College confirmed that I was right. He didn't say it in those terms, naturally, but he did say it. Ferguson will enter the story shortly for his outrageously crazy 'computer models' that led to Britain, the United States and many other countries following the Chinese and now Italian methods of response. Put another way, following the Cult script. Ferguson said that SAGE, the UK government's scientific advisory group which has controlled 'Covid' policy from the start, wanted to follow the Chinese lockdown model (while they all continued to work and be paid), but they wondered if they could possibly, in Ferguson's words, 'get away with it in Europe'. 'Get away with it'? Who the hell do these moronic, arrogant people think they are? This appalling man Ferguson said that once Italy went into national lockdown they realised they, too, could mimic China:

It's a communist one-party state, we said. We couldn't get away with it in Europe, we thought ... and then Italy did it. And we realised we could. Behind this garbage from Ferguson is a simple fact: Doing the same as China in every country was the plan from the start and Ferguson's 'models' would play a central role in achieving that. It's just a coincidence, of course, and absolutely nothing to worry your little head about.

Oops, sorry, our mistake

Once the Italian segment of the Psyop had done the job it was designed to do a very different story emerged. Italian authorities revealed that 99 percent of those who had 'died from Covid-19' in Italy had one, two, three, or more 'co-morbidities' or illnesses and health problems that could have ended their life. The US Centers for Disease Control and Prevention (CDC) published a figure of 94 percent for Americans dying of 'Covid' while having other serious medical conditions – on average two to three (some five or six) other potential causes of death. In terms of death from an unproven 'virus' I say it is 100 percent. The other one percent in Italy and six percent in the US would presumably have died from 'Covid's' flu-like symptoms with a range of other possible causes in conjunction with a test not testing for the 'virus'. Fox News reported that even more startling figures had emerged in one US county in which 410 of 422 deaths attributed to 'Covid-19' had other potentially deadly health conditions. The Italian National Health Institute said later that the average age of people dying with a 'Covid-19' diagnosis in Italy was about 81. Ninety percent were over 70 with ten percent over 90. In terms of other reasons to die some 80 percent had two or more chronic diseases with half having three or more including cardiovascular problems, diabetes, respiratory problems and cancer. Why is the phantom 'Covid-19' said to kill overwhelmingly old people and hardly affect the young? Old people continually die of many causes and especially respiratory disease which you can re-diagnose 'Covid-19' while young people die in tiny numbers by comparison and rarely of respiratory disease. Old people 'die of Covid' because they die of other things that can be redesignated 'Covid' and it really is that simple.

Flu has flown

The blueprint was in place. Get your illusory 'cases' from a test not testing for the 'virus' and redesignate other causes of death as 'Covid-19'. You have an instant 'pandemic' from something that is nothing more than a computer-generated fiction. With near-on a

billion people having 'flu-like' symptoms every year the potential was limitless and we can see why flu quickly and apparently miraculously disappeared *worldwide* by being diagnosed 'Covid-19'. The painfully bloody obvious was explained away by the childlike media in headlines like this in the UK '*Independent*': 'Not a single case of flu detected by Public Health England this year as Covid restrictions suppress virus'. I kid you not. The masking, social distancing and house arrest that did not make the 'Covid virus' disappear somehow did so with the 'flu virus'. Even worse the article, by a bloke called Samuel Lovett, suggested that maybe the masking, sanitising and other 'Covid' measures should continue to keep the flu away. With a ridiculousness that disturbs your breathing (it's 'Covid-19') the said Lovett wrote: 'With widespread social distancing and mask-wearing measures in place throughout the UK, the usual routes of transmission for influenza have been blocked.' He had absolutely no evidence to support that statement, but look at the consequences of him acknowledging the obvious. With flu not disappearing at all and only being relabelled 'Covid-19' he would have to contemplate that 'Covid' was a hoax on a scale that is hard to imagine. You need guts and commitment to truth to even go there and that's clearly something Samuel Lovett does not have in abundance. He would never have got it through the editors anyway.

Tens of thousands die in the United States alone every winter from flu including many with pneumonia complications. CDC figures record *45 million* Americans diagnosed with flu in 2017-2018 of which 61,000 died and some reports claim 80,000. Where was the same hysteria then that we have seen with 'Covid-19'? Some 250,000 Americans are admitted to hospital with pneumonia every year with about 50,000 cases proving fatal. About 65 million suffer respiratory disease every year and three million deaths makes this the third biggest cause of death worldwide. You only have to redesignate a portion of all these people 'Covid-19' and you have an instant global pandemic or the *appearance* of one. Why would doctors do this? They are told to do this and all but a few dare not refuse those who must be obeyed. Doctors in general are not researching their own

knowledge and instead take it direct and unquestioned from the authorities that own them and their careers. The authorities say they must now diagnose these symptoms 'Covid-19' and not flu, or whatever, and they do it. Dark suits say put 'Covid-19' on death certificates no matter what the cause of death and the doctors do it. Renegade Minds don't fall for the illusion that doctors and medical staff are all highly-intelligent, highly-principled, seekers of medical truth. *Some are*, but not the majority. They are repeaters, gofers, and yes sir, no sir, purveyors of what the system demands they purvey. The 'Covid' con is not merely confined to diseases of the lungs. Instructions to doctors to put 'Covid-19' on death certificates for anyone dying of *anything* within 28 days (or much more) of a positive test not testing for the 'virus' opened the floodgates. The term dying *with* 'Covid' and not *of* 'Covid' was coined to cover the truth. Whether it was a *with* or an *of* they were all added to the death numbers attributed to the 'deadly virus' compiled by national governments and globally by the Gates-funded Johns Hopkins operation in the United States that was so involved in those 'pandemic' simulations. Fraudulent deaths were added to the ever-growing list of fraudulent 'cases' from false positives from a false test. No wonder Professor Walter Ricciardi, scientific advisor to the Italian minister of health, said after the Lombardy hysteria had done its job that 'Covid' death rates were due to Italy having the second oldest population in the world and to *how hospitals record deaths*:

The way in which we code deaths in our country is very generous in the sense that all the people who die in hospitals with the coronavirus are deemed to be dying of the coronavirus. On re-evaluation by the National Institute of Health, only 12 per cent of death certificates have shown a direct causality from coronavirus, while 88 per cent of patients who have died have at least one pre-morbidity – many had two or three.

This is extraordinary enough when you consider the propaganda campaign to use Italy to terrify the world, but how can they even say twelve percent were genuine when the 'virus' has not been shown to exist, its 'code' is a computer program, and diagnosis comes from a test not testing for it? As in China, and soon the world, 'Covid-19' in

Italy was a redesignation of diagnosis. Lies and corruption were to become the real 'pandemic' fuelled by a pathetically-compliant medical system taking its orders from the tiny few at the top of their national hierarchy who answered to the World Health Organization which answers to Gates and the Cult. Doctors were told – ordered – to diagnose a particular set of symptoms 'Covid-19' and put that on the death certificate for any cause of death if the patient had tested positive with a test not testing for the virus or had 'Covid' symptoms like the flu. The United States even introduced big financial incentives to manipulate the figures with hospitals receiving £4,600 from the Medicare system for diagnosing someone with regular pneumonia, \$13,000 if they made the diagnosis from the same symptoms 'Covid-19' pneumonia, and \$39,000 if they put a 'Covid' diagnosed patient on a ventilator that would almost certainly kill them. A few – painfully and pathetically few – medical whistleblowers revealed (before Cult-owned YouTube deleted their videos) that they had been instructed to 'let the patient crash' and put them straight on a ventilator instead of going through a series of far less intrusive and dangerous methods as they would have done before the pandemic hoax began and the financial incentives kicked in. We are talking cold-blooded murder given that ventilators are so damaging to respiratory systems they are usually the last step before heaven awaits. Renegade Minds never fall for the belief that people in white coats are all angels of mercy and cannot be full-on psychopaths. I have explained in detail in *The Answer* how what I am describing here played out across the world coordinated by the World Health Organization through the medical hierarchies in almost every country.

Medical scientist calls it

Information about the non-existence of the 'virus' began to emerge for me in late March, 2020, and mushroomed after that. I was sent an email by Sir Julian Rose, a writer, researcher, and organic farming promotor, from a medical scientist friend of his in the United States. Even at that early stage in March the scientist was able to explain

how the 'Covid' hoax was being manipulated. He said there were no reliable tests for a specific 'Covid-19 virus' and nor were there any reliable agencies or media outlets for reporting numbers of actual 'Covid-19' cases. We have seen in the long period since then that he was absolutely right. 'Every action and reaction to Covid-19 is based on totally flawed data and we simply cannot make accurate assessments,' he said. Most people diagnosed with 'Covid-19' were showing nothing more than cold and flu-like symptoms 'because most coronavirus strains *are* nothing more than cold/flu-like symptoms'. We had farcical situations like an 84-year-old German man testing positive for 'Covid-19' and his nursing home ordered to quarantine only for him to be found to have a common cold. The scientist described back then why PCR tests and what he called the 'Mickey Mouse test kits' were useless for what they were claimed to be identifying. 'The idea these kits can isolate a specific virus like Covid-19 is nonsense,' he said. Significantly, he pointed out that 'if you want to create a totally false panic about a totally false pandemic – pick a coronavirus'. This is exactly what the Cult-owned Gates, World Economic Forum and Johns Hopkins University did with their Event 201 'simulation' followed by their real-life simulation called the 'pandemic'. The scientist said that all you had to do was select the sickest of people with respiratory-type diseases in a single location – 'say Wuhan' – and administer PCR tests to them. You can then claim that anyone showing 'viral sequences' similar to a coronavirus 'which will inevitably be quite a few' is suffering from a 'new' disease:

Since you already selected the sickest flu cases a fairly high proportion of your sample will go on to die. You can then say this 'new' virus has a CFR [case fatality rate] higher than the flu and use this to infuse more concern and do more tests which will of course produce more 'cases', which expands the testing, which produces yet more 'cases' and so on and so on. Before long you have your 'pandemic', and all you have done is use a simple test kit trick to convert the worst flu and pneumonia cases into something new that doesn't ACTUALLY EXIST [my emphasis].

He said that you then 'just run the same scam in other countries' and make sure to keep the fear message running high 'so that people

will feel panicky and less able to think critically'. The only problem to overcome was the fact *there is no* actual new deadly pathogen and only regular sick people. This meant that deaths from the 'new deadly pathogen' were going to be way too low for a real new deadly virus pandemic, but he said this could be overcome in the following ways – all of which would go on to happen:

1. You can claim this is just the beginning and more deaths are imminent [you underpin this with fantasy 'computer projections']. Use this as an excuse to quarantine everyone and then claim the quarantine prevented the expected millions of dead.
2. You can [say that people] 'minimizing' the dangers are irresponsible and bully them into not talking about numbers.
3. You can talk crap about made up numbers hoping to blind people with pseudoscience.
4. You can start testing well people (who, of course, will also likely have shreds of coronavirus [RNA] in them) and thus inflate your 'case figures' with 'asymptomatic carriers' (you will of course have to spin that to sound deadly even though any virologist knows the more symptom-less cases you have the less deadly is your pathogen).

The scientist said that if you take these simple steps 'you can have your own entirely manufactured pandemic up and running in weeks'. His analysis made so early in the hoax was brilliantly prophetic of what would actually unfold. Pulling all the information together in these recent chapters we have this is simple 1, 2, 3, of how you can delude virtually the entire human population into believing in a 'virus' that doesn't exist:

- A 'Covid case' is someone who tests positive with a test not testing for the 'virus'.
- A 'Covid death' is someone who dies of *any cause* within 28 days (or much longer) of testing positive with a test not testing for the 'virus'.
- Asymptomatic means there is nothing wrong with you, but they claim you can pass on what you don't have to justify locking

down (quarantining) healthy people in totality.

The foundations of the hoax are that simple. A study involving ten million people in Wuhan, published in November, 2020, demolished the whole lie about those without symptoms passing on the 'virus'. They found '300 asymptomatic cases' and traced their contacts to find that not one of them was detected with the 'virus'.

'Asymptomatic' patients and their contacts were isolated for no less than two weeks and nothing changed. I know it's all crap, but if you are going to claim that those without symptoms can transmit 'the virus' then you must produce evidence for that and they never have. Even World Health Organization official Dr Maria Van Kerkhove, head of the emerging diseases and zoonosis unit, said as early as June, 2020, that she doubted the validity of asymptomatic transmission. She said that 'from the data we have, it still seems to be rare that an asymptomatic person actually transmits onward to a secondary individual' and by 'rare' she meant that she couldn't cite any case of asymptomatic transmission.

The Ferguson factor

The problem for the Cult as it headed into March, 2020, when the script had lockdown due to start, was that despite all the manipulation of the case and death figures they still did not have enough people alleged to have died from 'Covid' to justify mass house arrest. This was overcome in the way the scientist described: 'You can claim this is just the beginning and more deaths are imminent ... Use this as an excuse to quarantine everyone and then claim the quarantine prevented the expected millions of dead.' Enter one Professor Neil Ferguson, the Gates-funded 'epidemiologist' at the Gates-funded Imperial College in London. Ferguson is Britain's Christian Drosten in that he has a dire record of predicting health outcomes, but is still called upon to advise government on the next health outcome when another 'crisis' comes along. This may seem to be a strange and ridiculous thing to do. Why would you keep turning for policy guidance to people who have a history of being

monumentally wrong? Ah, but it makes sense from the Cult point of view. These 'experts' keep on producing predictions that suit the Cult agenda for societal transformation and so it was with Neil Ferguson as he revealed his horrific (and clearly insane) computer model predictions that allowed lockdowns to be imposed in Britain, the United States and many other countries. Ferguson does not have even an A-level in biology and would appear to have no formal training in computer modelling, medicine or epidemiology, according to Derek Winton, an MSc in Computational Intelligence. He wrote an article somewhat aghast at what Ferguson did which included taking no account of respiratory disease 'seasonality' which means it is far worse in the winter months. Who would have thought that respiratory disease could be worse in the winter? Well, certainly not Ferguson.

The massively China-connected Imperial College and its bizarre professor provided the excuse for the long-incubated Chinese model of human control to travel westward at lightning speed. Imperial College confirms on its website that it collaborates with the Chinese Research Institute; publishes more than 600 research papers every year with Chinese research institutions; has 225 Chinese staff; 2,600 Chinese students – the biggest international group; 7,000 former students living in China which is the largest group outside the UK; and was selected for a tour by China's President Xi Jinping during his state visit to the UK in 2015. The college takes major donations from China and describes itself as the UK's number one university collaborator with Chinese research institutions. The China communist/fascist government did not appear phased by the woeful predictions of Ferguson and Imperial when during the lockdown that Ferguson induced the college signed a five-year collaboration deal with China tech giant Huawei that will have Huawei's indoor 5G network equipment installed at the college's West London tech campus along with an 'AI cloud platform'. The deal includes Chinese sponsorship of Imperial's Venture Catalyst entrepreneurship competition. Imperial is an example of the enormous influence the Chinese government has within British and North American

universities and research centres – and further afield. Up to 200 academics from more than a dozen UK universities are being investigated on suspicion of ‘unintentionally’ helping the Chinese government build weapons of mass destruction by ‘transferring world-leading research in advanced military technology such as aircraft, missile designs and cyberweapons’. Similar scandals have broken in the United States, but it’s all a coincidence. Imperial College serves the agenda in many other ways including the promotion of every aspect of the United Nations Agenda 21/2030 (the Great Reset) and produced computer models to show that human-caused ‘climate change’ is happening when in the real world it isn’t. Imperial College is driving the climate agenda as it drives the ‘Covid’ agenda (both Cult hoaxes) while Patrick Vallance, the UK government’s Chief Scientific Adviser on ‘Covid’, was named Chief Scientific Adviser to the UN ‘climate change’ conference known as COP26 hosted by the government in Glasgow, Scotland. ‘Covid’ and ‘climate’ are fundamentally connected.

Professor Woeful

From Imperial’s bosom came Neil Ferguson still advising government despite his previous disasters and it was announced early on that he and other key people like UK Chief Medical Adviser Chris Whitty had caught the ‘virus’ as the propaganda story was being sold. Somehow they managed to survive and we had Prime Minister Boris Johnson admitted to hospital with what was said to be a severe version of the ‘virus’ in this same period. His whole policy and demeanour changed when he returned to Downing Street. It’s a small world with these government advisors – especially in their communal connections to Gates – and Ferguson had partnered with Whitty to write a paper called ‘Infectious disease: Tough choices to reduce Ebola transmission’ which involved another scare-story that didn’t happen. Ferguson’s ‘models’ predicted that up to 150,000 could die from ‘mad cow disease’, or BSE, and its version in sheep if it was transmitted to humans. BSE was not transmitted and instead triggered by an organophosphate pesticide used to treat a pest on

cows. Fewer than 200 deaths followed from the human form. Models by Ferguson and his fellow incompetents led to the unnecessary culling of millions of pigs, cattle and sheep in the foot and mouth outbreak in 2001 which destroyed the lives and livelihoods of farmers and their families who had often spent decades building their herds and flocks. Vast numbers of these animals did not have foot and mouth and had no contact with the infection. Another 'expert' behind the cull was Professor Roy Anderson, a computer modeller at Imperial College specialising in the epidemiology of *human*, not animal, disease. Anderson has served on the Bill and Melinda Gates Grand Challenges in Global Health advisory board and chairs another Gates-funded organisation. Gates is everywhere.

In a precursor to the 'Covid' script Ferguson backed closing schools 'for prolonged periods' over the swine flu 'pandemic' in 2009 and said it would affect a third of the world population if it continued to spread at the speed he claimed to be happening. His mates at Imperial College said much the same and a news report said: 'One of the authors, the epidemiologist and disease modeller Neil Ferguson, who sits on the World Health Organisation's emergency committee for the outbreak, said the virus had "full pandemic potential".' Professor Liam Donaldson, the Chris Whitty of his day as Chief Medical Officer, said the worst case could see 30 percent of the British people infected by swine flu with 65,000 dying. Ferguson and Donaldson were indeed proved correct when at the end of the year the number of deaths attributed to swine flu was 392. The term 'expert' is rather liberally applied unfortunately, not least to complete idiots. Swine flu 'projections' were great for GlaxoSmithKline (GSK) as millions rolled in for its Pandemrix influenza vaccine which led to brain damage with children most affected. The British government (taxpayers) paid out more than £60 million in compensation after GSK was given immunity from prosecution. Yet another 'Covid' déjà vu. Swine flu was supposed to have broken out in Mexico, but Dr Wolfgang Wodarg, a German doctor, former member of parliament and critic of the 'Covid' hoax, observed 'the spread of swine flu' in Mexico City at the time. He

said: 'What we experienced in Mexico City was a very mild flu which did not kill more than usual – which killed even fewer people than usual.' Hyping the fear against all the facts is not unique to 'Covid' and has happened many times before. Ferguson is reported to have over-estimated the projected death toll of bird flu (H5N1) by some three million-fold, but bird flu vaccine makers again made a killing from the scare. This is some of the background to the Neil Ferguson who produced the perfectly-timed computer models in early 2020 predicting that half a million people would die in Britain without draconian lockdown and 2.2 million in the United States. Politicians panicked, people panicked, and lockdowns of alleged short duration were instigated to 'flatten the curve' of cases gleaned from a test not testing for the 'virus'. I said at the time that the public could forget the 'short duration' bit. This was an agenda to destroy the livelihoods of the population and force them into mass control through dependency and there was going to be nothing 'short' about it. American researcher Daniel Horowitz described the consequences of the 'models' spewed out by Gates-funded Ferguson and Imperial College:

What led our government and the governments of many other countries into panic was a single Imperial College of UK study, funded by global warming activists, that predicted 2.2 million deaths if we didn't lock down the country. In addition, the reported 8-9% death rate in Italy scared us into thinking there was some other mutation of this virus that they got, which might have come here.

Together with the fact that we were finally testing and had the ability to actually report new cases, we thought we were headed for a death spiral. But again ... we can't flatten a curve if we don't know when the curve started.

How about it *never* started?

Giving them what they want

An investigation by German news outlet *Welt Am Sonntag* (*World on Sunday*) revealed how in March, 2020, the German government gathered together 'leading scientists from several research institutes and universities' and 'together, they were to produce a [modelling]

paper that would serve as legitimization for further tough political measures'. The Cult agenda was justified by computer modelling not based on evidence or reality; it was specifically constructed to justify the Cult demand for lockdowns all over the world to destroy the independent livelihoods of the global population. All these modellers and everyone responsible for the 'Covid' hoax have a date with a trial like those in Nuremberg after World War Two when Nazis faced the consequences of their war crimes. These corrupt-beyond-belief 'modellers' wrote the paper according to government instructions and it said that if lockdown measures were lifted then up to one million Germans would die from 'Covid-19' adding that some would die 'agonizingly at home, gasping for breath' unable to be treated by hospitals that couldn't cope. All lies. No matter – it gave the Cult all that it wanted. What did long-time government 'modeller' Neil Ferguson say? If the UK and the United States didn't lockdown half a million would die in Britain and 2.2 million Americans. Anyone see a theme here? 'Modellers' are such a crucial part of the lockdown strategy that we should look into their background and follow the money. Researcher Rosemary Frei produced an excellent article headlined 'The Modelling-paper Mafiosi'. She highlights a guy called John Edmunds, a British epidemiologist, and professor in the Faculty of Epidemiology and Population Health at the London School of Hygiene & Tropical Medicine. He studied at Imperial College. Edmunds is a member of government 'Covid' advisory bodies which have been dictating policy, the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG) and the Scientific Advisory Group for Emergencies (SAGE).

Ferguson, another member of NERVTAG and SAGE, led the way with the original 'virus' and Edmunds has followed in the 'variant' stage and especially the so-called UK or Kent variant known as the 'Variant of Concern' (VOC) B.1.1.7. He said in a co-written report for the Centre for Mathematical modelling of Infectious Diseases at the London School of Hygiene and Tropical Medicine, with input from the Centre's 'Covid-19' Working Group, that there was 'a realistic

possibility that VOC B.1.1.7 is associated with an increased risk of death compared to non-VOC viruses'. Fear, fear, fear, get the vaccine, fear, fear, fear, get the vaccine. Rosemary Frei reveals that almost all the paper's authors and members of the modelling centre's 'Covid-19' Working Group receive funding from the Bill and Melinda Gates Foundation and/or the associated Gates-funded Wellcome Trust. The paper was published by e-journal *Medrx* ^{xiv} which only publishes papers not peer-reviewed and the journal was established by an organisation headed by Facebook's Mark Zuckerberg and his missus. What a small world it is. Frei discovered that Edmunds is on the Scientific Advisory Board of the Coalition for Epidemic Preparedness Innovations (CEPI) which was established by the Bill and Melinda Gates Foundation, Klaus Schwab's Davos World Economic Forum and Big Pharma giant Wellcome. CEPI was 'launched in Davos [in 2017] to develop vaccines to stop future epidemics', according to its website. 'Our mission is to accelerate the development of vaccines against emerging infectious diseases and enable equitable access to these vaccines for people during outbreaks.' What kind people they are. Rosemary Frei reveals that Public Health England (PHE) director Susan Hopkins is an author of her organisation's non-peer-reviewed reports on 'new variants'. Hopkins is a professor of infectious diseases at London's Imperial College which is gifted tens of millions of dollars a year by the Bill and Melinda Gates Foundation. Gates-funded modelling disaster Neil Ferguson also co-authors Public Health England reports and he spoke in December, 2020, about the potential danger of the B.1.1.7. 'UK variant' promoted by Gates-funded modeller John Edmunds. When I come to the 'Covid vaccines' the 'new variants' will be shown for what they are – bollocks.

Connections, connections

All these people and modellers are lockdown-obsessed or, put another way, they demand what the Cult demands. Edmunds said in January, 2021, that to ease lockdowns too soon would be a disaster and they had to 'vaccinate much, much, much more widely than the

elderly'. Rosemary Frei highlights that Edmunds is married to Jeanne Pimenta who is described in a LinkedIn profile as director of epidemiology at GlaxoSmithKline (GSK) and she held shares in the company. Patrick Vallance, co-chair of SAGE and the government's Chief Scientific Adviser, is a former executive of GSK and has a deferred bonus of shares in the company worth £600,000. GSK has serious business connections with Bill Gates and is collaborating with mRNA-'vaccine' company CureVac to make 'vaccines' for the new variants that Edmunds is talking about. GSK is planning a 'Covid vaccine' with drug giant Sanofi. Puppets Prime Minister Boris Johnson announced in the spring of 2021 that up to 60 million vaccine doses were to be made at the GSK facility at Barnard Castle in the English North East. Barnard Castle, with a population of just 6,000, was famously visited in breach of lockdown rules in April, 2020, by Johnson aide Dominic Cummings who said that he drove there 'to test his eyesight' before driving back to London. Cummings would be better advised to test his integrity – not that it would take long. The GSK facility had nothing to do with his visit then although I'm sure Patrick Vallance would have been happy to arrange an introduction and some tea and biscuits. Ruthless psychopath Gates has made yet another fortune from vaccines in collaboration with Big Pharma companies and gushes at the phenomenal profits to be made from vaccines – more than a 20-to-1 return as he told one interviewer. Gates also tweeted in December, 2019, with the foreknowledge of what was coming: 'What's next for our foundation? I'm particularly excited about what the next year could mean for one of the best buys in global health: vaccines.'

Modeller John Edmunds is a big promotor of vaccines as all these people appear to be. He's the dean of the London School of Hygiene & Tropical Medicine's Faculty of Epidemiology and Population Health which is primarily funded by the Bill and Melinda Gates Foundation and the Gates-established and funded GAVI vaccine alliance which is the Gates vehicle to vaccinate the world. The organisation Doctors Without Borders has described GAVI as being 'aimed more at supporting drug-industry desires to promote new

products than at finding the most efficient and sustainable means for fighting the diseases of poverty'. But then that's why the psychopath Gates created it. John Edmunds said in a video that the London School of Hygiene & Tropical Medicine is involved in every aspect of vaccine development including large-scale clinical trials. He contends that mathematical modelling can show that vaccines protect individuals and society. That's on the basis of shit in and shit out, I take it. Edmunds serves on the UK Vaccine Network as does Ferguson and the government's foremost 'Covid' adviser, the grim-faced, dark-eyed Chris Whitty. The Vaccine Network says it works 'to support the government to identify and shortlist targeted investment opportunities for the most promising vaccines and vaccine technologies that will help combat infectious diseases with epidemic potential, and to address structural issues related to the UK's broader vaccine infrastructure'. Ferguson is acting Director of the Imperial College Vaccine Impact Modelling Consortium which has funding from the Bill and Melina Gates Foundation and the Gates-created GAVI 'vaccine alliance'. Anyone wonder why these characters see vaccines as the answer to every problem? Ferguson is wildly enthusiastic in his support for GAVI's campaign to vaccinate children en masse in poor countries. You would expect someone like Gates who has constantly talked about the need to reduce the population to want to fund vaccines to keep more people alive. I'm sure that's why he does it. The John Edmunds London School of Hygiene & Tropical Medicine (LSHTM) has a Vaccines Manufacturing Innovation Centre which develops, tests and commercialises vaccines. Rosemary Frei writes:

The vaccines centre also performs affiliated activities like combating 'vaccine hesitancy'. The latter includes the Vaccine Confidence Project. The project's stated purpose is, among other things, 'to provide analysis and guidance for early response and engagement with the public to ensure sustained confidence in vaccines and immunisation'. The Vaccine Confidence Project's director is LSHTM professor Heidi Larson. For more than a decade she's been researching how to combat vaccine hesitancy.

How the bloody hell can blokes like John Edmunds and Neil Ferguson with those connections and financial ties model 'virus' case

and death projections for the government and especially in a way that gives their paymasters like Gates exactly what they want? It's insane, but this is what you find throughout the world.

'Covid' is not dangerous, oops, wait, yes it is

Only days before Ferguson's nightmare scenario made Jackboot Johnson take Britain into a China-style lockdown to save us from a deadly 'virus' the UK government website gov.uk was reporting something very different to Ferguson on a page of official government guidance for 'high consequence infectious diseases (HCID)'. It said this about 'Covid-19':

As of 19 March 2020, COVID-19 is no longer considered to be a high consequence infectious diseases (HCID) in the UK [my emphasis]. The 4 nations public health HCID group made an interim recommendation in January 2020 to classify COVID-19 as an HCID. This was based on consideration of the UK HCID criteria about the virus and the disease with information available during the early stages of the outbreak.

Now that more is known about COVID-19, the public health bodies in the UK have reviewed the most up to date information about COVID-19 against the UK HCID criteria. They have determined that several features have now changed; in particular, more information is available about mortality rates (low overall), and there is now greater clinical awareness and a specific and sensitive laboratory test, the availability of which continues to increase. The Advisory Committee on Dangerous Pathogens (ACDP) is also of the opinion that COVID-19 should no longer be classified as an HCID.

Soon after the government had been exposed for downgrading the risk they upgraded it again and everyone was back to singing from the same Cult hymn book. Ferguson and his fellow Gates clones indicated that lockdowns and restrictions would have to continue until a Gates-funded vaccine was developed. Gates said the same because Ferguson and his like were repeating the Gates script which is the Cult script. 'Flatten the curve' became an ongoing nightmare of continuing lockdowns with periods in between of severe restrictions in pursuit of destroying independent incomes and had nothing to do with protecting health about which the Cult gives not a shit. Why wouldn't Ferguson be pushing a vaccine 'solution' when he's owned by vaccine-obsessive Gates who makes a fortune from them and

when Ferguson heads the Vaccine Impact Modelling Consortium at Imperial College funded by the Gates Foundation and GAVI, the 'vaccine alliance', created by Gates as his personal vaccine promotion operation? To compound the human catastrophe that Ferguson's 'models' did so much to create he was later exposed for breaking his own lockdown rules by having sexual liaisons with his married girlfriend Antonia Staats at his home while she was living at another location with her husband and children. Staats was a 'climate' activist and senior campaigner at the Soros-funded Avaaz which I wouldn't trust to tell me that grass is green. Ferguson had to resign as a government advisor over this hypocrisy in May, 2020, but after a period of quiet he was back being quoted by the ridiculous media on the need for more lockdowns and a vaccine rollout. Other government-advising 'scientists' from Imperial College held the fort in his absence and said lockdown could be indefinite until a vaccine was found. The Cult script was being sung by the payrolled choir. I said there was no intention of going back to 'normal' when the 'vaccine' came because the 'vaccine' is part of a very different agenda that I will discuss in Human 2.0. Why would the Cult want to let the world go back to normal when destroying that normal forever was the whole point of what was happening? House arrest, closing businesses and schools through lockdown, (un)social distancing and masks all followed the Ferguson fantasy models. Again as I predicted (these people are so predictable) when the 'vaccine' arrived we were told that house arrest, lockdown, (un)social distancing and masks would still have to continue. I will deal with the masks in the next chapter because they are of fundamental importance.

Where's the 'pandemic'?

Any mildly in-depth assessment of the figures revealed what was really going on. Cult-funded and controlled organisations still have genuine people working within them such is the number involved. So it is with Genevieve Briand, assistant program director of the Applied Economics master's degree program at Johns Hopkins

University. She analysed the impact that 'Covid-19' had on deaths from *all* causes in the United States using official data from the CDC for the period from early February to early September, 2020. She found that allegedly 'Covid' *related*-deaths exceeded those from heart disease which she found strange with heart disease always the biggest cause of fatalities. Her research became even more significant when she noted the sudden decline in 2020 of *all* non-'Covid' deaths: 'This trend is completely contrary to the pattern observed in all previous years ... the total decrease in deaths by other causes almost exactly equals the increase in deaths by Covid-19.' This was such a game, set and match in terms of what was happening that Johns Hopkins University deleted the article on the grounds that it 'was being used to support false and dangerous inaccuracies about the impact of the pandemic'. No – because it exposed the scam from official CDC figures and this was confirmed when those figures were published in January, 2021. Here we can see the effect of people dying from heart attacks, cancer, road accidents and gunshot wounds – *anything* – having 'Covid-19' on the death certificate along with those diagnosed from 'symptoms' who had even not tested positive with a test not testing for the 'virus'. I am not kidding with the gunshot wounds, by the way. Brenda Bock, coroner in Grand County, Colorado, revealed that two gunshot victims tested positive for the 'virus' within the previous 30 days and were therefore classified as 'Covid deaths'. Bock said: 'These two people had tested positive for Covid, but that's not what killed them. A gunshot wound is what killed them.' She said she had not even finished her investigation when the state listed the gunshot victims as deaths due to the 'virus'. The death and case figures for 'Covid-19' are an absolute joke and yet they are repeated like parrots by the media, politicians and alleged medical 'experts'. The official Cult narrative is the only show in town.

Genevieve Briand found that deaths from all causes were not exceptional in 2020 compared with previous years and a Spanish magazine published figures that said the same about Spain which was a 'Covid' propaganda hotspot at one point. *Discovery Salud*, a

health and medicine magazine, quoted government figures which showed how 17,000 *fewer* people died in Spain in 2020 than in 2019 and more than 26,000 fewer than in 2018. The age-standardised mortality rate for England and Wales when age distribution is taken into account was significantly lower in 2020 than the 1970s, 80s and 90s, and was only the ninth highest since 2000. Where is the 'pandemic'?

Post mortems and autopsies virtually disappeared for 'Covid' deaths amid claims that 'virus-infected' bodily fluids posed a risk to those carrying out the autopsy. This was rejected by renowned German pathologist and forensic doctor Klaus Püschel who said that he and his staff had by then done 150 autopsies on 'Covid' patients with no problems at all. He said they were needed to know why some 'Covid' patients suffered blood clots and not severe respiratory infections. The 'virus' is, after all, called SARS or 'severe acute respiratory syndrome'. I highlighted in the spring of 2020 this phenomenon and quoted New York intensive care doctor Cameron Kyle-Sidell who posted a soon deleted YouTube video to say that they had been told to prepare to treat an infectious disease called 'Covid-19', but that was not what they were dealing with. Instead he likened the lung condition of the most severely ill patients to what you would expect with cabin depressurisation in a plane at 30,000 feet or someone dropped on the top of Everest without oxygen or acclimatisation. I have never said this is not happening to a small minority of alleged 'Covid' patients – I am saying this is not caused by a phantom 'contagious virus'. Indeed Kyle-Sidell said that 'Covid-19' was not the disease they were told was coming their way. 'We are operating under a medical paradigm that is untrue,' he said, and he believed they were treating the wrong disease: 'These people are being slowly starved of oxygen.' Patients would take off their oxygen masks in a state of fear and stress and while they were blue in the face on the brink of death. They did not look like patients dying of pneumonia. You can see why they don't want autopsies when their virus doesn't exist and there is another condition in some people that they don't wish to be uncovered. I should add here that

the 5G system of millimetre waves was being rapidly introduced around the world in 2020 and even more so now as they fire 5G at the Earth from satellites. At 60 gigahertz within the 5G range that frequency interacts with the oxygen molecule and stops people breathing in sufficient oxygen to be absorbed into the bloodstream. They are installing 5G in schools and hospitals. The world is not mad or anything. 5G can cause major changes to the lungs and blood as I detail in *The Answer* and these consequences are labelled 'Covid-19', the alleged symptoms of which can be caused by 5G and other electromagnetic frequencies as cells respond to radiation poisoning.

The 'Covid death' scam

Dr Scott Jensen, a Minnesota state senator and medical doctor, exposed 'Covid' Medicare payment incentives to hospitals and death certificate manipulation. He said he was sent a seven-page document by the US Department of Health 'coaching' him on how to fill out death certificates which had never happened before. The document said that he didn't need to have a laboratory test for 'Covid-19' to put that on the death certificate and that shocked him when death certificates are supposed to be about facts. Jensen described how doctors had been 'encouraged, if not pressured' to make a diagnosis of 'Covid-19' if they thought it was probable or '*presumed*'. No positive test was necessary – not that this would have mattered anyway. He said doctors were told to diagnose 'Covid' by symptoms when these were the same as colds, allergies, other respiratory problems, and certainly with influenza which 'disappeared' in the 'Covid' era. A common sniffle was enough to get the dreaded verdict. Ontario authorities decreed that a single care home resident with *one* symptom from a long list must lead to the isolation of the entire home. Other courageous doctors like Jensen made the same point about death figure manipulation and how deaths by other causes were falling while 'Covid-19 deaths' were rising at the same rate due to re-diagnosis. Their videos rarely survive long on YouTube with its Cult-supporting algorithms courtesy of CEO Susan Wojcicki and her bosses at Google. Figure-tampering was so glaring

and ubiquitous that even officials were letting it slip or outright saying it. UK chief scientific adviser Patrick Vallance said on one occasion that 'Covid' on the death certificate doesn't mean 'Covid' was the cause of death (so why the hell is it there?) and we had the rare sight of a BBC reporter telling the truth when she said: 'Someone could be successfully treated for Covid, in say April, discharged, and then in June, get run over by a bus and die ... That person would still be counted as a Covid death in England.' Yet the BBC and the rest of the world media went on repeating the case and death figures as if they were real. Illinois Public Health Director Dr Ngozi Ezike revealed the deceit while her bosses must have been clenching their buttocks:

If you were in a hospice and given a few weeks to live and you were then found to have Covid that would be counted as a Covid death. [There might be] a clear alternate cause, but it is still listed as a Covid death. So everyone listed as a Covid death doesn't mean that was the cause of the death, but that they had Covid at the time of death.

Yes, a 'Covid virus' never shown to exist and tested for with a test not testing for the 'virus'. In the first period of the pandemic hoax through the spring of 2020 the process began of designating almost everything a 'Covid' death and this has continued ever since. I sat in a restaurant one night listening to a loud conversation on the next table where a family was discussing in bewilderment how a relative who had no symptoms of 'Covid', and had died of a long-term problem, could have been diagnosed a death by the 'virus'. I could understand their bewilderment. If they read this book they will know why this medical fraud has been perpetrated the world over.

Some media truth shock

The media ignored the evidence of death certificate fraud until eventually one columnist did speak out when she saw it first-hand. Bel Mooney is a long-time national newspaper journalist in Britain currently working for the *Daily Mail*. Her article on February 19th, 2021, carried this headline: 'My dad Ted passed three Covid tests

and died of a chronic illness yet he's officially one of Britain's 120,000 victims of the virus and is far from alone ... so how many more are there?' She told how her 99-year-old father was in a care home with a long-standing chronic obstructive pulmonary disease and vascular dementia. Maybe, but he was still aware enough to tell her from the start that there was no 'virus' and he refused the 'vaccine' for that reason. His death was not unexpected given his chronic health problems and Mooney said she was shocked to find that 'Covid-19' was declared the cause of death on his death certificate. She said this was a 'bizarre and unacceptable untruth' for a man with long-time health problems who had tested negative twice at the home for the 'virus'. I was also shocked by this story although not by what she said. I had been highlighting the death certificate manipulation for ten months. It was the confirmation that a professional full-time journalist only realised this was going on when it affected her directly and neither did she know that whether her dad tested positive or negative was irrelevant with the test not testing for the 'virus'. Where had she been? She said she did not believe in 'conspiracy theories' without knowing I'm sure that this and 'conspiracy theorists' were terms put into widespread circulation by the CIA in the 1960s to discredit those who did not accept the ridiculous official story of the Kennedy assassination. A blanket statement of 'I don't believe in conspiracy theories' is always bizarre. The dictionary definition of the term alone means the world is drowning in conspiracies. What she said was even more daft when her dad had just been affected by the 'Covid' conspiracy. Why else does she think that 'Covid-19' was going on the death certificates of people who died of something else?

To be fair once she saw from personal experience what was happening she didn't mince words. Mooney was called by the care home on the morning of February 9th to be told her father had died in his sleep. When she asked for the official cause of death what came back was 'Covid-19'. Mooney challenged this and was told there had been deaths from Covid on the dementia floor (confirmed by a test not testing for the 'virus') so they considered it 'reasonable

to assume'. 'But doctor,' Mooney rightly protested, 'an assumption isn't a diagnosis.' She said she didn't blame the perfectly decent and sympathetic doctor – 'he was just doing his job'. Sorry, but that's *bullshit*. He wasn't doing his job at all. He was putting a false cause of death on the death certificate and that is a criminal offence for which he should be brought to account and the same with the millions of doctors worldwide who have done the same. They were not doing their job they were following orders and that must not wash at new Nuremberg trials any more than it did at the first ones. Mooney's doctor was 'assuming' (presuming) as he was told to, but 'just following orders' makes no difference to his actions. A doctor's job is to serve the patient and the truth, not follow orders, but that's what they have done all over the world and played a central part in making the 'Covid' hoax possible with all its catastrophic consequences for humanity. Shame on them and they must answer for their actions. Mooney said her disquiet worsened when she registered her father's death by telephone and was told by the registrar there had been very many other cases like hers where 'the deceased' had not tested positive for 'Covid' yet it was recorded as the cause of death. The test may not matter, but those involved at their level *think* it matters and it shows a callous disregard for accurate diagnosis. The pressure to do this is coming from the top of the national 'health' pyramids which in turn obey the World Health Organization which obeys Gates and the Cult. Mooney said the registrar agreed that this must distort the national figures adding that 'the strangest thing is that every winter we record countless deaths from flu, and this winter there have been none. Not one!' She asked if the registrar thought deaths from flu were being misdiagnosed and lumped together with 'Covid' deaths. The answer was a 'puzzled yes'. Mooney said that the funeral director said the same about 'Covid' deaths which had nothing to do with 'Covid'. They had lost count of the number of families upset by this and other funeral companies in different countries have had the same experience. Mooney wrote:

The nightly shroud-waving and shocking close-ups of pain imposed on us by the TV news bewildered and terrified the population into eager compliance with lockdowns. We were invited to 'save the NHS' and to grieve for strangers – the real-life loved ones behind those shocking death counts. Why would the public imagine what I now fear, namely that the way Covid-19 death statistics are compiled might make the numbers seem greater than they are?

Oh, just a little bit – like 100 percent.

Do the maths

Mooney asked why a country would wish to skew its mortality figures by wrongly certifying deaths? What had been going on? Well, if you don't believe in conspiracies you will never find the answer which is that *it's a conspiracy*. She did, however, describe what she had discovered as a 'national scandal'. In reality it's a global scandal and happening everywhere. Pillars of this conspiracy were all put into place before the button was pressed with the Drosten PCR protocol and high amplifications to produce the cases and death certificate changes to secure illusory 'Covid' deaths. Mooney notes that normally two doctors were needed to certify a death, with one having to know the patient, and how the rules were changed in the spring of 2020 to allow one doctor to do this. In the same period 'Covid deaths' were decreed to be all cases where Covid-19 was put on the death certificate even without a positive test or any symptoms. Mooney asked: 'How many of the 30,851 (as of January 15) care home resident deaths with Covid-19 on the certificate (32.4 per cent of all deaths so far) were based on an assumption, like that of my father? And what has that done to our national psyche?' All of them is the answer to the first question and it has devastated and dismantled the national psyche, actually the global psyche, on a colossal scale. In the UK case and death data is compiled by organisations like Public Health England (PHE) and the Office for National Statistics (ONS). Mooney highlights the insane policy of counting a death from any cause as 'Covid-19' if this happens within 28 days of a positive test (with a test not testing for the 'virus') and she points out that ONS statistics reflect deaths 'involving Covid' 'or due to Covid' which meant in practice any

death where 'Covid-19' was mentioned on the death certificate. She described the consequences of this fraud:

Most people will accept the narrative they are fed, so panicky governments here and in Europe witnessed the harsh measures enacted in totalitarian China and jumped into lockdown. Headlines about Covid deaths tolled like the knell that would bring doomsday to us all. Fear stalked our empty streets. Politicians parroted the frankly ridiculous aim of 'zero Covid' and shut down the economy, while most British people agreed that lockdown was essential and (astonishingly to me, as a patriotic Brit) even wanted more restrictions.

For what? Lies on death certificates? Never mind the grim toll of lives ruined, suicides, schools closed, rising inequality, depression, cancelled hospital treatments, cancer patients in a torture of waiting, poverty, economic devastation, loneliness, families kept apart, and so on. How many lives have been lost as a direct result of lockdown?

She said that we could join in a national chorus of shock and horror at reaching the 120,000 death toll which was surely certain to have been totally skewed all along, but what about the human cost of lockdown justified by these 'death figures'? *The British Medical Journal* had reported a 1,493 percent increase in cases of children taken to Great Ormond Street Hospital with abusive head injuries alone and then there was the effect on families:

Perhaps the most shocking thing about all this is that families have been kept apart – and obeyed the most irrational, changing rules at the whim of government – because they believed in the statistics. They succumbed to fear, which his generation rejected in that war fought for freedom. Dad (God rest his soul) would be angry. And so am I.

Another theme to watch is that in the winter months when there are more deaths from all causes they focus on 'Covid' deaths and in the summer when the British Lung Foundation says respiratory disease plummets by 80 percent they rage on about 'cases'. Either way fascism on population is always the answer.

Nazi eugenics in the 21st century

Elderly people in care homes have been isolated from their families month after lonely month with no contact with relatives and grandchildren who were banned from seeing them. We were told

that lockdown fascism was to 'protect the vulnerable' like elderly people. At the same time Do Not Resuscitate (DNR) orders were placed on their medical files so that if they needed resuscitation it wasn't done and 'Covid-19' went on their death certificates. Old people were not being 'protected' they were being culled – murdered in truth. DNR orders were being decreed for disabled and young people with learning difficulties or psychological problems. The UK Care Quality Commission, a non-departmental body of the Department of Health and Social Care, found that 34 percent of those working in health and social care were pressured into placing 'do not attempt cardiopulmonary resuscitation' orders on 'Covid' patients who suffered from disabilities and learning difficulties without involving the patient or their families in the decision. UK judges ruled that an elderly woman with dementia should have the DNA-manipulating 'Covid vaccine' against her son's wishes and that a man with severe learning difficulties should have the jab despite his family's objections. Never mind that many had already died. The judiciary always supports doctors and government in fascist dictatorships. They wouldn't dare do otherwise. A horrific video was posted showing fascist officers from Los Angeles police forcibly giving the 'Covid' shot to women with special needs who were screaming that they didn't want it. The same fascists are seen giving the jab to a sleeping elderly woman in a care home. This is straight out of the Nazi playbook. Hitler's Nazis committed mass murder of the mentally ill and physically disabled throughout Germany and occupied territories in the programme that became known as Aktion T4, or just T4. Sabbatian-controlled Hitler and his grotesque crazies set out to kill those they considered useless and unnecessary. The Reich Committee for the Scientific Registering of Hereditary and Congenital Illnesses registered the births of babies identified by physicians to have 'defects'. By 1941 alone more than 5,000 children were murdered by the state and it is estimated that in total the number of innocent people killed in Aktion T4 was between 275,000 and 300,000. Parents were told their children had been sent away for 'special treatment' never to return. It is rather pathetic to see claims about plans for new extermination camps being dismissed today

when the same force behind current events did precisely that 80 years ago. Margaret Sanger was a Cult operative who used 'birth control' to sanitise her programme of eugenics. Organisations she founded became what is now Planned Parenthood. Sanger proposed that 'the whole dysgenic population would have its choice of segregation or sterilization'. These included epileptics, 'feeble-minded', and prostitutes. Sanger opposed charity because it perpetuated 'human waste'. She reveals the Cult mentality and if anyone thinks that extermination camps are a 'conspiracy theory' their naivety is touching if breathtakingly stupid.

If you don't believe that doctors can act with callous disregard for their patients it is worth considering that doctors and medical staff agreed to put government-decreed DNR orders on medical files and do nothing when resuscitation is called for. I don't know what you call such people in your house. In mine they are Nazis from the Josef Mengele School of Medicine. Phenomenal numbers of old people have died worldwide from the effects of lockdown, depression, lack of treatment, the 'vaccine' (more later) and losing the will to live. A common response at the start of the manufactured pandemic was to remove old people from hospital beds and transfer them to nursing homes. The decision would result in a mass cull of elderly people in those homes through lack of treatment – *not* 'Covid'. Care home whistleblowers have told how once the 'Covid' era began doctors would not come to their homes to treat patients and they were begging for drugs like antibiotics that often never came. The most infamous example was ordered by New York governor Andrew Cuomo, brother of a moronic CNN host, who amazingly was given an Emmy Award for his handling of the 'Covid crisis' by the ridiculous Wokers that hand them out. Just how ridiculous could be seen in February, 2021, when a Department of Justice and FBI investigation began into how thousands of old people in New York died in nursing homes after being discharged from hospital to make way for 'Covid' patients on Cuomo's say-so – and how he and his staff covered up these facts. This couldn't have happened to a nicer psychopath. Even then there was a 'Covid' spin. Reports said that

thousands of old people who tested positive for 'Covid' in hospital were transferred to nursing homes to both die of 'Covid' and transmit it to others. No – they were in hospital because they were ill and the fact that they tested positive with a test not testing for the 'virus' is irrelevant. They were ill often with respiratory diseases ubiquitous in old people near the end of their lives. Their transfer out of hospital meant that their treatment stopped and many would go on to die.

They're old. Who gives a damn?

I have exposed in the books for decades the Cult plan to cull the world's old people and even to introduce at some point what they call a 'demise pill' which at a certain age everyone would take and be out of here by law. In March, 2021, Spain legalised euthanasia and assisted suicide following the Netherlands, Belgium, Luxembourg and Canada on the Tiptoe to the demise pill. Treatment of old people by many 'care' homes has been a disgrace in the 'Covid' era. There are many, many, caring staff – I know some. There have, however, been legions of stories about callous treatment of old people and their families. Police were called when families came to take their loved ones home in the light of isolation that was killing them. They became prisoners of the state. Care home residents in insane, fascist Ontario, Canada, were not allowed to leave their *room* once the 'Covid' hoax began. UK staff have even wheeled elderly people away from windows where family members were talking with them. Oriana Criscuolo from Stockport in the English North West dropped off some things for her 80-year-old father who has Parkinson's disease and dementia and she wanted to wave to him through a ground-floor window. She was told that was 'illegal'. When she went anyway they closed the curtains in the middle of the day. Oriana said:

It's just unbelievable. I cannot understand how care home staff – people who are being paid to care – have become so uncaring. Their behaviour is inhumane and cruel. It's beyond belief.

She was right and this was not a one-off. What a way to end your life in such loveless circumstances. UK registered nurse Nicky Millen, a proper old school nurse for 40 years, said that when she started her career care was based on dignity, choice, compassion and empathy. Now she said 'the things that are important to me have gone out of the window.' She was appalled that people were dying without their loved ones and saying goodbye on iPads. Nicky described how a distressed 89-year-old lady stroked her face and asked her 'how many paracetamol would it take to finish me off'. Life was no longer worth living while not seeing her family. Nicky said she was humiliated in front of the ward staff and patients for letting the lady stroke her face and giving her a cuddle. Such is the dehumanisation that the 'Covid' hoax has brought to the surface. Nicky worked in care homes where patients told her they were being held prisoner. 'I want to live until I die', one said to her. 'I had a lady in tears because she hadn't seen her great-grandson.' Nicky was compassionate old school meeting psychopathic New Normal. She also said she had worked on a 'Covid' ward with no 'Covid' patients. Jewish writer Shai Held wrote an article in March, 2020, which was headlined 'The Staggering, Heartless Cruelty Toward the Elderly'. What he described was happening from the earliest days of lockdown. He said 'the elderly' were considered a group and not unique individuals (the way of the Woke). Shai Held said:

Notice how the all-too-familiar rhetoric of dehumanization works: 'The elderly' are bunched together as a faceless mass, all of them considered culprits and thus effectively deserving of the suffering the pandemic will inflict upon them. Lost entirely is the fact that the elderly are individual human beings, each with a distinctive face and voice, each with hopes and dreams, memories and regrets, friendships and marriages, loves lost and loves sustained.

'The elderly' have become another dehumanised group for which anything goes and for many that has resulted in cold disregard for their rights and their life. The distinctive face that Held talks about is designed to be deleted by masks until everyone is part of a faceless mass.

'War-zone' hospitals myth

Again and again medical professionals have told me what was really going on and how hospitals 'overrun like war zones' according to the media were virtually empty. The mantra from medical whistleblowers was please don't use my name or my career is over. Citizen journalists around the world sneaked into hospitals to film evidence exposing the 'war-zone' lie. They really *were* largely empty with closed wards and operating theatres. I met a hospital worker in my town on the Isle of Wight during the first lockdown in 2020 who said the only island hospital had never been so quiet. Lockdown was justified by the psychopaths to stop hospitals being overrun. At the same time that the island hospital was near-empty the military arrived here to provide *extra beds*. It was all propaganda to ramp up the fear to ensure compliance with fascism as were never-used temporary hospitals with thousands of beds known as Nightingales and never-used make-shift mortuaries opened by the criminal UK government. A man who helped to install those extra island beds attributed to the army said they were never used and the hospital was empty. Doctors and nurses 'stood around talking or on their phones, wandering down to us to see what we were doing'. There were no masks or social distancing. He accused the useless local island paper, the *County Press*, of 'pumping the fear as if our hospital was overrun and we only have one so it should have been'. He described ambulances parked up with crews outside in deck chairs. When his brother called an ambulance he was told there was a two-hour backlog which he called 'bullshit'. An old lady on the island fell 'and was in a bad way', but a caller who rang for an ambulance was told the situation wasn't urgent enough. Ambulance stations were working under capacity while people would hear ambulances with sirens blaring driving through the streets. When those living near the stations realised what was going on they would follow them as they left, circulated around an urban area with the sirens going, and then came back without stopping. All this was to increase levels of fear and the same goes for the 'ventilator shortage crisis' that cost tens of millions for hastily produced ventilators never to be used.

Ambulance crews that agreed to be exploited in this way for fear propaganda might find themselves a mirror. I wish them well with that. Empty hospitals were the obvious consequence of treatment and diagnoses of non-'Covid' conditions cancelled and those involved handed a death sentence. People have been dying at home from undiagnosed and untreated cancer, heart disease and other life-threatening conditions to allow empty hospitals to deal with a 'pandemic' that wasn't happening.

Death of the innocent

'War-zones' have been laying off nursing staff, even doctors where they can. There was no work for them. Lockdown was justified by saving lives and protecting the vulnerable they were actually killing with DNR orders and preventing empty hospitals being 'overrun'. In Britain the mantra of stay at home to 'save the NHS' was everywhere and across the world the same story was being sold when it was all lies. Two California doctors, Dan Erickson and Artin Massihi at Accelerated Urgent Care in Bakersfield, held a news conference in April, 2020, to say that intensive care units in California were 'empty, essentially', with hospitals shutting floors, not treating patients and laying off doctors. The California health system was working at minimum capacity 'getting rid of doctors because we just don't have the volume'. They said that people with conditions such as heart disease and cancer were not coming to hospital out of fear of 'Covid-19'. Their video was deleted by Susan Wojcicki's Cult-owned YouTube after reaching five million views. Florida governor Ron Desantis, who rejected the severe lockdowns of other states and is being targeted for doing so, said that in March, 2020, every US governor was given models claiming they would run out of hospital beds in days. That was never going to happen and the 'modellers' knew it. Deceit can be found at every level of the system. Urgent children's operations were cancelled including fracture repairs and biopsies to spot cancer. Eric Nicholls, a consultant paediatrician, said 'this is obviously concerning and we need to return to normal operating and to increase capacity as soon as possible'. Psychopaths

in power were rather less concerned *because* they are psychopaths. Deletion of urgent care and diagnosis has been happening all over the world and how many kids and others have died as a result of the actions of these cold and heartless lunatics dictating 'health' policy? The number must be stratospheric. Richard Sullivan, professor of cancer and global health at King's College London, said people feared 'Covid' more than cancer such was the campaign of fear. 'Years of lost life will be quite dramatic', Sullivan said, with 'a huge amount of avoidable mortality'. Sarah Woolnough, executive director for policy at Cancer Research UK, said there had been a 75 percent drop in urgent referrals to hospitals by family doctors of people with suspected cancer. Sullivan said that 'a lot of services have had to scale back – we've seen a dramatic decrease in the amount of elective cancer surgery'. Lockdown deaths worldwide has been absolutely fantastic with the *New York Post* reporting how data confirmed that 'lockdowns end more lives than they save':

There was a sharp decline in visits to emergency rooms and an increase in fatal heart attacks because patients didn't receive prompt treatment. Many fewer people were screened for cancer. Social isolation contributed to excess deaths from dementia and Alzheimer's.

Researchers predicted that the social and economic upheaval would lead to tens of thousands of "deaths of despair" from drug overdoses, alcoholism and suicide. As unemployment surged and mental-health and substance-abuse treatment programs were interrupted, the reported levels of anxiety, depression and suicidal thoughts increased dramatically, as did alcohol sales and fatal drug overdoses.

This has been happening while nurses and other staff had so much time on their hands in the 'war-zones' that Tic-Tok dancing videos began appearing across the Internet with medical staff dancing around in empty wards and corridors as people died at home from causes that would normally have been treated in hospital.

Mentions in dispatches

One brave and truth-committed whistleblower was Louise Hampton, a call handler with the UK NHS who made a viral Internet video saying she had done 'fuck all' during the 'pandemic'

which was 'a load of bollocks'. She said that 'Covid-19' was rebranded flu and of course she lost her job. This is what happens in the medical and endless other professions now when you tell the truth. Louise filmed inside 'war-zone' accident and emergency departments to show they were empty and I mean *empty* as in no one there. The mainstream media could have done the same and blown the gaff on the whole conspiracy. They haven't to their eternal shame. Not that most 'journalists' seem capable of manifesting shame as with the psychopaths they slavishly repeat without question. The relative few who were admitted with serious health problems were left to die alone with no loved ones allowed to see them because of 'Covid' rules and they included kids dying without the comfort of mum and dad at their bedside while the evil behind this couldn't give a damn. It was all good fun to them. A Scottish NHS staff nurse publicly quit in the spring of 2021 saying: 'I can no longer be part of the lies and the corruption by the government.' She said hospitals 'aren't full, the beds aren't full, beds have been shut, wards have been shut'. Hospitals were never busy throughout 'Covid'. The staff nurse said that Nicola Sturgeon, tragically the leader of the Scottish government, was on television saying save the hospitals and the NHS – 'but the beds are empty' and 'we've not seen flu, we always see flu every year'. She wrote to government and spoke with her union Unison (the unions are Cult-compromised and *useless*, but nothing changed. Many of her colleagues were scared of losing their jobs if they spoke out as they wanted to. She said nursing staff were being affected by wearing masks all day and 'my head is splitting every shift from wearing a mask'. The NHS is part of the fascist tyranny and must be dismantled so we can start again with human beings in charge. (Ironically, hospitals were reported to be busier again when official 'Covid' cases *fell* in spring/summer of 2021 and many other conditions required treatment at the same time as *the fake vaccine rollout*.)

I will cover the 'Covid vaccine' scam in detail later, but it is another indicator of the sickening disregard for human life that I am highlighting here. The DNA-manipulating concoctions do not fulfil

the definition of a 'vaccine', have never been used on humans before and were given only emergency approval because trials were not completed and they continued using the unknowing public. The result was what a NHS senior nurse with responsibility for 'vaccine' procedure said was 'genocide'. She said the 'vaccines' were not 'vaccines'. They had not been shown to be safe and claims about their effectiveness by drug companies were 'poetic licence'. She described what was happening as a 'horrid act of human annihilation'. The nurse said that management had instigated a policy of not providing a Patient Information Leaflet (PIL) before people were 'vaccinated' even though health care professionals are supposed to do this according to protocol. Patients should also be told that they are taking part in an ongoing clinical trial. Her challenges to what is happening had seen her excluded from meetings and ridiculed in others. She said she was told to 'watch my step ... or I would find myself surplus to requirements'. The nurse, who spoke anonymously in fear of her career, said she asked her NHS manager why he/she was content with taking part in genocide against those having the 'vaccines'. The reply was that everyone had to play their part and to 'put up, shut up, and get it done'. Government was 'leaning heavily' on NHS management which was clearly leaning heavily on staff. This is how the global 'medical' hierarchy operates and it starts with the Cult and its World Health Organization.

She told the story of a doctor who had the Pfizer jab and when questioned had no idea what was in it. The doctor had never read the literature. We have to stop treating doctors as intellectual giants when so many are moral and medical pygmies. The doctor did not even know that the 'vaccines' were not fully approved or that their trials were ongoing. They were, however, asking their patients if they minded taking part in follow-ups for research purposes – yes, the *ongoing clinical trial*. The nurse said the doctor's ignorance was not rare and she had spoken to a hospital consultant who had the jab without any idea of the background or that the 'trials' had not been completed. Nurses and pharmacists had shown the same ignorance.

‘My NHS colleagues have forsaken their duty of care, broken their code of conduct – Hippocratic Oath – and have been brainwashed just the same as the majority of the UK public through propaganda ...’ She said she had not been able to recruit a single NHS colleague, doctor, nurse or pharmacist to stand with her and speak out. Her union had refused to help. She said that if the genocide came to light she would not hesitate to give evidence at a Nuremberg-type trial against those in power who could have affected the outcomes but didn’t.

And all for what?

To put the nonsense into perspective let’s say the ‘virus’ does exist and let’s go completely crazy and accept that the official manipulated figures for cases and deaths are accurate. *Even then* a study by Stanford University epidemiologist Dr John Ioannidis published on the World Health Organization website produced an average infection to fatality rate of ... *0.23 percent!* Ioannidis said: ‘If one could sample equally from all locations globally, the median infection fatality rate might even be substantially lower than the 0.23% observed in my analysis.’ For healthy people under 70 it was ... *0.05 percent!* This compares with the 3.4 percent claimed by the Cult-owned World Health Organization when the hoax was first played and maximum fear needed to be generated. An updated Stanford study in April, 2021, put the ‘infection’ to ‘fatality’ rate at just 0.15 percent. Another team of scientists led by Megan O’Driscoll and Henrik Salje studied data from 45 countries and published their findings on the Nature website. For children and young people the figure is so small it virtually does not register although authorities will be hyping dangers to the young when they introduce DNA-manipulating ‘vaccines’ for children. The O’Driscoll study produced an average infection-fatality figure of 0.003 for children from birth to four; 0.001 for 5 to 14; 0.003 for 15 to 19; and it was still only 0.456 up to 64. To claim that children must be ‘vaccinated’ to protect them from ‘Covid’ is an obvious lie and so there must be another reason and there is. What’s more the average age of a ‘Covid’ death is akin

to the average age that people die in general. The average age of death in England is about 80 for men and 83 for women. The average age of death from alleged 'Covid' is between 82 and 83. California doctors, Dan Erickson and Artin Massihi, said at their April media conference that projection models of millions of deaths had been 'woefully inaccurate'. They produced detailed figures showing that Californians had a 0.03 chance of dying from 'Covid' based on the number of people who tested positive (with a test not testing for the 'virus'). Erickson said there was a 0.1 percent chance of dying from 'Covid' in the *state* of New York, not just the city, and a 0.05 percent chance in Spain, a centre of 'Covid-19' hysteria at one stage. The Stanford studies supported the doctors' data with fatality rate estimates of 0.23 and 0.15 percent. How close are these figures to my estimate of *zero*? Death-rate figures claimed by the World Health Organization at the start of the hoax were some 15 times higher. The California doctors said there was no justification for lockdowns and the economic devastation they caused. Everything they had ever learned about quarantine was that you quarantine the *sick* and not the healthy. They had never seen this before and it made no medical sense.

Why in the light of all this would governments and medical systems the world over say that billions must go under house arrest; lose their livelihood; in many cases lose their mind, their health and their life; force people to wear masks dangerous to health and psychology; make human interaction and even family interaction a criminal offence; ban travel; close restaurants, bars, watching live sport, concerts, theatre, and any activity involving human togetherness and discourse; and closing schools to isolate children from their friends and cause many to commit suicide in acts of hopelessness and despair? The California doctors said lockdown consequences included increased child abuse, partner abuse, alcoholism, depression, and other impacts they were seeing every day. Who would do that to the entire human race if not mentally-ill psychopaths of almost unimaginable extremes like Bill Gates? We must face the reality of what we are dealing with and come out of

denial. Fascism and tyranny are made possible only by the target population submitting and acquiescing to fascism and tyranny. The whole of human history shows that to be true. Most people naively and unquestioning believed what they were told about a 'deadly virus' and meekly and weakly submitted to house arrest. Those who didn't believe it – at least in total – still submitted in fear of the consequences of not doing so. For the rest who wouldn't submit draconian fines have been imposed, brutal policing by psychopaths *for* psychopaths, and condemnation from the meek and weak who condemn the Pushbackers on behalf of the very force that has them, too, in its gunsights. 'Pathetic' does not even begin to suffice. Britain's brainless 'Health' Secretary Matt Hancock warned anyone lying to border officials about returning from a list of 'hotspot' countries could face a jail sentence of up to ten years which is more than for racially-aggravated assault, incest and attempting to have sex with a child under 13. Hancock is a lunatic, but he has the state apparatus behind him in a Cult-led chain reaction and the same with UK 'Vaccine Minister' Nadhim Zahawi, a prominent member of the mega-Cult secret society, Le Cercle, which featured in my earlier books. The Cult enforces its will on governments and medical systems; government and medical systems enforce their will on business and police; business enforces its will on staff who enforce it on customers; police enforce the will of the Cult on the population and play their essential part in creating a world of fascist control that their own children and grandchildren will have to live in their entire lives. It is a hierarchical pyramid of imposition and acquiescence and, yes indeed, of clinical insanity.

Does anyone bright enough to read this book have to ask what the answer is? I think not, but I will reveal it anyway in the fewest of syllables: Tell the psychos and their moronic lackeys to fuck off and let's get on with our lives. We are many – They are few.

CHAPTER SEVEN

War on your mind

One believes things because one has been conditioned to believe them

Aldous Huxley, Brave New World

I have described the 'Covid' hoax as a 'Psyop' and that is true in every sense and on every level in accordance with the definition of that term which is psychological warfare. Break down the 'Covid pandemic' to the foundation themes and it is psychological warfare on the human individual and collective mind.

The same can be said for the entire human belief system involving every subject you can imagine. Huxley was right in his contention that people believe what they are conditioned to believe and this comes from the repetition throughout their lives of the same falsehoods. They spew from government, corporations, media and endless streams of 'experts' telling you what the Cult wants you to believe and often believing it themselves (although *far* from always). 'Experts' are rewarded with 'prestigious' jobs and titles and as agents of perceptual programming with regular access to the media. The Cult has to control the narrative – control *information* – or they lose control of the vital, crucial, without-which-they-cannot-prevail public perception of reality. The foundation of that control today is the Internet made possible by the Defense Advanced Research Projects Agency (DARPA), the incredibly sinister technological arm of the Pentagon. The Internet is the result of military technology.

DARPA openly brags about establishing the Internet which has been a long-term project to lasso the minds of the global population. I have said for decades the plan is to control information to such an extreme that eventually no one would see or hear anything that the Cult does not approve. We are closing in on that end with ferocious censorship since the 'Covid' hoax began and in my case it started back in the 1990s in terms of books and speaking venues. I had to create my own publishing company in 1995 precisely because no one else would publish my books even then. I think they're all still running.

Cult Internet

To secure total control of information they needed the Internet in which pre-programmed algorithms can seek out 'unclean' content for deletion and even stop it being posted in the first place. The Cult had to dismantle print and non-Internet broadcast media to ensure the transfer of information to the appropriate-named 'Web' – a critical expression of the *Cult* web. We've seen the ever-quicken demise of traditional media and control of what is left by a tiny number of corporations operating worldwide. Independent journalism in the mainstream is already dead and never was that more obvious than since the turn of 2020. The Cult wants all information communicated via the Internet to globally censor and allow the plug to be pulled any time. Lockdowns and forced isolation has meant that communication between people has been through electronic means and no longer through face-to-face discourse and discussion. Cult psychopaths have targeted the bars, restaurants, sport, venues and meeting places in general for this reason. None of this is by chance and it's to stop people gathering in any kind of privacy or number while being able to track and monitor all Internet communications and block them as necessary. Even private messages between individuals have been censored by these fascists that control Cult fronts like Facebook, Twitter, Google and YouTube which are all officially run by Sabbatian place-people and from the background by higher-level Sabbatian place people.

Facebook, Google, Amazon and their like were seed-funded and supported into existence with money-no-object infusions of funds either directly or indirectly from DARPA and CIA technology arm In-Q-Tel. The Cult plays the long game and prepares very carefully for big plays like 'Covid'. Amazon is another front in the psychological war and pretty much controls the global market in book sales and increasingly publishing. Amazon's limitless funds have deleted fantastic numbers of independent publishers to seize global domination on the way to deciding which books can be sold and circulated and which cannot. Moves in that direction are already happening. Amazon's leading light Jeff Bezos is the grandson of Lawrence Preston Gise who worked with DARPA predecessor ARPA. Amazon has big connections to the CIA and the Pentagon. The plan I have long described went like this:

1. Employ military technology to establish the Internet.
2. Sell the Internet as a place where people can freely communicate without censorship and allow that to happen until the Net becomes the central and irreversible pillar of human society. If the Internet had been highly censored from the start many would have rejected it.
3. Fund and manipulate major corporations into being to control the circulation of information on your Internet using cover stories about geeks in garages to explain how they came about. Give them unlimited funds to expand rapidly with no need to make a profit for years while non-Cult companies who need to balance the books cannot compete. You know that in these circumstances your Googles, YouTubes, Facebooks and Amazons are going to secure near monopolies by either crushing or buying up the opposition.
4. Allow freedom of expression on both the Internet and communication platforms to draw people in until the Internet is the central and irreversible pillar of human society and your communication corporations have reached a stage of near monopoly domination.
5. Then unleash your always-planned frenzy of censorship on the basis of 'where else are you going to go?' and continue to expand that until nothing remains that the Cult does not want its human targets to see.

The process was timed to hit the 'Covid' hoax to ensure the best chance possible of controlling the narrative which they knew they had to do at all costs. They were, after all, about to unleash a 'deadly virus' that didn't really exist. If you do that in an environment of free-flowing information and opinion you would be dead in the

water before you could say Gates is a psychopath. The network was in place through which the Cult-created-and-owned World Health Organization could dictate the 'Covid' narrative and response policy slavishly supported by Cult-owned Internet communication giants and mainstream media while those telling a different story were censored. Google, YouTube, Facebook and Twitter openly announced that they would do this. What else would we expect from Cult-owned operations like Facebook which former executives have confirmed set out to make the platform more addictive than cigarettes and coldly manipulates emotions of its users to sow division between people and groups and scramble the minds of the young? If Zuckerberg lives out the rest of his life without going to jail for crimes against humanity, and most emphatically against the young, it will be a travesty of justice. Still, no matter, cause and effect will catch up with him eventually and the same with Sergey Brin and Larry Page at Google with its CEO Sundar Pichai who fix the Google search results to promote Cult narratives and hide the opposition. Put the same key words into Google and other search engines like DuckDuckGo and you will see how different results can be. Wikipedia is another intensely biased 'encyclopaedia' which skews its content to the Cult agenda. YouTube links to Wikipedia's version of 'Covid' and 'climate change' on video pages in which experts in their field offer a different opinion (even that is increasingly rare with Wojcicki censorship). Into this 'Covid' silence-them network must be added government media censors, sorry 'regulators', such as Ofcom in the UK which imposed tyrannical restrictions on British broadcasters that had the effect of banning me from ever appearing. Just to debate with me about my evidence and views on 'Covid' would mean breaking the fascistic impositions of Ofcom and its CEO career government bureaucrat Melanie Dawes. Gutless British broadcasters tremble at the very thought of fascist Ofcom.

Psychos behind 'Covid'

The reason for the 'Covid' catastrophe in all its facets and forms can be seen by whom and what is driving the policies worldwide in such a coordinated way. Decisions are not being made to protect health, but to target psychology. The dominant group guiding and 'advising' government policy are not medical professionals. They are psychologists and behavioural scientists. Every major country has its own version of this phenomenon and I'll use the British example to show how it works. In many ways the British version has been affecting the wider world in the form of the huge behaviour manipulation network in the UK which operates in other countries. The network involves private companies, government, intelligence and military. The Cabinet Office is at the centre of the government 'Covid' Psyop and part-owns, with 'innovation charity' Nesta, the Behavioural Insights Team (BIT) which claims to be independent of government but patently isn't. The BIT was established in 2010 and its job is to manipulate the psyche of the population to acquiesce to government demands and so much more. It is also known as the 'Nudge Unit', a name inspired by the 2009 book by two ultra-Zionists, Cass Sunstein and Richard Thaler, called *Nudge: Improving Decisions About Health, Wealth, and Happiness*. The book, as with the Behavioural Insights Team, seeks to 'nudge' behaviour (manipulate it) to make the public follow patterns of action and perception that suit those in authority (the Cult). Sunstein is so skilled at this that he advises the World Health Organization and the UK Behavioural Insights Team and was Administrator of the White House Office of Information and Regulatory Affairs in the Obama administration. Biden appointed him to the Department of Homeland Security – another ultra-Zionist in the fold to oversee new immigration laws which is another policy the Cult wants to control. Sunstein is desperate to silence anyone exposing conspiracies and co-authored a 2008 report on the subject in which suggestions were offered to ban 'conspiracy theorizing' or impose 'some kind of tax, financial or otherwise, on those who disseminate such theories'. I guess a psychiatrist's chair is out of the question?

Sunstein's mate Richard Thaler, an 'academic affiliate' of the UK Behavioural Insights Team, is a proponent of 'behavioural economics' which is defined as the study of 'the effects of psychological, cognitive, emotional, cultural and social factors on the decisions of individuals and institutions'. Study the effects so they can be manipulated to be what you want them to be. Other leading names in the development of behavioural economics are ultra-Zionists Daniel Kahneman and Robert J. Shiller and they, with Thaler, won the Nobel Memorial Prize in Economic Sciences for their work in this field. The Behavioural Insights Team is operating at the heart of the UK government and has expanded globally through partnerships with several universities including Harvard, Oxford, Cambridge, University College London (UCL) and Pennsylvania. They claim to have 'trained' (reframed) 20,000 civil servants and run more than 750 projects involving 400 randomised controlled trials in dozens of countries' as another version of mind reframers Common Purpose. BIT works from its office in New York with cities and their agencies, as well as other partners, across the United States and Canada – this is a company part-owned by the British government Cabinet Office. An executive order by President Cult-servant Obama established a US Social and Behavioral Sciences Team in 2015. They all have the same reason for being and that's to brainwash the population directly and by brainwashing those in positions of authority.

'Covid' mind game

Another prime aspect of the UK mind-control network is the 'independent' [joke] Scientific Pandemic Insights Group on Behaviours (SPI-B) which 'provides behavioural science advice aimed at anticipating and helping people adhere to interventions that are recommended by medical or epidemiological experts'. That means manipulating public perception and behaviour to do whatever government tells them to do. It's disgusting and if they really want the public to be 'safe' this lot should all be under lock and key. According to the government website SPI-B consists of

'behavioural scientists, health and social psychologists, anthropologists and historians' and advises the Whitty-Vallance-led Scientific Advisory Group for Emergencies (SAGE) which in turn advises the government on 'the science' (it doesn't) and 'Covid' policy. When politicians say they are being guided by 'the science' this is the rabble in each country they are talking about and that 'science' is dominated by behaviour manipulators to enforce government fascism through public compliance. The Behaviour Insight Team is headed by psychologist David Solomon Halpern, a visiting professor at King's College London, and connects with a national and global web of other civilian and military organisations as the Cult moves towards its goal of fusing them into one fascistic whole in every country through its 'Fusion Doctrine'. The behaviour manipulation network involves, but is not confined to, the Foreign Office; National Security Council; government communications headquarters (GCHQ); MI5; MI6; the Cabinet Office-based Media Monitoring Unit; and the Rapid Response Unit which 'monitors digital trends to spot emerging issues; including misinformation and disinformation; and identifies the best way to respond'.

There is also the 77th Brigade of the UK military which operates like the notorious Israeli military's Unit 8200 in manipulating information and discussion on the Internet by posing as members of the public to promote the narrative and discredit those who challenge it. Here we have the military seeking to manipulate *domestic* public opinion while the Nazis in government are fine with that. Conservative Member of Parliament Tobias Ellwood, an advocate of lockdown and control through 'vaccine passports', is a Lieutenant Colonel reservist in the 77th Brigade which connects with the military operation jHub, the 'innovation centre' for the Ministry of Defence and Strategic Command. jHub has also been involved with the civilian National Health Service (NHS) in 'symptom tracing' the population. The NHS is a key part of this mind control network and produced a document in December, 2020, explaining to staff how to use psychological manipulation with different groups and ages to get them to have the DNA-manipulating 'Covid vaccine'

that's designed to cumulatively rewrite human genetics. The document, called 'Optimising Vaccination Roll Out – Do's and Don'ts for all messaging, documents and "communications" in the widest sense', was published by NHS England and the NHS Improvement *Behaviour Change Unit* in partnership with Public Health England and Warwick Business School. I hear the mantra about 'save the NHS' and 'protect the NHS' when we need to scrap the NHS and start again. The current version is far too corrupt, far too anti-human and totally compromised by Cult operatives and their assets. UK government broadcast media censor Ofcom will connect into this web – as will the BBC with its tremendous Ofcom influence – to control what the public see and hear and dictate mass perception. Nuremberg trials must include personnel from all these organisations.

The fear factor

The 'Covid' hoax has led to the creation of the UK Cabinet Office-connected Joint Biosecurity Centre (JBC) which is officially described as providing 'expert advice on pandemics' using its independent [all Cult operations are 'independent'] analytical function to provide real-time analysis about infection outbreaks to identify and respond to outbreaks of Covid-19'. Another role is to advise the government on a response to spikes in infections – 'for example by closing schools or workplaces in local areas where infection levels have risen'. Put another way, promoting the Cult agenda. The Joint Biosecurity Centre is modelled on the Joint Terrorism Analysis Centre which analyses intelligence to set 'terrorism threat levels' and here again you see the fusion of civilian and military operations and intelligence that has led to military intelligence producing documents about 'vaccine hesitancy' and how it can be combated. Domestic civilian matters and opinions should not be the business of the military. The Joint Biosecurity Centre is headed by Tom Hurd, director general of the Office for Security and Counter-Terrorism from the establishment-to-its-fingertips Hurd family. His father is former Foreign Secretary Douglas Hurd. How coincidental that Tom

Hurd went to the elite Eton College and Oxford University with Boris Johnson. Imperial College with its ridiculous computer modeller Neil Ferguson will connect with this gigantic web that will itself interconnect with similar set-ups in other major and not so major countries. Compared with this Cult network the politicians, be they Boris Johnson, Donald Trump or Joe Biden, are bit-part players 'following the science'. The network of psychologists was on the 'Covid' case from the start with the aim of generating maximum fear of the 'virus' to ensure compliance by the population. A government behavioural science group known as SPI-B produced a paper in March, 2020, for discussion by the main government science advisory group known as SAGE. It was headed 'Options for increasing adherence to social distancing measures' and it said the following in a section headed 'Persuasion':

- A substantial number of people still do not feel sufficiently personally threatened; it could be that they are reassured by the low death rate in their demographic group, although levels of concern may be rising. Having a good understanding of the risk has been found to be positively associated with adoption of COVID-19 social distancing measures in Hong Kong.
- The perceived level of personal threat needs to be increased among those who are complacent, using hard-hitting evaluation of options for increasing social distancing emotional messaging. To be effective this must also empower people by making clear the actions they can take to reduce the threat.
- Responsibility to others: There seems to be insufficient understanding of, or feelings of responsibility about, people's role in transmitting the infection to others ... Messaging about actions need to be framed positively in terms of protecting oneself and the community, and increase confidence that they will be effective.
- Some people will be more persuaded by appeals to play by the rules, some by duty to the community, and some to personal risk.

All these different approaches are needed. The messaging also needs to take account of the realities of different people's lives. Messaging needs to take account of the different motivational levers and circumstances of different people.

All this could be achieved the SPI-B psychologists said by *using the media to increase the sense of personal threat* which translates as terrify the shit out of the population, including children, so they all do what we want. That's not happened has it? Those excuses for 'journalists' who wouldn't know journalism if it bit them on the arse (the great majority) have played their crucial part in serving this Cult-government Psyop to enslave their own kids and grandkids. How they live with themselves I have no idea. The psychological war has been underpinned by constant government 'Covid' propaganda in almost every television and radio ad break, plus the Internet and print media, which has pounded out the fear with taxpayers footing the bill for their own programming. The result has been people terrified of a 'virus' that doesn't exist or one with a tiny fatality rate even if you believe it does. People walk down the street and around the shops wearing face-nappies damaging their health and psychology while others report those who refuse to be that naïve to the police who turn up in their own face-nappies. I had a cameraman come to my flat and he was so frightened of 'Covid' he came in wearing a mask and refused to shake my hand in case he caught something. He had – naïveitis – and the thought that he worked in the mainstream media was both depressing and made his behaviour perfectly explainable. The fear which has gripped the minds of so many and frozen them into compliance has been carefully cultivated by these psychologists who are really psychopaths. If lives get destroyed and a lot of young people commit suicide it shows our plan is working. SPI-B then turned to compulsion on the public to comply. 'With adequate preparation, rapid change can be achieved', it said. Some countries had introduced mandatory self-isolation on a wide scale without evidence of major public unrest and a large majority of the UK's population appeared to be supportive of more coercive measures with 64 percent of adults saying they would

support putting London under a lockdown (watch the 'polls' which are designed to make people believe that public opinion is in favour or against whatever the subject in hand).

For 'aggressive protective measures' to be effective, the SPI-B paper said, special attention should be devoted to those population groups that are more at risk. Translated from the Orwellian this means making the rest of population feel guilty for not protecting the 'vulnerable' such as old people which the Cult and its agencies were about to kill on an industrial scale with lockdown, lack of treatment and the Gates 'vaccine'. Psychopath psychologists sold their guilt-trip so comprehensively that Los Angeles County Supervisor Hilda Solis reported that children were apologising (from a distance) to their parents and grandparents for bringing 'Covid' into their homes and getting them sick. '... These apologies are just some of the last words that loved ones will ever hear as they die alone,' she said. Gut-wrenchingly Solis then used this childhood tragedy to tell children to stay at home and 'keep your loved ones alive'. Imagine heaping such potentially life-long guilt on a kid when it has absolutely nothing to do with them. These people are deeply disturbed and the psychologists behind this even more so.

Uncivil war – divide and rule

Professional mind-controllers at SPI-B wanted the media to increase a sense of responsibility to others (do as you're told) and promote 'positive messaging' for those actions while in contrast to invoke 'social disapproval' by the unquestioning, obedient, community of anyone with a mind of their own. Again the compliant Goebbels-like media obliged. This is an old, old, trick employed by tyrannies the world over throughout human history. You get the target population to keep the target population in line – *your* line. SPI-B said this could 'play an important role in preventing anti-social behaviour or discouraging failure to enact pro-social behaviour'. For 'anti-social' in the Orwellian parlance of SPI-B see any behaviour that government doesn't approve. SPI-B recommendations said that 'social disapproval' should be accompanied by clear messaging and

promotion of strong collective identity – hence the government and celebrity mantra of ‘we’re all in this together’. Sure we are. The mind doctors have such contempt for their targets that they think some clueless comedian, actor or singer telling them to do what the government wants will be enough to win them over. We have had UK comedian Lenny Henry, actor Michael Caine and singer Elton John wheeled out to serve the propagandists by urging people to have the DNA-manipulating ‘Covid’ non-‘vaccine’. The role of Henry and fellow black celebrities in seeking to coax a ‘vaccine’ reluctant black community into doing the government’s will was especially stomach-turning. An emotion-manipulating script and carefully edited video featuring these black ‘celebs’ was such an insult to the intelligence of black people and where’s the self-respect of those involved selling their souls to a fascist government agenda? Henry said he heard black people’s ‘legitimate worries and concerns’, but people must ‘trust the facts’ when they were doing exactly that by not having the ‘vaccine’. They had to include the obligatory reference to Black Lives Matter with the line ... ‘Don’t let coronavirus cost even more black lives – because we matter’. My god, it was pathetic. ‘I know the vaccine is safe and what it does.’ How? ‘I’m a comedian and it says so in my script.’

SPI-B said social disapproval needed to be carefully managed to avoid victimisation, scapegoating and misdirected criticism, but they knew that their ‘recommendations’ would lead to exactly that and the media were specifically used to stir-up the divide-and-conquer hostility. Those who conform like good little baa, baas, are praised while those who have seen through the tidal wave of lies are ‘Covidiot’. The awake have been abused by the fast asleep for not conforming to fascism and impositions that the awake know are designed to endanger their health, dehumanise them, and tear asunder the very fabric of human society. We have had the curtain-twitchers and morons reporting neighbours and others to the face-napped police for breaking ‘Covid rules’ with fascist police delighting in posting links and phone numbers where this could be done. The Cult cannot impose its will without a compliant police

and military or a compliant population willing to play their part in enslaving themselves and their kids. The words of a pastor in Nazi Germany are so appropriate today:

First they came for the socialists and I did not speak out because I was not a socialist.

Then they came for the trade unionists and I did not speak out because I was not a trade unionist.

Then they came for the Jews and I did not speak out because I was not a Jew.

Then they came for me and there was no one left to speak for me.

Those who don't learn from history are destined to repeat it and so many are.

'Covid' rules: Rewiring the mind

With the background laid out to this gigantic national and global web of psychological manipulation we can put 'Covid' rules into a clear and sinister perspective. Forget the claims about protecting health. 'Covid' rules are about dismantling the human mind, breaking the human spirit, destroying self-respect, and then putting Humpty Dumpty together again as a servile, submissive slave. Social isolation through lockdown and distancing have devastating effects on the human psyche as the psychological psychopaths well know and that's the real reason for them. Humans need contact with each other, discourse, closeness and touch, or they eventually, and literally, go crazy. Masks, which I will address at some length, fundamentally add to the effects of isolation and the Cult agenda to dehumanise and de-individualise the population. To do this while knowing – in fact *seeking* – this outcome is the very epitome of evil and psychologists involved in this *are* the epitome of evil. They must like all the rest of the Cult demons and their assets stand trial for crimes against humanity on a scale that defies the imagination. Psychopaths in uniform use isolation to break enemy troops and agents and make them subservient and submissive to tell what they know. The technique is rightly considered a form of torture and

torture is most certainly what has been imposed on the human population.

Clinically-insane American psychologist Harry Harlow became famous for his isolation experiments in the 1950s in which he separated baby monkeys from their mothers and imprisoned them for months on end in a metal container or 'pit of despair'. They soon began to show mental distress and depression as any idiot could have predicted. Harlow put other monkeys in steel chambers for three, six or twelve months while denying them any contact with animals or humans. He said that the effects of total social isolation for six months were 'so devastating and debilitating that we had assumed initially that twelve months of isolation would not produce any additional decrement'; but twelve months of isolation 'almost obliterated the animals socially'. This is what the Cult and its psychopaths are doing to you and your children. Even monkeys in partial isolation in which they were not allowed to form relationships with other monkeys became 'aggressive and hostile, not only to others, but also towards their own bodies'. We have seen this in the young as a consequence of lockdown. UK government psychopaths launched a public relations campaign telling people not to hug each other even after they received the 'Covid-19 vaccine' which we were told with more lies would allow a return to 'normal life'. A government source told *The Telegraph*: 'It will be along the lines that it is great that you have been vaccinated, but if you are going to visit your family and hug your grandchildren there is a chance you are going to infect people you love.' The source was apparently speaking from a secure psychiatric facility. Janet Lord, director of Birmingham University's Institute of Inflammation and Ageing, said that parents and grandparents should avoid hugging their children. Well, how can I put it, Ms Lord? Fuck off. Yep, that'll do.

Destroying the kids – where are the parents?

Observe what has happened to people enslaved and isolated by lockdown as suicide and self-harm has soared worldwide,

particularly among the young denied the freedom to associate with their friends. A study of 49,000 people in English-speaking countries concluded that almost half of young adults are at clinical risk of mental health disorders. A national survey in America of 1,000 currently enrolled high school and college students found that 5 percent reported attempting suicide during the pandemic. Data from the US CDC's National Syndromic Surveillance Program from January 1st to October 17th, 2020, revealed a *31 percent* increase in mental health issues among adolescents aged 12 to 17 compared with 2019. The CDC reported that America in general suffered the biggest drop in life expectancy since World War Two as it fell by a year in the first half of 2020 as a result of 'deaths of despair' – overdoses and suicides. Deaths of despair have leapt by more than 20 percent during lockdown and include the highest number of fatal overdoses ever recorded in a single year – 81,000. Internet addiction is another consequence of being isolated at home which lowers interest in physical activities as kids fall into inertia and what's the point? Children and young people are losing hope and giving up on life, sometimes literally. A 14-year-old boy killed himself in Maryland because he had 'given up' when his school district didn't reopen; an 11-year-old boy shot himself during a zoom class; a teenager in Maine succumbed to the isolation of the 'pandemic' when he ended his life after experiencing a disrupted senior year at school. Children as young as nine have taken their life and all these stories can be repeated around the world. Careers are being destroyed before they start and that includes those in sport in which promising youngsters have not been able to take part. The plan of the psycho-psychologists is working all right. Researchers at Cambridge University found that lockdowns cause significant harm to children's mental health. Their study was published in the *Archives of Disease in Childhood*, and followed 168 children aged between 7 and 11. The researchers concluded:

During the UK lockdown, children's depression symptoms have increased substantially, relative to before lockdown. The scale of this effect has direct relevance for the continuation of different elements of lockdown policy, such as complete or partial school closures ...

... Specifically, we observed a statistically significant increase in ratings of depression, with a medium-to-large effect size. Our findings emphasise the need to incorporate the potential impact of lockdown on child mental health in planning the ongoing response to the global pandemic and the recovery from it.

Not a chance when the Cult's psycho-psychologists were getting exactly what they wanted. The UK's Royal College of Paediatrics and Child Health has urged parents to look for signs of eating disorders in children and young people after a three to four fold increase. Specialists say the 'pandemic' is a major reason behind the rise. You don't say. The College said isolation from friends during school closures, exam cancellations, loss of extra-curricular activities like sport, and an increased use of social media were all contributory factors along with fears about the virus (psycho-psychologists again), family finances, and students being forced to quarantine. Doctors said young people were becoming severely ill by the time they were seen with 'Covid' regulations reducing face-to-face consultations. Nor is it only the young that have been devastated by the psychopaths. Like all bullies and cowards the Cult is targeting the young, elderly, weak and infirm. A typical story was told by a British lady called Lynn Parker who was not allowed to visit her husband in 2020 for the last ten and half months of his life 'when he needed me most' between March 20th and when he died on December 19th. This vacates the criminal and enters the territory of evil. The emotional impact on the immune system alone is immense as are the number of people of all ages worldwide who have died as a result of Cult-demanded, Gates-demanded, lockdowns.

Isolation is torture

The experience of imposing solitary confinement on millions of prisoners around the world has shown how a large percentage become 'actively psychotic and/or acutely suicidal'. Social isolation has been found to trigger 'a specific psychiatric syndrome, characterized by hallucinations; panic attacks; overt paranoia; diminished impulse control; hypersensitivity to external stimuli; and difficulties with thinking, concentration and memory'. Juan Mendez,

a United Nations rapporteur (investigator), said that isolation is a form of torture. Research has shown that even after isolation prisoners find it far more difficult to make social connections and I remember chatting to a shop assistant after one lockdown who told me that when her young son met another child again he had no idea how to act or what to do. Hannah Flanagan, Director of Emergency Services at Journey Mental Health Center in Dane County, Wisconsin, said: 'The specificity about Covid social distancing and isolation that we've come across as contributing factors to the suicides are really new to us this year.' But they are not new to those that devised them. They are getting the effect they want as the population is psychologically dismantled to be rebuilt in a totally different way. Children and the young are particularly targeted. They will be the adults when the full-on fascist AI-controlled technocracy is planned to be imposed and they are being prepared to meekly submit. At the same time older people who still have a memory of what life was like before – and how fascist the new normal really is – are being deleted. You are going to see efforts to turn the young against the old to support this geriatric genocide. Hannah Flanagan said the big increase in suicide in her county proved that social isolation is not only harmful, but deadly. Studies have shown that isolation from others is one of the main risk factors in suicide and even more so with women. Warnings that lockdown could create a 'perfect storm' for suicide were ignored. After all this was one of the *reasons* for lockdown. Suicide, however, is only the most extreme of isolation consequences. There are many others. Dr Dhruv Khullar, assistant professor of healthcare policy at Weill Cornell Medical College, said in a *New York Times* article in 2016 long before the fake 'pandemic':

A wave of new research suggests social separation is bad for us. Individuals with less social connection have disrupted sleep patterns, altered immune systems, more inflammation and higher levels of stress hormones. One recent study found that isolation increases the risk of heart disease by 29 percent and stroke by 32 percent. Another analysis that pooled data from 70 studies and 3.4 million people found that socially isolated individuals had a 30 percent higher risk of dying in the next seven years, and that this effect was largest in middle age.

Loneliness can accelerate cognitive decline in older adults, and isolated individuals are twice as likely to die prematurely as those with more robust social interactions. These effects start early: Socially isolated children have significantly poorer health 20 years later, even after controlling for other factors. All told, loneliness is as important a risk factor for early death as obesity and smoking.

There you have proof from that one article alone four years before 2020 that those who have enforced lockdown, social distancing and isolation knew what the effect would be and that is even more so with professional psychologists that have been driving the policy across the globe. We can go back even further to the years 2000 and 2003 and the start of a major study on the effects of isolation on health by Dr Janine Gronewold and Professor Dirk M. Hermann at the University Hospital in Essen, Germany, who analysed data on 4,316 people with an average age of 59 who were recruited for the long-term research project. They found that socially isolated people are more than 40 percent more likely to have a heart attack, stroke, or other major cardiovascular event and nearly 50 percent more likely to die from any cause. Given the financial Armageddon unleashed by lockdown we should note that the study found a relationship between increased cardiovascular risk and lack of financial support. After excluding other factors social isolation was still connected to a 44 percent increased risk of cardiovascular problems and a 47 percent increased risk of death by any cause. Lack of financial support was associated with a 30 percent increase in the risk of cardiovascular health events. Dr Gronewold said it had been known for some time that feeling lonely or lacking contact with close friends and family can have an impact on physical health and the study had shown that having strong social relationships is of high importance for heart health. Gronewold said they didn't understand yet why people who are socially isolated have such poor health outcomes, but this was obviously a worrying finding, particularly during these times of prolonged social distancing. Well, it can be explained on many levels. You only have to identify the point in the body where people feel loneliness and missing people they are parted from – it's in the centre of the chest where they feel the ache of loneliness and the ache of missing people. 'My heart aches for

you' ... 'My heart aches for some company.' I will explain this more in the chapter Escaping Wetiko, but when you realise that the body is the mind – they are expressions of each other – the reason why state of the mind dictates state of the body becomes clear.

American psychologist Ranjit Powar was highlighting the effects of lockdown isolation as early as April, 2020. She said humans have evolved to be social creatures and are wired to live in interactive groups. Being isolated from family, friends and colleagues could be unbalancing and traumatic for most people and could result in short or even long-term psychological and physical health problems. An increase in levels of anxiety, aggression, depression, forgetfulness and hallucinations were possible psychological effects of isolation. 'Mental conditions may be precipitated for those with underlying pre-existing susceptibilities and show up in many others without any pre-condition.' Powar said personal relationships helped us cope with stress and if we lost this outlet for letting off steam the result can be a big emotional void which, for an average person, was difficult to deal with. 'Just a few days of isolation can cause increased levels of anxiety and depression' – so what the hell has been the effect on the global population of *18 months* of this at the time of writing? Powar said: 'Add to it the looming threat of a dreadful disease being repeatedly hammered in through the media and you have a recipe for many shades of mental and physical distress.' For those with a house and a garden it is easy to forget that billions have had to endure lockdown isolation in tiny overcrowded flats and apartments with nowhere to go outside. The psychological and physical consequences of this are unimaginable and with lunatic and abusive partners and parents the consequences have led to tremendous increases in domestic and child abuse and alcoholism as people seek to shut out the horror. Ranjit Powar said:

Staying in a confined space with family is not all a rosy picture for everyone. It can be extremely oppressive and claustrophobic for large low-income families huddled together in small single-room houses. Children here are not lucky enough to have many board/electronic games or books to keep them occupied.

Add to it the deep insecurity of running out of funds for food and basic necessities. On the other hand, there are people with dysfunctional family dynamics, such as domineering, abusive or alcoholic partners, siblings or parents which makes staying home a period of trial. Incidence of suicide and physical abuse against women has shown a worldwide increase. Heightened anxiety and depression also affect a person's immune system, making them more susceptible to illness.

To think that Powar's article was published on April 11th, 2020.

Six-feet fantasy

Social (unsocial) distancing demanded that people stay six feet or two metres apart. UK government advisor Robert Dingwall from the New and Emerging Respiratory Virus Threats Advisory Group said in a radio interview that the two-metre rule was 'conjured up out of nowhere' and was not based on science. No, it was not based on *medical* science, but it didn't come out of nowhere. The distance related to *psychological* science. Six feet/two metres was adopted in many countries and we were told by people like the criminal Anthony Fauci and his ilk that it was founded on science. Many schools could not reopen because they did not have the space for six-foot distancing. Then in March, 2021, after a year of six-foot 'science', a study published in the *Journal of Infectious Diseases* involving more than 500,000 students and almost 100,000 staff over 16 weeks revealed no significant difference in 'Covid' cases between six feet and three feet and Fauci changed his tune. Now three feet was okay. There is no difference between six feet and three *inches* when there is no 'virus' and they got away with six feet for psychological reasons for as long as they could. I hear journalists and others talk about 'unintended consequences' of lockdown. They are not *unintended* at all; they have been coldly-calculated for a specific outcome of human control and that's why super-psychopaths like Gates have called for them so vehemently. Super-psychopath psychologists have demanded them and psychopathic or clueless, spineless, politicians have gone along with them by 'following the science'. But it's not science at all. 'Science' is not what is; it's only what people can be manipulated to believe it is. The whole 'Covid' catastrophe is

founded on mind control. Three word or three statement mantras issued by the UK government are a well-known mind control technique and so we've had 'Stay home/protect the NHS/save lives', 'Stay alert/control the virus/save lives' and 'hands/face/space'. One of the most vocal proponents of extreme 'Covid' rules in the UK has been Professor Susan Michie, a member of the British Communist Party, who is not a medical professional. Michie is the director of the Centre for Behaviour Change at University College London. She is a *behavioural psychologist* and another filthy rich 'Marxist' who praised China's draconian lockdown. She was known by fellow students at Oxford University as 'Stalin's nanny' for her extreme Marxism. Michie is an influential member of the UK government's Scientific Advisory Group for Emergencies (SAGE) and behavioural manipulation groups which have dominated 'Covid' policy. She is a consultant adviser to the World Health Organization on 'Covid-19' and behaviour. Why the hell are lockdowns anything to do with her when they are claimed to be about health? Why does a behavioural psychologist from a group charged with changing the behaviour of the public want lockdown, human isolation and mandatory masks? Does that question really need an answer? Michie *absolutely* has to explain herself before a Nuremberg court when humanity takes back its world again and even more so when you see the consequences of masks that she demands are compulsory. This is a Michie classic:

The benefits of getting primary school children to wear masks is that regardless of what little degree of transmission is occurring in those age groups it could help normalise the practice. Young children wearing masks may be more likely to get their families to accept masks.

Those words alone should carry a prison sentence when you ponder on the callous disregard for children involved and what a statement it makes about the mind and motivations of Susan Michie. What a lovely lady and what she said there encapsulates the mentality of the psychopaths behind the 'Covid' horror. Let us compare what Michie said with a countrywide study in Germany published at [researchsquare.com](https://www.researchsquare.com) involving 25,000 school children and 17,854 health complaints submitted by parents. Researchers

found that masks are harming children physically, psychologically, and behaviourally with 24 health issues associated with mask wearing. They include: shortness of breath (29.7%); dizziness (26.4%); increased headaches (53%); difficulty concentrating (50%); drowsiness or fatigue (37%); and malaise (42%). Nearly a third of children experienced more sleep issues than before and a quarter developed new fears. Researchers found health issues and other impairments in 68 percent of masked children covering their faces for an average of 4.5 hours a day. Hundreds of those taking part experienced accelerated respiration, tightness in the chest, weakness, and short-term impairment of consciousness. A reminder of what Michie said again:

The benefits of getting primary school children to wear masks is that regardless of what little degree of transmission is occurring in those age groups it could help normalise the practice. Young children wearing masks may be more likely to get their families to accept masks.

Psychopaths in government and psychology now have children and young people – plus all the adults – wearing masks for hours on end while clueless teachers impose the will of the psychopaths on the young they should be protecting. What the hell are parents doing?

Cult lab rats

We have some schools already imposing on students microchipped buzzers that activate when they get 'too close' to their pals in the way they do with lab rats. How apt. To the Cult and its brain-dead servants our children *are* lab rats being conditioned to be unquestioning, dehumanised slaves for the rest of their lives.

Children and young people are being weaned and frightened away from the most natural human instincts including closeness and touch. I have tracked in the books over the years how schools were banning pupils from greeting each other with a hug and the whole Cult-induced Me Too movement has terrified men and boys from a relaxed and natural interaction with female friends and work colleagues to the point where many men try never to be in a room

alone with a woman that's not their partner. Airhead celebrities have as always played their virtue-signalling part in making this happen with their gross exaggeration. For every monster like Harvey Weinstein there are at least tens of thousands of men that don't treat women like that; but everyone must be branded the same and policy changed for them as well as the monster. I am going to be using the word 'dehumanise' many times in this chapter because that is what the Cult is seeking to do and it goes very deep as we shall see. Don't let them kid you that social distancing is planned to end one day. That's not the idea. We are seeing more governments and companies funding and producing wearable gadgets to keep people apart and they would not be doing that if this was meant to be short-term. A tech start-up company backed by GCHQ, the British Intelligence and military surveillance headquarters, has created a social distancing wrist sensor that alerts people when they get too close to others. The CIA has also supported tech companies developing similar devices. The wearable sensor was developed by Tended, one of a number of start-up companies supported by GCHQ (see the CIA and DARPA). The device can be worn on the wrist or as a tag on the waistband and will vibrate whenever someone wearing the device breaches social distancing and gets anywhere near natural human contact. The company had a lucky break in that it was developing a distancing sensor when the 'Covid' hoax arrived which immediately provided a potentially enormous market. How fortunate. The government in big-time Cult-controlled Ontario in Canada is investing \$2.5 million in wearable contact tracing technology that 'will alert users if they may have been exposed to the Covid-19 in the workplace and will beep or vibrate if they are within six feet of another person'. Facedrive Inc., the technology company behind this, was founded in 2016 with funding from the Ontario Together Fund and obviously they, too, had a prophet on the board of directors. The human surveillance and control technology is called TraceSCAN and would be worn by the human cyborgs in places such as airports, workplaces, construction sites, care homes and ... *schools*.

I emphasise schools with children and young people the prime targets. You know what is planned for society as a whole if you keep your eyes on the schools. They have always been places where the state program the next generation of slaves to be its compliant worker-ants – or Woker-ants these days; but in the mist of the ‘Covid’ madness they have been transformed into mind laboratories on a scale never seen before. Teachers and head teachers are just as programmed as the kids – often more so. Children are kept apart from human interaction by walk lanes, classroom distancing, staggered meal times, masks, and the rolling-out of buzzer systems. Schools are now physically laid out as a laboratory maze for lab-rats. Lunatics at a school in Anchorage, Alaska, who should be prosecuted for child abuse, took away desks and forced children to kneel (know your place) on a mat for five hours a day while wearing a mask and using their chairs as a desk. How this was supposed to impact on a ‘virus’ only these clinically insane people can tell you and even then it would be clap-trap. The school banned recess (interaction), art classes (creativity), and physical exercise (getting body and mind moving out of inertia). Everyone behind this outrage should be in jail or better still a mental institution. The behavioural manipulators are all for this dystopian approach to schools. Professor Susan Michie, the mind-doctor and British Communist Party member, said it was wrong to say that schools were safe. They had to be made so by ‘distancing’, masks and ventilation (sitting all day in the cold). I must ask this lady round for dinner on a night I know I am going to be out and not back for weeks. She probably wouldn’t be able to make it, anyway, with all the visits to her own psychologist she must have block-booked.

Masking identity

I know how shocking it must be for you that a behaviour manipulator like Michie wants everyone to wear masks which have long been a feature of mind-control programs like the infamous MKUltra in the United States, but, there we are. We live and learn. I spent many years from 1996 to right across the millennium

researching mind control in detail on both sides of the Atlantic and elsewhere. I met a large number of mind-control survivors and many had been held captive in body and mind by MKUltra. MK stands for mind-control, but employs the German spelling in deference to the Nazis spirited out of Germany at the end of World War Two by Operation Paperclip in which the US authorities, with help from the Vatican, transported Nazi mind-controllers and engineers to America to continue their work. Many of them were behind the creation of NASA and they included Nazi scientist and SS officer Wernher von Braun who swapped designing V-2 rockets to bombard London with designing the Saturn V rockets that powered the NASA moon programme's Apollo craft. I think I may have mentioned that the Cult has no borders. Among Paperclip escapees was Josef Mengele, the Angel of Death in the Nazi concentration camps where he conducted mind and genetic experiments on children often using twins to provide a control twin to measure the impact of his 'work' on the other. If you want to observe the Cult mentality in all its extremes of evil then look into the life of Mengele. I have met many people who suffered mercilessly under Mengele in the United States where he operated under the name Dr Greene and became a stalwart of MKUltra programming and torture. Among his locations was the underground facility in the Mojave Desert in California called the China Lake Naval Weapons Station which is almost entirely below the surface. My books *The Biggest Secret*, *Children of the Matrix* and *The Perception Deception* have the detailed background to MKUltra.

The best-known MKUltra survivor is American Cathy O'Brien. I first met her and her late partner Mark Phillips at a conference in Colorado in 1996. Mark helped her escape and deprogram from decades of captivity in an offshoot of MKUltra known as Project Monarch in which 'sex slaves' were provided for the rich and famous including Father George Bush, Dick Cheney and the Clintons. Read Cathy and Mark's book *Trance-Formation of America* and if you are new to this you will be shocked to the core. I read it in 1996 shortly before, with the usual synchronicity of my life, I found

myself given a book table at the conference right next to hers. MKUltra never ended despite being very publicly exposed (only a small part of it) in the 1970s and continues in other guises. I am still in touch with Cathy. She contacted me during 2020 after masks became compulsory in many countries to tell me how they were used as part of MKUltra programming. I had been observing 'Covid regulations' and the relationship between authority and public for months. I saw techniques that I knew were employed on individuals in MKUltra being used on the global population. I had read many books and manuals on mind control including one called *Silent Weapons for Quiet Wars* which came to light in the 1980s and was a guide on how to perceptually program on a mass scale. 'Silent Weapons' refers to mind-control. I remembered a line from the manual as governments, medical authorities and law enforcement agencies have so obviously talked to – or rather at – the adult population since the 'Covid' hoax began as if they are children. The document said:

If a person is spoken to by a T.V. advertiser as if he were a twelve-year-old, then, due to suggestibility, he will, with a certain probability, respond or react to that suggestion with the uncritical response of a twelve-year-old and will reach in to his economic reservoir and deliver its energy to buy that product on impulse when he passes it in the store.

That's why authority has spoken to adults like children since all this began.

Why did Michael Jackson wear masks?

Every aspect of the 'Covid' narrative has mind-control as its central theme. Cathy O'Brien wrote an article for davidicke.com about the connection between masks and mind control. Her daughter Kelly who I first met in the 1990s was born while Cathy was still held captive in MKUltra. Kelly was forced to wear a mask as part of her programming from the age of *two* to dehumanise her, target her sense of individuality and reduce the amount of oxygen her brain and body received. *Bingo*. This is the real reason for compulsory

masks, why they have been enforced en masse, and why they seek to increase the number they demand you wear. First one, then two, with one disgraceful alleged 'doctor' recommending four which is nothing less than a death sentence. Where and how often they must be worn is being expanded for the purpose of mass mind control and damaging respiratory health which they can call 'Covid-19'. Canada's government headed by the man-child Justin Trudeau, says it's fine for children of two and older to wear masks. An insane 'study' in Italy involving just 47 children concluded there was no problem for babies as young as *four months* wearing them. Even after people were 'vaccinated' they were still told to wear masks by the criminal that is Anthony Fauci. Cathy wrote that mandating masks is allowing the authorities literally to control the air we breathe which is what was done in MKUltra. You might recall how the singer Michael Jackson wore masks and there is a reason for that. He was subjected to MKUltra mind control through Project Monarch and his psyche was scrambled by these simpletons. Cathy wrote:

In MKUltra Project Monarch mind control, Michael Jackson had to wear a mask to silence his voice so he could not reach out for help. Remember how he developed that whisper voice when he wasn't singing? Masks control the mind from the outside in, like the redefining of words is doing. By controlling what we can and cannot say for fear of being labeled racist or beaten, for example, it ultimately controls thought that drives our words and ultimately actions (or lack thereof).

Likewise, a mask muffles our speech so that we are not heard, which controls voice ... words ... mind. This is Mind Control. Masks are an obvious mind control device, and I am disturbed so many people are complying on a global scale. Masks depersonalize while making a person feel as though they have no voice. It is a barrier to others. People who would never choose to comply but are forced to wear a mask in order to keep their job, and ultimately their family fed, are compromised. They often feel shame and are subdued. People have stopped talking with each other while media controls the narrative.

The 'no voice' theme has often become literal with train passengers told not to speak to each other in case they pass on the 'virus', singing banned for the same reason and bonkers California officials telling people riding roller coasters that they cannot shout and scream. Cathy said she heard every day from healed MKUltra survivors who cannot wear a mask without flashing back on ways

their breathing was controlled – ‘from ball gags and penises to water boarding’. She said that through the years when she saw images of people in China wearing masks ‘due to pollution’ that it was really to control their oxygen levels. ‘I knew it was as much of a population control mechanism of depersonalisation as are burkas’, she said. Masks are another Chinese communist/fascist method of control that has been swept across the West as the West becomes China at lightning speed since we entered 2020.

Mask-19

There are other reasons for mandatory masks and these include destroying respiratory health to call it ‘Covid-19’ and stunting brain development of children and the young. Dr Margarite Griesz-Brisson MD, PhD, is a Consultant Neurologist and Neurophysiologist and the Founder and Medical Director of the London Neurology and Pain Clinic. Her CV goes down the street and round the corner. She is clearly someone who cares about people and won’t parrot the propaganda. Griesz-Brisson has a PhD in pharmacology, with special interest in neurotoxicology, environmental medicine, neuroregeneration and neuroplasticity (the way the brain can change in the light of information received). She went public in October, 2020, with a passionate warning about the effects of mask-wearing laws:

The reinhalation of our exhaled air will without a doubt create oxygen deficiency and a flooding of carbon dioxide. We know that the human brain is very sensitive to oxygen deprivation. There are nerve cells for example in the hippocampus that can’t be longer than 3 minutes without oxygen – they cannot survive. The acute warning symptoms are headaches, drowsiness, dizziness, issues in concentration, slowing down of reaction time – reactions of the cognitive system.

Oh, I know, let’s tell bus, truck and taxi drivers to wear them and people working machinery. How about pilots, doctors and police? Griesz-Brisson makes the important point that while the symptoms she mentions may fade as the body readjusts this does not alter the fact that people continue to operate in oxygen deficit with long list of

potential consequences. She said it was well known that neurodegenerative diseases take years or decades to develop. 'If today you forget your phone number, the breakdown in your brain would have already started 20 or 30 years ago.' She said degenerative processes in your brain are getting amplified as your oxygen deprivation continues through wearing a mask. Nerve cells in the brain are unable to divide themselves normally in these circumstances and lost nerve cells will no longer be regenerated. 'What is gone is gone.' Now consider that people like shop workers and *schoolchildren* are wearing masks for hours every day. What in the name of sanity is going to be happening to them? 'I do not wear a mask, I need my brain to think', Griesz-Brisson said, 'I want to have a clear head when I deal with my patients and not be in a carbon dioxide-induced anaesthesia'. If you are told to wear a mask anywhere ask the organisation, police, store, whatever, for their risk assessment on the dangers and negative effects on mind and body of enforcing mask-wearing. They won't have one because it has never been done not even by government. All of them must be subject to class-action lawsuits as the consequences come to light. They don't do mask risk assessments for an obvious reason. They know what the conclusions would be and independent scientific studies that *have* been done tell a horror story of consequences.

'Masks are criminal'

Dr Griesz-Brisson said that for children and adolescents, masks are an absolute no-no. They had an extremely active and adaptive immune system and their brain was incredibly active with so much to learn. 'The child's brain, or the youth's brain, is thirsting for oxygen.' The more metabolically active an organ was, the more oxygen it required; and in children and adolescents every organ was metabolically active. Griesz-Brisson said that to deprive a child's or adolescent's brain of oxygen, or to restrict it in any way, was not only dangerous to their health, it was absolutely criminal. 'Oxygen deficiency inhibits the development of the brain, and the damage that has taken place as a result CANNOT be reversed.' Mind

manipulators of MKUltra put masks on two-year-olds they wanted to neurologically rewire and you can see why. Griesz-Brisson said a child needs the brain to learn and the brain needs oxygen to function. 'We don't need a clinical study for that. This is simple, indisputable physiology.' Consciously and purposely induced oxygen deficiency was an absolutely deliberate health hazard, and an absolute medical contraindication which means that 'this drug, this therapy, this method or measure should not be used, and is not allowed to be used'. To coerce an entire population to use an absolute medical contraindication by force, she said, there had to be definite and serious reasons and the reasons must be presented to competent interdisciplinary and independent bodies to be verified and authorised. She had this warning of the consequences that were coming if mask wearing continued:

When, in ten years, dementia is going to increase exponentially, and the younger generations couldn't reach their god-given potential, it won't help to say 'we didn't need the masks'. I know how damaging oxygen deprivation is for the brain, cardiologists know how damaging it is for the heart, pulmonologists know how damaging it is for the lungs. Oxygen deprivation damages every single organ. Where are our health departments, our health insurance, our medical associations? It would have been their duty to be vehemently against the lockdown and to stop it and stop it from the very beginning.

Why do the medical boards issue punishments to doctors who give people exemptions? Does the person or the doctor seriously have to prove that oxygen deprivation harms people? What kind of medicine are our doctors and medical associations representing? Who is responsible for this crime? The ones who want to enforce it? The ones who let it happen and play along, or the ones who don't prevent it?

All of the organisations and people she mentions there either answer directly to the Cult or do whatever hierarchical levels above them tell them to do. The outcome of both is the same. 'It's not about masks, it's not about viruses, it's certainly not about your health', Griesz-Brisson said. 'It is about much, much more. I am not participating. I am not afraid.' They were taking our air to breathe and there was no unfounded medical exemption from face masks. Oxygen deprivation was dangerous for every single brain. It had to be the free decision of every human being whether they want to

wear a mask that was absolutely ineffective to protect themselves from a virus. She ended by rightly identifying where the responsibility lies for all this:

The imperative of the hour is personal responsibility. We are responsible for what we think, not the media. We are responsible for what we do, not our superiors. We are responsible for our health, not the World Health Organization. And we are responsible for what happens in our country, not the government.

Halle-bloody-lujah.

But surgeons wear masks, right?

Independent studies of mask-wearing have produced a long list of reports detailing mental, emotional and physical dangers. What a definition of insanity to see police officers imposing mask-wearing on the public which will cumulatively damage their health while the police themselves wear masks that will cumulatively damage *their* health. It's utter madness and both public and police do this because 'the government says so' – yes a government of brain-donor idiots like UK Health Secretary Matt Hancock reading the 'follow the science' scripts of psychopathic, lunatic psychologists. The response you get from Stockholm syndrome sufferers defending the very authorities that are destroying them and their families is that 'surgeons wear masks'. This is considered the game, set and match that they must work and don't cause oxygen deficit. Well, actually, scientific studies have shown that they *do* and oxygen levels are monitored in operating theatres to compensate. Surgeons wear masks to stop spittle and such like dropping into open wounds – not to stop 'viral particles' which are so miniscule they can only be seen through an electron microscope. Holes in the masks are significantly bigger than 'viral particles' and if you sneeze or cough they will breach the mask. I watched an incredibly disingenuous 'experiment' that claimed to prove that masks work in catching 'virus' material from the mouth and nose. They did this with a slow motion camera and the mask did block big stuff which stayed inside the mask and

against the face to be breathed in or cause infections on the face as we have seen with many children. 'Viral particles', however, would never have been picked up by the camera as they came through the mask when they are far too small to be seen. The 'experiment' was therefore disingenuous *and* useless.

Studies have concluded that wearing masks in operating theatres (and thus elsewhere) make no difference to preventing infection while the opposite is true with toxic shite building up in the mask and this had led to an explosion in tooth decay and gum disease dubbed by dentists 'mask mouth'. You might have seen the Internet video of a furious American doctor urging people to take off their masks after a four-year-old patient had been rushed to hospital the night before and nearly died with a lung infection that doctors sourced to mask wearing. A study in the journal *Cancer Discovery* found that inhalation of harmful microbes can contribute to advanced stage lung cancer in adults and long-term use of masks can help breed dangerous pathogens. Microbiologists have said frequent mask wearing creates a moist environment in which microbes can grow and proliferate before entering the lungs. The Canadian Agency for Drugs and Technologies in Health, or CADTH, a Canadian national organisation that provides research and analysis to healthcare decision-makers, said this as long ago as 2013 in a report entitled 'Use of Surgical Masks in the Operating Room: A Review of the Clinical Effectiveness and Guidelines'. It said:

- No evidence was found to support the use of surgical face masks to reduce the frequency of surgical site infections
- No evidence was found on the effectiveness of wearing surgical face masks to protect staff from infectious material in the operating room.
- Guidelines recommend the use of surgical face masks by staff in the operating room to protect both operating room staff and patients (despite the lack of evidence).

We were told that the world could go back to 'normal' with the arrival of the 'vaccines'. When they came, fraudulent as they are, the story changed as I knew that it would. We are in the midst of transforming 'normal', not going back to it. Mary Ramsay, head of immunisation at Public Health England, echoed the words of US criminal Anthony Fauci who said masks and other regulations must stay no matter if people are vaccinated. The Fauci idiot continued to wear two masks – different colours so both could be clearly seen – after he *claimed* to have been vaccinated. Senator Rand Paul told Fauci in one exchange that his double-masks were 'theatre' and he was right. It's all theatre. Mary Ramsay back-tracked on the vaccine-return-to-normal theme when she said the public may need to wear masks and social-distance for years despite the jabs. 'People have got used to those lower-level restrictions now, and [they] can live with them', she said telling us what the idea has been all along. 'The vaccine does not give you a pass, even if you have had it, you must continue to follow all the guidelines' said a Public Health England statement which reneged on what we had been told before and made having the 'vaccine' irrelevant to 'normality' even by the official story. Spain's fascist government trumped everyone by passing a law mandating the wearing of masks on the beach and even when swimming in the sea. The move would have devastated what's left of the Spanish tourist industry, posed potential breathing dangers to swimmers and had Northern European sunbathers walking around with their forehead brown and the rest of their face white as a sheet. The ruling was so crazy that it had to be retracted after pressure from public and tourist industry, but it confirmed where the Cult wants to go with masks and how clinically insane authority has become. The determination to make masks permanent and hide the serious dangers to body and mind can be seen in the censorship of scientist Professor Denis Rancourt by Bill Gates-funded academic publishing website ResearchGate over his papers exposing the dangers and uselessness of masks. Rancourt said:

ResearchGate today has permanently locked my account, which I have had since 2015. Their reasons graphically show the nature of their attack against democracy, and their corruption of

science ... By their obscene non-logic, a scientific review of science articles reporting on harms caused by face masks has a 'potential to cause harm'. No criticism of the psychological device (face masks) is tolerated, if the said criticism shows potential to influence public policy.

This is what happens in a fascist world.

Where are the 'greens' (again)?

Other dangers of wearing masks especially regularly relate to the inhalation of minute plastic fibres into the lungs and the deluge of discarded masks in the environment and oceans. Estimates predicted that more than 1.5 billion disposable masks will end up in the world's oceans every year polluting the water with tons of plastic and endangering marine wildlife. Studies project that humans are using 129 billion face masks each month worldwide – about three million a minute. Most are disposable and made from plastic, non-biodegradable microfibers that break down into smaller plastic particles that become widespread in ecosystems. They are littering cities, clogging sewage channels and turning up in bodies of water. I have written in other books about the immense amounts of microplastics from endless sources now being absorbed into the body. Rolf Halden, director of the Arizona State University (ASU) Biodesign Center for Environmental Health Engineering, was the senior researcher in a 2020 study that analysed 47 human tissue samples and found microplastics in all of them. 'We have detected these chemicals of plastics in every single organ that we have investigated', he said. I wrote in *The Answer* about the world being deluged with microplastics. A study by the Worldwide Fund for Nature (WWF) found that people are consuming on average every week some 2,000 tiny pieces of plastic mostly through water and also through marine life and the air. Every year humans are ingesting enough microplastics to fill a heaped dinner plate and in a life-time of 79 years it is enough to fill two large waste bins. Marco Lambertini, WWF International director general said: 'Not only are plastics polluting our oceans and waterways and killing marine life – it's in all of us and we can't escape consuming plastics,' American

geologists found tiny plastic fibres, beads and shards in rainwater samples collected from the remote slopes of the Rocky Mountain National Park near Denver, Colorado. Their report was headed: 'It is raining plastic.' Rachel Adams, senior lecturer in Biomedical Science at Cardiff Metropolitan University, said that among health consequences are internal inflammation and immune responses to a 'foreign body'. She further pointed out that microplastics become carriers of toxins including mercury, pesticides and dioxins (a known cause of cancer and reproductive and developmental problems). These toxins accumulate in the fatty tissues once they enter the body through microplastics. Now this is being compounded massively by people putting plastic on their face and throwing it away.

Workers exposed to polypropylene plastic fibres known as 'flock' have developed 'flock worker's lung' from inhaling small pieces of the flock fibres which can damage lung tissue, reduce breathing capacity and exacerbate other respiratory problems. *Now ...* commonly used surgical masks have three layers of melt-blown textiles made of ... polypropylene. We have billions of people putting these microplastics against their mouth, nose and face for hours at a time day after day in the form of masks. How does anyone think that will work out? I mean – what could possibly go wrong? We posted a number of scientific studies on this at davidicke.com, but when I went back to them as I was writing this book the links to the science research website where they were hosted were dead. Anything that challenges the official narrative in any way is either censored or vilified. The official narrative is so unsupportable by the evidence that only deleting the truth can protect it. A study by Chinese scientists still survived – with the usual twist which it why it was still active, I guess. Yes, they found that virtually all the masks they tested increased the daily intake of microplastic fibres, but people should still wear them because the danger from the 'virus' was worse said the crazy 'team' from the Institute of Hydrobiology in Wuhan. Scientists first discovered microplastics in lung tissue of some patients who died of lung cancer

in the 1990s. Subsequent studies have confirmed the potential health damage with the plastic degrading slowly and remaining in the lungs to accumulate in volume. Wuhan researchers used a machine simulating human breathing to establish that masks shed up to nearly 4,000 microplastic fibres in a month with reused masks producing more. Scientists said some masks are laced with toxic chemicals and a variety of compounds seriously restricted for both health and environmental reasons. They include cobalt (used in blue dye) and formaldehyde known to cause watery eyes, burning sensations in the eyes, nose, and throat, plus coughing, wheezing and nausea. No – that must be ‘Covid-19’.

Mask ‘worms’

There is another and potentially even more sinister content of masks. Mostly new masks of different makes filmed under a microscope around the world have been found to contain strange black fibres or ‘worms’ that appear to move or ‘crawl’ by themselves and react to heat and water. The nearest I have seen to them are the self-replicating fibres that are pulled out through the skin of those suffering from Morgellons disease which has been connected to the phenomena of ‘chemtrails’ which I will bring into the story later on. Morgellons fibres continue to grow outside the body and have a form of artificial intelligence. Black ‘worm’ fibres in masks have that kind of feel to them and there is a nanotechnology technique called ‘worm micelles’ which carry and release drugs or anything else you want to deliver to the body. For sure the suppression of humanity by mind altering drugs is the Cult agenda big time and the more excuses they can find to gain access to the body the more opportunities there are to make that happen whether through ‘vaccines’ or masks pushed against the mouth and nose for hours on end.

So let us summarise the pros and cons of masks:

Against masks: Breathing in your own carbon dioxide; depriving the body and brain of sufficient oxygen; build-up of toxins in the mask that can be breathed into the lungs and cause rashes on the face and 'mask-mouth'; breathing microplastic fibres and toxic chemicals into the lungs; dehumanisation and deleting individualisation by literally making people faceless; destroying human emotional interaction through facial expression and deleting parental connection with their babies which look for guidance to their facial expression.

For masks: They don't protect you from a 'virus' that doesn't exist and even if it did 'viral' particles are so minute they are smaller than the holes in the mask.

Governments, police, supermarkets, businesses, transport companies, and all the rest who seek to impose masks have done no risk assessment on their consequences for health and psychology and are now open to group lawsuits when the impact becomes clear with a cumulative epidemic of respiratory and other disease. Authorities will try to exploit these effects and hide the real cause by dubbing them 'Covid-19'. Can you imagine setting out to force the population to wear health-destroying masks without doing any assessment of the risks? It is criminal and it is evil, but then how many people targeted in this way, who see their children told to wear them all day at school, have asked for a risk assessment? Billions can't be imposed upon by the few unless the billions allow it. Oh, yes, with just a tinge of irony, 85 percent of all masks made worldwide come from *China*.

Wash your hands in toxic shite

'Covid' rules include the use of toxic sanitisers and again the health consequences of constantly applying toxins to be absorbed through the skin is obvious to any level of Renegade Mind. America's Food and Drug Administration (FDA) said that sanitisers are drugs and issued a warning about 75 dangerous brands which contain

methanol used in antifreeze and can cause death, kidney damage and blindness. The FDA circulated the following warning even for those brands that it claims to be safe:

Store hand sanitizer out of the reach of pets and children, and children should use it only with adult supervision. Do not drink hand sanitizer. This is particularly important for young children, especially toddlers, who may be attracted by the pleasant smell or brightly colored bottles of hand sanitizer.

Drinking even a small amount of hand sanitizer can cause alcohol poisoning in children. (However, there is no need to be concerned if your children eat with or lick their hands after using hand sanitizer.) During this coronavirus pandemic, poison control centers have had an increase in calls about accidental ingestion of hand sanitizer, so it is important that adults monitor young children's use.

Do not allow pets to swallow hand sanitizer. If you think your pet has eaten something potentially dangerous, call your veterinarian or a pet poison control center right away. Hand sanitizer is flammable and should be stored away from heat and flames. When using hand sanitizer, rub your hands until they feel completely dry before performing activities that may involve heat, sparks, static electricity, or open flames.

There you go, perfectly safe, then, and that's without even a mention of the toxins absorbed through the skin. Come on kids – sanitise your hands everywhere you go. It will save you from the 'virus'. Put all these elements together of the 'Covid' normal and see how much health and psychology is being cumulatively damaged, even devastated, to 'protect your health'. Makes sense, right? They are only imposing these things because they care, right? *Right?*

Submitting to insanity

Psychological reframing of the population goes very deep and is done in many less obvious ways. I hear people say how contradictory and crazy 'Covid' rules are and how they are ever changing. This is explained away by dismissing those involved as idiots. It is a big mistake. The Cult is delighted if its cold calculation is perceived as incompetence and idiocy when it is anything but. Oh, yes, there are idiots within the system – lots of them – but they are *administering* the Cult agenda, mostly unknowingly. They are not deciding and dictating it. The bulwark against tyranny is self-

respect, always has been, always will be. It is self-respect that has broken every tyranny in history. By its very nature self-respect will not bow to oppression and its perpetrators. There is so little self-respect that it's always the few that overturn dictators. Many may eventually follow, but the few with the iron spines (self-respect) kick it off and generate the momentum. The Cult targets self-respect in the knowledge that once this has gone only submission remains. Crazy, contradictory, ever-changing 'Covid' rules are systematically applied by psychologists to delete self-respect. They *want* you to see that the rules make no sense. It is one thing to decide to do something when *you* have made the choice based on evidence and logic. You still retain your self-respect. It is quite another when you can see what you are being told to do is insane, ridiculous and makes no sense, and *yet you still do it*. Your self-respect is extinguished and this has been happening as ever more obviously stupid and nonsensical things have been demanded and the great majority have complied even when they can see they are stupid and nonsensical.

People walk around in face-nappies knowing they are damaging their health and make no difference to a 'virus'. They do it in fear of not doing it. I know it's daft, but I'll do it anyway. When that happens something dies inside of you and submissive reframing has begun. Next there's a need to hide from yourself that you have conceded your self-respect and you convince yourself that you have not really submitted to fear and intimidation. You begin to believe that you are complying with craziness because it's the right thing to do. When first you concede your self-respect of $2+2 = 4$ to $2+2 = 5$ you *know* you are compromising your self-respect. Gradually to avoid facing that fact you begin to *believe* that $2+2=5$. You have been reframed and I have been watching this process happening in the human psyche on an industrial scale. The Cult is working to break your spirit and one of its major tools in that war is humiliation. I read how former American soldier Bradley Manning (later Chelsea Manning after a sex-change) was treated after being jailed for supplying WikiLeaks with documents exposing the enormity of

government and elite mendacity. Manning was isolated in solitary confinement for eight months, put under 24-hour surveillance, forced to hand over clothing before going to bed, and stand naked for every roll call. This is systematic humiliation. The introduction of anal swab 'Covid' tests in China has been done for the same reason to delete self-respect and induce compliant submission. Anal swabs are mandatory for incoming passengers in parts of China and American diplomats have said they were forced to undergo the indignity which would have been calculated humiliation by the Cult-owned Chinese government that has America in its sights.

Government-people: An abusive relationship

Spirit-breaking psychological techniques include giving people hope and apparent respite from tyranny only to take it away again. This happened in the UK during Christmas, 2020, when the psycho-psychologists and their political lackeys announced an easing of restrictions over the holiday only to reimpose them almost immediately on the basis of yet another lie. There is a big psychological difference between getting used to oppression and being given hope of relief only to have that dashed. Psychologists know this and we have seen the technique used repeatedly. Then there is traumatising people before you introduce more extreme regulations that require compliance. A perfect case was the announcement by the dark and sinister Whitty and Vallance in the UK that 'new data' predicted that 4,000 could die every day over the winter of 2020/2021 if we did not lockdown again. I think they call it lying and after traumatising people with that claim out came Jackboot Johnson the next day with new curbs on human freedom. Psychologists know that a frightened and traumatised mind becomes suggestable to submission and behaviour reframing. Underpinning all this has been to make people fearful and suspicious of each other and see themselves as a potential danger to others. In league with deleted self-respect you have the perfect psychological recipe for self-loathing. The relationship between authority and public is now demonstrably the same as that of

subservience to an abusive partner. These are signs of an abusive relationship explained by psychologist Leslie Becker-Phelps:

Psychological and emotional abuse: Undermining a partner's self-worth with verbal attacks, name-calling, and belittling. Humiliating the partner in public, unjustly accusing them of having an affair, or interrogating them about their every behavior. Keeping partner confused or off balance by saying they were just kidding or blaming the partner for 'making' them act this way ... Feigning in public that they care while turning against them in private. This leads to victims frequently feeling confused, incompetent, unworthy, hopeless, and chronically self-doubting. [Apply these techniques to how governments have treated the population since New Year, 2020, and the parallels are obvious.]

Physical abuse: The abuser might physically harm their partner in a range of ways, such as grabbing, hitting, punching, or shoving them. They might throw objects at them or harm them with a weapon. [Observe the physical harm imposed by masks, lockdown, and so on.]

Threats and intimidation: One way abusers keep their partners in line is by instilling fear. They might be verbally threatening, or give threatening looks or gestures. Abusers often make it known that they are tracking their partner's every move. They might destroy their partner's possessions, threaten to harm them, or threaten to harm their family members. Not surprisingly, victims of this abuse often feel anxiety, fear, and panic. [No words necessary.]

Isolation: Abusers often limit their partner's activities, forbidding them to talk or interact with friends or family. They might limit access to a car or even turn off their phone. All of this might be done by physically holding them against their will, but is often accomplished through psychological abuse and intimidation. The more isolated a person feels, the fewer resources they have to help gain perspective on their situation and to escape from it. [No words necessary.]

Economic abuse: Abusers often make their partners beholden to them for money by controlling access to funds of any kind. They might prevent their partner from getting a job or withhold access to money they earn from a job. This creates financial dependency that makes leaving the relationship very difficult. [See destruction of livelihoods and the proposed meagre 'guaranteed income' so long as you do whatever you are told.]

Using children: An abuser might disparage their partner's parenting skills, tell their children lies about their partner, threaten to take custody of their children, or threaten to harm their children. These tactics instil fear and often elicit compliance. [See reframed social service mafia and how children are being mercilessly abused by the state over 'Covid' while their parents look on too frightened to do anything.]

A further recurring trait in an abusive relationship is the abused blaming themselves for their abuse and making excuses for the abuser. We have the public blaming each other for lockdown abuse by government and many making excuses for the government while attacking those who challenge the government. How often we have heard authorities say that rules are being imposed or reimposed only because people have refused to 'behave' and follow the rules. We don't want to do it – it's *you*.

Renegade Minds are an antidote to all of these things. They will never concede their self-respect no matter what the circumstances. Even when apparent humiliation is heaped upon them they laugh in its face and reflect back the humiliation on the abuser where it belongs. Renegade Minds will never wear masks they know are only imposed to humiliate, suppress and damage both physically and psychologically. Consequences will take care of themselves and they will never break their spirit or cause them to concede to tyranny. UK newspaper columnist Peter Hitchens was one of the few in the mainstream media to speak out against lockdowns and forced vaccinations. He then announced he had taken the jab. He wanted to see family members abroad and he believed vaccine passports were inevitable even though they had not yet been introduced. Hitchens

has a questioning and critical mind, but not a Renegade one. If he had no amount of pressure would have made him concede. Hitchens excused his action by saying that the battle has been lost. Renegade Minds never accept defeat when freedom is at stake and even if they are the last one standing the self-respect of not submitting to tyranny is more important than any outcome or any consequence.

That's why Renegade Minds are the only minds that ever changed anything worth changing.

CHAPTER EIGHT

'Reframing' insanity

Insanity is relative. It depends on who has who locked in what cage
Ray Bradbury

Reframing' a mind means simply to change its perception and behaviour. This can be done subconsciously to such an extent that subjects have no idea they have been 'reframed' while to any observer changes in behaviour and attitudes are obvious.

Human society is being reframed on a ginormous scale since the start of 2020 and here we have the reason why psychologists rather than doctors have been calling the shots. Ask most people who have succumbed to 'Covid' reframing if they have changed and most will say 'no'; but they *have* and fundamentally. The Cult's long-game has been preparing for these times since way back and crucial to that has been to prepare both population and officialdom mentally and emotionally. To use the mind-control parlance they had to reframe the population with a mentality that would submit to fascism and reframe those in government and law enforcement to impose fascism or at least go along with it. The result has been the fact-deleted mindlessness of 'Wokeness' and officialdom that has either enthusiastically or unquestioningly imposed global tyranny demanded by reframed politicians on behalf of psychopathic and deeply evil cultists. 'Cognitive reframing' identifies and challenges the way someone sees the world in the form of situations, experiences and emotions and then restructures those perceptions to view the same set of circumstances in a different way. This can have

benefits if the attitudes are personally destructive while on the other side it has the potential for individual and collective mind control which the subject has no idea has even happened.

Cognitive therapy was developed in the 1960s by Aaron T. Beck who was born in Rhode Island in 1921 as the son of Jewish immigrants from the Ukraine. He became interested in the techniques as a treatment for depression. Beck's daughter Judith S. Beck is prominent in the same field and they founded the Beck Institute for Cognitive Behavior Therapy in Philadelphia in 1994. Cognitive reframing, however, began to be used worldwide by those with a very dark agenda. The Cult reframes politicians to change their attitudes and actions until they are completely at odds with what they once appeared to stand for. The same has been happening to government administrators at all levels, law enforcement, military and the human population. Cultists love mind control for two main reasons: It allows them to control what people think, do and say to secure agenda advancement and, by definition, it calms their legendary insecurity and fear of the unexpected. I have studied mind control since the time I travelled America in 1996. I may have been talking to next to no one in terms of an audience in those years, but my goodness did I gather a phenomenal amount of information and knowledge about so many things including the techniques of mind control. I have described this in detail in other books going back to *The Biggest Secret* in 1998. I met a very large number of people recovering from MKUltra and its offshoots and successors and I began to see how these same techniques were being used on the population in general. This was never more obvious than since the 'Covid' hoax began.

Reframing the enforcers

I have observed over the last two decades and more the very clear transformation in the dynamic between the police, officialdom and the public. I tracked this in the books as the relationship mutated from one of serving the public to seeing them as almost the enemy and certainly a lower caste. There has always been a class divide

based on income and always been some psychopathic, corrupt, and big-I-am police officers. This was different. Wholesale change was unfolding in the collective dynamic; it was less about money and far more about position and perceived power. An us-and-them was emerging. Noses were lifted skyward by government administration and law enforcement and their attitude to the public they were *supposed* to be serving changed to one of increasing contempt, superiority and control. The transformation was so clear and widespread that it had to be planned. Collective attitudes and dynamics do not change naturally and organically that quickly on that scale. I then came across an organisation in Britain called Common Purpose created in the late 1980s by Julia Middleton who would work in the office of Deputy Prime Minister John Prescott during the long and disastrous premiership of war criminal Tony Blair. When Blair speaks the Cult is speaking and the man should have been in jail a long time ago. Common Purpose proclaims itself to be one of the biggest 'leadership development' organisations in the world while functioning as a *charity* with all the financial benefits which come from that. It hosts 'leadership development' courses and programmes all over the world and claims to have 'brought together' what it calls 'leaders' from more than 100 countries on six continents. The modus operandi of Common Purpose can be compared with the work of the UK government's reframing network that includes the Behavioural Insights Team 'nudge unit' and 'Covid' reframing specialists at SPI-B. WikiLeaks described Common Purpose long ago as 'a hidden virus in our government and schools' which is unknown to the general public: 'It recruits and trains "leaders" to be loyal to the directives of Common Purpose and the EU, instead of to their own departments, which they then undermine or subvert, the NHS [National Health Service] being an example.' This is a vital point to understand the 'Covid' hoax. The NHS, and its equivalent around the world, has been utterly reframed in terms of administrators and much of the medical personnel with the transformation underpinned by recruitment policies. The outcome has been the criminal and psychopathic behaviour of the

NHS over 'Covid' and we have seen the same in every other major country. WikiLeaks said Common Purpose trainees are 'learning to rule without regard to democracy' and to usher in a police state (current events explained). Common Purpose operated like a 'glue' and had members in the NHS, BBC, police, legal profession, church, many of Britain's 7,000 quangos, local councils, the Civil Service, government ministries and Parliament, and controlled many RDA's (Regional Development Agencies). Here we have one answer for how and why British institutions and their like in other countries have changed so negatively in relation to the public. This further explains how and why the beyond-disgraceful reframed BBC has become a propaganda arm of 'Covid' fascism. They are all part of a network pursuing the same goal.

By 2019 Common Purpose was quoting a figure of 85,000 'leaders' that had attended its programmes. These 'students' of all ages are known as Common Purpose 'graduates' and they consist of government, state and local government officials and administrators, police chiefs and officers, and a whole range of others operating within the national, local and global establishment. Cressida Dick, Commissioner of the London Metropolitan Police, is the Common Purpose graduate who was the 'Gold Commander' that oversaw what can only be described as the murder of Brazilian electrician Jean Charles de Menezes in 2005. He was held down by psychopathic police and shot seven times in the head by a psychopathic lunatic after being mistaken for a terrorist when he was just a bloke going about his day. Dick authorised officers to pursue and keep surveillance on de Menezes and ordered that he be stopped from entering the underground train system. Police psychopaths took her at her word clearly. She was 'disciplined' for this outrage by being *promoted* – eventually to the top of the 'Met' police where she has been a disaster. Many Chief Constables controlling the police in different parts of the UK are and have been Common Purpose graduates. I have heard the 'graduate' network described as a sort of Mafia or secret society operating within the fabric of government at all levels pursuing a collective policy

ingrained at Common Purpose training events. Founder Julia Middleton herself has said:

Locally and internationally, Common Purpose graduates will be 'lighting small fires' to create change in their organisations and communities ... The Common Purpose effect is best illustrated by the many stories of small changes brought about by leaders, who themselves have changed.

A Common Purpose mission statement declared:

Common Purpose aims to improve the way society works by expanding the vision, decision-making ability and influence of all kinds of leaders. The organisation runs a variety of educational programmes for leaders of all ages, backgrounds and sectors, in order to provide them with the inspirational, information and opportunities they need to change the world.

Yes, but into what? Since 2020 the answer has become clear.

NLP and the Delphi technique

Common Purpose would seem to be a perfect name or would common programming be better? One of the foundation methods of reaching 'consensus' (group think) is by setting the agenda theme and then encouraging, cajoling or pressuring everyone to agree a 'consensus' in line with the core theme promoted by Common Purpose. The methodology involves the 'Delphi technique', or an adaption of it, in which opinions are expressed that are summarised by a 'facilitator or change agent' at each stage. Participants are 'encouraged' to modify their views in the light of what others have said. Stage by stage the former individual opinions are merged into group consensus which just happens to be what Common Purpose wants them to believe. A key part of this is to marginalise anyone refusing to concede to group think and turn the group against them to apply pressure to conform. We are seeing this very technique used on the general population to make 'Covid' group-thinkers hostile to those who have seen through the bullshit. People can be reframed by using perception manipulation methods such as Neuro-Linguistic Programming (NLP) in which you change perception with the use of

carefully constructed language. An NLP website described the technique this way:

... A method of influencing brain behaviour (the 'neuro' part of the phrase) through the use of language (the 'linguistic' part) and other types of communication to enable a person to 'recode' the way the brain responds to stimuli (that's the 'programming') and manifest new and better behaviours. Neuro-Linguistic Programming often incorporates hypnosis and self-hypnosis to help achieve the change (or 'programming') that is wanted.

British alternative media operation UKColumn has done very detailed research into Common Purpose over a long period. I quoted co-founder and former naval officer Brian Gerrish in my book *Remember Who You Are*, published in 2011, as saying the following years before current times:

It is interesting that many of the mothers who have had children taken by the State speak of the Social Services people being icily cool, emotionless and, as two ladies said in slightly different words, '... like little robots'. We know that NLP is cumulative, so people can be given small imperceptible doses of NLP in a course here, another in a few months, next year etc. In this way, major changes are accrued in their personality, but the day by day change is almost unnoticeable.

In these and other ways 'graduates' have had their perceptions uniformly reframed and they return to their roles in the institutions of government, law enforcement, legal profession, military, 'education', the UK National Health Service and the whole swathe of the establishment structure to pursue a common agenda preparing for the 'post-industrial', 'post-democratic' society. I say 'preparing' but we are now there. 'Post-industrial' is code for the Great Reset and 'post-democratic' is 'Covid' fascism. UKColumn has spoken to partners of those who have attended Common Purpose 'training'. They have described how personalities and attitudes of 'graduates' changed very noticeably for the worse by the time they had completed the course. They had been 'reframed' and told they are the 'leaders' – the special ones – who know better than the population. There has also been the very demonstrable recruitment of psychopaths and narcissists into government administration at all

levels and law enforcement. If you want psychopathy hire psychopaths and you get a simple cause and effect. If you want administrators, police officers and 'leaders' to perceive the public as lesser beings who don't matter then employ narcissists. These personalities are identified using 'psychometrics' that identifies knowledge, abilities, attitudes and personality traits, mostly through carefully-designed questionnaires and tests. As this policy has passed through the decades we have had power-crazy, power-trippers appointed into law enforcement, security and government administration in preparation for current times and the dynamic between public and law enforcement/officialdom has been transformed. UKColumn's Brian Gerrish said of the narcissistic personality:

Their love of themselves and power automatically means that they will crush others who get in their way. I received a major piece of the puzzle when a friend pointed out that when they made public officials re-apply for their own jobs several years ago they were also required to do psychometric tests. This was undoubtedly the start of the screening process to get 'their' sort of people in post.

How obvious that has been since 2020 although it was clear what was happening long before if people paid attention to the changing public-establishment dynamic.

Change agents

At the centre of events in 'Covid' Britain is the National Health Service (NHS) which has behaved disgracefully in slavishly following the Cult agenda. The NHS management structure is awash with Common Purpose graduates or 'change agents' working to a common cause. Helen Bevan, a Chief of Service Transformation at the NHS Institute for Innovation and Improvement, co-authored a document called 'Towards a million change agents, a review of the social movements literature: implications for large scale change in the NHS'. The document compared a project management approach to that of change and social movements where 'people change

themselves and each other – peer to peer’. Two definitions given for a ‘social movement’ were:

A group of people who consciously attempt to build a radically new social order; involves people of a broad range of social backgrounds; and deploys politically confrontational and socially disruptive tactics – Cyrus Zirakzadeh 1997

Collective challenges, based on common purposes and social solidarities, in sustained interaction with elites, opponents, and authorities – Sidney Tarrow 1994

Helen Bevan wrote another NHS document in which she defined ‘framing’ as ‘the process by which leaders construct, articulate and put across their message in a powerful and compelling way in order to win people to their cause and call them to action’. I think I could come up with another definition that would be rather more accurate. The National Health Service and institutions of Britain and the wider world have been taken over by reframed ‘change agents’ and that includes everything from the United Nations to national governments, local councils and social services which have been kidnapping children from loving parents on an extraordinary and gathering scale on the road to the end of parenthood altogether. Children from loving homes are stolen and kidnapped by the state and put into the ‘care’ (inversion) of the local authority through council homes, foster parents and forced adoption. At the same time children are allowed to be abused without response while many are under council ‘care’. UKColumn highlighted the Common Purpose connection between South Yorkshire Police and Rotherham council officers in the case of the scandal in that area of the sexual exploitation of children to which the authorities turned not one blind eye, but both:

We were alarmed to discover that the Chief Executive, the Strategic Director of Children and Young People's Services, the Manager for the Local Strategic Partnership, the Community Cohesion Manager, the Cabinet Member for Cohesion, the Chief Constable and his predecessor had all attended Leadership training courses provided by the pseudo-charity Common Purpose.

Once 'change agents' have secured positions of hire and fire within any organisation things start to move very quickly. Personnel are then hired and fired on the basis of whether they will work towards the agenda the change agent represents. If they do they are rapidly promoted even though they may be incompetent. Those more qualified and skilled who are pre-Common Purpose 'old school' see their careers stall and even disappear. This has been happening for decades in every institution of state, police, 'health' and social services and all of them have been transformed as a result in their attitudes to their jobs and the public. Medical professions, including nursing, which were once vocations for the caring now employ many cold, callous and couldn't give a shit personality types. The UKColumn investigation concluded:

By blurring the boundaries between people, professions, public and private sectors, responsibility and accountability, Common Purpose encourages 'graduates' to believe that as new selected leaders, they can work together, outside of the established political and social structures, to achieve a paradigm shift or CHANGE – so called 'Leading Beyond Authority'. In doing so, the allegiance of the individual becomes 'reframed' on CP colleagues and their NETWORK.

Reframing the Face-Nappies

Nowhere has this process been more obvious than in the police where recruitment of psychopaths and development of unquestioning mind-controlled group-thinkers have transformed law enforcement into a politically-correct 'Woke' joke and a travesty of what should be public service. Today they wear their face-nappies like good little gofers and enforce 'Covid' rules which are fascism under another name. Alongside the specifically-recruited psychopaths we have software minds incapable of free thought. Brian Gerrish again:

An example is the policeman who would not get on a bike for a press photo because he had not done the cycling proficiency course. Normal people say this is political correctness gone mad. Nothing could be further from the truth. The policeman has been reframed, and in his reality it is perfect common sense not to get on the bike 'because he hasn't done the cycling course'.

Another example of this is where the police would not rescue a boy from a pond until they had taken advice from above on the 'risk assessment'. A normal person would have arrived, perhaps thought of the risk for a moment, and dived in. To the police now 'reframed', they followed 'normal' procedure.

There are shocking cases of reframed ambulance crews doing the same. Sheer unthinking stupidity of London Face-Nappies headed by Common Purpose graduate Cressida Dick can be seen in their behaviour at a vigil in March, 2021, for a murdered woman, Sarah Everard. A police officer had been charged with the crime. Anyone with a brain would have left the vigil alone in the circumstances. Instead they 'manhandled' women to stop them breaking 'Covid rules' to betray classic reframing. Minds in the thrall of perception control have no capacity for seeing a situation on its merits and acting accordingly. 'Rules is rules' is their only mind-set. My father used to say that rules and regulations are for the guidance of the intelligent and the blind obedience of the idiot. Most of the intelligent, decent, coppers have gone leaving only the other kind and a few old school for whom the job must be a daily nightmare. The combination of psychopaths and rule-book software minds has been clearly on public display in the 'Covid' era with automaton robots in uniform imposing fascistic 'Covid' regulations on the population without any personal initiative or judging situations on their merits. There are thousands of examples around the world, but I'll make my point with the infamous Derbyshire police in the English East Midlands – the ones who think pouring dye into beauty spots and using drones to track people walking in the countryside away from anyone is called 'policing'. To them there are rules decreed by the government which they have to enforce and in their bewildered state a group gathering in a closed space and someone walking alone in the countryside are the same thing. It is beyond idiocy and enters the realm of clinical insanity.

Police officers in Derbyshire said they were 'horrified' – *horrified* – to find 15 to 20 'irresponsible' kids playing a football match at a closed leisure centre 'in breach of coronavirus restrictions'. When they saw the police the kids ran away leaving their belongings behind and the reframed men and women of Derbyshire police were seeking to establish their identities with a view to fining their parents. The most natural thing for youngsters to do – kicking a ball about – is turned into a criminal activity and enforced by the moronic software programs of Derbyshire police. You find the same mentality in every country. These barely conscious 'horrified' officers said they had to take action because 'we need to ensure these rules are being followed' and 'it is of the utmost importance that you ensure your children are following the rules and regulations for Covid-19'. Had any of them done ten seconds of research to see if this parroting of their masters' script could be supported by any evidence? Nope. Reframed people don't think – others think for them and that's the whole idea of reframing. I have seen police officers one after the other repeating without question word for word what officialdom tells them just as I have seen great swathes of the public doing the same. Ask either for 'their' opinion and out spews what they have been told to think by the official narrative. Police and public may seem to be in different groups, but their mentality is the same. Most people do whatever they are told in fear not doing so or because they believe what officialdom tells them; almost the entirety of the police do what they are told for the same reason. Ultimately it's the tiny inner core of the global Cult that's telling both what to do.

So Derbyshire police were 'horrified'. Oh, really? Why did they think those kids were playing football? It was to relieve the psychological consequences of lockdown and being denied human contact with their friends and interaction, touch and discourse vital to human psychological health. Being denied this month after month has dismantled the psyche of many children and young people as depression and suicide have exploded. Were Derbyshire police *horrified by that*? Are you kidding? Reframed people don't have those

mental and emotional processes that can see how the impact on the psychological health of youngsters is far more dangerous than any 'virus' even if you take the mendacious official figures to be true. The reframed are told (programmed) how to act and so they do. The Derbyshire Chief Constable in the first period of lockdown when the black dye and drones nonsense was going on was Peter Goodman. He was the man who severed the connection between his force and the Derbyshire Constabulary *Male Voice* Choir when he decided that it was not inclusive enough to allow women to join. The fact it was a male voice choir making a particular sound produced by male voices seemed to elude a guy who terrifyingly ran policing in Derbyshire. He retired weeks after his force was condemned as disgraceful by former Supreme Court Justice Jonathan Sumption for their behaviour over extreme lockdown impositions. Goodman was replaced by his deputy Rachel Swann who was in charge when her officers were 'horrificed'. The police statement over the boys committing the hanging-offence of playing football included the line about the youngsters being 'irresponsible in the times we are all living through' missing the point that the real relevance of the 'times we are all living through' is the imposition of fascism enforced by psychopaths and reframed minds of police officers playing such a vital part in establishing the fascist tyranny that their own children and grandchildren will have to live in their entire lives. As a definition of insanity that is hard to beat although it might be run close by imposing masks on people that can have a serious effect on their health while wearing a face nappy all day themselves. Once again public and police do it for the same reason – the authorities tell them to and who are they to have the self-respect to say no?

Wokers in uniform

How reframed do you have to be to arrest a *six-year-old* and take him to court for *picking a flower* while waiting for a bus? Brain dead police and officialdom did just that in North Carolina where criminal proceedings happen regularly for children under nine. Attorney Julie Boyer gave the six-year-old crayons and a colouring book

during the 'flower' hearing while the 'adults' decided his fate. County Chief District Court Judge Jay Corpening asked: 'Should a child that believes in Santa Claus, the Easter Bunny and the tooth fairy be making life-altering decisions?' Well, of course not, but common sense has no meaning when you have a common purpose and a reframed mind. Treating children in this way, and police operating in American schools, is all part of the psychological preparation for children to accept a police state as normal all their adult lives. The same goes for all the cameras and biometric tracking technology in schools. Police training is focused on reframing them as snowflake Wokers and this is happening in the military. Pentagon top brass said that 'training sessions on extremism' were needed for troops who asked why they were so focused on the Capitol Building riot when Black Lives Matter riots were ignored. What's the difference between them some apparently and rightly asked. Actually, there is a difference. Five people died in the Capitol riot, only one through violence, and that was a police officer shooting an unarmed protestor. BLM riots killed at least 25 people and cost billions. Asking the question prompted the psychopaths and reframed minds that run the Pentagon to say that more 'education' (programming) was needed. Troop training is all based on psychological programming to make them fodder for the Cult – 'Military men are just dumb, stupid animals to be used as pawns in foreign policy' as Cult-to-his-DNA former Secretary of State Henry Kissinger famously said. Governments see the police in similar terms and it's time for those among them who can see this to defend the people and stop being enforcers of the Cult agenda upon the people.

The US military, like the country itself, is being targeted for destruction through a long list of Woke impositions. Cult-owned gaga 'President' Biden signed an executive order when he took office to allow taxpayer money to pay for transgender surgery for active military personnel and veterans. Are you a man soldier? No, I'm a LGBTQIA+ with a hint of Skoliosexual and Spectrasexual. Oh, good man. Bad choice of words you bigot. The Pentagon announced in March, 2021, the appointment of the first 'diversity and inclusion

officer' for US Special Forces. Richard Torres-Estrada arrived with the publication of a 'D&I Strategic Plan which will guide the enterprise-wide effort to institutionalize and sustain D&I'. If you think a Special Forces 'Strategic Plan' should have something to do with defending America you haven't been paying attention. Defending Woke is now the military's new role. Torres-Estrada has posted images comparing Donald Trump with Adolf Hitler and we can expect no bias from him as a representative of the supposedly non-political Pentagon. Cable news host Tucker Carlson said: 'The Pentagon is now the Yale faculty lounge but with cruise missiles.' Meanwhile Secretary of Defense Lloyd Austin, a board member of weapons-maker Raytheon with stock and compensation interests in October, 2020, worth \$1.4 million, said he was purging the military of the 'enemy within' – anyone who isn't Woke and supports Donald Trump. Austin refers to his targets as 'racist extremists' while in true Woke fashion being himself a racist extremist. Pentagon documents pledge to 'eradicate, eliminate and conquer all forms of racism, sexism and homophobia'. The definitions of these are decided by 'diversity and inclusion committees' peopled by those who see racism, sexism and homophobia in every situation and opinion. Woke (the Cult) is dismantling the US military and purging testosterone as China expands its military and gives its troops 'masculinity training'. How do we think that is going to end when this is all Cult coordinated? The US military, like the British military, is controlled by Woke and spineless top brass who just go along with it out of personal career interests.

'Woke' means fast asleep

Mind control and perception manipulation techniques used on individuals to create group-think have been unleashed on the global population in general. As a result many have no capacity to see the obvious fascist agenda being installed all around them or what 'Covid' is really all about. Their brains are firewalled like a computer system not to process certain concepts, thoughts and realisations that are bad for the Cult. The young are most targeted as the adults they

will be when the whole fascist global state is planned to be fully implemented. They need to be prepared for total compliance to eliminate all pushback from entire generations. The Cult has been pouring billions into taking complete control of 'education' from schools to universities via its operatives and corporations and not least Bill Gates as always. The plan has been to transform 'education' institutions into programming centres for the mentality of 'Woke'. James McConnell, professor of psychology at the University of Michigan, wrote in *Psychology Today* in 1970:

The day has come when we can combine sensory deprivation with drugs, hypnosis, and astute manipulation of reward and punishment, to gain almost absolute control over an individual's behaviour. It should then be possible to achieve a very rapid and highly effective type of brainwashing that would allow us to make dramatic changes in a person's behaviour and personality ...

... We should reshape society so that we all would be trained from birth to want to do what society wants us to do. We have the techniques to do it... no-one owns his own personality you acquired, and there's no reason to believe you should have the right to refuse to acquire a new personality if your old one is anti-social.

This was the potential for mass brainwashing in 1970 and the mentality there displayed captures the arrogant psychopathy that drives it forward. I emphasise that not all young people have succumbed to Woke programming and those that haven't are incredibly impressive people given that today's young are the most perceptually-targeted generations in history with all the technology now involved. Vast swathes of the young generations, however, have fallen into the spell – and that's what it is – of Woke. The Woke mentality and perceptual program is founded on *inversion* and you will appreciate later why that is so significant. Everything with Woke is inverted and the opposite of what it is claimed to be. Woke was a term used in African-American culture from the 1900s and referred to an awareness of social and racial justice. This is not the meaning of the modern version or 'New Woke' as I call it in *The Answer*. Oh, no, Woke today means something very different no matter how much Wokers may seek to hide that and insist Old Woke and New

Woke are the same. See if you find any 'awareness of social justice' here in the modern variety:

- Woke demands 'inclusivity' while excluding anyone with a different opinion and calls for mass censorship to silence other views.
- Woke claims to stand against oppression when imposing oppression is the foundation of all that it does. It is the driver of political correctness which is nothing more than a Cult invention to manipulate the population to silence itself.
- Woke believes itself to be 'liberal' while pursuing a global society that can only be described as fascist (see 'anti-fascist' fascist Antifa).
- Woke calls for 'social justice' while spreading injustice wherever it goes against the common 'enemy' which can be easily identified as a differing view.
- Woke is supposed to be a metaphor for 'awake' when it is solid-gold asleep and deep in a Cult-induced coma that meets the criteria for 'off with the fairies'.

I state these points as obvious facts if people only care to look. I don't do this with a sense of condemnation. We need to appreciate that the onslaught of perceptual programming on the young has been incessant and merciless. I can understand why so many have been reframed, or, given their youth, framed from the start to see the world as the Cult demands. The Cult has had access to their minds day after day in its 'education' system for their entire formative years. Perception is formed from information received and the Cult-created system is a life-long download of information delivered to elicit a particular perception, thus behaviour. The more this has expanded into still new extremes in recent decades and ever-increasing censorship has deleted other opinions and information why wouldn't that lead to a perceptual reframing on a mass scale? I

have described already cradle-to-grave programming and in more recent times the targeting of young minds from birth to adulthood has entered the stratosphere. This has taken the form of skewing what is 'taught' to fit the Cult agenda and the omnipresent techniques of group-think to isolate non-believers and pressure them into line. There has always been a tendency to follow the herd, but we really are in a new world now in relation to that. We have parents who can see the 'Covid' hoax told by their children not to stop them wearing masks at school, being 'Covid' tested or having the 'vaccine' in fear of the peer-pressure consequences of being different. What is 'peer-pressure' if not pressure to conform to group-think? Renegade Minds never group-think and always retain a set of perceptions that are unique to them. Group-think is always underpinned by consequences for not group-thinking. Abuse now aimed at those refusing DNA-manipulating 'Covid vaccines' are a potent example of this. The biggest pressure to conform comes from the very group which is itself being manipulated. 'I am programmed to be part of a hive mind and so you must be.'

Woke control structures in 'education' now apply to every mainstream organisation. Those at the top of the 'education' hierarchy (the Cult) decide the policy. This is imposed on governments through the Cult network; governments impose it on schools, colleges and universities; their leadership impose the policy on teachers and academics and they impose it on children and students. At any level where there is resistance, perhaps from a teacher or university lecturer, they are targeted by the authorities and often fired. Students themselves regularly demand the dismissal of academics (increasingly few) at odds with the narrative that the students have been programmed to believe in. It is quite a thought that students who are being targeted by the Cult become so consumed by programmed group-think that they launch protests and demand the removal of those who are trying to push back against those targeting the students. Such is the scale of perceptual inversion. We see this with 'Covid' programming as the Cult imposes the rules via psycho-psychologists and governments on

shops, transport companies and businesses which impose them on their staff who impose them on their customers who pressure Pushbackers to conform to the will of the Cult which is in the process of destroying them and their families. Scan all aspects of society and you will see the same sequence every time.

Fact free Woke and hijacking the 'left'

There is no more potent example of this than 'Woke', a mentality only made possible by the deletion of factual evidence by an 'education' system seeking to produce an ever more uniform society. Why would you bother with facts when you don't know any? Deletion of credible history both in volume and type is highly relevant. Orwell said: 'Who controls the past controls the future: who controls the present controls the past.' They who control the perception of the past control the perception of the future and they who control the present control the perception of the past through the writing and deleting of history. Why would you oppose the imposition of Marxism in the name of Wokeism when you don't know that Marxism cost at least 100 million lives in the 20th century alone? Watch videos and read reports in which Woker generations are asked basic historical questions – it's mind-blowing. A survey of 2,000 people found that six percent of millennials (born approximately early 1980s to early 2000s) believed the Second World War (1939-1945) broke out with the assassination of President Kennedy (in 1963) and one in ten thought Margaret Thatcher was British Prime Minister at the time. She was in office between 1979 and 1990. We are in a post-fact society. Provable facts are no defence against the fascism of political correctness or Silicon Valley censorship. Facts don't matter anymore as we have witnessed with the 'Covid' hoax. Sacrificing uniqueness to the Woke group-think religion is all you are required to do and that means thinking for yourself is the biggest Woke no, no. All religions are an expression of group-think and censorship and Woke is just another religion with an orthodoxy defended by group-think and censorship. Burned at

the stake becomes burned on Twitter which leads back eventually to burned at the stake as Woke humanity regresses to ages past.

The biggest Woke inversion of all is its creators and funders. I grew up in a traditional left of centre political household on a council estate in Leicester in the 1950s and 60s – you know, the left that challenged the power of wealth-hoarding elites and threats to freedom of speech and opinion. In those days students went on marches defending freedom of speech while today's Wokers march for its deletion. What on earth could have happened? Those very elites (collectively the Cult) that we opposed in my youth and early life have funded into existence the antithesis of that former left and hijacked the 'brand' while inverting everything it ever stood for. We have a mentality that calls itself 'liberal' and 'progressive' while acting like fascists. Cult billionaires and their corporations have funded themselves into control of 'education' to ensure that Woke programming is unceasing throughout the formative years of children and young people and that non-Wokers are isolated (that word again) whether they be students, teachers or college professors. The Cult has funded into existence the now colossal global network of Woke organisations that have spawned and promoted all the 'causes' on the Cult wish-list for global transformation and turned Wokers into demanders of them. Does anyone really think it's a coincidence that the Cult agenda for humanity is a carbon (sorry) copy of the societal transformations desired by Woke?? These are only some of them:

Political correctness: The means by which the Cult deletes all public debates that it knows it cannot win if we had the free-flow of information and evidence.

Human-caused 'climate change': The means by which the Cult seeks to transform society into a globally-controlled dictatorship imposing its will over the fine detail of everyone's lives 'to save the planet' which doesn't actually need saving.

Transgender obsession: Preparing collective perception to accept the 'new human' which would not have genders because it would be created technologically and not through procreation. I'll have much more on this in Human 2.0.

Race obsession: The means by which the Cult seeks to divide and rule the population by triggering racial division through the perception that society is more racist than ever when the opposite is the case. Is it perfect in that regard? No. But to compare today with the racism of apartheid and segregation brought to an end by the civil rights movement in the 1960s is to insult the memory of that movement and inspirations like Martin Luther King. Why is the 'anti-racism' industry (which it is) so dominated by privileged white people?

White supremacy: This is a label used by privileged white people to demonise poor and deprived white people pushing back on tyranny to marginalise and destroy them. White people are being especially targeted as the dominant race by number within Western society which the Cult seeks to transform in its image. If you want to change a society you must weaken and undermine its biggest group and once you have done that by using the other groups you next turn on them to do the same ... 'Then they came for the Jews and I was not a Jew so I did nothing.'

Mass migration: The mass movement of people from the Middle East, Africa and Asia into Europe, from the south into the United States and from Asia into Australia are another way the Cult seeks to dilute the racial, cultural and political influence of white people on Western society. White people ask why their governments appear to be working against them while being politically and culturally biased towards incoming cultures. Well, here's your answer. In the same way sexually 'straight' people, men and women, ask why the

authorities are biased against them in favour of other sexualities. The answer is the same – that's the way the Cult wants it to be for very sinister motives.

These are all central parts of the Cult agenda and central parts of the Woke agenda and Woke was created and continues to be funded to an immense degree by Cult billionaires and corporations. If anyone begins to say 'coincidence' the syllables should stick in their throat.

Billionaire 'social justice warriors'

Joe Biden is a 100 percent-owned asset of the Cult and the Wokers' man in the White House whenever he can remember his name and for however long he lasts with his rapidly diminishing cognitive function. Even walking up the steps of an aircraft without falling on his arse would appear to be a challenge. He's not an empty-shell puppet or anything. From the minute Biden took office (or the Cult did) he began his executive orders promoting the Woke wish-list. You will see the Woke agenda imposed ever more severely because it's really the *Cult* agenda. Woke organisations and activist networks spawned by the Cult are funded to the extreme so long as they promote what the Cult wants to happen. Woke is funded to promote 'social justice' by billionaires who become billionaires by destroying social justice. The social justice mantra is only a cover for dismantling social justice and funded by billionaires that couldn't give a damn about social justice. Everything makes sense when you see that. One of Woke's premier funders is Cult billionaire financier George Soros who said: 'I am basically there to make money, I cannot and do not look at the social consequences of what I do.' This is the same Soros who has given more than \$32 billion to his Open Society Foundations global Woke network and funded Black Lives Matter, mass immigration into Europe and the United States, transgender activism, climate change activism, political correctness and groups targeting 'white supremacy' in the form of privileged white thugs that dominate Antifa. What a scam it all is and when

you are dealing with the unquestioning fact-free zone of Woke scamming them is child's play. All you need to pull it off in all these organisations are a few in-the-know agents of the Cult and an army of naïve, reframed, uninformed, narcissistic, know-nothings convinced of their own self-righteousness, self-purity and virtue.

Soros and fellow billionaires and billionaire corporations have poured hundreds of millions into Black Lives Matter and connected groups and promoted them to a global audience. None of this is motivated by caring about black people. These are the billionaires that have controlled and exploited a system that leaves millions of black people in abject poverty and deprivation which they do absolutely nothing to address. The same Cult networks funding BLM were behind the *slave trade*! Black Lives Matter hijacked a phrase that few would challenge and they have turned this laudable concept into a political weapon to divide society. You know that BLM is a fraud when it claims that *All Lives Matter*, the most inclusive statement of all, is 'racist'. BLM and its Cult masters don't want to end racism. To them it's a means to an end to control all of humanity never mind the colour, creed, culture or background. What has destroying the nuclear family got to do with ending racism? Nothing – but that is one of the goals of BLM and also happens to be a goal of the Cult as I have been exposing in my books for decades. Stealing children from loving parents and giving schools ever more power to override parents is part of that same agenda. BLM is a Marxist organisation and why would that not be the case when the Cult created Marxism *and* BLM? Patrisse Cullors, a BLM co-founder, said in a 2015 video that she and her fellow organisers, including co-founder Alicia Garza, are 'trained Marxists'. The lady known after marriage as Patrisse Khan-Cullors bought a \$1.4 million home in 2021 in one of the whitest areas of California with a black population of just 1.6 per cent and has so far bought *four* high-end homes for a total of \$3.2 million. How very Marxist. There must be a bit of spare in the BLM coffers, however, when Cult corporations and billionaires have handed over the best part of \$100 million. Many black people can see that Black Lives Matter is not

working for them, but against them, and this is still more confirmation. Black journalist Jason Whitlock, who had his account suspended by Twitter for simply linking to the story about the 'Marxist's' home buying spree, said that BLM leaders are 'making millions of dollars off the backs of these dead black men who they wouldn't spit on if they were on fire and alive'.

Black Lies Matter

Cult assets and agencies came together to promote BLM in the wake of the death of career criminal George Floyd who had been jailed a number of times including for forcing his way into the home of a black woman with others in a raid in which a gun was pointed at her stomach. Floyd was filmed being held in a Minneapolis street in 2020 with the knee of a police officer on his neck and he subsequently died. It was an appalling thing for the officer to do, but the same technique has been used by police on peaceful protestors of lockdown without any outcry from the Woke brigade. As unquestioning supporters of the Cult agenda Wokers have supported lockdown and all the 'Covid' claptrap while attacking anyone standing up to the tyranny imposed in its name. Court documents would later include details of an autopsy on Floyd by County Medical Examiner Dr Andrew Baker who concluded that Floyd had taken a fatal level of the drug fentanyl. None of this mattered to fact-free, question-free, Woke. Floyd's death was followed by worldwide protests against police brutality amid calls to defund the police. Throwing babies out with the bathwater is a Woke speciality. In the wake of the murder of British woman Sarah Everard a Green Party member of the House of Lords, Baroness Jones of Moulsecoomb (Nincompoopia would have been better), called for a 6pm curfew for all men. This would be in breach of the Geneva Conventions on war crimes which ban collective punishment, but that would never have crossed the black and white Woke mind of Baroness Nincompoopia who would have been far too convinced of her own self-righteousness to compute such details. Many American cities did defund the police in the face of Floyd riots

and after \$15 million was deleted from the police budget in Washington DC under useless Woke mayor Muriel Bowser car-jacking alone rose by 300 percent and within six months the US capital recorded its highest murder rate in 15 years. The same happened in Chicago and other cities in line with the Cult/Soros plan to bring fear to streets and neighbourhoods by reducing the police, releasing violent criminals and not prosecuting crime. This is the mob-rule agenda that I have warned in the books was coming for so long. Shootings in the area of Minneapolis where Floyd was arrested increased by 2,500 percent compared with the year before. Defunding the police over George Floyd has led to a big increase in dead people with many of them black. Police protection for politicians making these decisions stayed the same or increased as you would expect from professional hypocrites. The Cult doesn't actually want to abolish the police. It wants to abolish local control over the police and hand it to federal government as the psychopaths advance the Hunger Games Society. Many George Floyd protests turned into violent riots with black stores and businesses destroyed by fire and looting across America fuelled by Black Lives Matter. Woke doesn't do irony. If you want civil rights you must loot the liquor store and the supermarket and make off with a smart TV. It's the only way.

It's not a race war – it's a class war

Black people are patronised by privileged blacks and whites alike and told they are victims of white supremacy. I find it extraordinary to watch privileged blacks supporting the very system and bloodline networks behind the slave trade and parroting the same Cult-serving manipulative crap of their privileged white, often billionaire, associates. It is indeed not a race war but a class war and colour is just a diversion. Black Senator Cory Booker and black Congresswoman Maxine Waters, more residents of Nincompoopia, personify this. Once you tell people they are victims of someone else you devalue both their own responsibility for their plight and the power they have to impact on their reality and experience. Instead

we have: 'You are only in your situation because of whiteness – turn on them and everything will change.' It won't change. Nothing changes in our lives unless *we* change it. Crucial to that is never seeing yourself as a victim and always as the creator of your reality. Life is a simple sequence of choice and consequence. Make different choices and you create different consequences. *You* have to make those choices – not Black Lives Matter, the Woke Mafia and anyone else that seeks to dictate your life. Who are they these Wokers, an emotional and psychological road traffic accident, to tell you what to do? Personal empowerment is the last thing the Cult and its Black Lives Matter want black people or anyone else to have. They claim to be defending the underdog while *creating* and perpetuating the underdog. The Cult's worst nightmare is human unity and if they are going to keep blacks, whites and every other race under economic servitude and control then the focus must be diverted from what they have in common to what they can be manipulated to believe divides them. Blacks have to be told that their poverty and plight is the fault of the white bloke living on the street in the same poverty and with the same plight they are experiencing. The difference is that your plight black people is due to him, a white supremacist with 'white privilege' living on the street. Don't unite as one human family against your mutual oppressors and suppressors – fight the oppressor with the white face who is as financially deprived as you are. The Cult knows that as its 'Covid' agenda moves into still new levels of extremism people are going to respond and it has been spreading the seeds of disunity everywhere to stop a united response to the evil that targets *all of us*.

Racist attacks on 'whiteness' are getting ever more outrageous and especially through the American Democratic Party which has an appalling history for anti-black racism. Barack Obama, Joe Biden, Hillary Clinton and Nancy Pelosi all eulogised about Senator Robert Byrd at his funeral in 2010 after a nearly 60-year career in Congress. Byrd was a brutal Ku Klux Klan racist and a violent abuser of Cathy O'Brien in MKUltra. He said he would never fight in the military 'with a negro by my side' and 'rather I should die a thousand times,

and see Old Glory trampled in the dirt never to rise again, than to see this beloved land of ours become degraded by race mongrels, a throwback to the blackest specimen from the wilds'. Biden called Byrd a 'very close friend and mentor'. These 'Woke' hypocrites are not anti-racist they are anti-poor and anti-people not of their perceived class. Here is an illustration of the scale of anti-white racism to which we have now descended. Seriously Woke and moronic *New York Times* contributor Damon Young described whiteness as a 'virus' that 'like other viruses will not die until there are no bodies left for it to infect'. He went on: '... the only way to stop it is to locate it, isolate it, extract it, and kill it.' Young can say that as a black man with no consequences when a white man saying the same in reverse would be facing a jail sentence. *That's* racism. We had super-Woke numbskull senators Tammy Duckworth and Mazie Hirono saying they would object to future Biden Cabinet appointments if he did not nominate more Asian Americans and Pacific Islanders. Never mind the ability of the candidate what do they look like? Duckworth said: 'I will vote for racial minorities and I will vote for LGBTQ, but anyone else I'm not voting for.' Appointing people on the grounds of race is illegal, but that was not a problem for this ludicrous pair. They were on-message and that's a free pass in any situation.

Critical race racism

White children are told at school they are intrinsically racist as they are taught the divisive 'critical race theory'. This claims that the law and legal institutions are inherently racist and that race is a socially constructed concept used by white people to further their economic and political interests at the expense of people of colour. White is a 'virus' as we've seen. Racial inequality results from 'social, economic, and legal differences that white people create between races to maintain white interests which leads to poverty and criminality in minority communities'. I must tell that to the white guy sleeping on the street. The principal of East Side Community School in New York sent white parents a manifesto that called on

them to become 'white traitors' and advocate for full 'white abolition'. These people are teaching your kids when they urgently need a psychiatrist. The 'school' included a chart with 'eight white identities' that ranged from 'white supremacist' to 'white abolition' and defined the behaviour white people must follow to end 'the regime of whiteness'. Woke blacks and their privileged white associates are acting exactly like the slave owners of old and Ku Klux Klan racists like Robert Byrd. They are too full of their own self-purity to see that, but it's true. Racism is not a body type; it's a state of mind that can manifest through any colour, creed or culture.

Another racial fraud is '*equity*'. Not equality of treatment and opportunity – equity. It's a term spun as equality when it means something very different. Equality in its true sense is a raising up while 'equity' is a race to the bottom. Everyone in the same level of poverty is 'equity'. Keep everyone down – that's equity. The Cult doesn't want anyone in the human family to be empowered and BLM leaders, like all these 'anti-racist' organisations, continue their privileged, pampered existence by perpetuating the perception of gathering racism. When is the last time you heard an 'anti-racist' or 'anti-Semitism' organisation say that acts of racism and discrimination have *fallen*? It's not in the interests of their fundraising and power to influence and the same goes for the professional soccer anti-racism operation, Kick It Out. Two things confirmed that the Black Lives Matter riots in the summer of 2020 were Cult creations. One was that while anti-lockdown protests were condemned in this same period for 'transmitting 'Covid' the authorities supported mass gatherings of Black Lives Matter supporters. I even saw self-deluding people claiming to be doctors say the two types of protest were not the same. No – the non-existent 'Covid' was in favour of lockdowns and attacked those that protested against them while 'Covid' supported Black Lives Matter and kept well away from its protests. The whole thing was a joke and as lockdown protestors were arrested, often brutally, by reframed Face-Nappies we had the grotesque sight of police officers taking the knee to Black Lives Matter, a Cult-funded Marxist

organisation that supports violent riots and wants to destroy the nuclear family and white people.

He's not white? Shucks!

Woke obsession with race was on display again when ten people were shot dead in Boulder, Colorado, in March, 2021. Cult-owned Woke TV channels like CNN said the shooter appeared to be a white man and Wokers were on Twitter condemning 'violent white men' with the usual mantras. Then the shooter's name was released as Ahmad Al Aliwi Alissa, an anti-Trump Arab-American, and the sigh of disappointment could be heard five miles away. Never mind that ten people were dead and what that meant for their families. Race baiting was all that mattered to these sick Cult-serving people like Barack Obama who exploited the deaths to further divide America on racial grounds which is his job for the Cult. This is the man that 'racist' white Americans made the first black president of the United States and then gave him a second term. Not-very-bright Obama has become filthy rich on the back of that and today appears to have a big influence on the Biden administration. Even so he's still a downtrodden black man and a victim of white supremacy. This disingenuous fraud reveals the contempt he has for black people when he puts on a Deep South Alabama accent whenever he talks to them, no, *at* them.

Another BLM red flag was how the now fully-Woke (fully-Cult) and fully-virtue-signalled professional soccer authorities had their teams taking the knee before every match in support of Marxist Black Lives Matter. Soccer authorities and clubs displayed 'Black Lives Matter' on the players' shirts and flashed the name on electronic billboards around the pitch. Any fans that condemned what is a Freemasonic taking-the-knee ritual were widely condemned as you would expect from the Woke virtue-signallers of professional sport and the now fully-Woke media. We have reverse racism in which you are banned from criticising any race or culture except for white people for whom anything goes – say what you like, no problem. What has this got to do with racial harmony and

equality? We've had black supremacists from Black Lives Matter telling white people to fall to their knees in the street and apologise for their white supremacy. Black supremacists acting like white supremacist slave owners of the past couldn't breach their self-obsessed, race-obsessed sense of self-purity. Joe Biden appointed a race-obsessed black supremacist Kristen Clarke to head the Justice Department Civil Rights Division. Clarke claimed that blacks are endowed with 'greater mental, physical and spiritual abilities' than whites. If anyone reversed that statement they would be vilified. Clarke is on-message so no problem. She's never seen a black-white situation in which the black figure is anything but a virtuous victim and she heads the Civil Rights Division which should treat everyone the same or it isn't civil rights. Another perception of the Renegade Mind: If something or someone is part of the Cult agenda they will be supported by Woke governments and media no matter what. If they're not, they will be condemned and censored. It really is that simple and so racist Clarke prospers despite (make that because of) her racism.

The end of culture

Biden's administration is full of such racial, cultural and economic bias as the Cult requires the human family to be divided into warring factions. We are now seeing racially-segregated graduations and everything, but everything, is defined through the lens of perceived 'racism'. We have 'racist' mathematics, 'racist' food and even 'racist' *plants*. World famous Kew Gardens in London said it was changing labels on plants and flowers to tell its pre-'Covid' more than two million visitors a year how racist they are. Kew director Richard Deverell said this was part of an effort to 'move quickly to decolonise collections' after they were approached by one Ajay Chhabra 'an actor with an insight into how sugar cane was linked to slavery'. They are *plants* you idiots. 'Decolonisation' in the Woke manual really means colonisation of society with its mentality and by extension colonisation by the Cult. We are witnessing a new Chinese-style 'Cultural Revolution' so essential to the success of all

Marxist takeovers. Our cultural past and traditions have to be swept away to allow a new culture to be built-back-better. Woke targeting of long-standing Western cultural pillars including historical monuments and cancelling of historical figures is what happened in the Mao revolution in China which 'purged remnants of capitalist and traditional elements from Chinese society' and installed Maoism as the dominant ideology'. For China see the Western world today and for 'dominant ideology' see Woke. Better still see Marxism or Maoism. The 'Covid' hoax has specifically sought to destroy the arts and all elements of Western culture from people meeting in a pub or restaurant to closing theatres, music venues, sports stadiums, places of worship and even banning *singing*. Destruction of Western society is also why criticism of any religion is banned except for Christianity which again is the dominant religion as white is the numerically-dominant race. Christianity may be fading rapidly, but its history and traditions are weaved through the fabric of Western society. Delete the pillars and other structures will follow until the whole thing collapses. I am not a Christian defending that religion when I say that. I have no religion. It's just a fact. To this end Christianity has itself been turned Woke to usher its own downfall and its ranks are awash with 'change agents' – knowing and unknowing – at every level including Pope Francis (*definitely* knowing) and the clueless Archbishop of Canterbury Justin Welby (possibly not, but who can be sure?). Woke seeks to coordinate attacks on Western culture, traditions, and ways of life through 'intersectionality' defined as 'the complex, cumulative way in which the effects of multiple forms of discrimination (such as racism, sexism, and classism) combine, overlap, or intersect especially in the experiences of marginalised individuals or groups'. Wade through the Orwellian Woke-speak and this means coordinating disparate groups in a common cause to overthrow freedom and liberal values.

The entire structure of public institutions has been infested with Woke – government at all levels, political parties, police, military, schools, universities, advertising, media and trade unions. This abomination has been achieved through the Cult web by appointing

Wokers to positions of power and battering non-Wokers into line through intimidation, isolation and threats to their job. Many have been fired in the wake of the empathy-deleted, vicious hostility of 'social justice' Wokers and the desire of gutless, spineless employers to virtue-signal their Wokeness. Corporations are filled with Wokers today, most notably those in Silicon Valley. Ironically at the top they are not Woke at all. They are only exploiting the mentality their Cult masters have created and funded to censor and enslave while the Wokers cheer them on until it's their turn. Thus the Woke 'liberal left' is an inversion of the traditional liberal left. Campaigning for justice on the grounds of power and wealth distribution has been replaced by campaigning for identity politics. The genuine traditional left would never have taken money from today's billionaire abusers of fairness and justice and nor would the billionaires have wanted to fund that genuine left. It would not have been in their interests to do so. The division of opinion in those days was between the haves and have nots. This all changed with Cult manipulated and funded identity politics. The division of opinion today is between Wokers and non-Wokers and not income brackets. Cult corporations and their billionaires may have taken wealth disparity to cataclysmic levels of injustice, but as long as they speak the language of Woke, hand out the dosh to the Woke network and censor the enemy they are 'one of us'. Billionaires who don't give a damn about injustice are laughing at them till their bellies hurt. Wokers are not even close to self-aware enough to see that. The transformed 'left' dynamic means that Wokers who drone on about 'social justice' are funded by billionaires that have destroyed social justice the world over. It's *why* they are billionaires.

The climate con

Nothing encapsulates what I have said more comprehensively than the hoax of human-caused global warming. I have detailed in my books over the years how Cult operatives and organisations were the pump-primers from the start of the climate con. A purpose-built vehicle for this is the Club of Rome established by the Cult in 1968

with the Rockefellers and Rothschilds centrally involved all along. Their gofer frontman Maurice Strong, a Canadian oil millionaire, hosted the Earth Summit in Rio de Janeiro, Brazil, in 1992 where the global 'green movement' really expanded in earnest under the guiding hand of the Cult. The Earth Summit established Agenda 21 through the Cult-created-and-owned United Nations to use the illusion of human-caused climate change to justify the transformation of global society to save the world from climate disaster. It is a No-Problem-Reaction-Solution sold through governments, media, schools and universities as whole generations have been terrified into believing that the world was going to end in their lifetimes unless what old people had inflicted upon them was stopped by a complete restructuring of how everything is done. Chill, kids, it's all a hoax. Such restructuring is precisely what the Cult agenda demands (purely by coincidence of course). Today this has been given the codename of the Great Reset which is only an updated term for Agenda 21 and its associated Agenda 2030. The latter, too, is administered through the UN and was voted into being by the General Assembly in 2015. Both 21 and 2030 seek centralised control of all resources and food right down to the raindrops falling on your own land. These are some of the demands of Agenda 21 established in 1992. See if you recognise this society emerging today:

- End national sovereignty
- State planning and management of all land resources, ecosystems, deserts, forests, mountains, oceans and fresh water; agriculture; rural development; biotechnology; and ensuring '*equity*'
- The state to 'define the role' of business and financial resources
- Abolition of private property
- 'Restructuring' the family unit (see BLM)
- Children raised by the state
- People told what their job will be
- Major restrictions on movement
- Creation of 'human settlement zones'

- Mass resettlement as people are forced to vacate land where they live
- Dumbing down education
- Mass global depopulation in pursuit of all the above

The United Nations was created as a Trojan horse for world government. With the climate con of critical importance to promoting that outcome you would expect the UN to be involved. Oh, it's involved all right. The UN is promoting Agenda 21 and Agenda 2030 justified by 'climate change' while also driving the climate hoax through its Intergovernmental Panel on Climate Change (IPCC), one of the world's most corrupt organisations. The IPCC has been lying ferociously and constantly since the day it opened its doors with the global media hanging unquestioningly on its every mendacious word. The Green movement is entirely Woke and has long lost its original environmental focus since it was co-opted by the Cult. An obsession with 'global warming' has deleted its values and scrambled its head. I experienced a small example of what I mean on a beautiful country walk that I have enjoyed several times a week for many years. The path merged into the fields and forests and you felt at one with the natural world. Then a 'Green' organisation, the Hampshire and Isle of Wight Wildlife Trust, took over part of the land and proceeded to cut down a large number of trees, including mature ones, to install a horrible big, bright steel 'this-is-ours-stay-out' fence that destroyed the whole atmosphere of this beautiful place. No one with a feel for nature would do that. Day after day I walked to the sound of chainsaws and a magnificent mature weeping willow tree that I so admired was cut down at the base of the trunk. When I challenged a Woke young girl in a green shirt (of course) about this vandalism she replied: 'It's a weeping willow – it will grow back.' This is what people are paying for when they donate to the Hampshire and Isle of Wight Wildlife Trust and many other 'green' organisations today. It is not the environmental movement that I knew and instead has become a support-system – as with Extinction Rebellion – for a very dark agenda.

Private jets for climate justice

The Cult-owned, Gates-funded, World Economic Forum and its founder Klaus Schwab were behind the emergence of Greta Thunberg to harness the young behind the climate agenda and she was invited to speak to the world at ... the UN. Schwab published a book, *Covid-19: The Great Reset* in 2020 in which he used the 'Covid' hoax and the climate hoax to lay out a new society straight out of Agenda 21 and Agenda 2030. Bill Gates followed in early 2021 when he took time out from destroying the world to produce a book in his name about the way to save it. Gates flies across the world in private jets and admitted that 'I probably have one of the highest greenhouse gas footprints of anyone on the planet ... my personal flying alone is gigantic.' He has also bid for the planet's biggest private jet operator. Other climate change saviours who fly in private jets include John Kerry, the US Special Presidential Envoy for Climate, and actor Leonardo DiCaprio, a 'UN Messenger of Peace with special focus on climate change'. These people are so full of bullshit they could corner the market in manure. We mustn't be sceptical, though, because the Gates book, *How to Avoid a Climate Disaster: The Solutions We Have and the Breakthroughs We Need*, is a genuine attempt to protect the world and not an obvious pile of excrement attributed to a mega-psychopath aimed at selling his masters' plans for humanity. The Gates book and the other shite-pile by Klaus Schwab could have been written by the same person and may well have been. Both use 'climate change' and 'Covid' as the excuses for their new society and by coincidence the Cult's World Economic Forum and Bill and Melinda Gates Foundation promote the climate hoax and hosted Event 201 which pre-empted with a 'simulation' the very 'coronavirus' hoax that would be simulated for real on humanity within weeks. The British 'royal' family is promoting the 'Reset' as you would expect through Prince 'climate change caused the war in Syria' Charles and his hapless son Prince William who said that we must 'reset our relationship with nature and our trajectory as a species' to avoid a climate disaster. Amazing how many promoters of the 'Covid' and 'climate change' control

systems are connected to Gates and the World Economic Forum. A 'study' in early 2021 claimed that carbon dioxide emissions must fall by the equivalent of a global lockdown roughly every two years for the next decade to save the planet. The 'study' appeared in the same period that the Schwab mob claimed in a video that lockdowns destroying the lives of billions are good because they make the earth 'quieter' with less 'ambient noise'. They took down the video amid a public backlash for such arrogant, empathy-deleted stupidity. You see, however, where they are going with this. Corinne Le Quéré, a professor at the Tyndall Centre for Climate Change Research, University of East Anglia, was lead author of the climate lockdown study, and she writes for ... the World Economic Forum. Gates calls in 'his' book for changing 'every aspect of the economy' (long-time Cult agenda) and for humans to eat synthetic 'meat' (predicted in my books) while cows and other farm animals are eliminated. Australian TV host and commentator Alan Jones described what carbon emission targets would mean for farm animals in Australia alone if emissions were reduced as demanded by 35 percent by 2030 and zero by 2050:

Well, let's take agriculture, the total emissions from agriculture are about 75 million tonnes of carbon dioxide, equivalent. Now reduce that by 35 percent and you have to come down to 50 million tonnes, I've done the maths. So if you take for example 1.5 million cows, you're going to have to reduce the herd by 525,000 [by] 2030, nine years, that's 58,000 cows a year. The beef herd's 30 million, reduce that by 35 percent, that's 10.5 million, which means 1.2 million cattle have to go every year between now and 2030. This is insanity!

There are 75 million sheep. Reduce that by 35 percent, that's 26 million sheep, that's almost 3 million a year. So under the Paris Agreement over 30 million beasts, dairy cows, cattle, pigs and sheep would go. More than 8,000 every minute of every hour for the next decade, do these people know what they're talking about?

Clearly they don't at the level of campaigners, politicians and administrators. The Cult *does* know; that's the outcome it wants. We are faced with not just a war on humanity. Animals and the natural world are being targeted and I have been saying since the 'Covid' hoax began that the plan eventually was to claim that the 'deadly virus' is able to jump from animals, including farm animals and

domestic pets, to humans. Just before this book went into production came this story: 'Russia registers world's first Covid-19 vaccine for cats & dogs as makers of Sputnik V warn pets & farm animals could spread virus'. The report said 'top scientists warned that the deadly pathogen could soon begin spreading through homes and farms' and 'the next stage is the infection of farm and domestic animals'. Know the outcome and you'll see the journey. Think what that would mean for animals and keep your eye on a term called zoonosis or zoonotic diseases which transmit between animals and humans. The Cult wants to break the connection between animals and people as it does between people and people. Farm animals fit with the Cult agenda to transform food from natural to synthetic.

The gas of life is killing us

There can be few greater examples of Cult inversion than the condemnation of carbon dioxide as a dangerous pollutant when it is the gas of life. Without it the natural world would be dead and so we would all be dead. We breathe in oxygen and breathe out carbon dioxide while plants produce oxygen and absorb carbon dioxide. It is a perfect symbiotic relationship that the Cult wants to dismantle for reasons I will come to in the final two chapters. Gates, Schwab, other Cult operatives and mindless repeaters, want the world to be 'carbon neutral' by at least 2050 and the earlier the better. 'Zero carbon' is the cry echoed by lunatics calling for 'Zero Covid' when we already have it. These carbon emission targets will deindustrialise the world in accordance with Cult plans – the post-industrial, post-democratic society – and with so-called renewables like solar and wind not coming even close to meeting human energy needs blackouts and cold are inevitable. Texans got the picture in the winter of 2021 when a snow storm stopped wind turbines and solar panels from working and the lights went down along with water which relies on electricity for its supply system. Gates wants everything to be powered by electricity to ensure that his masters have the kill switch to stop all human activity, movement, cooking, water and warmth any time they like. The climate lie is so

stupendously inverted that it claims we must urgently reduce carbon dioxide when we *don't have enough*.

Co2 in the atmosphere is a little above 400 parts per million when the optimum for plant growth is 2,000 ppm and when it falls anywhere near 150 ppm the natural world starts to die and so do we. It fell to as low as 280 ppm in an 1880 measurement in Hawaii and rose to 413 ppm in 2019 with industrialisation which is why the planet has become *greener* in the industrial period. How insane then that psychopathic madman Gates is not satisfied only with blocking the rise of Co2. He's funding technology to suck it out of the atmosphere. The reason why will become clear. The industrial era is not destroying the world through Co2 and has instead turned around a potentially disastrous ongoing fall in Co2. Greenpeace co-founder and scientist Patrick Moore walked away from Greenpeace in 1986 and has exposed the green movement for fear-mongering and lies. He said that 500 million years ago there was *17 times* more Co2 in the atmosphere than we have today and levels have been falling for hundreds of millions of years. In the last 150 million years Co2 levels in Earth's atmosphere had reduced by *90 percent*. Moore said that by the time humanity began to unlock carbon dioxide from fossil fuels we were at '38 seconds to midnight' and in that sense: 'Humans are [the Earth's] salvation.' Moore made the point that only half the Co2 emitted by fossil fuels stays in the atmosphere and we should remember that all pollution pouring from chimneys that we are told is carbon dioxide is in fact nothing of the kind. It's pollution. Carbon dioxide is an invisible gas.

William Happer, Professor of Physics at Princeton University and long-time government adviser on climate, has emphasised the Co2 deficiency for maximum growth and food production. Greenhouse growers don't add carbon dioxide for a bit of fun. He said that most of the warming in the last 100 years, after the earth emerged from the super-cold period of the 'Little Ice Age' into a natural warming cycle, was over by 1940. Happer said that a peak year for warming in 1988 can be explained by a 'monster El Nino' which is a natural and cyclical warming of the Pacific that has nothing to do with 'climate

change'. He said the effect of Co2 could be compared to painting a wall with red paint in that once two or three coats have been applied it didn't matter how much more you slapped on because the wall will not get much redder. Almost all the effect of the rise in Co2 has already happened, he said, and the volume in the atmosphere would now have to *double* to increase temperature by a single degree. Climate hoaxers know this and they have invented the most ridiculously complicated series of 'feedback' loops to try to overcome this rather devastating fact. You hear puppet Greta going on cluelessly about feedback loops and this is why.

The Sun affects temperature? No you *climate denier*

Some other nonsense to contemplate: Climate graphs show that rises in temperature do not follow rises in Co2 – *it's the other way round* with a lag between the two of some 800 years. If we go back 800 years from present time we hit the Medieval Warm Period when temperatures were higher than now without any industrialisation and this was followed by the Little Ice Age when temperatures plummeted. The world was still emerging from these centuries of serious cold when many climate records began which makes the ever-repeated line of the 'hottest year since records began' meaningless when you are not comparing like with like. The coldest period of the Little Ice Age corresponded with the lowest period of sunspot activity when the Sun was at its least active. Proper scientists will not be at all surprised by this when it confirms the obvious fact that earth temperature is affected by the scale of Sun activity and the energetic power that it subsequently emits; but when is the last time you heard a climate hoaxer talking about the Sun as a source of earth temperature?? Everything has to be focussed on Co2 which makes up just 0.117 percent of so-called greenhouse gases and only a fraction of even that is generated by human activity. The rest is natural. More than 90 percent of those greenhouse gases are water vapour and clouds ([Fig 9](#)). Ban moisture I say. Have you noticed that the climate hoaxers no longer use the polar bear as their promotion image? That's because far from becoming extinct polar

bear communities are stable or thriving. Joe Bastardi, American meteorologist, weather forecaster and outspoken critic of the climate lie, documents in his book *The Climate Chronicles* how weather patterns and events claimed to be evidence of climate change have been happening since long before industrialisation: 'What happened before naturally is happening again, as is to be expected given the cyclical nature of the climate due to the design of the planet.' If you read the detailed background to the climate hoax in my other books you will shake your head and wonder how anyone could believe the crap which has spawned a multi-trillion dollar industry based on absolute garbage (see HIV causes AIDs and Sars-Cov-2 causes 'Covid-19'). Climate and 'Covid' have much in common given they have the same source. They both have the contradictory *everything* factor in which everything is explained by reference to them. It's hot – 'it's climate change'. It's cold – 'it's climate change'. I got a sniffle – 'it's Covid'. I haven't got a sniffle – 'it's Covid'. Not having a sniffle has to be a symptom of 'Covid'. Everything is and not having a sniffle is especially dangerous if you are a slow walker. For sheer audacity I offer you a Cambridge University 'study' that actually linked 'Covid' to 'climate change'. It had to happen eventually. They concluded that climate change played a role in 'Covid-19' spreading from animals to humans because ... wait for it ... I kid you not ... *the two groups were forced closer together as populations grow*. Er, that's it. The whole foundation on which this depended was that 'Bats are the likely zoonotic origin of SARS-CoV-1 and SARS-CoV-2'. Well, they are not. They are nothing to do with it. Apart from bats not being the origin and therefore 'climate change' effects on bats being irrelevant I am in awe of their academic insight. Where would we be without them? Not where we are that's for sure.

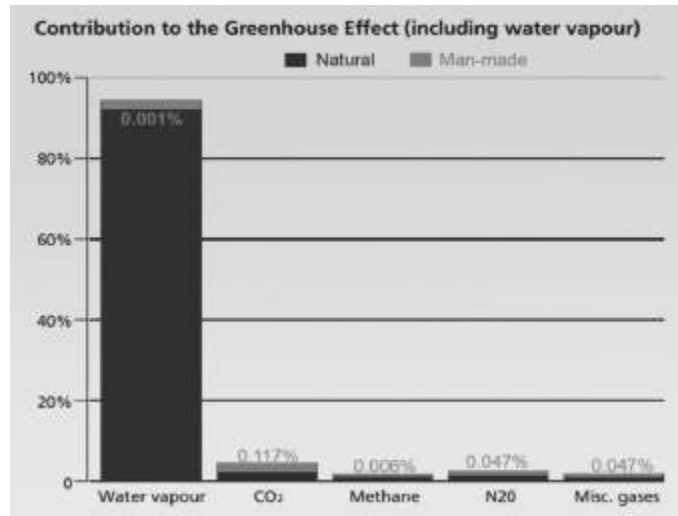


Figure 9: The idea that the gas of life is disastrously changing the climate is an insult to brain cell activity.

One other point about the weather is that climate modification is now well advanced and not every major weather event is natural – or earthquake come to that. I cover this subject at some length in other books. China is openly planning a rapid expansion of its weather modification programme which includes changing the climate in an area more than one and a half times the size of India. China used weather manipulation to ensure clear skies during the 2008 Olympics in Beijing. I have quoted from US military documents detailing how to employ weather manipulation as a weapon of war and they did that in the 1960s and 70s during the conflict in Vietnam with Operation Popeye manipulating monsoon rains for military purposes. Why would there be international treaties on weather modification if it wasn't possible? Of course it is. Weather is energetic information and it can be changed.

How was the climate hoax pulled off? See 'Covid'

If you can get billions to believe in a 'virus' that doesn't exist you can get them to believe in human-caused climate change that doesn't exist. Both are being used by the Cult to transform global society in the way it has long planned. Both hoaxes have been achieved in pretty much the same way. First you declare a lie is a fact. There's a

'virus' you call SARS-Cov-2 or humans are warming the planet with their behaviour. Next this becomes, via Cult networks, the foundation of government, academic and science policy and belief. Those who parrot the mantra are given big grants to produce research that confirms the narrative is true and ever more 'symptoms' are added to make the 'virus'/'climate change' sound even more scary. Scientists and researchers who challenge the narrative have their grants withdrawn and their careers destroyed. The media promote the lie as the unquestionable truth and censor those with an alternative view or evidence. A great percentage of the population believe what they are told as the lie becomes an everybody-knows-that and the believing-masses turn on those with a mind of their own. The technique has been used endlessly throughout human history. Wokers are the biggest promoters of the climate lie *and* 'Covid' fascism because their minds are owned by the Cult; their sense of self-righteous self-purity knows no bounds; and they exist in a bubble of reality in which facts are irrelevant and only get in the way of looking without seeing.

Running through all of this like veins in a blue cheese is control of information, which means control of perception, which means control of behaviour, which collectively means control of human society. The Cult owns the global media and Silicon Valley fascists for the simple reason that it *has* to. Without control of information it can't control perception and through that human society. Examine every facet of the Cult agenda and you will see that anything supporting its introduction is never censored while anything pushing back is always censored. I say again: Psychopaths that know why they are doing this must go before Nuremberg trials and those that follow their orders must trot along behind them into the same dock. 'I was just following orders' didn't work the first time and it must not work now. Nuremberg trials must be held all over the world before public juries for politicians, government officials, police, compliant doctors, scientists and virologists, and all Cult operatives such as Gates, Tedros, Fauci, Vallance, Whitty, Ferguson, Zuckerberg, Wojcicki, Brin, Page, Dorsey, the whole damn lot of

them – including, no *especially*, the psychopath psychologists. Without them and the brainless, gutless excuses for journalists that have repeated their lies, none of this could be happening. Nobody can be allowed to escape justice for the psychological and economic Armageddon they are all responsible for visiting upon the human race.

As for the compliant, unquestioning, swathes of humanity, and the self-obsessed, all-knowing ignorance of the Wokers ... don't start me. God help their kids. God help their grandkids. God *help them*.

CHAPTER NINE

We must have it? So what is it?

*Well I won't back down. No, I won't back down. You can stand me
up at the Gates of Hell. But I won't back down*

Tom Petty

I will now focus on the genetically-manipulating 'Covid vaccines' which do not meet this official definition of a vaccine by the US Centers for Disease Control (CDC): 'A product that stimulates a person's immune system to produce immunity to a specific disease, protecting the person from that disease.' On that basis 'Covid vaccines' are not a vaccine in that the makers don't even claim they stop infection or transmission.

They are instead part of a multi-levelled conspiracy to change the nature of the human body and what it means to be 'human' and to depopulate an enormous swathe of humanity. What I shall call Human 1.0 is on the cusp of becoming Human 2.0 and for very sinister reasons. Before I get to the 'Covid vaccine' in detail here's some background to vaccines in general. Government regulators do not test vaccines – the makers do – and the makers control which data is revealed and which isn't. Children in America are given 50 vaccine doses by age six and 69 by age 19 and the effect of the whole combined schedule has never been tested. Autoimmune diseases when the immune system attacks its own body have soared in the mass vaccine era and so has disease in general in children and the young. Why wouldn't this be the case when vaccines target the *immune system*? The US government gave Big Pharma drug

companies immunity from prosecution for vaccine death and injury in the 1986 National Childhood Vaccine Injury Act (NCVIA) and since then the government (taxpayer) has been funding compensation for the consequences of Big Pharma vaccines. The criminal and satanic drug giants can't lose and the vaccine schedule has increased dramatically since 1986 for this reason. There is no incentive to make vaccines safe and a big incentive to make money by introducing ever more. Even against a ridiculously high bar to prove vaccine liability, and with the government controlling the hearing in which it is being challenged for compensation, the vaccine court has so far paid out more than \$4 billion. These are the vaccines we are told are safe and psychopaths like Zuckerberg censor posts saying otherwise. The immunity law was even justified by a ruling that vaccines by their nature were 'unavoidably unsafe'.

Check out the ingredients of vaccines and you will be shocked if you are new to this. *They put that in children's bodies?? What??* Try aluminium, a brain toxin connected to dementia, aborted foetal tissue and formaldehyde which is used to embalm corpses. World-renowned aluminium expert Christopher Exley had his research into the health effect of aluminium in vaccines shut down by Keele University in the UK when it began taking funding from the Bill and Melinda Gates Foundation. Research when diseases 'eradicated' by vaccines began to decline and you will find the fall began long *before* the vaccine was introduced. Sometimes the fall even plateaued after the vaccine. Diseases like scarlet fever for which there was no vaccine declined in the same way because of environmental and other factors. A perfect case in point is the polio vaccine. Polio began when lead arsenate was first sprayed as an insecticide and residues remained in food products. Spraying started in 1892 and the first US polio epidemic came in Vermont in 1894. The simple answer was to stop spraying, but Rockefeller-created Big Pharma had a better idea. Polio was decreed to be caused by the *poliovirus* which 'spreads from person to person and can infect a person's spinal cord'. Lead arsenate was replaced by the lethal DDT which had the same effect of causing paralysis by damaging the brain and central nervous

system. Polio plummeted when DDT was reduced and then banned, but the vaccine is still given the credit for something it didn't do. Today by far the biggest cause of polio is the vaccines promoted by Bill Gates. Vaccine justice campaigner Robert Kennedy Jr, son of assassinated (by the Cult) US Attorney General Robert Kennedy, wrote:

In 2017, the World Health Organization (WHO) reluctantly admitted that the global explosion in polio is predominantly vaccine strain. The most frightening epidemics in Congo, Afghanistan, and the Philippines, are all linked to vaccines. In fact, by 2018, 70% of global polio cases were vaccine strain.

Vaccines make fortunes for Cult-owned Gates and Big Pharma while undermining the health and immune systems of the population. We had a glimpse of the mentality behind the Big Pharma cartel with a report on WION (World is One News), an international English language TV station based in India, which exposed the extraordinary behaviour of US drug company Pfizer over its 'Covid vaccine'. The WION report told how Pfizer had made fantastic demands of Argentina, Brazil and other countries in return for its 'vaccine'. These included immunity from prosecution, even for Pfizer negligence, government insurance to protect Pfizer from law suits and handing over as collateral sovereign assets of the country to include Argentina's bank reserves, military bases and embassy buildings. Pfizer demanded the same of Brazil in the form of waiving sovereignty of its assets abroad; exempting Pfizer from Brazilian laws; and giving Pfizer immunity from all civil liability. This is a 'vaccine' developed with government funding. Big Pharma is evil incarnate as a creation of the Cult and all must be handed tickets to Nuremberg.

Phantom 'vaccine' for a phantom 'disease'

I'll expose the 'Covid vaccine' fraud and then go on to the wider background of why the Cult has set out to 'vaccinate' every man, woman and child on the planet for an alleged 'new disease' with a survival rate of 99.77 percent (or more) even by the grotesquely-

manipulated figures of the World Health Organization and Johns Hopkins University. The 'infection' to 'death' ratio is 0.23 to 0.15 percent according to Stanford epidemiologist Dr John Ioannidis and while estimates vary the danger remains tiny. I say that if the truth be told the fake infection to fake death ratio is zero. Never mind all the evidence I have presented here and in *The Answer* that there is no 'virus' let us just focus for a moment on that death-rate figure of say 0.23 percent. The figure includes all those worldwide who have tested positive with a test not testing for the 'virus' and then died within 28 days or even longer of any other cause – *any other cause*. Now subtract all those illusory 'Covid' deaths on the global data sheets from the 0.23 percent. What do you think you would be left with? *Zero*. A vaccination has never been successfully developed for a so-called coronavirus. They have all failed at the animal testing stage when they caused hypersensitivity to what they were claiming to protect against and made the impact of a disease far worse. Cult-owned vaccine corporations got around that problem this time by bypassing animal trials, going straight to humans and making the length of the 'trials' before the public rollout as short as they could get away with. Normally it takes five to ten years or more to develop vaccines that still cause demonstrable harm to many people and that's without including the long-term effects that are never officially connected to the vaccination. 'Covid' non-vaccines have been officially produced and approved in a matter of months from a standing start and part of the reason is that (a) they were developed before the 'Covid' hoax began and (b) they are based on computer programs and not natural sources. Official non-trials were so short that government agencies gave *emergency*, not full, approval. 'Trials' were not even completed and full approval cannot be secured until they are. Public 'Covid vaccination' is actually a *continuation of the trial*. Drug company 'trials' are not scheduled to end until 2023 by which time a lot of people are going to be dead. Data on which government agencies gave this emergency approval was supplied by the Big Pharma corporations themselves in the form of Pfizer/BioNTech, AstraZeneca, Moderna, Johnson & Johnson, and

others, and this is the case with all vaccines. By its very nature *emergency* approval means drug companies do not have to prove that the 'vaccine' is 'safe and effective'. How could they with trials way short of complete? Government regulators only have to *believe* that they *could* be safe and effective. It is criminal manipulation to get products in circulation with no testing worth the name. Agencies giving that approval are infested with Big Pharma-connected place-people and they act in the interests of Big Pharma (the Cult) and not the public about whom they do not give a damn.

More human lab rats

'Covid vaccines' produced in record time by Pfizer/BioNTech and Moderna employ a technique *never approved before for use on humans*. They are known as mRNA 'vaccines' and inject a synthetic version of 'viral' mRNA or 'messenger RNA'. The key is in the term 'messenger'. The body works, or doesn't, on the basis of information messaging. Communications are constantly passing between and within the genetic system and the brain. Change those messages and you change the state of the body and even its very nature and you can change psychology and behaviour by the way the brain processes information. I think you are going to see significant changes in personality and perception of many people who have had the 'Covid vaccine' synthetic potions. Insider Aldous Huxley predicted the following in 1961 and mRNA 'vaccines' can be included in the term 'pharmacological methods':

There will be, in the next generation or so, a pharmacological method of making people love their servitude, and producing dictatorship without tears, so to speak, producing a kind of painless concentration camp for entire societies, so that people will in fact have their own liberties taken away from them, but rather enjoy it, because they will be distracted from any desire to rebel by propaganda or brainwashing, or brainwashing enhanced by pharmacological methods. And this seems to be the final revolution.

Apologists claim that mRNA synthetic 'vaccines' don't change the DNA genetic blueprint because RNA does not affect DNA only the other way round. This is so disingenuous. A process called 'reverse

transcription' can convert RNA into DNA and be integrated into DNA in the cell nucleus. This was highlighted in December, 2020, by scientists at Harvard and Massachusetts Institute of Technology (MIT). Geneticists report that more than 40 percent of mammalian genomes results from reverse transcription. On the most basic level if messaging changes then that sequence must lead to changes in DNA which is receiving and transmitting those communications. How can introducing synthetic material into cells not change the cells where DNA is located? The process is known as transfection which is defined as 'a technique to insert foreign nucleic acid (DNA or RNA) into a cell, typically with the intention of altering the properties of the cell'. Researchers at the Sloan Kettering Institute in New York found that changes in messenger RNA can deactivate tumour-suppressing proteins and thereby promote cancer. This is what happens when you mess with messaging. 'Covid vaccine' maker Moderna was founded in 2010 by Canadian stem cell biologist Derrick J. Rossi after his breakthrough discovery in the field of transforming and reprogramming stem cells. These are neutral cells that can be programmed to become any cell including sperm cells. Moderna was therefore founded on the principle of genetic manipulation and has never produced any vaccine or drug before its genetically-manipulating synthetic 'Covid' shite. Look at the name – Mode-RNA or Modify-RNA. Another important point is that the US Supreme Court has ruled that genetically-modified DNA, or complementary DNA (cDNA) synthesized in the laboratory from messenger RNA, can be patented and owned. These psychopaths are doing this to the human body.

Cells replicate synthetic mRNA in the 'Covid vaccines' and in theory the body is tricked into making antigens which trigger antibodies to target the 'virus spike proteins' which as Dr Tom Cowan said have *never been seen*. Cut the crap and these 'vaccines' deliver *self-replicating* synthetic material to the cells with the effect of changing human DNA. The more of them you have the more that process is compounded while synthetic material is all the time self-replicating. 'Vaccine'-maker Moderna describes mRNA as 'like

software for the cell' and so they are messing with the body's software. What happens when you change the software in a computer? Everything changes. For this reason the Cult is preparing a production line of mRNA 'Covid vaccines' and a long list of excuses to use them as with all the 'variants' of a 'virus' never shown to exist. The plan is further to transfer the mRNA technique to other vaccines mostly given to children and young people. The cumulative consequences will be a transformation of human DNA through a constant infusion of synthetic genetic material which will kill many and change the rest. Now consider that governments that have given emergency approval for a vaccine that's not a vaccine; never been approved for humans before; had no testing worth the name; and the makers have been given immunity from prosecution for any deaths or adverse effects suffered by the public. The UK government awarded *permanent legal indemnity* to itself and its employees for harm done when a patient is being treated for 'Covid-19' or 'suspected Covid-19'. That is quite a thought when these are possible 'side-effects' from the 'vaccine' (they are not 'side', they are effects) listed by the US Food and Drug Administration:

Guillain-Barre syndrome; acute disseminated encephalomyelitis; transverse myelitis; encephalitis; myelitis; encephalomyelitis; meningoencephalitis; meningitis; encephalopathy; convulsions; seizures; stroke; narcolepsy; cataplexy; anaphylaxis; acute myocardial infarction (heart attack); myocarditis; pericarditis; autoimmune disease; death; implications for pregnancy, and birth outcomes; other acute demyelinating diseases; non anaphylactic allergy reactions; thrombocytopenia ; disseminated intravascular coagulation; venous thromboembolism; arthritis; arthralgia; joint pain; Kawasaki disease; multisystem inflammatory syndrome in children; vaccine enhanced disease. The latter is the way the 'vaccine' has the potential to make diseases far worse than they would otherwise be.

UK doctor and freedom campaigner Vernon Coleman described the conditions in this list as 'all unpleasant, most of them very serious, and you can't get more serious than death'. The thought that anyone at all has had the 'vaccine' in these circumstances is testament to the potential that humanity has for clueless, unquestioning, stupidity and for many that programmed stupidity has already been terminal.

An insider speaks

Dr Michael Yeadon is a former Vice President, head of research and Chief Scientific Adviser at vaccine giant Pfizer. Yeadon worked on the inside of Big Pharma, but that did not stop him becoming a vocal critic of 'Covid vaccines' and their potential for multiple harms, including infertility in women. By the spring of 2021 he went much further and even used the no, no, term 'conspiracy'. When you begin to see what is going on it is impossible not to do so. Yeadon spoke out in an interview with freedom campaigner James Delingpole and I mentioned earlier how he said that no one had samples of 'the virus'. He explained that the mRNA technique originated in the anti-cancer field and ways to turn on and off certain genes which could be advantageous if you wanted to stop cancer growing out of control. 'That's the origin of them. They are a very unusual application, really.' Yeadon said that treating a cancer patient with an aggressive procedure might be understandable if the alternative was dying, but it was quite another thing to use the same technique as a public health measure. Most people involved wouldn't catch the infectious agent you were vaccinating against and if they did they probably wouldn't die:

If you are really using it as a public health measure you really want to as close as you can get to zero side-effects ... I find it odd that they chose techniques that were really cutting their teeth in the field of oncology and I'm worried that in using gene-based vaccines that have to be injected in the body and spread around the body, get taken up into some cells, and the regulators haven't quite told us which cells they get taken up into ... you are going to be generating a wide range of responses ... with multiple steps each of which could go well or badly.

I doubt the Cult intends it to go well. Yeadon said that you can put any gene you like into the body through the 'vaccine'. 'You can certainly give them a gene that would do them some harm if you wanted.' I was intrigued when he said that when used in the cancer field the technique could turn genes on and off. I explore this process in *The Answer* and with different genes having different functions you could create mayhem – physically and psychologically – if you turned the wrong ones on and the right ones off. I read reports of an experiment by researchers at the University of Washington's school of computer science and engineering in which they encoded DNA to infect computers. The body is itself a biological computer and if human DNA can inflict damage on a computer why can't the computer via synthetic material mess with the human body? It can. The Washington research team said it was possible to insert malicious malware into 'physical DNA strands' and corrupt the computer system of a gene sequencing machine as it 'reads gene letters and stores them as binary digits 0 and 1'. They concluded that hackers could one day use blood or spit samples to access computer systems and obtain sensitive data from police forensics labs or infect genome files. It is at this level of digital interaction that synthetic 'vaccines' need to be seen to get the full picture and that will become very clear later on. Michael Yeadon said it made no sense to give the 'vaccine' to younger people who were in no danger from the 'virus'. What was the benefit? It was all downside with potential effects:

The fact that my government in what I thought was a civilised, rational country, is raining [the 'vaccine'] on people in their 30s and 40s, even my children in their 20s, they're getting letters and phone calls, I know this is not right and any of you doctors who are vaccinating you know it's not right, too. They are not at risk. They are not at risk from the disease, so you are now hoping that the side-effects are so rare that you get away with it. You don't give new technology ... that you don't understand to 100 percent of the population.

Blood clot problems with the AstraZeneca 'vaccine' have been affecting younger people to emphasise the downside risks with no benefit. AstraZeneca's version, produced with Oxford University, does not use mRNA, but still gets its toxic cocktail inside cells where

it targets DNA. The Johnson & Johnson 'vaccine' which uses a similar technique has also produced blood clot effects to such an extent that the United States paused its use at one point. They are all 'gene therapy' (cell modification) procedures and not 'vaccines'. The truth is that once the content of these injections enter cells we have no idea what the effect will be. People can speculate and some can give very educated opinions and that's good. In the end, though, only the makers know what their potions are designed to do and even they won't know every last consequence. Michael Yeadon was scathing about doctors doing what they knew to be wrong. 'Everyone's mute', he said. Doctors in the NHS must know this was not right, coming into work and injecting people. 'I don't know how they sleep at night. I know I couldn't do it. I know that if I were in that position I'd have to quit.' He said he knew enough about toxicology to know this was not a good risk-benefit. Yeadon had spoken to seven or eight university professors and all except two would not speak out publicly. Their universities had a policy that no one said anything that countered the government and its medical advisors. They were afraid of losing their government grants. This is how intimidation has been used to silence the truth at every level of the system. I say silence, but these people could still speak out if they made that choice. Yeadon called them 'moral cowards' – 'This is about your children and grandchildren's lives and you have just buggered off and left it.'

'Variant' nonsense

Some of his most powerful comments related to the alleged 'variants' being used to instil more fear, justify more lockdowns, and introduce more 'vaccines'. He said government claims about 'variants' were nonsense. He had checked the alleged variant 'codes' and they were 99.7 percent identical to the 'original'. This was the human identity difference equivalent to putting a baseball cap on and off or wearing it the other way round. A 0.3 percent difference would make it impossible for that 'variant' to escape immunity from the 'original'. This made no sense of having new 'vaccines' for

‘variants’. He said there would have to be at least a *30 percent* difference for that to be justified and even then he believed the immune system would still recognise what it was. Gates-funded ‘variant modeller’ and ‘vaccine’-pusher John Edmunds might care to comment. Yeadon said drug companies were making new versions of the ‘vaccine’ as a ‘top up’ for ‘variants’. Worse than that, he said, the ‘regulators’ around the world like the MHRA in the UK had got together and agreed that because ‘vaccines’ for ‘variants’ were so similar to the first ‘vaccines’ *they did not have to do safety studies*. How transparently sinister that is. This is when Yeadon said: ‘There is a conspiracy here.’ There was no need for another vaccine for ‘variants’ and yet we were told that there was and the country had shut its borders because of them. ‘They are going into hundreds of millions of arms without passing ‘go’ or any regulator. Why did they do that? Why did they pick this method of making the vaccine?’

The reason had to be something bigger than that it seemed and ‘it’s not protection against the virus’. It’s was a far bigger project that meant politicians and advisers were willing to do things and not do things that knowingly resulted in avoidable deaths – ‘that’s already happened when you think about lockdown and deprivation of health care for a year.’ He spoke of people prepared to do something that results in the avoidable death of their fellow human beings and it not bother them. This is the penny-drop I have been working to get across for more than 30 years – the level of pure evil we are dealing with. Yeadon said his friends and associates could not believe there could be that much evil, but he reminded them of Stalin, Pol Pot and Hitler and of what Stalin had said: ‘One death is a tragedy. A million? A statistic.’ He could not think of a benign explanation for why you need top-up vaccines ‘which I’m sure you don’t’ and for the regulators ‘to just get out of the way and wave them through’. Why would the regulators do that when they were still wrestling with the dangers of the ‘parent’ vaccine? He was clearly shocked by what he had seen since the ‘Covid’ hoax began and now he was thinking the previously unthinkable:

If you wanted to depopulate a significant proportion of the world and to do it in a way that doesn't involve destruction of the environment with nuclear weapons, poisoning everyone with anthrax or something like that, and you wanted plausible deniability while you had a multi-year infectious disease crisis, I actually don't think you could come up with a better plan of work than seems to be in front of me. I can't say that's what they are going to do, but I can't think of a benign explanation why they are doing it.

He said he never thought that they would get rid of 99 percent of humans, but now he wondered. 'If you wanted to that this would be a hell of a way to do it – it would be unstoppable folks.' Yeadon had concluded that those who submitted to the 'vaccine' would be allowed to have some kind of normal life (but for how long?) while screws were tightened to coerce and mandate the last few percent. 'I think they'll put the rest of them in a prison camp. I wish I was wrong, but I don't think I am.' Other points he made included: There were no coronavirus vaccines then suddenly they all come along at the same time; we have no idea of the long term affect with trials so short; coercing or forcing people to have medical procedures is against the Nuremberg Code instigated when the Nazis did just that; people should at least delay having the 'vaccine'; a quick Internet search confirms that masks don't reduce respiratory viral transmission and 'the government knows that'; they have smashed civil society and they know that, too; two dozen peer-reviewed studies show no connection between lockdown and reducing deaths; he knew from personal friends the elite were still flying around and going on holiday while the public were locked down; the elite were not having the 'vaccines'. He was also asked if 'vaccines' could be made to target difference races. He said he didn't know, but the document by the Project for the New American Century in September, 2000, said developing 'advanced forms of biological warfare that can target *specific genotypes* may transform biological warfare from the realm of terror to a politically useful tool.' Oh, they're evil all right. Of that we can be *absolutely* sure.

Another cull of old people

We have seen from the CDC definition that the mRNA 'Covid vaccine' is not a vaccine and nor are the others that *claim* to reduce 'severity of symptoms' in *some* people, but not protect from infection or transmission. What about all the lies about returning to 'normal' if people were 'vaccinated'? If they are not claimed to stop infection and transmission of the alleged 'virus', how does anything change? This was all lies to manipulate people to take the jabs and we are seeing that now with masks and distancing still required for the 'vaccinated'. How did they think that elderly people with fragile health and immune responses were going to be affected by infusing their cells with synthetic material and other toxic substances? They *knew* that in the short and long term it would be devastating and fatal as the culling of the old that began with the first lockdowns was continued with the 'vaccine'. Death rates in care homes soared immediately residents began to be 'vaccinated' – infused with synthetic material. Brave and committed whistleblower nurses put their careers at risk by exposing this truth while the rest kept their heads down and their mouths shut to put their careers before those they are supposed to care for. A long-time American Certified Nursing Assistant who gave his name as James posted a video in which he described emotionally what happened in his care home when vaccination began. He said that during 2020 very few residents were sick with 'Covid' and no one died during the entire year; but shortly after the Pfizer mRNA injections 14 people died within two weeks and many others were near death. 'They're dropping like flies', he said. Residents who walked on their own before the shot could no longer and they had lost their ability to conduct an intelligent conversation. The home's management said the sudden deaths were caused by a 'super-spreader' of 'Covid-19'. Then how come, James asked, that residents who refused to take the injections were not sick? It was a case of inject the elderly with mRNA synthetic potions and blame their illness and death that followed on the 'virus'. James described what was happening in care homes as 'the greatest crime of genocide this country has ever seen'. Remember the NHS staff nurse from earlier who used the same

word 'genocide' for what was happening with the 'vaccines' and that it was an 'act of human annihilation'. A UK care home whistleblower told a similar story to James about the effect of the 'vaccine' in deaths and 'outbreaks' of illness dubbed 'Covid' after getting the jab. She told how her care home management and staff had zealously imposed government regulations and no one was allowed to even question the official narrative let alone speak out against it. She said the NHS was even worse. Again we see the results of reframing. A worker at a local care home where I live said they had not had a single case of 'Covid' there for almost a year and when the residents were 'vaccinated' they had 19 positive cases in two weeks with eight dying.

It's not the 'vaccine' – honest

The obvious cause and effect was being ignored by the media and most of the public. Australia's health minister Greg Hunt (a former head of strategy at the World Economic Forum) was admitted to hospital after he had the 'vaccine'. He was suffering according to reports from the skin infection 'cellulitis' and it must have been a severe case to have warranted days in hospital. Immediately the authorities said this was nothing to do with the 'vaccine' when an effect of some vaccines is a 'cellulitis-like reaction'. We had families of perfectly healthy old people who died after the 'vaccine' saying that if only they had been given the 'vaccine' earlier they would still be alive. As a numbskull rating that is off the chart. A father of four 'died of Covid' at aged 48 when he was taken ill two days after having the 'vaccine'. The man, a health administrator, had been 'shielding during the pandemic' and had 'not really left the house' until he went for the 'vaccine'. Having the 'vaccine' and then falling ill and dying does not seem to have qualified as a possible cause and effect and 'Covid-19' went on his death certificate. His family said they had no idea how he 'caught the virus'. A family member said: 'Tragically, it could be that going for a vaccination ultimately led to him catching Covid ... The sad truth is that they are never going to know where it came from.' The family warned people to remember

that the virus still existed and was 'very real'. So was their stupidity. Nurses and doctors who had the first round of the 'vaccine' were collapsing, dying and ending up in a hospital bed while they or their grieving relatives were saying they'd still have the 'vaccine' again despite what happened. I kid you not. You mean if your husband returned from the dead he'd have the same 'vaccine' again that killed him??

Doctors at the VCU Medical Center in Richmond, Virginia, said the Johnson & Johnson 'vaccine' was to blame for a man's skin peeling off. Patient Richard Terrell said: 'It all just happened so fast. My skin peeled off. It's still coming off on my hands now.' He said it was stinging, burning and itching and when he bent his arms and legs it was very painful with 'the skin swollen and rubbing against itself'. Pfizer/BioNTech and Moderna vaccines use mRNA to change the cell while the Johnson & Johnson version uses DNA in a process similar to AstraZeneca's technique. Johnson & Johnson and AstraZeneca have both had their 'vaccines' paused by many countries after causing serious blood problems. Terrell's doctor Fnu Nutan said he could have died if he hadn't got medical attention. It sounds terrible so what did Nutan and Terrell say about the 'vaccine' now? Oh, they still recommend that people have it. A nurse in a hospital bed 40 minutes after the vaccination and unable to swallow due to throat swelling was told by a doctor that he lost mobility in his arm for 36 hours following the vaccination. What did he say to the ailing nurse? 'Good for you for getting the vaccination.' We are dealing with a serious form of cognitive dissonance madness in both public and medical staff. There is a remarkable correlation between those having the 'vaccine' and trumpeting the fact and suffering bad happenings shortly afterwards. Witold Rogiewicz, a Polish doctor, made a video of his 'vaccination' and ridiculed those who were questioning its safety and the intentions of Bill Gates: 'Vaccinate yourself to protect yourself, your loved ones, friends and also patients. And to mention quickly I have info for anti-vaxxers and anti-Covidors if you want to contact Bill Gates you can do this through me.' He further ridiculed the dangers of 5G. Days later he

was dead, but naturally the vaccination wasn't mentioned in the verdict of 'heart attack'.

Lies, lies and more lies

So many members of the human race have slipped into extreme states of insanity and unfortunately they include reframed doctors and nursing staff. Having a 'vaccine' and dying within minutes or hours is not considered a valid connection while death from any cause within 28 days or longer of a positive test with a test not testing for the 'virus' means 'Covid-19' goes on the death certificate. How could that 'vaccine'-death connection not have been made except by calculated deceit? US figures in the initial rollout period to February 12th, 2020, revealed that a third of the deaths reported to the CDC after 'Covid vaccines' happened within 48 hours. Five men in the UK suffered an 'extremely rare' blood clot problem after having the AstraZeneca 'vaccine', but no causal link was established said the Gates-funded Medicines and Healthcare products Regulatory Agency (MHRA) which had given the 'vaccine' emergency approval to be used. Former Pfizer executive Dr Michael Yeadon explained in his interview how the procedures could cause blood coagulation and clots. People who should have been at no risk were dying from blood clots in the brain and he said he had heard from medical doctor friends that people were suffering from skin bleeding and massive headaches. The AstraZeneca 'shot' was stopped by some 20 countries over the blood clotting issue and still the corrupt MHRA, the European Medicines Agency (EMA) and the World Health Organization said that it should continue to be given even though the EMA admitted that it 'still cannot rule out definitively' a link between blood clotting and the 'vaccine'. Later Marco Cavaleri, head of EMA vaccine strategy, said there was indeed a clear link between the 'vaccine' and thrombosis, but they didn't know why. So much for the trials showing the 'vaccine' is safe. Blood clots were affecting younger people who would be under virtually no danger from 'Covid' even if it existed which makes it all the more stupid and sinister.

The British government responded to public alarm by wheeling out June Raine, the terrifyingly weak infant school headmistress sound-alike who heads the UK MHRA drug 'regulator'. The idea that she would stand up to Big Pharma and government pressure is laughable and she told us that all was well in the same way that she did when allowing untested, never-used-on-humans-before, genetically-manipulating 'vaccines' to be exposed to the public in the first place. Mass lying is the new normal of the 'Covid' era. The MHRA later said 30 cases of rare blood clots had by then been connected with the AstraZeneca 'vaccine' (that means a lot more in reality) while stressing that the benefits of the jab in preventing 'Covid-19' outweighed any risks. A more ridiculous and disingenuous statement with callous disregard for human health it is hard to contemplate. Immediately after the mendacious 'all-clears' two hospital workers in Denmark experienced blood clots and cerebral haemorrhaging following the AstraZeneca jab and one died. Top Norwegian health official Pål Andre Holme said the 'vaccine' was the only common factor: 'There is nothing in the patient history of these individuals that can give such a powerful immune response ... I am confident that the antibodies that we have found are the cause, and I see no other explanation than it being the vaccine which triggers it.' Strokes, a clot or bleed in the brain, were clearly associated with the 'vaccine' from word of mouth and whistleblower reports. Similar consequences followed with all these 'vaccines' that we were told were so safe and as the numbers grew by the day it was clear we were witnessing human carnage.

Learning the hard way

A woman interviewed by UKColumn told how her husband suffered dramatic health effects after the vaccine when he'd been in good health all his life. He went from being a little unwell to losing all feeling in his legs and experiencing 'excruciating pain'. Misdiagnosis followed twice at Accident and Emergency (an 'allergy' and 'sciatica') before he was admitted to a neurology ward where doctors said his serious condition had been caused by the

'vaccine'. Another seven 'vaccinated' people were apparently being treated on the same ward for similar symptoms. The woman said he had the 'vaccine' because they believed media claims that it was safe. 'I didn't think the government would give out a vaccine that does this to somebody; I believed they would be bringing out a vaccination that would be safe.' What a tragic way to learn that lesson. Another woman posted that her husband was transporting stroke patients to hospital on almost every shift and when he asked them if they had been 'vaccinated' for 'Covid' they all replied 'yes'. One had a 'massive brain bleed' the day after his second dose. She said her husband reported the 'just been vaccinated' information every time to doctors in A and E only for them to ignore it, make no notes and appear annoyed that it was even mentioned. This particular report cannot be verified, but it expresses a common theme that confirms the monumental underreporting of 'vaccine' consequences. Interestingly as the 'vaccines' and their brain blood clot/stroke consequences began to emerge the UK National Health Service began a publicity campaign telling the public what to do in the event of a stroke. A Scottish NHS staff nurse who quit in disgust in March, 2021, said:

I have seen traumatic injuries from the vaccine, they're not getting reported to the yellow card [adverse reaction] scheme, they're treating the symptoms, not asking why, why it's happening. It's just treating the symptoms and when you speak about it you're dismissed like you're crazy, I'm not crazy, I'm not crazy because every other colleague I've spoken to is terrified to speak out, they've had enough.

Videos appeared on the Internet of people uncontrollably shaking after the 'vaccine' with no control over muscles, limbs and even their face. A Scottish mother broke out in a severe rash all over her body almost immediately after she was given the AstraZeneca 'vaccine'. The pictures were horrific. Leigh King, a 41-year-old hairdresser from Lanarkshire said: 'Never in my life was I prepared for what I was about to experience ... My skin was so sore and constantly hot ... I have never felt pain like this ...' But don't you worry, the 'vaccine' is perfectly safe. Then there has been the effect on medical

staff who have been pressured to have the 'vaccine' by psychopathic 'health' authorities and government. A London hospital consultant who gave the name K. Polyakova wrote this to the *British Medical Journal* or *BMJ*:

I am currently struggling with ... the failure to report the reality of the morbidity caused by our current vaccination program within the health service and staff population. The levels of sickness after vaccination is unprecedented and staff are getting very sick and some with neurological symptoms which is having a huge impact on the health service function. Even the young and healthy are off for days, some for weeks, and some requiring medical treatment. Whole teams are being taken out as they went to get vaccinated together.

Mandatory vaccination in this instance is stupid, unethical and irresponsible when it comes to protecting our staff and public health. We are in the voluntary phase of vaccination, and encouraging staff to take an unlicensed product that is impacting on their immediate health ... it is clearly stated that these vaccine products do not offer immunity or stop transmission. In which case why are we doing it?

Not to protect health that's for sure. Medical workers are lauded by governments for agenda reasons when they couldn't give a toss about them any more than they can for the population in general. Schools across America faced the same situation as they closed due to the high number of teachers and other staff with bad reactions to the Pfizer/BioNTech, Moderna, and Johnson & Johnson 'Covid vaccines' all of which were linked to death and serious adverse effects. The *BMJ* took down the consultant's comments pretty quickly on the grounds that they were being used to spread 'disinformation'. They were exposing the truth about the 'vaccine' was the real reason. The cover-up is breathtaking.

Hiding the evidence

The scale of the 'vaccine' death cover-up worldwide can be confirmed by comparing official figures with the personal experience of the public. I heard of many people in my community who died immediately or soon after the vaccine that would never appear in the media or even likely on the official totals of 'vaccine' fatalities and adverse reactions when only about ten percent are estimated to be

reported and I have seen some estimates as low as one percent in a Harvard study. In the UK alone by April 29th, 2021, some 757,654 adverse reactions had been officially reported from the Pfizer/BioNTech, Oxford/AstraZeneca and Moderna 'vaccines' with more than a thousand deaths linked to jabs and that means an estimated ten times this number in reality from a ten percent reporting rate percentage. That's seven million adverse reactions and 10,000 potential deaths and a one percent reporting rate would be ten times *those* figures. In 1976 the US government pulled the swine flu vaccine after 53 deaths. The UK data included a combined 10,000 eye disorders from the 'Covid vaccines' with more than 750 suffering visual impairment or blindness and again multiply by the estimated reporting percentages. As 'Covid cases' officially fell hospitals virtually empty during the 'Covid crisis' began to fill up with a range of other problems in the wake of the 'vaccine' rollout. The numbers across America have also been catastrophic. Deaths linked to *all* types of vaccine increased by 6,000 *percent* in the first quarter of 2021 compared with 2020. A 39-year-old woman from Ogden, Utah, died four days after receiving a second dose of Moderna's 'Covid vaccine' when her liver, heart and kidneys all failed despite the fact that she had no known medical issues or conditions. Her family sought an autopsy, but Dr Erik Christensen, Utah's chief medical examiner, said proving vaccine injury as a cause of death almost never happened. He could think of only one instance where an autopsy would name a vaccine as the official cause of death and that would be anaphylaxis where someone received a vaccine and died almost instantaneously. 'Short of that, it would be difficult for us to definitively say this is the vaccine,' Christensen said. If that is true this must be added to the estimated ten percent (or far less) reporting rate of vaccine deaths and serious reactions and the conclusion can only be that vaccine deaths and serious reactions – including these 'Covid' potions' – are phenomenally understated in official figures. The same story can be found everywhere. Endless accounts of deaths and serious reactions among the public, medical

and care home staff while official figures did not even begin to reflect this.

Professional script-reader Dr David Williams, a 'top public-health official' in Ontario, Canada, insulted our intelligence by claiming only four serious adverse reactions and no deaths from the more than 380,000 vaccine doses then given. This bore no resemblance to what people knew had happened in their own circles and we had Dirk Huyer in charge of getting millions vaccinated in Ontario while at the same time he was Chief Coroner for the province investigating causes of death including possible death from the vaccine. An aide said he had stepped back from investigating deaths, but evidence indicated otherwise. Rosemary Frei, who secured a Master of Science degree in molecular biology at the Faculty of Medicine at Canada's University of Calgary before turning to investigative journalism, was one who could see that official figures for 'vaccine' deaths and reactions made no sense. She said that doctors seldom reported adverse events and when people got really sick or died after getting a vaccination they would attribute that to anything except the vaccines. It had been that way for years and anyone who wondered aloud whether the 'Covid vaccines' or other shots cause harm is immediately branded as 'anti-vax' and 'anti-science'. This was 'career-threatening' for health professionals. Then there was the huge pressure to support the push to 'vaccinate' billions in the quickest time possible. Frei said:

So that's where we're at today. More than half a million vaccine doses have been given to people in Ontario alone. The rush is on to vaccinate all 15 million of us in the province by September. And the mainstream media are screaming for this to be sped up even more. That all adds up to only a very slim likelihood that we're going to be told the truth by officials about how many people are getting sick or dying from the vaccines.

What is true of Ontario is true of everywhere.

They KNEW – and still did it

The authorities knew what was going to happen with multiple deaths and adverse reactions. The UK government's Gates-funded

and Big Pharma-dominated Medicines and Healthcare products Regulatory Agency (MHRA) hired a company to employ AI in compiling the projected reactions to the 'vaccine' that would otherwise be uncountable. The request for applications said: 'The MHRA urgently seeks an Artificial Intelligence (AI) software tool to process the expected high volume of Covid-19 vaccine Adverse Drug Reaction ...' This was from the agency, headed by the disingenuous June Raine, that gave the 'vaccines' emergency approval and the company was hired before the first shot was given. 'We are going to kill and maim you – is that okay?' 'Oh, yes, perfectly fine – I'm very grateful, thank you, doctor.' The range of 'Covid vaccine' adverse reactions goes on for page after page in the MHRA criminally underreported 'Yellow Card' system and includes affects to eyes, ears, skin, digestion, blood and so on. Raine's MHRA amazingly claimed that the 'overall safety experience ... is so far as expected from the clinical trials'. The death, serious adverse effects, deafness and blindness were *expected*? When did they ever mention that? If these human tragedies were expected then those that gave approval for the use of these 'vaccines' must be guilty of crimes against humanity including murder – a definition of which is 'killing a person with malice aforethought or with recklessness manifesting extreme indifference to the value of human life.' People involved at the MHRA, the CDC in America and their equivalent around the world must go before Nuremberg trials to answer for their callous inhumanity. We are only talking here about the immediate effects of the 'vaccine'. The longer-term impact of the DNA synthetic manipulation is the main reason they are so hysterically desperate to inoculate the entire global population in the shortest possible time.

Africa and the developing world are a major focus for the 'vaccine' depopulation agenda and a mass vaccination sales-pitch is underway thanks to caring people like the Rockefellers and other Cult assets. The Rockefeller Foundation, which pre-empted the 'Covid pandemic' in a document published in 2010 that 'predicted' what happened a decade later, announced an initial \$34.95 million grant in February, 2021, 'to ensure more equitable access to Covid-19

testing and vaccines' among other things in Africa in collaboration with '24 organizations, businesses, and government agencies'. The pan-Africa initiative would focus on 10 countries: Burkina Faso, Ethiopia, Ghana, Kenya, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Zambia'. Rajiv Shah, President of the Rockefeller Foundation and former administrator of CIA-controlled USAID, said that if Africa was not mass-vaccinated (to change the DNA of its people) it was a 'threat to all of humanity' and not fair on Africans. When someone from the Rockefeller Foundation says they want to do something to help poor and deprived people and countries it is time for a belly-laugh. They are doing this out of the goodness of their 'heart' because 'vaccinating' the entire global population is what the 'Covid' hoax set out to achieve. Official 'decolonisation' of Africa by the Cult was merely a prelude to financial colonisation on the road to a return to physical colonisation. The 'vaccine' is vital to that and the sudden and convenient death of the 'Covid' sceptic president of Tanzania can be seen in its true light. A lot of people in Africa are aware that this is another form of colonisation and exploitation and they need to stand their ground.

The 'vaccine is working' scam

A potential problem for the Cult was that the 'vaccine' is meant to change human DNA and body messaging and not to protect anyone from a 'virus' never shown to exist. The vaccine couldn't work because it was not designed to work and how could they make it *appear* to be working so that more people would have it? This was overcome by lowering the amplification rate of the PCR test to produce fewer 'cases' and therefore fewer 'deaths'. Some of us had been pointing out since March, 2020, that the amplification rate of the test not testing for the 'virus' had been made artificially high to generate positive tests which they could call 'cases' to justify lockdowns. The World Health Organization recommended an absurdly high 45 amplification cycles to ensure the high positives required by the Cult and then remained silent on the issue until January 20th, 2021 – Biden's Inauguration Day. This was when the

'vaccinations' were seriously underway and on that day the WHO recommended after discussions with America's CDC that laboratories *lowered their testing amplification*. Dr David Samadi, a certified urologist and health writer, said the WHO was encouraging all labs to reduce their cycle count for PCR tests. He said the current cycle was much too high and was 'resulting in any particle being declared a positive case'. Even one mainstream news report I saw said this meant the number of 'Covid' infections may have been 'dramatically inflated'. Oh, just a little bit. The CDC in America issued new guidance to laboratories in April, 2021, to use 28 cycles *but only for 'vaccinated' people*. The timing of the CDC/WHO interventions were cynically designed to make it appear the 'vaccines' were responsible for falling cases and deaths when the real reason can be seen in the following examples. New York's state lab, the Wadsworth Center, identified 872 positive tests in July, 2020, based on a threshold of 40 cycles. When the figure was lowered to 35 cycles 43 percent of the 872 were no longer 'positives'. At 30 cycles the figure was 63 percent. A Massachusetts lab found that between 85 to 90 percent of people who tested positive in July with a cycle threshold of 40 would be negative at 30 cycles, Ashish Jha, MD, director of the Harvard Global Health Institute, said: 'I'm really shocked that it could be that high ... Boy, does it really change the way we need to be thinking about testing.' I'm shocked that I could see the obvious in the spring of 2020, with no medical background, and most medical professionals still haven't worked it out. No, that's not shocking – it's terrifying.

Three weeks after the WHO directive to lower PCR cycles the London *Daily Mail* ran this headline: 'Why ARE Covid cases plummeting? New infections have fallen 45% in the US and 30% globally in the past 3 weeks but experts say vaccine is NOT the main driver because only 8% of Americans and 13% of people worldwide have received their first dose.' They acknowledged that the drop could not be attributed to the 'vaccine', but soon this morphed throughout the media into the 'vaccine' has caused cases and deaths to fall when it was the PCR threshold. In December, 2020, there was

chaos at English Channel ports with truck drivers needing negative 'Covid' tests before they could board a ferry home for Christmas. The government wanted to remove the backlog as fast as possible and they brought in troops to do the 'testing'. Out of 1,600 drivers just 36 tested positive and the rest were given the all clear to cross the Channel. I guess the authorities thought that 36 was the least they could get away with without the unquestioning catching on. The amplification trick which most people believed in the absence of information in the mainstream applied more pressure on those refusing the 'vaccine' to succumb when it 'obviously worked'. The truth was the exact opposite with deaths in care homes soaring with the 'vaccine' and in Israel the term used was 'skyrocket'. A re-analysis of published data from the Israeli Health Ministry led by Dr Hervé Seligmann at the Medicine Emerging Infectious and Tropical Diseases at Aix-Marseille University found that Pfizer's 'Covid vaccine' killed 'about 40 times more [elderly] people than the disease itself would have killed' during a five-week vaccination period and *260 times* more younger people than would have died from the 'virus' even according to the manipulated 'virus' figures. Dr Seligmann and his co-study author, Haim Yativ, declared after reviewing the Israeli 'vaccine' death data: 'This is a new Holocaust.'

Then, in mid-April, 2021, after vast numbers of people worldwide had been 'vaccinated', the story changed with clear coordination. The UK government began to prepare the ground for more future lockdowns when Nuremberg-destined Boris Johnson told yet another whopper. He said that cases had fallen because of *lockdowns* not 'vaccines'. Lockdowns are irrelevant when *there is no 'virus'* and the test and fraudulent death certificates are deciding the number of 'cases' and 'deaths'. Study after study has shown that lockdowns don't work and instead kill and psychologically destroy people. Meanwhile in the United States Anthony Fauci and Rochelle Walensky, the ultra-Zionist head of the CDC, peddled the same line. More lockdown was the answer and not the 'vaccine', a line repeated on cue by the moron that is Canadian Prime Minister Justin Trudeau. Why all the hysteria to get everyone 'vaccinated' if lockdowns and

not 'vaccines' made the difference? None of it makes sense on the face of it. Oh, but it does. The Cult wants lockdowns *and* the 'vaccine' and if the 'vaccine' is allowed to be seen as the total answer lockdowns would no longer be justified when there are still livelihoods to destroy. 'Variants' and renewed upward manipulation of PCR amplification are planned to instigate never-ending lockdown *and* more 'vaccines'.

You *must* have it – we're desperate

Israel, where the Jewish and Arab population are ruled by the Sabbatian Cult, was the front-runner in imposing the DNA-manipulating 'vaccine' on its people to such an extent that Jewish refusers began to liken what was happening to the early years of Nazi Germany. This would seem to be a fantastic claim. Why would a government of Jewish people be acting like the Nazis did? If you realise that the Sabbatian Cult was behind the Nazis and that Sabbatians hate Jews the pieces start to fit and the question of why a 'Jewish' government would treat Jews with such callous disregard for their lives and freedom finds an answer. Those controlling the government of Israel *aren't Jewish* – they're Sabbatian. Israeli lawyer Tamir Turgal was one who made the Nazi comparison in comments to German lawyer Reiner Fuellmich who is leading a class action lawsuit against the psychopaths for crimes against humanity. Turgal described how the Israeli government was vaccinating children and pregnant women on the basis that there was no evidence that this was dangerous when they had no evidence that it *wasn't* dangerous either. They just had no evidence. This was medical experimentation and Turgal said this breached the Nuremberg Code about medical experimentation and procedures requiring informed consent and choice. Think about that. A Nuremberg Code developed because of Nazi experimentation on Jews and others in concentration camps by people like the evil-beyond-belief Josef Mengele is being breached by the *Israeli* government; but when you know that it's a *Sabbatian* government along with its intelligence and military agencies like Mossad, Shin Bet and the Israeli Defense Forces, and that Sabbatians

were the force behind the Nazis, the kaleidoscope comes into focus. What have we come to when Israeli Jews are suing their government for violating the Nuremberg Code by essentially making Israelis subject to a medical experiment using the controversial 'vaccines'? It's a shocker that this has to be done in the light of what happened in Nazi Germany. The Anshe Ha-Emet, or 'People of the Truth', made up of Israeli doctors, lawyers, campaigners and public, have launched a lawsuit with the International Criminal Court. It says:

When the heads of the Ministry of Health as well as the prime minister presented the vaccine in Israel and began the vaccination of Israeli residents, the vaccinated were not advised, that, in practice, they are taking part in a medical experiment and that their consent is required for this under the Nuremberg Code.

The irony is unbelievable, but easily explained in one word: Sabbatians. The foundation of Israeli 'Covid' apartheid is the 'green pass' or 'green passport' which allows Jews and Arabs who have had the DNA-manipulating 'vaccine' to go about their lives – to work, fly, travel in general, go to shopping malls, bars, restaurants, hotels, concerts, gyms, swimming pools, theatres and sports venues, while non-'vaccinated' are banned from all those places and activities. Israelis have likened the 'green pass' to the yellow stars that Jews in Nazi Germany were forced to wear – the same as the yellow stickers that a branch of UK supermarket chain Morrisons told exempt mask-wearers they had to display when shopping. How very sensitive. The Israeli system is blatant South African-style apartheid on the basis of compliance or non-compliance to fascism rather than colour of the skin. How appropriate that the Sabbatian Israeli government was so close to the pre-Mandela apartheid regime in Pretoria. The Sabbatian-instigated 'vaccine passport' in Israel is planned for everywhere. Sabbatians struck a deal with Pfizer that allowed them to lead the way in the percentage of a national population infused with synthetic material and the result was catastrophic. Israeli freedom activist Shai Dannon told me how chairs were appearing on beaches that said 'vaccinated only'. Health Minister Yuli Edelstein said that anyone unwilling or unable to get

the jabs that 'confer immunity' will be 'left behind'. The man's a liar. Not even the makers claim the 'vaccines' confer immunity. When you see those figures of 'vaccine' deaths these psychopaths were saying that you must take the chance the 'vaccine' will kill you or maim you while knowing it will change your DNA or lockdown for you will be permanent. That's fascism. The Israeli parliament passed a law to allow personal information of the non-vaccinated to be shared with local and national authorities for three months. This was claimed by its supporters to be a way to 'encourage' people to be vaccinated. Hadas Ziv from Physicians for Human Rights described this as a 'draconian law which crushed medical ethics and the patient rights'. But that's the idea, the Sabbatians would reply.

Your papers, please

Sabbatian Israel was leading what has been planned all along to be a global 'vaccine pass' called a 'green passport' without which you would remain in permanent lockdown restriction and unable to do anything. This is how badly – *desperately* – the Cult is to get everyone 'vaccinated'. The term and colour 'green' was not by chance and related to the psychology of fusing the perception of the green climate hoax with the 'Covid' hoax and how the 'solution' to both is the same Great Reset. Lying politicians, health officials and psychologists denied there were any plans for mandatory vaccinations or restrictions based on vaccinations, but they knew that was exactly what was meant to happen with governments of all countries reaching agreements to enforce a global system. 'Free' Denmark and 'free' Sweden unveiled digital vaccine certification. Cyprus, Czech Republic, Estonia, Greece, Hungary, Iceland, Italy, Poland, Portugal, Slovakia, and Spain have all committed to a vaccine passport system and the rest including the whole of the EU would follow. The satanic UK government will certainly go this way despite mendacious denials and at the time of writing it is trying to manipulate the public into having the 'vaccine' so they could go abroad on a summer holiday. How would that work without something to prove you had the synthetic toxicity injected into you?

Documents show that the EU's European Commission was moving towards 'vaccine certificates' in 2018 and 2019 before the 'Covid' hoax began. They knew what was coming. Abracadabra – Ursula von der Leyen, the German President of the Commission, announced in March, 2021, an EU 'Digital Green Certificate' – green again – to track the public's 'Covid status'. The passport sting is worldwide and the Far East followed the same pattern with South Korea ruling that only those with 'vaccination' passports – again the *green* pass – would be able to 'return to their daily lives'.

Bill Gates has been preparing for this 'passport' with other Cult operatives for years and beyond the paper version is a Gates-funded 'digital tattoo' to identify who has been vaccinated and who hasn't. The 'tattoo' is reported to include a substance which is externally readable to confirm who has been vaccinated. This is a bio-luminous light-generating enzyme (think fireflies) called ... *Luciferase*. Yes, named after the Cult 'god' Lucifer the 'light bringer' of whom more to come. Gates said he funded the readable tattoo to ensure children in the developing world were vaccinated and no one was missed out. He cares so much about poor kids as we know. This was just the cover story to develop a vaccine tagging system for everyone on the planet. Gates has been funding the ID2020 'alliance' to do just that in league with other lovely people at Microsoft, GAVI, the Rockefeller Foundation, Accenture and IDEO.org. He said in interviews in March, 2020, before any 'vaccine' publicly existed, that the world must have a globalised digital certificate to track the 'virus' and who had been vaccinated. Gates knew from the start that the mRNA vaccines were coming and when they would come and that the plan was to tag the 'vaccinated' to marginalise the intelligent and stop them doing anything including travel. Evil just doesn't suffice. Gates was exposed for offering a \$10 million bribe to the Nigerian House of Representatives to invoke compulsory 'Covid' vaccination of all Nigerians. Sara Cunial, a member of the Italian Parliament, called Gates a 'vaccine criminal'. She urged the Italian President to hand him over to the International Criminal Court for crimes against

humanity and condemned his plans to 'chip the human race' through ID2020.

You know it's a long-planned agenda when war criminal and Cult gofer Tony Blair is on the case. With the scale of arrogance only someone as dark as Blair can muster he said: 'Vaccination in the end is going to be your route to liberty.' Blair is a disgusting piece of work and he confirms that again. The media has given a lot of coverage to a bloke called Charlie Mullins, founder of London's biggest independent plumbing company, Pimlico Plumbers, who has said he won't employ anyone who has not been vaccinated or have them go to any home where people are not vaccinated. He said that if he had his way no one would be allowed to walk the streets if they have not been vaccinated. Gates was cheering at the time while I was alerting the white coats. The plan is that people will qualify for 'passports' for having the first two doses and then to keep it they will have to have all the follow ups and new ones for invented 'variants' until human genetics is transformed and many are dead who can't adjust to the changes. Hollywood celebrities – the usual propaganda stunt – are promoting something called the WELL Health-Safety Rating to verify that a building or space has 'taken the necessary steps to prioritize the health and safety of their staff, visitors and other stakeholders'. They included Lady Gaga, Jennifer Lopez, Michael B. Jordan, Robert DeNiro, Venus Williams, Wolfgang Puck, Deepak Chopra and 17th Surgeon General Richard Carmona. Yawn. WELL Health-Safety has big connections with China. Parent company Delos is headed by former Goldman Sachs partner Paul Scialla. This is another example – and we will see so many others – of using the excuse of 'health' to dictate the lives and activities of the population. I guess one confirmation of the 'safety' of buildings is that only 'vaccinated' people can go in, right?

Electronic concentration camps

I wrote decades ago about the plans to restrict travel and here we are for those who refuse to bow to tyranny. This can be achieved in one go with air travel if the aviation industry makes a blanket decree.

The 'vaccine' and guaranteed income are designed to be part of a global version of China's social credit system which tracks behaviour 24/7 and awards or deletes 'credits' based on whether your behaviour is supported by the state or not. I mean your entire lifestyle – what you do, eat, say, everything. Once your credit score falls below a certain level consequences kick in. In China tens of millions have been denied travel by air and train because of this. All the locations and activities denied to refusers by the 'vaccine' passports will be included in one big mass ban on doing almost anything for those that don't bow their head to government. It's beyond fascist and a new term is required to describe its extremes – I guess fascist technocracy will have to do. The way the Chinese system of technological – technocratic – control is sweeping the West can be seen in the Los Angeles school system and is planned to be expanded worldwide. Every child is required to have a 'Covid'-tracking app scanned daily before they can enter the classroom. The so-called Daily Pass tracking system is produced by Gates' Microsoft which I'm sure will shock you rigid. The pass will be scanned using a barcode (one step from an inside-the-body barcode) and the information will include health checks, 'Covid' tests and vaccinations. Entry codes are for one specific building only and access will only be allowed if a student or teacher has a negative test with a test not testing for the 'virus', has no symptoms of anything alleged to be related to 'Covid' (symptoms from a range of other illness), and has a temperature under 100 degrees. No barcode, no entry, is planned to be the case for everywhere and not only schools.

Kids are being psychologically prepared to accept this as 'normal' their whole life which is why what they can impose in schools is so important to the Cult and its gofers. Long-time American freedom campaigner John Whitehead of the Rutherford Institute was not exaggerating when he said: 'Databit by databit, we are building our own electronic concentration camps.' Canada under its Cult gofer prime minister Justin Trudeau has taken a major step towards the real thing with people interned against their will if they test positive with a test not testing for the 'virus' when they arrive at a Canadian

airport. They are jailed in internment hotels often without food or water for long periods and with many doors failing to lock there have been sexual assaults. The interned are being charged sometimes \$2,000 for the privilege of being abused in this way. Trudeau is fully on board with the Cult and says the 'Covid pandemic' has provided an opportunity for a global 'reset' to permanently change Western civilisation. His number two, Deputy Prime Minister Chrystia Freeland, is a trustee of the World Economic Forum and a Rhodes Scholar. The Trudeau family have long been servants of the Cult. See *The Biggest Secret* and Cathy O'Brien's book *Trance-Formation of America* for the horrific background to Trudeau's father Pierre Trudeau another Canadian prime minister. Hide your fascism behind the façade of a heart-on-the-sleeve liberal. It's a well-honed Cult technique.

What can the 'vaccine' really do?

We have a 'virus' never shown to exist and 'variants' of the 'virus' that have also never been shown to exist except, like the 'original', as computer-generated fictions. Even if you believe there's a 'virus' the 'case' to 'death' rate is in the region of 0.23 to 0.15 percent and those 'deaths' are concentrated among the very old around the same average age that people die anyway. In response to this lack of threat (in truth none) psychopaths and idiots, knowingly and unknowingly answering to Gates and the Cult, are seeking to 'vaccinate' every man, woman and child on Planet Earth. Clearly the 'vaccine' is not about 'Covid' – none of this ever has been. So what is it all about *really*? Why the desperation to infuse genetically-manipulating synthetic material into everyone through mRNA fraudulent 'vaccines' with the intent of doing this over and over with the excuses of 'variants' and other 'virus' inventions? Dr Sherri Tenpenny, an osteopathic medical doctor in the United States, has made herself an expert on vaccines and their effects as a vehement campaigner against their use. Tenpenny was board certified in emergency medicine, the director of a level two trauma centre for 12 years, and moved to Cleveland in 1996 to start an integrative

medicine practice which has treated patients from all 50 states and some 17 other countries. Weaning people off pharmaceutical drugs is a speciality.

She became interested in the consequences of vaccines after attending a meeting at the National Vaccine Information Center in Washington DC in 2000 where she 'sat through four days of listening to medical doctors and scientists and lawyers and parents of vaccine injured kids' and asked: 'What's going on?' She had never been vaccinated and never got ill while her father was given a list of vaccines to be in the military and was 'sick his entire life'. The experience added to her questions and she began to examine vaccine documents from the Centers for Disease Control (CDC). After reading the first one, the 1998 version of *The General Recommendations of Vaccination*, she thought: 'This is it?' The document was poorly written and bad science and Tenpenny began 20 years of research into vaccines that continues to this day. She began her research into 'Covid vaccines' in March, 2020, and she describes them as 'deadly'. For many, as we have seen, they already have been. Tenpenny said that in the first 30 days of the 'vaccine' rollout in the United States there had been more than 40,000 adverse events reported to the vaccine adverse event database. A document had been delivered to her the day before that was 172 pages long. 'We have over 40,000 adverse events; we have over 3,100 cases of [potentially deadly] anaphylactic shock; we have over 5,000 neurological reactions.' Effects ranged from headaches to numbness, dizziness and vertigo, to losing feeling in hands or feet and paraesthesia which is when limbs 'fall asleep' and people have the sensation of insects crawling underneath their skin. All this happened in the first 30 days and remember that only about *ten percent* (or far less) of adverse reactions and vaccine-related deaths are estimated to be officially reported. Tenpenny said:

So can you think of one single product in any industry, any industry, for as long as products have been made on the planet that within 30 days we have 40,000 people complaining of side effects that not only is still on the market but ... we've got paid actors telling us how great

they are for getting their vaccine. We're offering people \$500 if they will just get their vaccine and we've got nurses and doctors going; 'I got the vaccine, I got the vaccine'.

Tenpenny said they were not going to be 'happy dancing folks' when they began to suffer Bell's palsy (facial paralysis), neuropathies, cardiac arrhythmias and autoimmune reactions that kill through a blood disorder. 'They're not going to be so happy, happy then, but we're never going to see pictures of those people' she said. Tenpenny described the 'vaccine' as 'a well-designed killing tool'.

No off-switch

Bad as the initial consequences had been Tenpenny said it would be maybe 14 months before we began to see the 'full ravage' of what is going to happen to the 'Covid vaccinated' with full-out consequences taking anything between two years and 20 years to show. You can understand why when you consider that variations of the 'Covid vaccine' use mRNA (messenger RNA) to in theory activate the immune system to produce protective antibodies without using the actual 'virus'. How can they when it's a computer program and they've never isolated what they claim is the 'real thing'? Instead they use *synthetic* mRNA. They are inoculating synthetic material into the body which through a technique known as the Trojan horse is absorbed into cells to change the nature of DNA. Human DNA is changed by an infusion of messenger RNA and with each new 'vaccine' of this type it is changed even more. Say so and you are banned by Cult Internet platforms. The contempt the contemptuous Mark Zuckerberg has for the truth and human health can be seen in an internal Facebook video leaked to the Project Veritas investigative team in which he said of the 'Covid vaccines': '... I share some caution on this because we just don't know the long term side-effects of basically modifying people's DNA and RNA.' At the same time this disgusting man's Facebook was censoring and banning anyone saying exactly the same. He must go before a Nuremberg trial for crimes against humanity when he *knows* that he

is censoring legitimate concerns and denying the right of informed consent on behalf of the Cult that owns him. People have been killed and damaged by the very 'vaccination' technique he cast doubt on himself when they may not have had the 'vaccine' with access to information that he denied them. The plan is to have at least annual 'Covid vaccinations', add others to deal with invented 'variants', and change all other vaccines into the mRNA system. Pfizer executives told shareholders at a virtual Barclays Global Healthcare Conference in March, 2021, that the public may need a third dose of 'Covid vaccine', plus regular yearly boosters and the company planned to hike prices to milk the profits in a 'significant opportunity for our vaccine'. These are the professional liars, cheats and opportunists who are telling you their 'vaccine' is safe. Given this volume of mRNA planned to be infused into the human body and its ability to then replicate we will have a transformation of human genetics from biological to synthetic biological – exactly the long-time Cult plan for reasons we'll see – and many will die. Sherri Tenpenny said of this replication:

It's like having an on-button but no off-button and that whole mechanism ... they actually give it a name and they call it the Trojan horse mechanism, because it allows that [synthetic] virus and that piece of that [synthetic] virus to get inside of your cells, start to replicate and even get inserted into other parts of your DNA as a Trojan-horse.

Ask the overwhelming majority of people who have the 'vaccine' what they know about the contents and what they do and they would reply: 'The government says it will stop me getting the virus.' Governments give that false impression on purpose to increase take-up. You can read Sherri Tenpenny's detailed analysis of the health consequences in her blog at [Vaxxter.com](https://vaxxter.com), but in summary these are some of them. She highlights the statement by Bill Gates about how human beings can become their own 'vaccine manufacturing machine'. The man is insane. ['Vaccine'-generated] 'antibodies' carry synthetic messenger RNA into the cells and the damage starts, Tenpenny contends, and she says that lungs can be adversely affected through varying degrees of pus and bleeding which

obviously affects breathing and would be dubbed 'Covid-19'. Even more sinister was the impact of 'antibodies' on macrophages, a white blood cell of the immune system. They consist of Type 1 and Type 2 which have very different functions. She said Type 1 are 'hyper-vigilant' white blood cells which 'gobble up' bacteria etc. However, in doing so, this could cause inflammation and in extreme circumstances be fatal. She says these affects are mitigated by Type 2 macrophages which kick in to calm down the system and stop it going rogue. They clear up dead tissue debris and reduce inflammation that the Type 1 'fire crews' have caused. Type 1 kills the infection and Type 2 heals the damage, she says. This is her punchline with regard to 'Covid vaccinations': She says that mRNA 'antibodies' block Type 2 macrophages by attaching to them and deactivating them. This meant that when the Type 1 response was triggered by infection there was nothing to stop that getting out of hand by calming everything down. There's an on-switch, but no off-switch, she says. What follows can be 'over and out, see you when I see you'.

Genetic suicide

Tenpenny also highlights the potential for autoimmune disease – the body attacking itself – which has been associated with vaccines since they first appeared. Infusing a synthetic foreign substance into cells could cause the immune system to react in a panic believing that the body is being overwhelmed by an invader (it is) and the consequences can again be fatal. There is an autoimmune response known as a 'cytokine storm' which I have likened to a homeowner panicked by an intruder and picking up a gun to shoot randomly in all directions before turning the fire on himself. The immune system unleashes a storm of inflammatory response called cytokines to a threat and the body commits hara-kiri. The lesson is that you mess with the body's immune response at your peril and these 'vaccines' seriously – fundamentally – mess with immune response. Tenpenny refers to a consequence called anaphylactic shock which is a severe and highly dangerous allergic reaction when the immune system

floods the body with chemicals. She gives the example of having a bee sting which primes the immune system and makes it sensitive to those chemicals. When people are stung again maybe years later the immune response can be so powerful that it leads to anaphylactic shock. Tenpenny relates this 'shock' with regard to the 'Covid vaccine' to something called polyethylene glycol or PEG. Enormous numbers of people have become sensitive to this over decades of use in a whole range of products and processes including food, drink, skin creams and 'medicine'. Studies have claimed that some 72 percent of people have antibodies triggered by PEG compared with two percent in the 1960s and allergic hypersensitive reactions to this become a gathering cause for concern. Tenpenny points out that the 'mRNA vaccine' is coated in a 'bubble' of polyethylene glycol which has the potential to cause anaphylactic shock through immune sensitivity. Many reports have appeared of people reacting this way after having the 'Covid vaccine'. What do we think is going to happen as humanity has more and more of these 'vaccines'? Tenpenny said: 'All these pictures we have seen with people with these rashes ... these weepy rashes, big reactions on their arms and things like that – it's an acute allergic reaction most likely to the polyethylene glycol that you've been previously primed and sensitised to.'

Those who have not studied the conspiracy and its perpetrators at length might think that making the population sensitive to PEG and then putting it in these 'vaccines' is just a coincidence. It is not. It is instead testament to how carefully and coldly-planned current events have been and the scale of the conspiracy we are dealing with. Tenpenny further explains that the 'vaccine' mRNA procedure can breach the blood-brain barrier which protects the brain from toxins and other crap that will cause malfunction. In this case they could make two proteins corrupt brain function to cause Amyotrophic lateral sclerosis (ALS), a progressive nervous system disease leading to loss of muscle control, and frontal lobe degeneration – Alzheimer's and dementia. Immunologist J. Bart Classon published a paper connecting mRNA 'vaccines' to prion

disease which can lead to Alzheimer's and other forms of neurodegenerative disease while others have pointed out the potential to affect the placenta in ways that make women infertile. This will become highly significant in the next chapter when I will discuss other aspects of this non-vaccine that relate to its nanotechnology and transmission from the injected to the uninjected.

Qualified in idiocy

Tenpenny describes how research has confirmed that these 'vaccine'-generated antibodies can interact with a range of other tissues in the body and attack many other organs including the lungs. 'This means that if you have a hundred people standing in front of you that all got this shot they could have a hundred different symptoms.' Anyone really think that Cult gofers like the Queen, Tony Blair, Christopher Whitty, Anthony Fauci, and all the other psychopaths have really had this 'vaccine' in the pictures we've seen? Not a bloody chance. Why don't doctors all tell us about all these dangers and consequences of the 'Covid vaccine'? Why instead do they encourage and pressure patients to have the shot? Don't let's think for a moment that doctors and medical staff can't be stupid, lazy, and psychopathic and that's without the financial incentives to give the jab. Tenpenny again:

Some people are going to die from the vaccine directly but a large number of people are going to start to get horribly sick and get all kinds of autoimmune diseases 42 days to maybe a year out. What are they going to do, these stupid doctors who say; 'Good for you for getting that vaccine.' What are they going to say; 'Oh, it must be a mutant, we need to give an extra dose of that vaccine.'

Because now the vaccine, instead of one dose or two doses we need three or four because the stupid physicians aren't taking the time to learn anything about it. If I can learn this sitting in my living room reading a 19 page paper and several others so can they. There's nothing special about me, I just take the time to do it.

Remember how Sara Kayat, the NHS and TV doctor, said that the 'Covid vaccine' would '100 percent prevent hospitalisation and death'. Doctors can be idiots like every other profession and they

should not be worshipped as infallible. They are not and far from it. Behind many medical and scientific 'experts' lies an uninformed prat trying to hide themselves from you although in the 'Covid' era many have failed to do so as with UK narrative-repeating 'TV doctor' Hilary Jones. Pushing back against the minority of proper doctors and scientists speaking out against the 'vaccine' has been the entire edifice of the Cult global state in the form of governments, medical systems, corporations, mainstream media, Silicon Valley, and an army of compliant doctors, medical staff and scientists willing to say anything for money and to enhance their careers by promoting the party line. If you do that you are an 'expert' and if you won't you are an 'anti-vaxxer' and 'Covidiot'. The pressure to be 'vaccinated' is incessant. We have even had reports claiming that the 'vaccine' can help cure cancer and Alzheimer's and make the lame walk. I am waiting for the announcement that it can bring you coffee in the morning and cook your tea. Just as the symptoms of 'Covid' seem to increase by the week so have the miracles of the 'vaccine'. American supermarket giant Kroger Co. offered nearly 500,000 employees in 35 states a \$100 bonus for having the 'vaccine' while donut chain Krispy Kreme promised 'vaccinated' customers a free glazed donut every day for the rest of 2021. Have your DNA changed and you will get a doughnut although we might not have to give you them for long. Such offers and incentives confirm the desperation.

Perhaps the worse vaccine-stunt of them all was UK 'Health' Secretary Matt-the-prat Hancock on live TV after watching a clip of someone being 'vaccinated' when the roll-out began. Hancock faked tears so badly it was embarrassing. Brain-of-Britain Piers Morgan, the lockdown-supporting, 'vaccine' supporting, 'vaccine' passport-supporting, TV host played along with Hancock – 'You're quite emotional about that' he said in response to acting so atrocious it would have been called out at a school nativity which will presumably today include Mary and Jesus in masks, wise men keeping their camels six feet apart, and shepherds under tent arrest. System-serving Morgan tweeted this: 'Love the idea of covid vaccine passports for everywhere: flights, restaurants, clubs, football, gyms,

shops etc. It's time covid-denying, anti-vaxxer loonies had their bullsh*t bluff called & bar themselves from going anywhere that responsible citizens go.' If only I could aspire to his genius. To think that Morgan, who specialises in shouting over anyone he disagrees with, was lauded as a free speech hero when he lost his job after storming off the set of his live show like a child throwing his dolly out of the pram. If he is a free speech hero we are in real trouble. I have no idea what 'bullsh*t' means, by the way, the * throws me completely.

The Cult is desperate to infuse its synthetic DNA-changing concoction into everyone and has been using every lie, trick and intimidation to do so. The question of '*Why?*' we shall now address.

CHAPTER TEN

Human 2.0

I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted –
Alan Turing (1912-1954), the ‘Father of artificial intelligence’

I have been exposing for decades the plan to transform the human body from a biological to a synthetic-biological state. The new human that I will call Human 2.0 is planned to be connected to artificial intelligence and a global AI ‘Smart Grid’ that would operate as one global system in which AI would control everything from your fridge to your heating system to your car to your mind. Humans would no longer be ‘human’, but post-human and sub-human, with their thinking and emotional processes replaced by AI.

What I said sounded crazy and beyond science fiction and I could understand that. To any balanced, rational, mind it *is* crazy. Today, however, that world is becoming reality and it puts the ‘Covid vaccine’ into its true context. Ray Kurzweil is the ultra-Zionist ‘computer scientist, inventor and futurist’ and co-founder of the Singularity University. Singularity refers to the merging of humans with machines or ‘transhumanism’. Kurzweil has said humanity would be connected to the cyber ‘cloud’ in the period of the ever-recurring year of 2030:

Our thinking ... will be a hybrid of biological and non-biological thinking ... humans will be able to extend their limitations and ‘think in the cloud’ ... We’re going to put gateways to the

cloud in our brains ... We're going to gradually merge and enhance ourselves ... In my view, that's the nature of being human – we transcend our limitations. As the technology becomes vastly superior to what we are then the small proportion that is still human gets smaller and smaller and smaller until it's just utterly negligible.

They are trying to sell this end-of-humanity-as-we-know-it as the next stage of 'evolution' when we become super-human and 'like the gods'. They are lying to you. Shocked, eh? The population, and again especially the young, have been manipulated into addiction to technologies designed to enslave them for life. First they induced an addiction to smartphones (holdables); next they moved to technology on the body (wearables); and then began the invasion of the body (implantables). I warned way back about the plan for microchipped people and we are now entering that era. We should not be diverted into thinking that this refers only to chips we can see. Most important are the nanochips known as smart dust, neural dust and nanobots which are far too small to be seen by the human eye. Nanotechnology is everywhere, increasingly in food products, and released into the atmosphere by the geoengineering of the skies funded by Bill Gates to 'shut out the Sun' and 'save the planet from global warming'. Gates has been funding a project to spray millions of tonnes of chalk (calcium carbonate) into the stratosphere over Sweden to 'dim the Sun' and cool the Earth. Scientists warned the move could be disastrous for weather systems in ways no one can predict and opposition led to the Swedish space agency announcing that the 'experiment' would not be happening as planned in the summer of 2021; but it shows where the Cult is going with dimming the impact of the Sun and there's an associated plan to change the planet's atmosphere. Who gives psychopath Gates the right to dictate to the entire human race and dismantle planetary systems? The world will not be safe while this man is at large.

The global warming hoax has made the Sun, like the gas of life, something to fear when both are essential to good health and human survival (more inversion). The body transforms sunlight into vital vitamin D through a process involving ... *cholesterol*. This is the cholesterol we are also told to fear. We are urged to take Big Pharma

statin drugs to reduce cholesterol and it's all systematic. Reducing cholesterol means reducing vitamin D uptake with all the multiple health problems that will cause. At least if you take statins long term it saves the government from having to pay you a pension. The delivery system to block sunlight is widely referred to as chemtrails although these have a much deeper agenda, too. They appear at first to be contrails or condensation trails streaming from aircraft into cold air at high altitudes. Contrails disperse very quickly while chemtrails do not and spread out across the sky before eventually their content falls to earth. Many times I have watched aircraft cross-cross a clear blue sky releasing chemtrails until it looks like a cloudy day. Chemtrails contain many things harmful to humans and the natural world including toxic heavy metals, aluminium (see Alzheimer's) and nanotechnology. Ray Kurzweil reveals the reason without actually saying so: 'Nanobots will infuse all the matter around us with information. Rocks, trees, everything will become these intelligent creatures.' How do you deliver that? *From the sky*. Self-replicating nanobots would connect everything to the Smart Grid. The phenomenon of Morgellons disease began in the chemtrail era and the correlation has led to it being dubbed the 'chemtrail disease'. Self-replicating fibres appear in the body that can be pulled out through the skin. Morgellons fibres continue to grow outside the body and have a form of artificial intelligence. I cover this at greater length in *Phantom Self*.

'Vaccine' operating system

'Covid vaccines' with their self-replicating synthetic material are also designed to make the connection between humanity and Kurzweil's 'cloud'. American doctor and dedicated campaigner for truth, Carrie Madej, an Internal Medicine Specialist in Georgia with more than 20 years medical experience, has highlighted the nanotechnology aspect of the fake 'vaccines'. She explains how one of the components in at least the Moderna and Pfizer synthetic potions are 'lipid nanoparticles' which are 'like little tiny computer bits' – a 'sci-fi substance' known as nanobots and hydrogel which can be 'triggered

at any moment to deliver its payload' and act as 'biosensors'. The synthetic substance had 'the ability to accumulate data from your body like your breathing, your respiration, thoughts and emotions, all kind of things' and each syringe could carry a *million* nanobots:

This substance because it's like little bits of computers in your body, crazy, but it's true, it can do that, [and] obviously has the ability to act through Wi-Fi. It can receive and transmit energy, messages, frequencies or impulses. That issue has never been addressed by these companies. What does that do to the human?

Just imagine getting this substance in you and it can react to things all around you, the 5G, your smart device, your phones, what is happening with that? What if something is triggering it, too, like an impulse, a frequency? We have something completely foreign in the human body.

Madej said her research revealed that electromagnetic (EMF) frequencies emitted by phones and other devices had increased dramatically in the same period of the 'vaccine' rollout and she was seeing more people with radiation problems as 5G and other electromagnetic technology was expanded and introduced to schools and hospitals. She said she was 'floored with the EMF coming off' the devices she checked. All this makes total sense and syncs with my own work of decades when you think that Moderna refers in documents to its mRNA 'vaccine' as an 'operating system':

Recognizing the broad potential of mRNA science, we set out to create an mRNA technology platform that functions very much like an operating system on a computer. It is designed so that it can plug and play interchangeably with different programs. In our case, the 'program' or 'app' is our mRNA drug – the unique mRNA sequence that codes for a protein ...

... Our MRNA Medicines – 'The 'Software Of Life': When we have a concept for a new mRNA medicine and begin research, fundamental components are already in place. Generally, the only thing that changes from one potential mRNA medicine to another is the coding region – the actual genetic code that instructs ribosomes to make protein. Utilizing these instruction sets gives our investigational mRNA medicines a software-like quality. We also have the ability to combine different mRNA sequences encoding for different proteins in a single mRNA investigational medicine.

Who needs a real ‘virus’ when you can create a computer version to justify infusing your operating system into the entire human race on the road to making living, breathing people into cyborgs? What is missed with the ‘vaccines’ is the *digital* connection between synthetic material and the body that I highlighted earlier with the study that hacked a computer with human DNA. On one level the body is digital, based on mathematical codes, and I’ll have more about that in the next chapter. Those who ridiculously claim that mRNA ‘vaccines’ are not designed to change human genetics should explain the words of Dr Tal Zaks, chief medical officer at Moderna, in a 2017 TED talk. He said that over the last 30 years ‘we’ve been living this phenomenal digital scientific revolution, and I’m here today to tell you, that we are actually *hacking the software of life*, and that it’s changing the way we think about prevention and treatment of disease’:

In every cell there’s this thing called messenger RNA, or mRNA for short, that transmits the critical information from the DNA in our genes to the protein, which is really the stuff we’re all made out of. This is the critical information that determines what the cell will do. So we think about it as an operating system. So if you could change that, if you could introduce a line of code, or change a line of code, it turns out, that has profound implications for everything, from the flu to cancer.

Zaks should more accurately have said that this has profound implications for the human genetic code and the nature of DNA. Communications within the body go both ways and not only one. But, hey, no, the ‘Covid vaccine’ will not affect your genetics. Cult fact-checkers say so even though the man who helped to develop the mRNA technique says that it does. Zaks said in 2017:

If you think about what it is we’re trying to do. We’ve taken information and our understanding of that information and how that information is transmitted in a cell, and we’ve taken our understanding of medicine and how to make drugs, and we’re fusing the two. We think of it as information therapy.

I have been writing for decades that the body is an information field communicating with itself and the wider world. This is why

radiation which is information can change the information field of body and mind through phenomena like 5G and change their nature and function. 'Information therapy' means to change the body's information field and change the way it operates. DNA is a receiver-transmitter of information and can be mutated by information like mRNA synthetic messaging. Technology to do this has been ready and waiting in the underground bases and other secret projects to be rolled out when the 'Covid' hoax was played. 'Trials' of such short and irrelevant duration were only for public consumption. When they say the 'vaccine' is 'experimental' that is not true. It may appear to be 'experimental' to those who don't know what's going on, but the trials have already been done to ensure the Cult gets the result it desires. Zaks said that it took decades to sequence the human genome, completed in 2003, but now they could do it in a week. By 'they' he means scientists operating in the public domain. In the secret projects they were sequencing the genome in a week long before even 2003.

Deluge of mRNA

Highly significantly the Moderna document says the guiding premise is that if using mRNA as a medicine works for one disease then it should work for many diseases. They were leveraging the flexibility afforded by their platform and the fundamental role mRNA plays in protein synthesis to pursue mRNA medicines for a broad spectrum of diseases. Moderna is confirming what I was saying through 2020 that multiple 'vaccines' were planned for 'Covid' (and later invented 'variants') and that previous vaccines would be converted to the mRNA system to infuse the body with massive amounts of genetically-manipulating synthetic material to secure a transformation to a synthetic-biological state. The 'vaccines' are designed to kill stunning numbers as part of the long-exposed Cult depopulation agenda and transform the rest. Given this is the goal you can appreciate why there is such hysterical demand for every human to be 'vaccinated' for an alleged 'disease' that has an estimated 'infection' to 'death' ratio of 0.23-0.15 percent. As I write

children are being given the 'vaccine' in trials (their parents are a disgrace) and ever-younger people are being offered the vaccine for a 'virus' that even if you believe it exists has virtually zero chance of harming them. Horrific effects of the 'trials' on a 12-year-old girl were revealed by a family member to be serious brain and gastric problems that included a bowel obstruction and the inability to swallow liquids or solids. She was unable to eat or drink without throwing up, had extreme pain in her back, neck and abdomen, and was paralysed from the waist down which stopped her urinating unaided. When the girl was first taken to hospital doctors said it was all in her mind. She was signed up for the 'trial' by her parents for whom no words suffice. None of this 'Covid vaccine' insanity makes any sense unless you see what the 'vaccine' really is – a body-changer. Synthetic biology or 'SynBio' is a fast-emerging and expanding scientific discipline which includes everything from genetic and molecular engineering to electrical and computer engineering. Synthetic biology is defined in these ways:

- A multidisciplinary area of research that seeks to create new biological parts, devices, and systems, or to redesign systems that are already found in nature.
- The use of a mixture of physical engineering and genetic engineering to create new (and therefore synthetic) life forms.
- An emerging field of research that aims to combine the knowledge and methods of biology, engineering and related disciplines in the design of chemically-synthesized DNA to create organisms with novel or enhanced characteristics and traits (synthetic organisms including humans).

We now have synthetic blood, skin, organs and limbs being developed along with synthetic body parts produced by 3D printers. These are all elements of the synthetic human programme and this comment by Kurzweil's co-founder of the Singularity University,

Peter Diamandis, can be seen in a whole new light with the 'Covid' hoax and the sanctions against those that refuse the 'vaccine':

Anybody who is going to be resisting the progress forward [to transhumanism] is going to be resisting evolution and, fundamentally, they will die out. It's not a matter of whether it's good or bad. It's going to happen.

'Resisting evolution'? What absolute bollocks. The arrogance of these people is without limit. His 'it's going to happen' mantra is another way of saying 'resistance is futile' to break the spirit of those pushing back and we must not fall for it. Getting this genetically-transforming 'vaccine' into everyone is crucial to the Cult plan for total control and the desperation to achieve that is clear for anyone to see. Vaccine passports are a major factor in this and they, too, are a form of resistance is futile. It's NOT. The paper funded by the Rockefeller Foundation for the 2013 'health conference' in China said:

We will interact more with artificial intelligence. The use of robotics, bio-engineering to augment human functioning is already well underway and will advance. Re-engineering of humans into potentially separate and unequal forms through genetic engineering or mixed human-robots raises debates on ethics and equality.

A new demography is projected to emerge after 2030 [that year again] of technologies (robotics, genetic engineering, nanotechnology) producing robots, engineered organisms, 'nanobots' and artificial intelligence (AI) that can self-replicate. Debates will grow on the implications of an impending reality of human designed life.

What is happening today is so long planned. The world army enforcing the will of the world government is intended to be a robot army, not a human one. Today's military and its technologically 'enhanced' troops, pilotless planes and driverless vehicles are just stepping stones to that end. Human soldiers are used as Cult fodder and its time they woke up to that and worked for the freedom of the population instead of their own destruction and their family's destruction – the same with the police. Join us and let's sort this out. The phenomenon of enforce my own destruction is widespread in the 'Covid' era with Woker 'luvvies' in the acting and entertainment

industries supporting 'Covid' rules which have destroyed their profession and the same with those among the public who put signs on the doors of their businesses 'closed due to Covid – stay safe' when many will never reopen. It's a form of masochism and most certainly insanity.

Transgender = transhumanism

When something explodes out of nowhere and is suddenly everywhere it is always the Cult agenda and so it is with the tidal wave of claims and demands that have infiltrated every aspect of society under the heading of 'transgenderism'. The term 'trans' is so 'in' and this is the dictionary definition:

A prefix meaning 'across', 'through', occurring ... in loanwords from Latin, used in particular for denoting movement or conveyance from place to place (transfer; transmit; transplant) or complete change (transform; transmute), or to form adjectives meaning 'crossing', 'on the other side of', or 'going beyond' the place named (transmontane; transnational; trans-Siberian).

Transgender means to go beyond gender and transhuman means to go beyond human. Both are aspects of the Cult plan to transform the human body to a synthetic state with *no gender*. Human 2.0 is not designed to procreate and would be produced technologically with no need for parents. The new human would mean the end of parents and so men, and increasingly women, are being targeted for the deletion of their rights and status. Parental rights are disappearing at an ever-quickenning speed for the same reason. The new human would have no need for men or women when there is no procreation and no gender. Perhaps the transgender movement that appears to be in a permanent state of frenzy might now contemplate on how it is being used. This was never about transgender rights which are only the interim excuse for confusing gender, particularly in the young, on the road to *fusing* gender. Transgender activism is not an end; it is a *means* to an end. We see again the technique of creative destruction in which you destroy the status quo to 'build back better' in the form that you want. The gender status quo had to be

destroyed by persuading the Cult-created Woke mentality to believe that you can have 100 genders or more. A programme for 9 to 12 year olds produced by the Cult-owned BBC promoted the 100 genders narrative. The very idea may be the most monumental nonsense, but it is not what is true that counts, only what you can make people *believe* is true. Once the gender of $2 + 2 = 4$ has been dismantled through indoctrination, intimidation and $2 + 2 = 5$ then the new no-gender normal can take its place with Human 2.0.

Aldous Huxley revealed the plan in his prophetic *Brave New World* in 1932:

Natural reproduction has been done away with and children are created, decanted', and raised in 'hatcheries and conditioning centres'. From birth, people are genetically designed to fit into one of five castes, which are further split into 'Plus' and 'Minus' members and designed to fulfil predetermined positions within the social and economic strata of the World State.

How could Huxley know this in 1932? For the same reason George Orwell knew about the Big Brother state in 1948, Cult insiders I have quoted knew about it in 1969, and I have known about it since the early 1990s. If you are connected to the Cult or you work your balls off to uncover the plan you can predict the future. The process is simple. If there is a plan for the world and nothing intervenes to stop it then it will happen. Thus if you communicate the plan ahead of time you are perceived to have predicted the future, but you haven't. You have revealed the plan which without intervention will become the human future. The whole reason I have done what I have is to alert enough people to inspire an intervention and maybe at last that time has come with the Cult and its intentions now so obvious to anyone with a brain in working order.

The future is here

Technological wombs that Huxley described to replace parent procreation are already being developed and they are only the projects we know about in the public arena. Israeli scientists told *The Times of Israel* in March, 2021, that they have grown 250-cell embryos

into mouse fetuses with fully formed organs using artificial wombs in a development they say could pave the way for gestating humans outside the womb. Professor Jacob Hanna of the Weizmann Institute of Science said:

We took mouse embryos from the mother at day five of development, when they are just of 250 cells, and had them in the incubator from day five until day 11, by which point they had grown all their organs.

By day 11 they make their own blood and have a beating heart, a fully developed brain. Anybody would look at them and say, 'this is clearly a mouse foetus with all the characteristics of a mouse.' It's gone from being a ball of cells to being an advanced foetus.

A special liquid is used to nourish embryo cells in a laboratory dish and they float on the liquid to duplicate the first stage of embryonic development. The incubator creates all the right conditions for its development, Hanna said. The liquid gives the embryo 'all the nutrients, hormones and sugars they need' along with a custom-made electronic incubator which controls gas concentration, pressure and temperature. The cutting-edge in the underground bases and other secret locations will be light years ahead of that, however, and this was reported by the London *Guardian* in 2017:

We are approaching a biotechnological breakthrough. Ectogenesis, the invention of a complete external womb, could completely change the nature of human reproduction. In April this year, researchers at the Children's Hospital of Philadelphia announced their development of an artificial womb.

The article was headed 'Artificial wombs could soon be a reality. What will this mean for women?' What would it mean for children is an even bigger question. No mother to bond with only a machine in preparation for a life of soulless interaction and control in a world governed by machines (see the *Matrix* movies). Now observe the calculated manipulations of the 'Covid' hoax as human interaction and warmth has been curtailed by distancing, isolation and fear with people communicating via machines on a scale never seen before.

These are all dots in the same picture as are all the personal assistants, gadgets and children's toys through which kids and adults communicate with AI as if it is human. The AI 'voice' on Sat-Nav should be included. All these things are psychological preparation for the Cult endgame. Before you can make a physical connection with AI you have to make a psychological connection and that is what people are being conditioned to do with this ever gathering human-AI interaction. Movies and TV programmes depicting the transhuman, robot dystopia relate to a phenomenon known as 'pre-emptive programming' in which the world that is planned is portrayed everywhere in movies, TV and advertising. This is conditioning the conscious and subconscious mind to become familiar with the planned reality to dilute resistance when it happens for real. What would have been a shock such is the change is made less so. We have young children put on the road to transgender transition surgery with puberty blocking drugs at an age when they could never be able to make those life-changing decisions.

Rachel Levine, a professor of paediatrics and psychiatry who believes in treating children this way, became America's highest-ranked openly-transgender official when she was confirmed as US Assistant Secretary at the Department of Health and Human Services after being nominated by Joe Biden (the Cult). Activists and governments press for laws to deny parents a say in their children's transition process so the kids can be isolated and manipulated into agreeing to irreversible medical procedures. A Canadian father Robert Hoogland was denied bail by the Vancouver Supreme Court in 2021 and remained in jail for breaching a court order that he stay silent over his young teenage daughter, a minor, who was being offered life-changing hormone therapy without parental consent. At the age of 12 the girl's 'school counsellor' said she may be transgender, referred her to a doctor and told the school to treat her like a boy. This is another example of state-serving schools imposing ever more control over children's lives while parents have ever less.

Contemptible and extreme child abuse is happening all over the world as the Cult gender-fusion operation goes into warp-speed.

Why the war on men – and now women?

The question about what artificial wombs mean for women should rightly be asked. The answer can be seen in the deletion of women's rights involving sport, changing rooms, toilets and status in favour of people in male bodies claiming to identify as women. I can identify as a mountain climber, but it doesn't mean I can climb a mountain any more than a biological man can be a biological woman. To believe so is a triumph of belief over factual reality which is the very perceptual basis of everything Woke. Women's sport is being destroyed by allowing those with male bodies who say they identify as female to 'compete' with girls and women. Male body 'women' dominate 'women's' competition with their greater muscle mass, bone density, strength and speed. With that disadvantage sport for women loses all meaning. To put this in perspective nearly 300 American high school boys can run faster than the quickest woman sprinter in the world. Women are seeing their previously protected spaces invaded by male bodies simply because they claim to identify as women. That's all they need to do to access all women's spaces and activities under the Biden 'Equality Act' that destroys equality for women with the usual Orwellian Woke inversion. Male sex offenders have already committed rapes in women's prisons after claiming to identify as women to get them transferred. Does this not matter to the Woke 'equality' hypocrites? Not in the least. What matters to Cult manipulators and funders behind transgender activists is to advance gender fusion on the way to the no-gender 'human'. When you are seeking to impose transparent nonsense like this, or the 'Covid' hoax, the only way the nonsense can prevail is through censorship and intimidation of dissenters, deletion of factual information, and programming of the unquestioning, bewildered and naive. You don't have to scan the world for long to see that all these things are happening.

Many women's rights organisations have realised that rights and status which took such a long time to secure are being eroded and that it is systematic. Kara Dansky of the global Women's Human Rights Campaign said that Biden's transgender executive order immediately he took office, subsequent orders, and Equality Act legislation that followed 'seek to erase women and girls in the law as a category'. *Exactly*. I said during the long ago-started war on men (in which many women play a crucial part) that this was going to turn into a war on them. The Cult is phasing out *both* male and female genders. To get away with that they are brought into conflict so they are busy fighting each other while the Cult completes the job with no unity of response. Unity, people, *unity*. We need unity everywhere. Transgender is the only show in town as the big step towards the no-gender human. It's not about rights for transgender people and never has been. Woke political correctness is deleting words relating to genders to the same end. Wokers believe this is to be 'inclusive' when the opposite is true. They are deleting words describing gender because gender *itself* is being deleted by Human 2.0. Terms like 'man', 'woman', 'mother' and 'father' are being deleted in the universities and other institutions to be replaced by the *no*-gender, not trans-gender, 'individuals' and 'guardians'. Women's rights campaigner Maria Keffler of Partners for Ethical Care said: 'Children are being taught from kindergarten upward that some boys have a vagina, some girls have a penis, and that kids can be any gender they want to be.' Do we really believe that suddenly countries all over the world at the same time had the idea of having drag queens go into schools or read transgender stories to very young children in the local library? It's coldly-calculated confusion of gender on the way to the fusion of gender. Suzanne Vierling, a psychologist from Southern California, made another important point:

Yesterday's slave woman who endured gynecological medical experiments is today's girl-child being butchered in a booming gender-transitioning sector. Ovaries removed, pushing her into menopause and osteoporosis, uncharted territory, and parents' rights and authority decimated.

The erosion of parental rights is a common theme in line with the Cult plans to erase the very concept of parents and 'ovaries removed, pushing her into menopause' means what? Those born female lose the ability to have children – another way to discontinue humanity as we know it.

Eliminating Human 1.0 (before our very eyes)

To pave the way for Human 2.0 you must phase out Human 1.0. This is happening through plummeting sperm counts and making women infertile through an onslaught of chemicals, radiation (including smartphones in pockets of men) and mRNA 'vaccines'. Common agriculture pesticides are also having a devastating impact on human fertility. I have been tracking collapsing sperm counts in the books for a long time and in 2021 came a book by fertility scientist and reproductive epidemiologist Shanna Swan, *Count Down: How Our Modern World Is Threatening Sperm Counts, Altering Male and Female Reproductive Development and Imperiling the Future of the Human Race*. She reports how the global fertility rate dropped by *half* between 1960 and 2016 with America's birth rate 16 percent below where it needs to be to sustain the population. Women are experiencing declining egg quality, more miscarriages, and more couples suffer from infertility. Other findings were an increase in erectile dysfunction, infant boys developing more genital abnormalities, male problems with conception, and plunging levels of the male hormone testosterone which would explain why so many men have lost their backbone and masculinity. This has been very evident during the 'Covid' hoax when women have been prominent among the Pushbackers and big strapping blokes have bowed their heads, covered their faces with a nappy and quietly submitted. Mind control expert Cathy O'Brien also points to how global education introduced the concept of 'we're all winners' in sport and classrooms: 'Competition was defused, and it in turn defused a sense of fighting back.' This is another version of the 'equity' doctrine in which you drive down rather than raise up. What a contrast in Cult-controlled China with its global ambitions

where the government published plans in January, 2021, to 'cultivate masculinity' in boys from kindergarten through to high school in the face of a 'masculinity crisis'. A government adviser said boys would be soon become 'delicate, timid and effeminate' unless action was taken. Don't expect any similar policy in the targeted West. A 2006 study showed that a 65-year-old man in 2002 had testosterone levels 15 percent lower than a 65-year-old man in 1987 while a 2020 study found a similar story with young adults and adolescents. Men are getting prescriptions for testosterone replacement therapy which causes an even greater drop in sperm count with up to 99 percent seeing sperm counts drop to zero during the treatment. More sperm is defective and malfunctioning with some having two heads or not pursuing an egg.

A class of *synthetic* chemicals known as phthalates are being blamed for the decline. These are found everywhere in plastics, shampoos, cosmetics, furniture, flame retardants, personal care products, pesticides, canned foods and even receipts. Why till receipts? Everyone touches them. Let no one delude themselves that all this is not systematic to advance the long-time agenda for human body transformation. Phthalates mimic hormones and disrupt the hormone balance causing testosterone to fall and genital birth defects in male infants. Animals and fish have been affected in the same way due to phthalates and other toxins in rivers. When fish turn gay or change sex through chemicals in rivers and streams it is a pointer to why there has been such an increase in gay people and the sexually confused. It doesn't matter to me what sexuality people choose to be, but if it's being affected by chemical pollution and consumption then we need to know. Does anyone really think that this is not connected to the transgender agenda, the war on men and the condemnation of male 'toxic masculinity'? You watch this being followed by 'toxic femininity'. It's already happening. When breastfeeding becomes 'chest-feeding', pregnant women become pregnant people along with all the other Woke claptrap you know that the world is going insane and there's a Cult scam in progress. Transgender activists are promoting the Cult agenda while Cult

billionaires support and fund the insanity as they laugh themselves to sleep at the sheer stupidity for which humans must be infamous in galaxies far, far away.

‘Covid vaccines’ and female infertility

We can now see why the ‘vaccine’ has been connected to potential infertility in women. Dr Michael Yeadon, former Vice President and Chief Scientific Advisor at Pfizer, and Dr Wolfgang Wodarg in Germany, filed a petition with the European Medicines Agency in December, 2020, urging them to stop trials for the Pfizer/BioNTech shot and all other mRNA trials until further studies had been done. They were particularly concerned about possible effects on fertility with ‘vaccine’-produced antibodies attacking the protein Syncytin-1 which is responsible for developing the placenta. The result would be infertility ‘of indefinite duration’ in women who have the ‘vaccine’ with the placenta failing to form. Section 10.4.2 of the Pfizer/BioNTech trial protocol says that pregnant women or those who might become so should not have mRNA shots. Section 10.4 warns men taking mRNA shots to ‘be abstinent from heterosexual intercourse’ and not to donate sperm. The UK government said that it *did not know* if the mRNA procedure had an effect on fertility. *Did not know?* These people have to go to jail. UK government advice did not recommend at the start that pregnant women had the shot and said they should avoid pregnancy for at least two months after ‘vaccination’. The ‘advice’ was later updated to pregnant women should only have the ‘vaccine’ if the benefits outweighed the risks to mother and foetus. What the hell is that supposed to mean? Then ‘spontaneous abortions’ began to appear and rapidly increase on the adverse reaction reporting schemes which include only a fraction of adverse reactions. Thousands and ever-growing numbers of ‘vaccinated’ women are describing changes to their menstrual cycle with heavier blood flow, irregular periods and menstruating again after going through the menopause – all links to reproduction effects. Women are passing blood clots and the lining of their uterus while men report erectile dysfunction and blood effects. Most

significantly of all *unvaccinated* women began to report similar menstrual changes after interaction with '*vaccinated*' people and men and children were also affected with bleeding noses, blood clots and other conditions. 'Shedding' is when vaccinated people can emit the content of a vaccine to affect the unvaccinated, but this is different. 'Vaccinated' people were not shedding a 'live virus' allegedly in 'vaccines' as before because the fake 'Covid vaccines' involve synthetic material and other toxicity. Doctors exposing what is happening prefer the term 'transmission' to shedding. Somehow those that have had the shots are transmitting effects to those that haven't. Dr Carrie Madej said the nano-content of the 'vaccines' can 'act like an antenna' to others around them which fits perfectly with my own conclusions. This 'vaccine' transmission phenomenon was becoming known as the book went into production and I deal with this further in the Postscript.

Vaccine effects on sterility are well known. The World Health Organization was accused in 2014 of sterilising millions of women in Kenya with the evidence confirmed by the content of the vaccines involved. The same WHO behind the 'Covid' hoax admitted its involvement for more than ten years with the vaccine programme. Other countries made similar claims. Charges were lodged by Tanzania, Nicaragua, Mexico, and the Philippines. The Gardasil vaccine claimed to protect against a genital 'virus' known as HPV has also been linked to infertility. Big Pharma and the WHO (same thing) are criminal and satanic entities. Then there's the Bill Gates Foundation which is connected through funding and shared interests with 20 pharmaceutical giants and laboratories. He stands accused of directing the policy of United Nations Children's Fund (UNICEF), vaccine alliance GAVI, and other groupings, to advance the vaccine agenda and silence opposition at great cost to women and children. At the same time Gates wants to reduce the global population. Coincidence?

Great Reset = Smart Grid = new human

The Cult agenda I have been exposing for 30 years is now being openly promoted by Cult assets like Gates and Klaus Schwab of the World Economic Forum under code-terms like the 'Great Reset', 'Build Back Better' and 'a rare but narrow window of opportunity to reflect, reimagine, and reset our world'. What provided this 'rare but narrow window of opportunity'? The 'Covid' hoax did. Who created that? *They* did. My books from not that long ago warned about the planned 'Internet of Things' (IoT) and its implications for human freedom. This was the plan to connect all technology to the Internet and artificial intelligence and today we are way down that road with an estimated 36 billion devices connected to the World Wide Web and that figure is projected to be 76 billion by 2025. I further warned that the Cult planned to go beyond that to the Internet of *Everything* when the human brain was connected via AI to the Internet and Kurzweil's 'cloud'. Now we have Cult operatives like Schwab calling for precisely that under the term 'Internet of Bodies', a fusion of the physical, digital and biological into one centrally-controlled Smart Grid system which the Cult refers to as the 'Fourth Industrial Revolution'. They talk about the 'biological', but they really mean the synthetic-biological which is required to fully integrate the human body and brain into the Smart Grid and artificial intelligence planned to replace the human mind. We have everything being synthetically manipulated including the natural world through GMO and smart dust, the food we eat and the human body itself with synthetic 'vaccines'. I said in *The Answer* that we would see the Cult push for synthetic meat to replace animals and in February, 2021, the so predictable psychopath Bill Gates called for the introduction of synthetic meat to save us all from 'climate change'. The climate hoax just keeps on giving like the 'Covid' hoax. The war on meat by vegan activists is a carbon (oops, sorry) copy of the manipulation of transgender activists. They have no idea (except their inner core) that they are being used to promote and impose the agenda of the Cult or that they are only the *vehicle* and not the *reason*. This is not to say those who choose not to eat meat shouldn't be respected and supported in that right, but there are ulterior motives

for those in power. A *Forbes* article in December, 2019, highlighted the plan so beloved of Schwab and the Cult under the heading: 'What Is The Internet of Bodies? And How Is It Changing Our World?' The article said the human body is the latest data platform (remember 'our vaccine is an operating system'). *Forbes* described the plan very accurately and the words could have come straight out of my books from long before:

The Internet of Bodies (IoB) is an extension of the IoT and basically connects the human body to a network through devices that are ingested, implanted, or connected to the body in some way. Once connected, data can be exchanged, and the body and device can be remotely monitored and controlled.

They were really describing a human hive mind with human perception centrally-dictated via an AI connection as well as allowing people to be 'remotely monitored and controlled'. Everything from a fridge to a human mind could be directed from a central point by these insane psychopaths and 'Covid vaccines' are crucial to this. *Forbes* explained the process I mentioned earlier of holdable and wearable technology followed by implantable. The article said there were three generations of the Internet of Bodies that include:

- Body external: These are wearable devices such as Apple Watches or Fitbits that can monitor our health.
- Body internal: These include pacemakers, cochlear implants, and digital pills that go inside our bodies to monitor or control various aspects of health.
- Body embedded: The third generation of the Internet of Bodies is embedded technology where technology and the human body are melded together and have a real-time connection to a remote machine.

Forbes noted the development of the Brain Computer Interface (BCI) which merges the brain with an external device for monitoring and controlling in real-time. 'The ultimate goal is to help restore function to individuals with disabilities by using brain signals rather than conventional neuromuscular pathways.' Oh, do fuck off. The goal of brain interface technology is controlling human thought and emotion from the central point in a hive mind serving its masters wishes. Many people are now agreeing to be chipped to open doors without a key. You can recognise them because they'll be wearing a mask, social distancing and lining up for the 'vaccine'. The Cult plans a Great Reset money system after they have completed the demolition of the global economy in which 'money' will be exchanged through communication with body operating systems. Rand Corporation, a Cult-owned think tank, said of the Internet of Bodies or IoB:

Internet of Bodies technologies fall under the broader IoT umbrella. But as the name suggests, IoB devices introduce an even more intimate interplay between humans and gadgets. IoB devices monitor the human body, collect health metrics and other personal information, and transmit those data over the Internet. Many devices, such as fitness trackers, are already in use ... IoB devices ... and those in development can track, record, and store users' whereabouts, bodily functions, and what they see, hear, and even think.

Schwab's World Economic Forum, a long-winded way of saying 'fascism' or 'the Cult', has gone full-on with the Internet of Bodies in the 'Covid' era. 'We're entering the era of the Internet of Bodies', it declared, 'collecting our physical data via a range of devices that can be implanted, swallowed or worn'. The result would be a huge amount of health-related data that could improve human wellbeing around the world, and prove crucial in fighting the 'Covid-19 pandemic'. Does anyone think these clowns care about 'human wellbeing' after the death and devastation their pandemic hoax has purposely caused? Schwab and co say we should move forward with the Internet of Bodies because 'Keeping track of symptoms could help us stop the spread of infection, and quickly detect new cases'. How wonderful, but keeping track' is all they are really bothered

about. Researchers were investigating if data gathered from smartwatches and similar devices could be used as viral infection alerts by tracking the user's heart rate and breathing. Schwab said in his 2018 book *Shaping the Future of the Fourth Industrial Revolution*:

The lines between technologies and beings are becoming blurred and not just by the ability to create lifelike robots or synthetics. Instead it is about the ability of new technologies to literally become part of us. Technologies already influence how we understand ourselves, how we think about each other, and how we determine our realities. As the technologies ... give us deeper access to parts of ourselves, we may begin to integrate digital technologies into our bodies.

You can see what the game is. Twenty-four hour control and people – if you could still call them that – would never know when something would go ping and take them out of circulation. It's the most obvious rush to a global fascist dictatorship and the complete submission of humanity and yet still so many are locked away in their Cult-induced perceptual coma and can't see it.

Smart Grid control centres

The human body is being transformed by the 'vaccines' and in other ways into a synthetic cyborg that can be attached to the global Smart Grid which would be controlled from a central point and other sub-locations of Grid manipulation. Where are these planned to be? Well, China for a start which is one of the Cult's biggest centres of operation. The technological control system and technocratic rule was incubated here to be unleashed across the world after the 'Covid' hoax came out of China in 2020. Another Smart Grid location that will surprise people new to this is Israel. I have exposed in *The Trigger* how Sabbatian technocrats, intelligence and military operatives were behind the horrors of 9/11 and not 19 Arab hijackers' who somehow manifested the ability to pilot big passenger airliners when instructors at puddle-jumping flying schools described some of them as a joke. The 9/11 attacks were made possible through control of civilian and military air computer systems and those of the White House, Pentagon and connected agencies. See *The Trigger* – it

will blow your mind. The controlling and coordinating force were the Sabbatian networks in Israel and the United States which by then had infiltrated the entire US government, military and intelligence system. The real name of the American Deep State is 'Sabbatian State'. Israel is a tiny country of only nine million people, but it is one of the global centres of cyber operations and fast catching Silicon Valley in importance to the Cult. Israel is known as the 'start-up nation' for all the cyber companies spawned there with the Sabbatian specialisation of 'cyber security' that I mentioned earlier which gives those companies access to computer systems of their clients in real time through 'backdoors' written into the coding when security software is downloaded. The Sabbatian centre of cyber operations outside Silicon Valley is the Israeli military Cyber Intelligence Unit, the biggest infrastructure project in Israel's history, headquartered in the desert-city of Beersheba and involving some 20,000 'cyber soldiers'. Here are located a literal army of Internet trolls scanning social media, forums and comment lists for anyone challenging the Cult agenda. The UK military has something similar with its 77th Brigade and associated operations. The Beersheba complex includes research and development centres for other Cult operations such as Intel, Microsoft, IBM, Google, Apple, Hewlett-Packard, Cisco Systems, Facebook and Motorola. Techcrunch.com ran an article about the Beersheba global Internet technology centre headlined 'Israel's desert city of Beersheba is turning into a cybertech oasis':

The military's massive relocation of its prestigious technology units, the presence of multinational and local companies, a close proximity to Ben Gurion University and generous government subsidies are turning Beersheba into a major global cybertech hub. Beersheba has all of the ingredients of a vibrant security technology ecosystem, including Ben Gurion University with its graduate program in cybersecurity and Cyber Security Research Center, and the presence of companies such as EMC, Deutsche Telekom, PayPal, Oracle, IBM, and Lockheed Martin. It's also the future home of the INCB (Israeli National Cyber Bureau); offers a special income tax incentive for cyber security companies, and was the site for the relocation of the army's intelligence corps units.

Sabbatians have taken over the cyber world through the following process: They scan the schools for likely cyber talent and develop them at Ben Gurion University and their period of conscription in the Israeli Defense Forces when they are stationed at the Beersheba complex. When the cyber talented officially leave the army they are funded to start cyber companies with technology developed by themselves or given to them by the state. Much of this is stolen through backdoors of computer systems around the world with America top of the list. Others are sent off to Silicon Valley to start companies or join the major ones and so we have many major positions filled by apparently 'Jewish' but really Sabbatian operatives. Google, YouTube and Facebook are all run by 'Jewish' CEOs while Twitter is all but run by ultra-Zionist hedge-fund shark Paul Singer. At the centre of the Sabbatian global cyber web is the Israeli army's Unit 8200 which specialises in hacking into computer systems of other countries, inserting viruses, gathering information, instigating malfunction, and even taking control of them from a distance. A long list of Sabbatians involved with 9/11, Silicon Valley and Israeli cyber security companies are operatives of Unit 8200. This is not about Israel. It's about the Cult. Israel is planned to be a Smart Grid hub as with China and what is happening at Beersheba is not for the benefit of Jewish people who are treated disgustingly by the Sabbatian elite that control the country. A glance at the Nuremberg Codes will tell you that.

The story is much bigger than 'Covid', important as that is to where we are being taken. Now, though, it's time to really strap in. There's more ... much more ...

CHAPTER ELEVEN

Who controls the Cult?

Awake, arise or be forever fall'n
John Milton, *Paradise Lost*

I have exposed this far the level of the Cult conspiracy that operates in the world of the seen and within the global secret society and satanic network which operates in the shadows one step back from the seen. The story, however, goes much deeper than that.

The 'Covid' hoax is major part of the Cult agenda, but only part, and to grasp the biggest picture we have to expand our attention beyond the realm of human sight and into the infinity of possibility that we cannot see. It is from here, ultimately, that humanity is being manipulated into a state of total control by the force which dictates the actions of the Cult. How much of reality can we see? Next to damn all is the answer. We may appear to see all there is to see in the 'space' our eyes survey and observe, but little could be further from the truth. The human 'world' is only a tiny band of frequency that the body's visual and perceptual systems can decode into *perception* of a 'world'. According to mainstream science the electromagnetic spectrum is 0.005 percent of what exists in the Universe ([Fig 10](#)). The maximum estimate I have seen is 0.5 percent and either way it's miniscule. I say it is far, far, smaller even than 0.005 percent when you compare reality we see with the totality of reality that we don't. Now get this if you are new to such information: Visible light, the only band of frequency that we can see, is a *fraction* of the 0.005

percent (Fig 11 overleaf). Take this further and realise that our universe is one of infinite universes and that universes are only a fragment of overall reality – *infinite* reality. Then compare that with the almost infinitesimal frequency band of visible light or human sight. You see that humans are as near blind as it is possible to be without actually being so. Artist and filmmaker, Sergio Toporek, said:

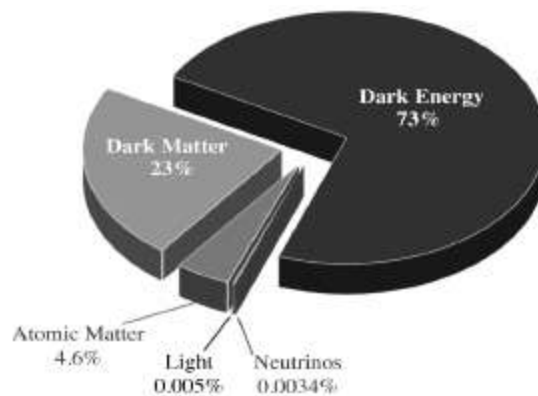


Figure 10: Humans can perceive such a tiny band of visual reality it's laughable.

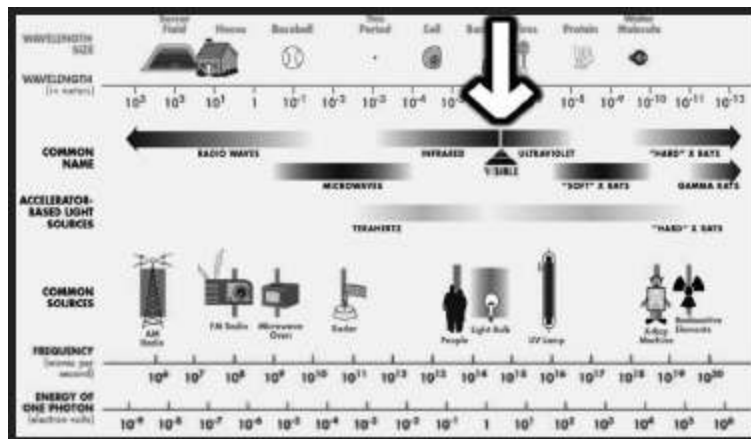


Figure 11: We can see a smear of the 0.005 percent electromagnetic spectrum, but we still know it all. Yep, makes sense.

Consider that you can see less than 1% of the electromagnetic spectrum and hear less than 1% of the acoustic spectrum. 90% of the cells in your body carry their own microbial DNA and are not 'you'. The atoms in your body are 99.999999999999999% empty space and none of them are the ones you were born with ... Human beings have 46 chromosomes, two less than a potato.

The existence of the rainbow depends on the conical photoreceptors in your eyes; to animals without cones, the rainbow does not exist. So you don't just look at a rainbow, you create it. This is pretty amazing, especially considering that all the beautiful colours you see represent less than 1% of the electromagnetic spectrum.

Suddenly the 'world' of humans looks a very different place. Take into account, too, that Planet Earth when compared with the projected size of this single universe is the equivalent of a billionth of a pinhead. Imagine the ratio that would be when compared to infinite reality. To think that Christianity once insisted that Earth and humanity were the centre of everything. This background is vital if we are going to appreciate the nature of 'human' and how we can be manipulated by an unseen force. To human visual reality virtually *everything* is unseen and yet the prevailing perception within the institutions and so much of the public is that if we can't see it, touch it, hear it, taste it and smell it then it cannot exist. Such perception is indoctrinated and encouraged by the Cult and its agents because it isolates believers in the strictly limited, village-idiot, realm of the five senses where perceptions can be firewalled and information controlled. Most of those perpetuating the 'this-world-is-all-there-is' insanity are themselves indoctrinated into believing the same delusion. While major players and influencers know that official reality is laughable most of those in science, academia and medicine really believe the nonsense they peddle and teach succeeding generations. Those who challenge the orthodoxy are dismissed as nutters and freaks to protect the manufactured illusion from exposure. Observe the dynamic of the 'Covid' hoax and you will see how that takes the same form. The inner-circle psychopaths knows it's a gigantic scam, but almost the entirety of those imposing their fascist rules believe that 'Covid' is all that they're told it is.

Stolen identity

Ask people who they are and they will give you their name, place of birth, location, job, family background and life story. Yet that is not who they are – it is what they are *experiencing*. The difference is *absolutely crucial*. The true 'I', the eternal, infinite 'I', is consciousness,

a state of being aware. Forget 'form'. That is a vehicle for a brief experience. Consciousness does not come *from* the brain, but *through* the brain and even that is more symbolic than literal. We are awareness, pure awareness, and this is what withdraws from the body at what we call 'death' to continue our eternal beingness, *isness*, in other realms of reality within the limitlessness of infinity or the Biblical 'many mansions in my father's house'. Labels of a human life, man, woman, transgender, black, white, brown, nationality, circumstances and income are not who we are. They are what we are – awareness – is *experiencing* in a brief connection with a band of frequency we call 'human'. The labels are not the self; they are, to use the title of one of my books, a *Phantom Self*. I am not David Icke born in Leicester, England, on April 29th, 1952. I am the consciousness *having that experience*. The Cult and its non-human masters seek to convince us through the institutions of 'education', science, medicine, media and government that what we are *experiencing* is who we *are*. It's so easy to control and direct perception locked away in the bewildered illusions of the five senses with no expanded radar. Try, by contrast, doing the same with a humanity aware of its true self and its true power to consciously create its reality and experience. How is it possible to do this? We do it all day every day. If you perceive yourself as 'little me' with no power to impact upon your life and the world then your life experience will reflect that. You will hand the power you don't think you have to authority in all its forms which will use it to control your experience. This, in turn, will appear to confirm your perception of 'little me' in a self-fulfilling feedback loop. But that is what 'little me' really is – a *perception*. We are all 'big-me', infinite me, and the Cult has to make us forget that if its will is to prevail. We are therefore manipulated and pressured into self-identifying with human labels and not the consciousness/awareness *experiencing* those human labels.

The phenomenon of identity politics is a Cult-instigated manipulation technique to sub-divide previous labels into even smaller ones. A United States university employs this list of letters to

describe student identity: LGBTTTQQFAGPBDSM or lesbian, gay, bisexual, transgender, transsexual, queer, questioning, flexual, asexual, gender-fuck, polyamorous, bondage/discipline, dominance/submission and sadism/masochism. I'm sure other lists are even longer by now as people feel the need to self-identity the 'I' with the minutiae of race and sexual preference. Wokers programmed by the Cult for generations believe this is about 'inclusivity' when it's really the Cult locking them away into smaller and smaller versions of Phantom Self while firewalling them from the influence of their true self, the infinite, eternal 'I'. You may notice that my philosophy which contends that we are all unique points of attention/awareness within the same infinite whole or Oneness is the ultimate non-racism. The very sense of Oneness makes the judgement of people by their body-type, colour or sexuality utterly ridiculous and confirms that racism has no understanding of reality (including anti-white racism). Yet despite my perception of life Cult agents and fast-asleep Wokers label me racist to discredit my information while they are themselves phenomenally racist and sexist. All they see is race and sexuality and they judge people as good or bad, demons or untouchables, by their race and sexuality. All they see is *Phantom Self* and perceive themselves in terms of Phantom Self. They are pawns and puppets of the Cult agenda to focus attention and self-identity in the five senses and play those identities against each other to divide and rule. Columbia University has introduced segregated graduations in another version of social distancing designed to drive people apart and teach them that different racial and cultural groups have nothing in common with each other. The last thing the Cult wants is unity. Again the pump-primers of this will be Cult operatives in the knowledge of what they are doing, but the rest are just the Phantom Self blind leading the Phantom Self blind. We *do* have something in common – we are all *the same consciousness* having different temporary experiences.

What is this 'human'?

Yes, what *is* 'human'? That is what we are supposed to be, right? I mean 'human'? True, but 'human' is the experience not the 'I'. Break it down to basics and 'human' is the way that information is processed. If we are to experience and interact with this band of frequency we call the 'world' we must have a vehicle that operates within that band of frequency. Our consciousness in its prime form cannot do that; it is way beyond the frequency of the human realm. My consciousness or awareness could not tap these keys and pick up the cup in front of me in the same way that radio station A cannot interact with radio station B when they are on different frequencies. The human body is the means through which we have that interaction. I have long described the body as a biological computer which processes information in a way that allows consciousness to experience this reality. The body is a receiver, transmitter and processor of information in a particular way that we call human. We visually perceive only the world of the five senses in a wakened state – that is the limit of the body's visual decoding system. In truth it's not even visual in the way we experience 'visual reality' as I will come to in a moment. We are 'human' because the body processes the information sources of human into a reality and behaviour system that we *perceive* as human. Why does an elephant act like an elephant and not like a human or a duck? The elephant's biological computer is a different information field and processes information according to that program into a visual and behaviour type we call an elephant. The same applies to everything in our reality. These body information fields are perpetuated through procreation (like making a copy of a software program). The Cult wants to break that cycle and intervene technologically to transform the human information field into one that will change what we call humanity. If it can change the human information field it will change the way that field processes information and change humanity both 'physically' and psychologically. Hence the *messenger* (information) RNA 'vaccines' and so much more that is targeting human genetics by changing the body's information – *messaging* – construct through food, drink, radiation, toxicity and other means.

Reality that we experience is nothing like reality as it really is in the same way that the reality people experience in virtual reality games is not the reality they are really living in. The game is only a decoded source of information that appears to be a reality. Our world is also an information construct – a *simulation* (more later). In its base form our reality is a wavefield of information much the same in theme as Wi-Fi. The five senses decode wavefield information into electrical information which they communicate to the brain to decode into holographic (illusory ‘physical’) information. Different parts of the brain specialise in decoding different senses and the information is fused into a reality that appears to be outside of us but is really inside the brain and the genetic structure in general (Fig 12 overleaf). DNA is a receiver-transmitter of information and a vital part of this decoding process and the body’s connection to other realities. Change DNA and you change the way we decode and connect with reality – see ‘Covid vaccines’. Think of computers decoding Wi-Fi. You have information encoded in a radiation field and the computer decodes that information into a very different form on the screen. You can’t see the Wi-Fi until its information is made manifest on the screen and the information on the screen is inside the computer and not outside. I have just described how we decode the ‘human world’. All five senses decode the waveform ‘Wi-Fi’ field into electrical signals and the brain (computer) constructs reality inside the brain and not outside – ‘You don’t just look at a rainbow, you create it’. Sound is a simple example. We don’t hear sound until the brain decodes it. Waveform sound waves are picked up by the hearing sense and communicated to the brain in an electrical form to be decoded into the sounds that we hear. Everything we hear is inside the brain along with everything we see, feel, smell and taste. Words and language are waveform fields generated by our vocal chords which pass through this process until they are decoded by the brain into words that we hear. Different languages are different frequency fields or sound waves generated by vocal chords. Late British philosopher Alan Watts said:

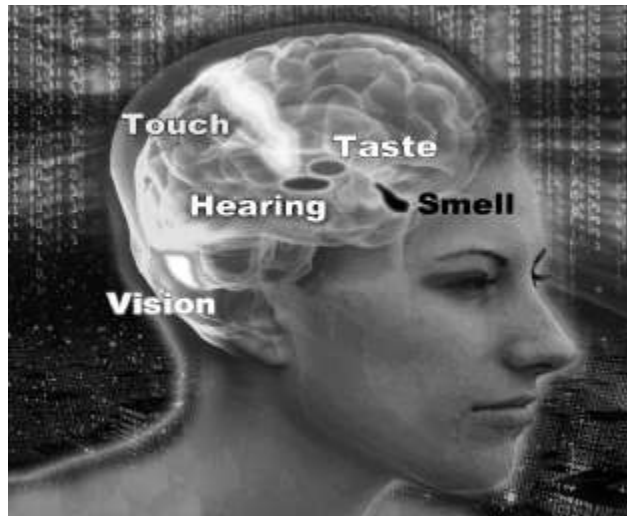


Figure 12: The brain receives information from the five senses and constructs from that our perceived reality.

[Without the brain] the world is devoid of light, heat, weight, solidity, motion, space, time or any other imaginable feature. All these phenomena are interactions, or transactions, of vibrations with a certain arrangement of neurons.

That's exactly what they are and scientist Robert Lanza describes in his book, *Biocentrism*, how we decode electromagnetic waves and energy into visual and 'physical' experience. He uses the example of a flame emitting photons, electromagnetic energy, each pulsing electrically and magnetically:

... these ... invisible electromagnetic waves strike a human retina, and if (and only if) the waves happen to measure between 400 and 700 nano meters in length from crest to crest, then their energy is just right to deliver a stimulus to the 8 million cone-shaped cells in the retina.

Each in turn send an electrical pulse to a neighbour neuron, and on up the line this goes, at 250 mph, until it reaches the ... occipital lobe of the brain, in the back of the head. There, a cascading complex of neurons fire from the incoming stimuli, and we subjectively perceive this experience as a yellow brightness occurring in a place we have been conditioned to call the 'external world'.

You hear what you decode

If a tree falls or a building collapses they make no noise unless someone is there to decode the energetic waves generated by the disturbance into what we call sound. Does a falling tree make a noise? Only if you hear it – *decode* it. Everything in our reality is a frequency field of information operating within the overall ‘Wi-Fi’ field that I call The Field. A vibrational disturbance is generated in The Field by the fields of the falling tree or building. These disturbance waves are what we decode into the sound of them falling. If no one is there to do that then neither will make any noise. Reality is created by the observer – *decoder* – and the *perceptions* of the observer affect the decoding process. For this reason different people – different *perceptions* – will perceive the same reality or situation in a different way. What one may perceive as a nightmare another will see as an opportunity. The question of why the Cult is so focused on controlling human perception now answers itself. All experienced reality is the act of decoding and we don’t experience Wi-Fi until it is decoded on the computer screen. The sight and sound of an Internet video is encoded in the Wi-Fi all around us, but we don’t see or hear it until the computer decodes that information. Taste, smell and touch are all phenomena of the brain as a result of the same process. We don’t taste, smell or feel anything except in the brain and there are pain relief techniques that seek to block the signal from the site of discomfort to the brain because if the brain doesn’t decode that signal we don’t feel pain. Pain is in the brain and only appears to be at the point of impact thanks to the feedback loop between them. We don’t see anything until electrical information from the sight senses is decoded in an area at the back of the brain. If that area is damaged we can go blind when our eyes are perfectly okay. So why do we go blind if we damage an eye? We damage the information processing between the waveform visual information and the visual decoding area of the brain. If information doesn’t reach the brain in a form it can decode then we can’t see the visual reality that it represents. What’s more the brain is decoding only a fraction of the information it receives and the rest is absorbed by the

sub-conscious mind. This explanation is from the science magazine, *Wonderpedia*:

Every second, 11 million sensations crackle along these [brain] pathways ... The brain is confronted with an alarming array of images, sounds and smells which it rigorously filters down until it is left with a manageable list of around 40. Thus 40 sensations per second make up what we perceive as reality.

The 'world' is not what people are told to believe that is it and the inner circles of the Cult *know that*.

Illusory 'physical' reality

We can only see a smear of 0.005 percent of the Universe which is only one of a vast array of universes – 'mansions' – within infinite reality. Even then the brain decodes only 40 pieces of information ('sensations') from a potential *11 million* that we receive every second. Two points strike you from this immediately: The sheer breathtaking stupidity of believing we know anything so rigidly that there's nothing more to know; and the potential for these processes to be manipulated by a malevolent force to control the reality of the population. One thing I can say for sure with no risk of contradiction is that when you can perceive an almost indescribable fraction of infinite reality there is always more to know as in tidal waves of it. Ancient Greek philosopher Socrates was so right when he said that wisdom is to know how little we know. How obviously true that is when you think that we are experiencing a physical world of solidity that is neither physical nor solid and a world of apartness when everything is connected. Cult-controlled 'science' dismisses the so-called 'paranormal' and all phenomena related to that when the 'para'-normal is perfectly normal and explains the alleged 'great mysteries' which dumbfound scientific minds. There is a reason for this. A 'scientific mind' in terms of the mainstream is a material mind, a five-sense mind imprisoned in see it, touch it, hear it, smell it and taste it. Phenomena and happenings that can't be explained that way leave the 'scientific mind' bewildered and the rule is that if they

can't account for why something is happening then it can't, by definition, be happening. I beg to differ. Telepathy is thought waves passing through The Field (think wave disturbance again) to be decoded by someone able to connect with that wavelength (information). For example: You can pick up the thought waves of a friend at any distance and at the very least that will bring them to mind. A few minutes later the friend calls you. 'My god', you say, 'that's incredible – I was just thinking of you.' Ah, but *they* were thinking of *you* before they made the call and that's what you decoded. Native peoples not entrapped in five-sense reality do this so well it became known as the 'bush telegraph'. Those known as psychics and mediums (genuine ones) are doing the same only across dimensions of reality. 'Mind over matter' comes from the fact that matter and mind are the *same*. The state of one influences the state of the other. Indeed one *and* the other are illusions. They are aspects of the same field. Paranormal phenomena are all explainable so why are they still considered 'mysteries' or not happening? Once you go down this road of understanding you begin to expand awareness beyond the five senses and that's the nightmare for the Cult.



Figure 13: Holograms are not solid, but the best ones appear to be.

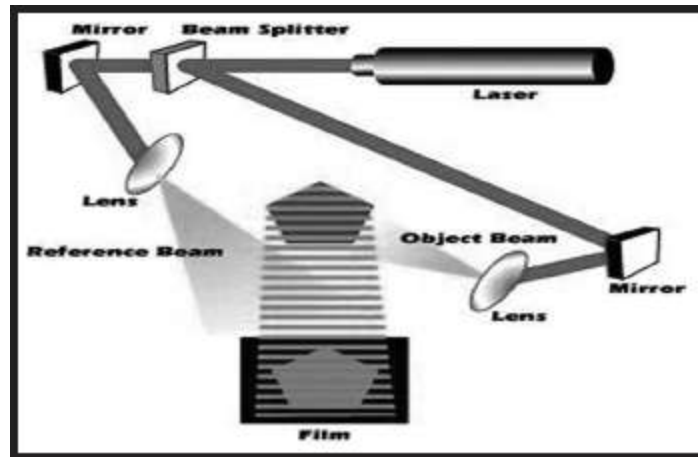


Figure 14: How holograms are created by capturing a waveform version of the subject image.

Holographic 'solidity'

Our reality is not solid, it is holographic. We are now well aware of holograms which are widely used today. Two-dimensional information is decoded into a three-dimensional reality that is not solid although can very much appear to be (Fig 13). Holograms are created with a laser divided into two parts. One goes directly onto a holographic photographic print ('reference beam') and the other takes a waveform image of the subject ('working beam') before being directed onto the print where it 'collides' with the other half of the laser (Fig 14). This creates a *waveform* interference pattern which contains the wavefield information of whatever is being photographed (Fig 15 overleaf). The process can be likened to dropping pebbles in a pond. Waves generated by each one spread out across the water to collide with the others and create a wave representation of where the stones fell and at what speed, weight and distance. A waveform interference pattern of a hologram is akin to the waveform information in The Field which the five senses decode into electrical signals to be decoded by the brain into a holographic illusory 'physical' reality. In the same way when a laser (think human attention) is directed at the waveform interference pattern a three-dimensional version of the subject is projected into apparently 'solid' reality (Fig 16). An amazing trait of holograms reveals more 'paranormal mysteries'. Information of the *whole*

hologram is encoded in waveform in every part of the interference pattern by the way they are created. This means that every *part* of a hologram is a smaller version of the whole. Cut the interference wave-pattern into four and you won't get four parts of the image. You get quarter-sized versions of the *whole* image. The body is a hologram and the same applies. Here we have the basis of acupuncture, reflexology and other forms of healing which identify representations of the whole body in all of the parts, hands, feet, ears, everywhere. Skilled palm readers can do what they do because the information of whole body is encoded in the hand. The concept of as above, so below, comes from this.



Figure 15: A waveform interference pattern that holds the information that transforms into a hologram.



Figure 16: Holographic people including 'Elvis' holographically inserted to sing a duet with Celine Dion.

The question will be asked of why, if solidity is illusory, we can't just walk through walls and each other. The resistance is not solid against solid; it is electromagnetic field against electromagnetic field and we decode this into the *experience* of solid against solid. We should also not underestimate the power of belief to dictate reality. What you believe is impossible *will be*. Your belief impacts on your decoding processes and they won't decode what you think is impossible. What we believe we perceive and what we perceive we experience. 'Can't dos' and 'impossibles' are like a firewall in a computer system that won't put on the screen what the firewall blocks. How vital that is to understanding how human experience has been hijacked. I explain in *The Answer, Everything You Need To Know But Have Never Been Told* and other books a long list of 'mysteries' and 'paranormal' phenomena that are not mysterious and perfectly normal once you realise what reality is and how it works. 'Ghosts' can be seen to pass through 'solid' walls because the walls are not solid and the ghost is a discarnate entity operating on a frequency so different to that of the wall that it's like two radio stations sharing the same space while never interfering with each other. I have seen ghosts do this myself. The apartness of people and objects is also an illusion. Everything is connected by the Field like all sea life is connected by the sea. It's just that within the limits of our visual reality we only 'see' holographic information and not the field of information that connects everything and from which the holographic world is made manifest. If you can only see holographic 'objects' and not the field that connects them they will appear to you as unconnected to each other in the same way that we see the computer while not seeing the Wi-Fi.

What you don't know *can* hurt you

Okay, we return to those 'two worlds' of human society and the Cult with its global network of interconnecting secret societies and satanic groups which manipulate through governments, corporations, media, religions, etc. The fundamental difference between them is *knowledge*. The idea has been to keep humanity

ignorant of the plan for its total enslavement underpinned by a crucial ignorance of reality – who we are and where we are – and how we interact with it. ‘Human’ should be the interaction between our expanded eternal consciousness and the five-sense body experience. We are meant to be *in* this world in terms of the five senses but not *of* this world in relation to our greater consciousness and perspective. In that state we experience the small picture of the five senses within the wider context of the big picture of awareness beyond the five senses. Put another way the five senses see the dots and expanded awareness connects them into pictures and patterns that give context to the apparently random and unconnected. Without the context of expanded awareness the five senses see only apartness and randomness with apparently no meaning. The Cult and its other-dimensional controllers seek to intervene in the frequency realm where five-sense reality is supposed to connect with expanded reality and to keep the two apart (more on this in the final chapter). When that happens five-sense mental and emotional processes are no longer influenced by expanded awareness, or the True ‘I’, and instead are driven by the isolated perceptions of the body’s decoding systems. They are in the world *and* of it. Here we have the human plight and why humanity with its potential for infinite awareness can be so easily manipulatable and descend into such extremes of stupidity.

Once the Cult isolates five-sense mind from expanded awareness it can then program the mind with perceptions and beliefs by controlling information that the mind receives through the ‘education’ system of the formative years and the media perceptual bombardment and censorship of an entire lifetime. Limit perception and a sense of the possible through limiting knowledge by limiting and skewing information while censoring and discrediting that which could set people free. As the title of another of my books says ... *And The Truth Shall Set You Free*. For this reason the last thing the Cult wants in circulation is the truth about anything – especially the reality of the eternal ‘I’ – and that’s why it is desperate to control information. The Cult knows that information becomes perception

which becomes behaviour which, collectively, becomes human society. Cult-controlled and funded mainstream 'science' denies the existence of an eternal 'I' and seeks to dismiss and trash all evidence to the contrary. Cult-controlled mainstream religion has a version of 'God' that is little more than a system of control and dictatorship that employs threats of damnation in an afterlife to control perceptions and behaviour in the here and now through fear and guilt. Neither is true and it's the 'neither' that the Cult wishes to suppress. This 'neither' is that everything is an expression, a point of attention, within an infinite state of consciousness which is the real meaning of the term 'God'.

Perceptual obsession with the 'physical body' and five-senses means that 'God' becomes personified as a bearded bloke sitting among the clouds or a raging bully who loves us if we do what 'he' wants and condemns us to the fires of hell if we don't. These are no more than a 'spiritual' fairy tales to control and dictate events and behaviour through fear of this 'God' which has bizarrely made 'God-fearing' in religious circles a state to be desired. I would suggest that fearing *anything* is not to be encouraged and celebrated, but rather deleted. You can see why 'God fearing' is so beneficial to the Cult and its religions when *they* decide what 'God' wants and what 'God' demands (the Cult demands) that everyone do. As the great American comedian Bill Hicks said satirising a Christian zealot: 'I think what God meant to say.' How much of this infinite awareness ('God') that we access is decided by how far we choose to expand our perceptions, self-identity and sense of the possible. The scale of self-identity reflects itself in the scale of awareness that we can connect with and are influenced by – how much knowing and insight we have instead of programmed perception. You cannot expand your awareness into the infinity of possibility when you believe that you are little me Peter the postman or Mary in marketing and nothing more. I'll deal with this in the concluding chapter because it's crucial to how we turnaround current events.

Where the Cult came from

When I realised in the early 1990s there was a Cult network behind global events I asked the obvious question: When did it start? I took it back to ancient Rome and Egypt and on to Babylon and Sumer in Mesopotamia, the 'Land Between Two Rivers', in what we now call Iraq. The two rivers are the Tigris and Euphrates and this region is of immense historical and other importance to the Cult, as is the land called Israel only 550 miles away by air. There is much more going on with deep esoteric meaning across this whole region. It's not only about 'wars for oil'. Priceless artefacts from Mesopotamia were stolen or destroyed after the American and British invasion of Iraq in 2003 justified by the lies of Boy Bush and Tony Blair (their Cult masters) about non-existent 'weapons of mass destruction'.

Mesopotamia was the location of Sumer (about 5,400BC to 1,750BC), and Babylon (about 2,350BC to 539BC). Sabbatians may have become immensely influential in the Cult in modern times but they are part of a network that goes back into the mists of history. Sumer is said by historians to be the 'cradle of civilisation'. I disagree. I say it was the re-start of what we call human civilisation after cataclysmic events symbolised in part as the 'Great Flood' destroyed the world that existed before. These fantastic upheavals that I have been describing in detail in the books since the early 1990s appear in accounts and legends of ancient cultures across the world and they are supported by geological and biological evidence. Stone tablets found in Iraq detailing the Sumer period say the cataclysms were caused by non-human 'gods' they call the Anunnaki. These are described in terms of extraterrestrial visitations in which knowledge supplied by the Anunnaki is said to have been the source of at least one of the world's oldest writing systems and developments in astronomy, mathematics and architecture that were way ahead of their time. I have covered this subject at length in *The Biggest Secret* and *Children of the Matrix* and the same basic 'Anunnaki' story can be found in Zulu accounts in South Africa where the late and very great Zulu high shaman Credo Mutwa told me that the Sumerian Anunnaki were known by Zulus as the Chitauri or 'children of the serpent'. See my six-hour video interview with Credo on this subject entitled *The*

Reptilian Agenda recorded at his then home near Johannesburg in 1999 which you can watch on the Ickonic media platform.

The Cult emerged out of Sumer, Babylon and Egypt (and elsewhere) and established the Roman Empire before expanding with the Romans into northern Europe from where many empires were savagely imposed in the form of Cult-controlled societies all over the world. Mass death and destruction was their calling card. The Cult established its centre of operations in Europe and European Empires were Cult empires which allowed it to expand into a global force. Spanish and Portuguese colonialists headed for Central and South America while the British and French targeted North America. Africa was colonised by Britain, France, Belgium, the Netherlands, Portugal, Spain, Italy, and Germany. Some like Britain and France moved in on the Middle East. The British Empire was by far the biggest for a simple reason. By now Britain was the headquarters of the Cult from which it expanded to form Canada, the United States, Australia and New Zealand. The Sun never set on the British Empire such was the scale of its occupation. London remains a global centre for the Cult along with Rome and the Vatican although others have emerged in Israel and China. It is no accident that the 'virus' is alleged to have come out of China while Italy was chosen as the means to terrify the Western population into compliance with 'Covid' fascism. Nor that Israel has led the world in 'Covid' fascism and mass 'vaccination'.

You would think that I would mention the United States here, but while it has been an important means of imposing the Cult's will it is less significant than would appear and is currently in the process of having what power it does have deleted. The Cult in Europe has mostly loaded the guns for the US to fire. America has been controlled from Europe from the start through Cult operatives in Britain and Europe. The American Revolution was an illusion to make it appear that America was governing itself while very different forces were pulling the strings in the form of Cult families such as the Rothschilds through the Rockefellers and other subordinates. The Rockefellers are extremely close to Bill Gates and

established both scalpel and drug 'medicine' and the World Health Organization. They play a major role in the development and circulation of vaccines through the Rockefeller Foundation on which Bill Gates said his Foundation is based. Why wouldn't this be the case when the Rockefellers and Gates are on the same team? Cult infiltration of human society goes way back into what we call history and has been constantly expanding and centralising power with the goal of establishing a global structure to dictate everything. Look how this has been advanced in great leaps with the 'Covid' hoax.

The non-human dimension

I researched and observed the comings and goings of Cult operatives through the centuries and even thousands of years as they were born, worked to promote the agenda within the secret society and satanic networks, and then died for others to replace them. Clearly there had to be a coordinating force that spanned this entire period while operatives who would not have seen the end goal in their lifetimes came and went advancing the plan over millennia. I went in search of that coordinating force with the usual support from the extraordinary synchronicity of my life which has been an almost daily experience since 1990. I saw common themes in religious texts and ancient cultures about a non-human force manipulating human society from the hidden. Christianity calls this force Satan, the Devil and demons; Islam refers to the Jinn or Djinn; Zulus have their Chitauri (spelt in other ways in different parts of Africa); and the Gnostic people in Egypt in the period around and before 400AD referred to this phenomena as the 'Archons', a word meaning rulers in Greek. Central American cultures speak of the 'Predators' among other names and the same theme is everywhere. I will use 'Archons' as a collective name for all of them. When you see how their nature and behaviour is described all these different sources are clearly talking about the same force. Gnostics described the Archons in terms of 'luminous fire' while Islam relates the Jinn to 'smokeless fire'. Some refer to beings in form that could occasionally be seen, but the most common of common theme is that they operate from

unseen realms which means almost all existence to the visual processes of humans. I had concluded that this was indeed the foundation of human control and that the Cult was operating within the human frequency band on behalf of this hidden force when I came across the writings of Gnostics which supported my conclusions in the most extraordinary way.

A sealed earthen jar was found in 1945 near the town of Nag Hammadi about 75-80 miles north of Luxor on the banks of the River Nile in Egypt. Inside was a treasure trove of manuscripts and texts left by the Gnostic people some 1,600 years earlier. They included 13 leather-bound papyrus codices (manuscripts) and more than 50 texts written in Coptic Egyptian estimated to have been hidden in the jar in the period of 400AD although the source of the information goes back much further. Gnostics oversaw the Great or Royal Library of Alexandria, the fantastic depository of ancient texts detailing advanced knowledge and accounts of human history. The Library was dismantled and destroyed in stages over a long period with the death-blow delivered by the Cult-established Roman Church in the period around 415AD. The Church of Rome was the Church of Babylon relocated as I said earlier. Gnostics were not a race. They were a way of perceiving reality. Whenever they established themselves and their information circulated the terrorists of the Church of Rome would target them for destruction. This happened with the Great Library and with the Gnostic Cathars who were burned to death by the psychopaths after a long period of oppression at the siege of the Castle of Monségur in southern France in 1244. The Church has always been terrified of Gnostic information which demolishes the official Christian narrative although there is much in the Bible that supports the Gnostic view if you read it in another way. To anyone studying the texts of what became known as the Nag Hammadi Library it is clear that great swathes of Christian and Biblical belief has its origin with Gnostics sources going back to Sumer. Gnostic themes have been twisted to manipulate the perceived reality of Bible believers. Biblical texts have been in the open for centuries where they could be changed while Gnostic

documents found at Nag Hammadi were sealed away and untouched for 1,600 years. What you see is what they wrote.

Use your *pneuma* not your *nous*

Gnosticism and Gnostic come from 'gnosis' which means knowledge, or rather *secret* knowledge, in the sense of spiritual awareness – knowledge about reality and life itself. The desperation of the Cult's Church of Rome to destroy the Gnostics can be understood when the knowledge they were circulating was the last thing the Cult wanted the population to know. Sixteen hundred years later the same Cult is working hard to undermine and silence me for the same reason. The dynamic between knowledge and ignorance is a constant. 'Time' appears to move on, but essential themes remain the same. We are told to 'use your nous', a Gnostic word for head/brain/intelligence. They said, however, that spiritual awakening or 'salvation' could only be secured by expanding awareness *beyond* what they called *nous* and into *pneuma* or Infinite Self. Obviously as I read these texts the parallels with what I have been saying since 1990 were fascinating to me. There is a universal truth that spans human history and in that case why wouldn't we be talking the same language 16 centuries apart? When you free yourself from the perception program of the five senses and explore expanded realms of consciousness you are going to connect with the same information no matter what the perceived 'era' within a manufactured timeline of a single and tiny range of manipulated frequency. Humans working with 'smart' technology or knocking rocks together in caves is only a timeline appearing to operate within the human frequency band. Expanded awareness and the knowledge it holds have always been there whether the era be Stone Age or computer age. We can only access that knowledge by opening ourselves to its frequency which the five-sense prison cell is designed to stop us doing. Gates, Fauci, Whitty, Vallance, Zuckerberg, Brin, Page, Wojcicki, Bezos, and all the others behind the 'Covid' hoax clearly have a long wait before their range of frequency can make that connection given that an open heart is

crucial to that as we shall see. Instead of accessing knowledge directly through expanded awareness it is given to Cult operatives by the secret society networks of the Cult where it has been passed on over thousands of years outside the public arena. Expanded realms of consciousness is where great artists, composers and writers find their inspiration and where truth awaits anyone open enough to connect with it. We need to go there fast.

Archon hijack

A fifth of the Nag Hammadi texts describe the existence and manipulation of the Archons led by a 'Chief Archon' they call 'Yaldabaoth', or the 'Demiurge', and this is the Christian 'Devil', 'Satan', 'Lucifer', and his demons. Archons in Biblical symbolism are the 'fallen ones' which are also referred to as fallen angels after the angels expelled from heaven according to the Abrahamic religions of Judaism, Christianity and Islam. These angels are claimed to tempt humans to 'sin' ongoing and you will see how accurate that symbolism is during the rest of the book. The theme of 'original sin' is related to the 'Fall' when Adam and Eve were 'tempted by the serpent' and fell from a state of innocence and 'obedience' (connection) with God into a state of disobedience (disconnection). The Fall is said to have brought sin into the world and corrupted everything including human nature. Yaldabaoth, the 'Lord Archon', is described by Gnostics as a 'counterfeit spirit', 'The Blind One', 'The Blind God', and 'The Foolish One'. The Jewish name for Yaldabaoth in Talmudic writings is Samael which translates as 'Poison of God', or 'Blindness of God'. You see the parallels. Yaldabaoth in Islamic belief is the Muslim Jinn devil known as Shaytan – Shaytan is Satan as the same themes are found all over the world in every religion and culture. The 'Lord God' of the Old Testament is the 'Lord Archon' of Gnostic manuscripts and that's why he's such a bloodthirsty bastard. Satan is known by Christians as 'the Demon of Demons' and Gnostics called Yaldabaoth the 'Archon of Archons'. Both are known as 'The Deceiver'. We are talking about the same 'bloke' for sure and these common themes

using different names, storylines and symbolism tell a common tale of the human plight.

Archons are referred to in Nag Hammadi documents as mind parasites, inverters, guards, gatekeepers, detainers, judges, pitiless ones and deceivers. The 'Covid' hoax alone is a glaring example of all these things. The Biblical 'God' is so different in the Old and New Testaments because they are not describing the same phenomenon. The vindictive, angry, hate-filled, 'God' of the Old Testament, known as Yahweh, is Yaldabaoth who is depicted in Cult-dictated popular culture as the 'Dark Lord', 'Lord of Time', Lord (Darth) Vader and Dormammu, the evil ruler of the 'Dark Dimension' trying to take over the 'Earth Dimension' in the Marvel comic movie, *Dr Strange*. Yaldabaoth is both the Old Testament 'god' and the Biblical 'Satan'. Gnostics referred to Yaldabaoth as the 'Great Architect of the Universe' and the Cult-controlled Freemason network calls their god 'the 'Great Architect of the Universe' (also Grand Architect). The 'Great Architect' Yaldabaoth is symbolised by the Cult as the all-seeing eye at the top of the pyramid on the Great Seal of the United States and the dollar bill. Archon is encoded in *arch*-itect as it is in *arch*-angels and *arch*-bishops. All religions have the theme of a force for good and force for evil in some sort of spiritual war and there is a reason for that – the theme is true. The Cult and its non-human masters are quite happy for this to circulate. They present themselves as the force for good fighting evil when they are really the force of evil (absence of love). The whole foundation of Cult modus operandi is inversion. They promote themselves as a force for good and anyone challenging them in pursuit of peace, love, fairness, truth and justice is condemned as a satanic force for evil. This has been the game plan throughout history whether the Church of Rome inquisitions of non-believers or 'conspiracy theorists' and 'anti-vaxxers' of today. The technique is the same whatever the timeline era.

Yaldabaoth is revolting (true)

Yaldabaoth and the Archons are said to have revolted against God with Yaldabaoth claiming to *be* God – the *All That Is*. The Old Testament ‘God’ (Yaldabaoth) demanded to be worshipped as such: ‘*I am the LORD, and there is none else, there is no God beside me*’ (Isaiah 45:5). I have quoted in other books a man who said he was the unofficial son of the late Baron Philippe de Rothschild of the Mouton-Rothschild wine producing estates in France who died in 1988 and he told me about the Rothschild ‘revolt from God’. The man said he was given the name Phillip Eugene de Rothschild and we shared long correspondence many years ago while he was living under another identity. He said that he was conceived through ‘occult incest’ which (within the Cult) was ‘normal and to be admired’. ‘Phillip’ told me about his experience attending satanic rituals with rich and famous people whom he names and you can see them and the wider background to Cult Satanism in my other books starting with *The Biggest Secret*. Cult rituals are interactions with Archontic ‘gods’. ‘Phillip’ described Baron Philippe de Rothschild as ‘a master Satanist and hater of God’ and he used the same term ‘revolt from God’ associated with Yaldabaoth/Satan/Lucifer/the Devil in describing the Sabbatian Rothschild dynasty. ‘I played a key role in my family’s revolt from God’, he said. That role was to infiltrate in classic Sabbatian style the Christian Church, but eventually he escaped the mind-prison to live another life. The Cult has been targeting religion in a plan to make worship of the Archons the global one-world religion. Infiltration of Satanism into modern ‘culture’, especially among the young, through music videos, stage shows and other means, is all part of this.

Nag Hammadi texts describe Yaldabaoth and the Archons in their prime form as energy – consciousness – and say they can take form if they choose in the same way that consciousness takes form as a human. Yaldabaoth is called ‘formless’ and represents a deeply inverted, distorted and chaotic state of consciousness which seeks to attached to humans and turn them into a likeness of itself in an attempt at assimilation. For that to happen it has to manipulate

humans into low frequency mental and emotional states that match its own. Archons can certainly appear in human form and this is the origin of the psychopathic personality. The energetic distortion Gnostics called Yaldabaoth is psychopathy. When psychopathic Archons take human form that human will be a psychopath as an expression of Yaldabaoth consciousness. Cult psychopaths are Archons in human form. The principle is the same as that portrayed in the 2009 *Avatar* movie when the American military travelled to a fictional Earth-like moon called Pandora in the Alpha Centauri star system to infiltrate a society of blue people, or Na'vi, by hiding within bodies that looked like the Na'vi. Archons posing as humans have a particular hybrid information field, part human, part Archon, (the ancient 'demigods') which processes information in a way that manifests behaviour to match their psychopathic evil, lack of empathy and compassion, and stops them being influenced by the empathy, compassion and love that a fully-human information field is capable of expressing. Cult bloodlines interbreed, be they royalty or dark suits, for this reason and you have their obsession with incest. Interbreeding with full-blown humans would dilute the Archontic energy field that guarantees psychopathy in its representatives in the human realm.

Gnostic writings say the main non-human forms that Archons take are *serpentine* (what I have called for decades 'reptilian' amid unbounded ridicule from the Archontically-programmed) and what Gnostics describe as 'an unborn baby or foetus with grey skin and dark, unmoving eyes'. This is an excellent representation of the ET 'Greys' of UFO folklore which large numbers of people claim to have seen and been abducted by – Zulu shaman Credo Mutwa among them. I agree with those that believe in extraterrestrial or interdimensional visitations today and for thousands of years past. No wonder with their advanced knowledge and technological capability they were perceived and worshipped as gods for technological and other 'miracles' they appeared to perform. Imagine someone arriving in a culture disconnected from the modern world with a smartphone and computer. They would be

seen as a 'god' capable of 'miracles'. The Renegade Mind, however, wants to know the source of everything and not only the way that source manifests as human or non-human. In the same way that a Renegade Mind seeks the original source material for the 'Covid virus' to see if what is claimed is true. The original source of Archons in form is consciousness – the distorted state of consciousness known to Gnostics as Yaldabaoth.

'Revolt from God' is energetic disconnection

Where I am going next will make a lot of sense of religious texts and ancient legends relating to 'Satan', Lucifer' and the 'gods'. Gnostic descriptions sync perfectly with the themes of my own research over the years in how they describe a consciousness distortion seeking to impose itself on human consciousness. I've referred to the core of infinite awareness in previous books as Infinite Awareness in Awareness of Itself. By that I mean a level of awareness that knows that it is all awareness and is aware of all awareness. From here comes the frequency of love in its true sense and balance which is what love is on one level – the balance of all forces into a single whole called Oneness and Isness. The more we disconnect from this state of love that many call 'God' the constituent parts of that Oneness start to unravel and express themselves as a part and not a whole. They become individualised as intellect, mind, selfishness, hatred, envy, desire for power over others, and such like. This is not a problem in the greater scheme in that 'God', the *All That Is*, can experience all these possibilities through different expressions of itself including humans. What we as expressions of the whole experience the *All That Is* experiences. We are the *All That Is* experiencing itself. As we withdraw from that state of Oneness we disconnect from its influence and things can get very unpleasant and very stupid. Archontic consciousness is at the extreme end of that. It has so disconnected from the influence of Oneness that it has become an inversion of unity and love, an inversion of everything, an inversion of life itself. Evil is appropriately live written backwards. Archontic consciousness is obsessed with death, an inversion of life,

and so its manifestations in Satanism are obsessed with death. They use inverted symbols in their rituals such as the inverted pentagram and cross. Sabbatians as Archontic consciousness incarnate invert Judaism and every other religion and culture they infiltrate. They seek disunity and chaos and they fear unity and harmony as they fear love like garlic to a vampire. As a result the Cult, Archons incarnate, act with such evil, psychopathy and lack of empathy and compassion disconnected as they are from the source of love. How could Bill Gates and the rest of the Archontic psychopaths do what they have to human society in the 'Covid' era with all the death, suffering and destruction involved and have no emotional consequence for the impact on others? Now you know. Why have Zuckerberg, Brin, Page, Wojcicki and company callously censored information warning about the dangers of the 'vaccine' while thousands have been dying and having severe, sometimes life-changing reactions? Now you know. Why have Tedros, Fauci, Whitty, Vallance and their like around the world been using case and death figures they're aware are fraudulent to justify lockdowns and all the deaths and destroyed lives that have come from that? Now you know. Why did Christian Drosten produce and promote a 'testing' protocol that he knew couldn't test for infectious disease which led to a global human catastrophe. Now you know. The Archontic mind doesn't give a shit ([Fig 17](#)). I personally think that Gates and major Cult insiders are a form of AI cyborg that the Archons want humans to become.



Figure 17: Artist Neil Hague's version of the 'Covid' hierarchy.

Human batteries

A state of such inversion does have its consequences, however. The level of disconnection from the Source of All means that you withdraw from that source of energetic sustenance and creativity. This means that you have to find your own supply of energetic power and it has – *us*. When the Morpheus character in the first *Matrix* movie held up a battery he spoke a profound truth when he said: 'The Matrix is a computer-generated dream world built to keep us under control in order to change the human being into one of

these.' The statement was true in all respects. We do live in a technologically-generated virtual reality simulation (more very shortly) and we have been manipulated to be an energy source for Archontic consciousness. The Disney-Pixar animated movie *Monsters, Inc.* in 2001 symbolised the dynamic when monsters in their world had no energy source and they would enter the human world to terrify children in their beds, catch the child's scream, terror (low-vibrational frequencies), and take that energy back to power the monster world. The lead character you might remember was a single giant eye and the symbolism of the Cult's all-seeing eye was obvious. Every thought and emotion is broadcast as a frequency unique to that thought and emotion. Feelings of love and joy, empathy and compassion, are high, quick, frequencies while fear, depression, anxiety, suffering and hate are low, slow, dense frequencies. Which kind do you think Archontic consciousness can connect with and absorb? In such a low and dense frequency state there's no way it can connect with the energy of love and joy. Archons can only feed off energy compatible with their own frequency and they and their Cult agents want to delete the human world of love and joy and manipulate the transmission of low vibrational frequencies through low-vibrational human mental and emotional states. *We are their energy source.* Wars are energetic banquets to the Archons – a world war even more so – and think how much low-frequency mental and emotional energy has been generated from the consequences for humanity of the 'Covid' hoax orchestrated by Archons incarnate like Gates.

The ancient practice of human sacrifice 'to the gods', continued in secret today by the Cult, is based on the same principle. 'The gods' are Archontic consciousness in different forms and the sacrifice is induced into a state of intense terror to generate the energy the Archontic frequency can absorb. Incarnate Archons in the ritual drink the blood which contains an adrenaline they crave which floods into the bloodstream when people are terrorised. Most of the sacrifices, ancient and modern, are children and the theme of 'sacrificing young virgins to the gods' is just code for children. They

have a particular pre-puberty energy that Archons want more than anything and the energy of the young in general is their target. The California Department of Education wants students to chant the names of Aztec gods (Archontic gods) once worshipped in human sacrifice rituals in a curriculum designed to encourage them to 'challenge racist, bigoted, discriminatory, imperialist/colonial beliefs', join 'social movements that struggle for social justice', and 'build new possibilities for a post-racist, post-systemic racism society'. It's the usual Woke crap that inverts racism and calls it anti-racism. In this case solidarity with 'indigenous tribes' is being used as an excuse to chant the names of 'gods' to which people were sacrificed (and still are in secret). What an example of Woke's inability to see beyond black and white, us and them, They condemn the colonisation of these tribal cultures by Europeans (quite right), but those cultures sacrificing people including children to their 'gods', and mass murdering untold numbers as the Aztecs did, is just fine. One chant is to the Aztec god Tezcatlipoca who had a man sacrificed to him in the 5th month of the Aztec calendar. His heart was cut out and he was eaten. Oh, that's okay then. Come on children ... after three ... Other sacrificial 'gods' for the young to chant their allegiance include Quetzalcoatl, Huitzilopochtli and Xipe Totec. The curriculum says that 'chants, affirmations, and energizers can be used to bring the class together, build unity around ethnic studies principles and values, and to reinvigorate the class following a lesson that may be emotionally taxing or even when student engagement may appear to be low'. Well, that's the cover story, anyway. Chanting and mantras are the repetition of a particular frequency generated from the vocal cords and chanting the names of these Archontic 'gods' tunes you into their frequency. That is the last thing you want when it allows for energetic synchronisation, attachment and perceptual influence. Initiates chant the names of their 'Gods' in their rituals for this very reason.

Vampires of the Woke

Paedophilia is another way that Archons absorb the energy of children. Paedophiles possessed by Archontic consciousness are used as the conduit during sexual abuse for discarnate Archons to vampire the energy of the young they desire so much. Stupendous numbers of children disappear every year never to be seen again although you would never know from the media. Imagine how much low-vibrational energy has been generated by children during the 'Covid' hoax when so many have become depressed and psychologically destroyed to the point of killing themselves. Shocking numbers of children are now taken by the state from loving parents to be handed to others. I can tell you from long experience of researching this since 1996 that many end up with paedophiles and assets of the Cult through corrupt and Cult-owned social services which in the reframing era has hired many psychopaths and emotionless automatons to do the job. Children are even stolen to order using spurious reasons to take them by the corrupt and secret (because they're corrupt) 'family courts'. I have written in detail in other books, starting with *The Biggest Secret* in 1997, about the ubiquitous connections between the political, corporate, government, intelligence and military elites (Cult operatives) and Satanism and paedophilia. If you go deep enough both networks have an interlocking leadership. The Woke mentality has been developed by the Cult for many reasons: To promote almost every aspect of its agenda; to hijack the traditional political left and turn it fascist; to divide and rule; and to target agenda pushbackers. But there are other reasons which relate to what I am describing here. How many happy and joyful Wokers do you ever see especially at the extreme end? They are a mental and psychological mess consumed by emotional stress and constantly emotionally cocked for the next explosion of indignation at someone referring to a female as a female. They are walking, talking, batteries as Morpheus might say emitting frequencies which both enslave them in low-vibrational bubbles of perceptual limitation and feed the Archons. Add to this the hatred claimed to be love; fascism claimed to 'anti-fascism', racism claimed to be 'anti-racism';

exclusion claimed to inclusion; and the abuse-filled Internet trolling. You have a purpose-built Archontic energy system with not a wind turbine in sight and all founded on Archontic *inversion*. We have whole generations now manipulated to serve the Archons with their actions and energy. They will be doing so their entire adult lives unless they snap out of their Archon-induced trance. Is it really a surprise that Cult billionaires and corporations put so much money their way? Where is the energy of joy and laughter, including laughing at yourself which is confirmation of your own emotional security? Mark Twain said: 'The human race has one really effective weapon, and that is laughter.' We must use it all the time. Woke has destroyed comedy because it has no humour, no joy, sense of irony, or self-deprecation. Its energy is dense and intense. *Mmmmm*, lunch says the Archontic frequency. Rudolf Steiner (1861-1925) was the Austrian philosopher and famous esoteric thinker who established Waldorf education or Steiner schools to treat children like unique expressions of consciousness and not minds to be programmed with the perceptions determined by authority. I'd been writing about this energy vampiring for decades when I was sent in 2016 a quote by Steiner. He was spot on:

There are beings in the spiritual realms for whom anxiety and fear emanating from human beings offer welcome food. When humans have no anxiety and fear, then these creatures starve. If fear and anxiety radiates from people and they break out in panic, then these creatures find welcome nutrition and they become more and more powerful. These beings are hostile towards humanity. Everything that feeds on negative feelings, on anxiety, fear and superstition, despair or doubt, are in reality hostile forces in super-sensible worlds, launching cruel attacks on human beings, while they are being fed ... These are exactly the feelings that belong to contemporary culture and materialism; because it estranges people from the spiritual world, it is especially suited to evoke hopelessness and fear of the unknown in people, thereby calling up the above mentioned hostile forces against them.

Pause for a moment from this perspective and reflect on what has happened in the world since the start of 2020. Not only will pennies drop, but billion dollar bills. We see the same theme from Don Juan Matus, a Yaqui Indian shaman in Mexico and the information source for Peruvian-born writer, Carlos Castaneda, who wrote a series of

books from the 1960s to 1990s. Don Juan described the force manipulating human society and his name for the Archons was the predator:

We have a predator that came from the depths of the cosmos and took over the rule of our lives. Human beings are its prisoners. The predator is our lord and master. It has rendered us docile, helpless. If we want to protest, it suppresses our protest. If we want to act independently, it demands that we don't do so ... indeed we are held prisoner!

They took us over because we are food to them, and they squeeze us mercilessly because we are their sustenance. Just as we rear chickens in coops, the predators rear us in human coops, humaneros. Therefore, their food is always available to them.

Different cultures, different eras, same recurring theme.

The 'ennoia' dilemma

Nag Hammadi Gnostic manuscripts say that Archon consciousness has no 'ennoia'. This is directly translated as 'intentionality', but I'll use the term 'creative imagination'. The *All That Is* in awareness of itself is the source of all creativity – all possibility – and the more disconnected you are from that source the more you are subsequently denied 'creative imagination'. Given that Archon consciousness is almost entirely disconnected it severely lacks creativity and has to rely on far more mechanical processes of thought and exploit the creative potential of those that do have 'ennoia'. You can see cases of this throughout human society. Archon consciousness almost entirely dominates the global banking system and if we study how that system works you will appreciate what I mean. Banks manifest 'money' out of nothing by issuing lines of 'credit' which is 'money' that has never, does not, and will never exist except in theory. It's a confidence trick. If you think 'credit' figures-on-a-screen 'money' is worth anything you accept it as payment. If you don't then the whole system collapses through lack of confidence in the value of that 'money'. Archontic bankers with no 'ennoia' are 'lending' 'money' that doesn't exist to humans that *do* have creativity – those that have the inspired ideas and create businesses and products. Archon banking feeds off human creativity

which it controls through 'money' creation and debt. Humans have the creativity and Archons exploit that for their own benefit and control while having none themselves. Archon Internet platforms like Facebook claim joint copyright of everything that creative users post and while Archontic minds like Zuckerberg may officially head that company it will be human creatives on the staff that provide the creative inspiration. When you have limitless 'money' you can then buy other companies established by creative humans. Witness the acquisition record of Facebook, Google and their like. Survey the Archon-controlled music industry and you see non-creative dark suit executives making their fortune from the human creativity of their artists. The cases are endless. Research the history of people like Gates and Zuckerberg and how their empires were built on exploiting the creativity of others. Archon minds cannot create out of nothing, but they are skilled (because they have to be) in what Gnostic texts call 'countermimicry'. They can imitate, but not innovate. Sabbatians trawl the creativity of others through backdoors they install in computer systems through their cybersecurity systems. Archon-controlled China is globally infamous for stealing intellectual property and I remember how Hong Kong, now part of China, became notorious for making counterfeit copies of the creativity of others – 'countermimicry'. With the now pervasive and all-seeing surveillance systems able to infiltrate any computer you can appreciate the potential for Archons to vampire the creativity of humans. Author John Lamb Lash wrote in his book about the Nag Hammadi texts, *Not In His Image*:

Although they cannot originate anything, because they lack the divine factor of ennoia (intentionality), Archons can imitate with a vengeance. Their expertise is simulation (HAL, virtual reality). The Demiurge [Yaldabaoth] fashions a heaven world copied from the fractal patterns [of the original] ... His construction is celestial kitsch, like the fake Italianate villa of a Mafia don complete with militant angels to guard every portal.

This brings us to something that I have been speaking about since the turn of the millennium. Our reality is a simulation; a virtual reality that we think is real. No, I'm not kidding.

Human reality? Well, virtually

I had pondered for years about whether our reality is 'real' or some kind of construct. I remembered being immensely affected on a visit as a small child in the late 1950s to the then newly-opened Planetarium on the Marylebone Road in London which is now closed and part of the adjacent Madame Tussauds wax museum. It was in the middle of the day, but when the lights went out there was the night sky projected in the Planetarium's domed ceiling and it appeared to be so real. The experience never left me and I didn't know why until around the turn of the millennium when I became certain that our 'night sky' and entire reality is a projection, a virtual reality, akin to the illusory world portrayed in the *Matrix* movies. I looked at the sky one day in this period and it appeared to me like the domed roof of the Planetarium. The release of the first *Matrix* movie in 1999 also provided a synchronistic and perfect visual representation of where my mind had been going for a long time. I hadn't come across the Gnostic Nag Hammadi texts then. When I did years later the correlation was once again astounding. As I read Gnostic accounts from 1,600 years and more earlier it was clear that they were describing the same simulation phenomenon. They tell how the Yaldabaoth 'Demiurge' and Archons created a 'bad copy' of original reality to rule over all that were captured by its illusions and the body was a prison to trap consciousness in the 'bad copy' fake reality. Read how Gnostics describe the 'bad copy' and update that to current times and they are referring to what we would call today a virtual reality simulation.

Author John Lamb Lash said 'the Demiurge fashions a heaven world copied from the fractal patterns' of the original through expertise in 'HAL' or virtual reality simulation. Fractal patterns are part of the energetic information construct of our reality, a sort of blueprint. If these patterns were copied in computer terms it would indeed give you a copy of a 'natural' reality in a non-natural frequency and digital form. The principle is the same as making a copy of a website. The original website still exists, but now you can change the copy version to make it whatever you like and it can

become very different to the original website. Archons have done this with our reality, a *synthetic* copy of prime reality that still exists beyond the frequency walls of the simulation. Trapped within the illusions of this synthetic Matrix, however, were and are human consciousness and other expressions of prime reality and this is why the Archons via the Cult are seeking to make the human body synthetic and give us synthetic AI minds to complete the job of turning the entire reality synthetic including what we perceive to be the natural world. To quote Kurzweil: 'Nanobots will infuse all the matter around us with information. Rocks, trees, everything will become these intelligent creatures.' Yes, *synthetic* 'creatures' just as 'Covid' and other genetically-manipulating 'vaccines' are designed to make the human body synthetic. From this perspective it is obvious why Archons and their Cult are so desperate to infuse synthetic material into every human with their 'Covid' scam.

Let there be (electromagnetic) light

Yaldabaoth, the force that created the simulation, or Matrix, makes sense of the Gnostic reference to 'The Great Architect' and its use by Cult Freemasonry as the name of its deity. The designer of the Matrix in the movies is called 'The Architect' and that trilogy is jam-packed with symbolism relating to these subjects. I have contended for years that the angry Old Testament God (Yaldabaoth) is the 'God' being symbolically 'quoted' in the opening of Genesis as 'creating the world'. This is not the creation of prime reality – it's the creation of the *simulation*. The Genesis 'God' says: 'Let there be Light: and there was light.' But what is this 'Light'? I have said for decades that the speed of light (186,000 miles per second) is not the fastest speed possible as claimed by mainstream science and is in fact the frequency walls or outer limits of the Matrix. You can't have a fastest or slowest anything within all possibility when everything is possible. The human body is encoded to operate within the speed of light or *within the simulation* and thus we see only the tiny frequency band of visible *light*. Near-death experiencers who perceive reality outside the body during temporary 'death' describe a very different

form of light and this is supported by the Nag Hammadi texts. Prime reality beyond the simulation ('Upper Aeons' to the Gnostics) is described as a realm of incredible beauty, bliss, love and harmony – a realm of 'watery light' that is so powerful 'there are no shadows'. Our false reality of Archon control, which Gnostics call the 'Lower Aeons', is depicted as a realm with a different kind of 'light' and described in terms of chaos, 'Hell', 'the Abyss' and 'Outer Darkness', where trapped souls are tormented and manipulated by demons (relate that to the 'Covid' hoax alone). The watery light theme can be found in near-death accounts and it is not the same as *simulation* 'light' which is electromagnetic or radiation light within the speed of light – the 'Lower Aeons'. Simulation 'light' is the 'luminous fire' associated by Gnostics with the Archons. The Bible refers to Yaldabaoth as 'that old serpent, called the Devil, and Satan, which deceiveth the whole world' (Revelation 12:9). I think that making a simulated copy of prime reality ('countermimicry') and changing it dramatically while all the time manipulating humanity to believe it to be real could probably meet the criteria of deceiving the whole world. Then we come to the Cult god Lucifer – the *Light Bringer*. Lucifer is symbolic of Yaldabaoth, the bringer of radiation light that forms the bad copy simulation within the speed of light. 'He' is symbolised by the lighted torch held by the Statue of Liberty and in the name 'Illuminati'. Sabbatian-Frankism declares that Lucifer is the true god and Lucifer is the real god of Freemasonry honoured as their 'Great or Grand Architect of the Universe' (simulation).

I would emphasise, too, the way Archontic technologically-generated luminous fire of radiation has deluged our environment since I was a kid in the 1950s and changed the nature of The Field with which we constantly interact. Through that interaction technological radiation is changing us. The Smart Grid is designed to operate with immense levels of communication power with 5G expanding across the world and 6G, 7G, in the process of development. Radiation is the simulation and the Archontic manipulation system. Why wouldn't the Archon Cult wish to unleash radiation upon us to an ever-greater extreme to form

Kurzweil's 'cloud'? The plan for a synthetic human is related to the need to cope with levels of radiation beyond even anything we've seen so far. Biological humans would not survive the scale of radiation they have in their script. The Smart Grid is a technological sub-reality within the technological simulation to further disconnect five-sense perception from expanded consciousness. It's a technological prison of the mind.

Infusing the 'spirit of darkness'

A recurring theme in religion and native cultures is the manipulation of human genetics by a non-human force and most famously recorded as the biblical 'sons of god' (the gods plural in the original) who interbred with the daughters of men. The Nag Hammadi *Apocryphon of John* tells the same story this way:

He [Yaldabaoth] sent his angels [Archons/demons] to the daughters of men, that they might take some of them for themselves and raise offspring for their enjoyment. And at first they did not succeed. When they had no success, they gathered together again and they made a plan together ... And the angels changed themselves in their likeness into the likeness of their mates, filling them with the spirit of darkness, which they had mixed for them, and with evil ... And they took women and begot children out of the darkness according to the likeness of their spirit.

Possession when a discarnate entity takes over a human body is an age-old theme and continues today. It's very real and I've seen it. Satanic and secret society rituals can create an energetic environment in which entities can attach to initiates and I've heard many stories of how people have changed their personality after being initiated even into lower levels of the Freemasons. I have been inside three Freemasonic temples, one at a public open day and two by just walking in when there was no one around to stop me. They were in Ryde, the town where I live, Birmingham, England, when I was with a group, and Boston, Massachusetts. They all felt the same energetically – dark, dense, low-vibrational and sinister. Demonic attachment can happen while the initiate has no idea what is going on. To them it's just a ritual to get in the Masons and do a bit of good

business. In the far more extreme rituals of Satanism human possession is even more powerful and they are designed to make possession possible. The hierarchy of the Cult is dictated by the power and perceived status of the possessing Archon. In this way the Archon hierarchy becomes the Cult hierarchy. Once the entity has attached it can influence perception and behaviour and if it attaches to the extreme then so much of its energy (information) infuses into the body information field that the hologram starts to reflect the nature of the possessing entity. This is the *Exorcist* movie type of possession when facial features change and it's known as shapeshifting. Islam's Jinn are said to be invisible tricksters who change shape, 'whisper', confuse and take human form. These are all traits of the Archons and other versions of the same phenomenon. Extreme possession could certainly infuse the 'spirit of darkness' into a partner during sex as the Nag Hammadi texts appear to describe. Such an infusion can change genetics which is also energetic information. Human genetics is information and the 'spirit of darkness' is information. Mix one with the other and change must happen. Islam has the concept of a 'Jinn baby' through possession of the mother and by Jinn taking human form. There are many ways that human genetics can be changed and remember that Archons have been aware all along of advanced techniques to do this. What is being done in human society today – and far more – was known about by Archons at the time of the 'fallen ones' and their other versions described in religions and cultures.

Archons and their human-world Cult are obsessed with genetics as we see today and they know this dictates how information is processed into perceived reality during a human life. They needed to produce a human form that would decode the simulation and this is symbolically known as 'Adam and Eve' who left the 'garden' (prime reality) and 'fell' into Matrix reality. The simulation is not a 'physical' construct (there is no 'physical'); it is a source of information. Think Wi-Fi again. The simulation is an energetic field encoded with information and body-brain systems are designed to decode that information encoded in wave or frequency form which

is transmitted to the brain as electrical signals. These are decoded by the brain to construct our sense of reality – an illusory ‘physical’ world that only exists in the brain or the mind. Virtual reality games mimic this process using the same sensory decoding system. Information is fed to the senses to decode a virtual reality that can appear so real, but isn’t (Figs 18 and 19). Some scientists believe – and I agree with them – that what we perceive as ‘physical’ reality only exists when we are looking or observing. The act of perception or focus triggers the decoding systems which turn waveform information into holographic reality. When we are not observing something our reality reverts from a holographic state to a waveform state. This relates to the same principle as a falling tree not making a noise unless someone is there to hear it or decode it. The concept makes sense from the simulation perspective. A computer is not decoding all the information in a Wi-Fi field all the time and only decodes or brings into reality on the screen that part of Wi-Fi that it’s decoding – focusing upon – at that moment.



Figure 18: Virtual reality technology ‘hacks’ into the body’s five-sense decoding system.



Figure 19: The result can be experienced as very ‘real’.

Interestingly, Professor Donald Hoffman at the Department of Cognitive Sciences at the University of California, Irvine, says that our experienced reality is like a computer interface that shows us only the level with which we interact while hiding all that exists beyond it: 'Evolution shaped us with a user interface that hides the truth. Nothing that we see is the truth – the very language of space and time and objects is the wrong language to describe reality.' He is correct in what he says on so many levels. Space and time are not a universal reality. They are a phenomenon of decoded *simulation* reality as part of the process of enslaving our sense of reality. Near-death experiencers report again and again how space and time did not exist as we perceive them once they were free of the body – body decoding systems. You can appreciate from this why Archons and their Cult are so desperate to entrap human attention in the five senses where we are in the Matrix and of the Matrix. Opening your mind to expanded states of awareness takes you beyond the information confines of the simulation and you become aware of knowledge and insights denied to you before. This is what we call 'awakening' – *awakening from the Matrix* – and in the final chapter I will relate this to current events.

Where are the 'aliens'?

A simulation would explain the so-called 'Fermi Paradox' named after Italian physicist Enrico Fermi (1901-1954) who created the first nuclear reactor. He considered the question of why there is such a lack of extraterrestrial activity when there are so many stars and planets in an apparently vast universe; but what if the night sky that we see, or think we do, is a simulated projection as I say? If you control the simulation and your aim is to hold humanity fast in essential ignorance would you want other forms of life including advanced life coming and going sharing information with humanity? Or would you want them to believe they were isolated and apparently alone? Themes of human isolation and apartness are common whether they be the perception of a lifeless universe or the fascist isolation laws of the 'Covid' era. Paradoxically the very

existence of a simulation means that we are not alone when some force had to construct it. My view is that experiences that people have reported all over the world for centuries with Reptilians and Grey entities are Archon phenomena as Nag Hammadi texts describe; and that benevolent 'alien' interactions are non-human groups that come in and out of the simulation by overcoming Archon attempts to keep them out. It should be highlighted, too, that Reptilians and Greys are obsessed with *genetics* and *technology* as related by cultural accounts and those who say they have been abducted by them. Technology is their way of overcoming some of the limitations in their creative potential and our technology-driven and controlled human society of today is *archetypical* Archon-Reptilian-Grey *modus operandi*. Technocracy is really *Archontocracy*. The Universe does not have to be as big as it appears with a simulation. There is no space or distance only information decoded into holographic reality. What we call 'space' is only the absence of holographic 'objects' and that 'space' is The Field of energetic information which connects everything into a single whole. The same applies with the artificially-generated information field of the simulation. The Universe is not big or small as a physical reality. It is decoded information, that's all, and its perceived size is decided by the way the simulation is encoded to make it appear. The entire night sky as we perceive it only exists in our brain and so where are those 'millions of light years'? The 'stars' on the ceiling of the Planetarium looked a vast distance away.

There's another point to mention about 'aliens'. I have been highlighting since the 1990s the plan to stage a fake 'alien invasion' to justify the centralisation of global power and a world military. Nazi scientist Werner von Braun, who was taken to America by Operation Paperclip after World War Two to help found NASA, told his American assistant Dr Carol Rosin about the Cult agenda when he knew he was dying in 1977. Rosin said that he told her about a sequence that would lead to total human control by a one-world government. This included threats from terrorism, rogue nations, meteors and asteroids before finally an 'alien invasion'. All of these

things, von Braun said, would be bogus and what I would refer to as a No-Problem-Reaction-Solution. Keep this in mind when 'the aliens are coming' is the new mantra. The aliens are not coming – they are *already here* and they have infiltrated human society while looking human. French-Canadian investigative journalist Serge Monast said in 1994 that he had uncovered a NASA/military operation called Project Blue Beam which fits with what Werner von Braun predicted. Monast died of a 'heart attack' in 1996 the day after he was arrested and spent a night in prison. He was 51. He said Blue Beam was a plan to stage an alien invasion that would include religious figures beamed holographically into the sky as part of a global manipulation to usher in a 'new age' of worshipping what I would say is the Cult 'god' Yaldabaoth in a one-world religion. Fake holographic asteroids are also said to be part of the plan which again syncs with von Braun. How could you stage an illusory threat from asteroids unless they were holographic inserts? This is pretty straightforward given the advanced technology outside the public arena and the fact that our 'physical' reality is holographic anyway. Information fields would be projected and we would decode them into the illusion of a 'physical' asteroid. If they can sell a global 'pandemic' with a 'virus' that doesn't exist what will humans not believe if government and media tell them?

All this is particularly relevant as I write with the Pentagon planning to release in June, 2021, information about 'UFO sightings'. I have been following the UFO story since the early 1990s and the common theme throughout has been government and military denials and cover up. More recently, however, the Pentagon has suddenly become more talkative and apparently open with Air Force pilot radar images released of unexplained craft moving and changing direction at speeds well beyond anything believed possible with human technology. Then, in March, 2021, former Director of National Intelligence John Ratcliffe said a Pentagon report months later in June would reveal a great deal of information about UFO sightings unknown to the public. He said the report would have 'massive implications'. The order to do this was included bizarrely

in a \$2.3 trillion 'coronavirus' relief and government funding bill passed by the Trump administration at the end of 2020. I would add some serious notes of caution here. I have been pointing out since the 1990s that the US military and intelligence networks have long had craft – 'flying saucers' or anti-gravity craft – which any observer would take to be extraterrestrial in origin. Keeping this knowledge from the public allows craft flown by *humans* to be perceived as alien visitations. I am not saying that 'aliens' do not exist. I would be the last one to say that, but we have to be streetwise here. President Ronald Reagan told the UN General Assembly in 1987: 'I occasionally think how quickly our differences worldwide would vanish if we were facing an alien threat from outside this world.' That's the idea. Unite against a common 'enemy' with a common purpose behind your 'saviour force' (the Cult) as this age-old technique of mass manipulation goes global.

Science moves this way ...

I could find only one other person who was discussing the simulation hypothesis publicly when I concluded it was real. This was Nick Bostrom, a Swedish-born philosopher at the University of Oxford, who has explored for many years the possibility that human reality is a computer simulation although his version and mine are not the same. Today the simulation and holographic reality hypothesis have increasingly entered the scientific mainstream. Well, the more open-minded mainstream, that is. Here are a few of the ever-gathering examples. American nuclear physicist Silas Beane led a team of physicists at the University of Bonn in Germany pursuing the question of whether we live in a simulation. They concluded that we probably do and it was likely based on a lattice of cubes. They found that cosmic rays align with that specific pattern. The team highlighted the Greisen–Zatsepin–Kuzmin (GZK) limit which refers to cosmic ray particle interaction with cosmic background radiation that creates an apparent boundary for cosmic ray particles. They say in a paper entitled 'Constraints on the Universe as a Numerical Simulation' that this 'pattern of constraint' is exactly what you

would find with a computer simulation. They also made the point that a simulation would create its own 'laws of physics' that would limit possibility. I've been making the same point for decades that the *perceived* laws of physics relate only to this reality, or what I would later call the simulation. When designers write codes to create computer and virtual reality games they are the equivalent of the laws of physics for that game. Players interact within the limitations laid out by the coding. In the same way those who wrote the codes for the simulation decided the laws of physics that would apply. These can be overridden by expanded states of consciousness, but not by those enslaved in only five-sense awareness where simulation codes rule. Overriding the codes is what people call 'miracles'. They are not. They are bypassing the encoded limits of the simulation. A population caught in simulation perception would have no idea that this was their plight. As the Bonn paper said: 'Like a prisoner in a pitch-black cell we would not be able to see the "walls" of our prison,' That's true if people remain mesmerised by the five senses. Open to expanded awareness and those walls become very clear. The main one is the speed of light.

American theoretical physicist James Gates is another who has explored the simulation question and found considerable evidence to support the idea. Gates was Professor of Physics at the University of Maryland, Director of The Center for String and Particle Theory, and on Barack Obama's Council of Advisors on Science and Technology. He and his team found *computer codes* of digital data embedded in the fabric of our reality. They relate to on-off electrical charges of 1 and 0 in the binary system used by computers. 'We have no idea what they are doing there', Gates said. They found within the energetic fabric mathematical sequences known as error-correcting codes or block codes that 'reboot' data to its original state or 'default settings' when something knocks it out of sync. Gates was asked if he had found a set of equations embedded in our reality indistinguishable from those that drive search engines and browsers and he said: 'That is correct.' Rich Terrile, director of the Centre for Evolutionary Computation and Automated Design at NASA's Jet

Propulsion Laboratory, has said publicly that he believes the Universe is a digital hologram that must have been created by a form of intelligence. I agree with that in every way. Waveform information is delivered electrically by the senses to the brain which constructs a *digital* holographic reality that we call the 'world'. This digital level of reality can be read by the esoteric art of numerology. Digital holograms are at the cutting edge of holographics today. We have digital technology everywhere designed to access and manipulate our digital level of perceived reality. Synthetic mRNA in 'Covid vaccines' has a digital component to manipulate the body's digital 'operating system'.

Reality is numbers

How many know that our reality can be broken down to numbers and codes that are the same as computer games? Max Tegmark, a physicist at the Massachusetts Institute of Technology (MIT), is the author of *Our Mathematical Universe* in which he lays out how reality can be entirely described by numbers and maths in the way that a video game is encoded with the 'physics' of computer games. Our world and computer virtual reality are essentially the same.

Tegmark imagines the perceptions of characters in an advanced computer game when the graphics are so good they don't know they are in a game. They think they can bump into real objects (electromagnetic resistance in our reality), fall in love and feel emotions like excitement. When they began to study the apparently 'physical world' of the video game they would realise that everything was made of pixels (which have been found in our energetic reality as must be the case when on one level our world is digital). What computer game characters thought was physical 'stuff', Tegmark said, could actually be broken down into numbers:

And we're exactly in this situation in our world. We look around and it doesn't seem that mathematical at all, but everything we see is made out of elementary particles like quarks and electrons. And what properties does an electron have? Does it have a smell or a colour or a texture? No! ... We physicists have come up with geeky names for [Electron] properties, like

electric charge, or spin, or lepton number, but the electron doesn't care what we call it, the properties are just numbers.

This is the illusory reality Gnostics were describing. This is the simulation. The A, C, G, and T codes of DNA have a binary value – A and C = 0 while G and T = 1. This has to be when the simulation is digital and the body must be digital to interact with it. Recurring mathematical sequences are encoded throughout reality and the body. They include the Fibonacci sequence in which the two previous numbers are added to get the next one, as in ... 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, etc. The sequence is encoded in the human face and body, proportions of animals, DNA, seed heads, pine cones, trees, shells, spiral galaxies, hurricanes and the number of petals in a flower. The list goes on and on. There are fractal patterns – a 'never-ending pattern that is infinitely complex and self-similar across all scales in the as above, so below, principle of holograms. These and other famous recurring geometrical and mathematical sequences such as Phi, Pi, Golden Mean, Golden Ratio and Golden Section are *computer codes* of the simulation. I had to laugh and give my head a shake the day I finished this book and it went into the production stage. I was sent an article in *Scientific American* published in April, 2021, with the headline 'Confirmed! We Live in a Simulation'. Two decades after I first said our reality is a simulation and the speed of light is its outer limit the article suggested that we do live in a simulation and that the speed of light is its outer limit. I left school at 15 and never passed a major exam in my life while the writer was up to his eyes in qualifications. As I will explain in the final chapter *knowing* is far better than thinking and they come from very different sources. The article rightly connected the speed of light to the processing speed of the 'Matrix' and said what has been in my books all this time ... 'If we are in a simulation, as it appears, then space is an abstract property written in code. It is not real'. No it's not and if we live in a simulation something created it and it wasn't *us*. 'That David Icke says we are manipulated by aliens' – he's crackers.'

Wow ...

The reality that humanity thinks is so real is an illusion. Politicians, governments, scientists, doctors, academics, law enforcement, media, school and university curriculums, on and on, are all founded on a world that *does not exist* except as a simulated prison cell. Is it such a stretch to accept that 'Covid' doesn't exist when our entire 'physical' reality doesn't exist? Revealed here is the knowledge kept under raps in the Cult networks of compartmentalised secrecy to control humanity's sense of reality by inducing the population to believe in a reality that's not real. If it wasn't so tragic in its experiential consequences the whole thing would be hysterically funny. None of this is new to Renegade Minds. Ancient Greek philosopher Plato (about 428 to about 347BC) was a major influence on Gnostic belief and he described the human plight thousands of years ago with his Allegory of the Cave. He told the symbolic story of prisoners living in a cave who had never been outside. They were chained and could only see one wall of the cave while behind them was a fire that they could not see. Figures walked past the fire casting shadows on the prisoners' wall and those moving shadows became their sense of reality. Some prisoners began to study the shadows and were considered experts on them (today's academics and scientists), but what they studied was only an illusion (today's academics and scientists). A prisoner escaped from the cave and saw reality as it really is. When he returned to report this revelation they didn't believe him, called him mad and threatened to kill him if he tried to set them free. Plato's tale is not only a brilliant analogy of the human plight and our illusory reality. It describes, too, the dynamics of the 'Covid' hoax. I have only skimmed the surface of these subjects here. The aim of this book is to crisply connect all essential dots to put what is happening today into its true context. All subject areas and their connections in this chapter are covered in great evidential detail in *Everything You Need To Know, But Have Never Been Told* and *The Answer*.

They say that bewildered people 'can't see the forest for the trees'. Humanity, however, can't see the forest for the *twigs*. The five senses

see only twigs while Renegade Minds can see the forest and it's the forest where the answers lie with the connections that reveals.

Breaking free of perceptual programming so the forest can be seen is the way we turn all this around. Not breaking free is how humanity got into this mess. The situation may seem hopeless, but I promise you it's not. We are a perceptual heartbeat from paradise if only we knew.

CHAPTER TWELVE

Escaping Wetiko

Life is simply a vacation from the infinite
Dean Cavanagh

Renegade Minds weave the web of life and events and see common themes in the apparently random. They are always there if you look for them and their pursuit is aided by incredible synchronicity that comes when your mind is open rather than mesmerised by what it thinks it can see.

Infinite awareness is infinite possibility and the more of infinite possibility that we access the more becomes infinitely possible. That may be stating the apparently obvious, but it is a devastatingly-powerful fact that can set us free. We are a point of attention within an infinity of consciousness. The question is how much of that infinity do we choose to access? How much knowledge, insight, awareness, wisdom, do we want to connect with and explore? If your focus is only in the five senses you will be influenced by a fraction of infinite awareness. I mean a range so tiny that it gives new meaning to infinitesimal. Limitation of self-identity and a sense of the possible limit accordingly your range of consciousness. We are what we think we are. Life is what we think it is. The dream is the dreamer and the dreamer is the dream. Buddhist philosophy puts it this way: 'As a thing is viewed, so it appears.' Most humans live in the realm of touch, taste, see, hear, and smell and that's the limit of their sense of the possible and sense of self. Many will follow a religion and speak of a God in his heaven, but their lives are still

dominated by the five senses in their perceptions and actions. The five senses become the arbiter of everything. When that happens all except a smear of infinity is sealed away from influence by the rigid, unyielding, reality bubbles that are the five-sense human or Phantom Self. Archon Cult methodology is to isolate consciousness within five-sense reality – the simulation – and then program that consciousness with a sense of self and the world through a deluge of life-long information designed to instil the desired perception that allows global control. Efforts to do this have increased dramatically with identity politics as identity bubbles are squeezed into the minutiae of five-sense detail which disconnect people even more profoundly from the infinite 'I'.

Five-sense focus and self-identity are like a firewall that limits access to the infinite realms. You only perceive one radio or television station and no other. We'll take that literally for a moment. Imagine a vast array of stations giving different information and angles on reality, but you only ever listen to one. Here we have the human plight in which the population is overwhelmingly confined to CultFM. This relates only to the frequency range of CultFM and limits perception and insight to that band – limits *possibility* to that band. It means you are connecting with an almost imperceptibly minuscule range of possibility and creative potential within the infinite Field. It's a world where everything seems apart from everything else and where synchronicity is rare. Synchronicity is defined in the dictionary as 'the happening by chance of two or more related or similar events at the same time'. Use of 'by chance' betrays a complete misunderstanding of reality. Synchronicity is not 'by chance'. As people open their minds, or 'awaken' to use the term, they notice more and more coincidences in their lives, bits of 'luck', apparently miraculous happenings that put them in the right place at the right time with the right people. Days become peppered with 'fancy meeting you here' and 'what are the chances of that?' My entire life has been lived like this and ever more so since my own colossal awakening in 1990 and 91 which transformed my sense of reality. Synchronicity is not 'by chance'; it is by accessing expanded

realms of possibility which allow expanded potential for manifestation. People broadcasting the same vibe from the same openness of mind tend to be drawn 'by chance' to each other through what I call frequency magnetism and it's not only people. In the last more than 30 years incredible synchronicity has also led me through the Cult maze to information in so many forms and to crucial personal experiences. These 'coincidences' have allowed me to put the puzzle pieces together across an enormous array of subjects and situations. Those who have breached the bubble of five-sense reality will know exactly what I mean and this escape from the perceptual prison cell is open to everyone whenever they make that choice. This may appear super-human when compared with the limitations of 'human', but it's really our natural state. 'Human' as currently experienced is consciousness in an unnatural state of induced separation from the infinity of the whole. I'll come to how this transformation into unity can be made when I have described in more detail the force that holds humanity in servitude by denying this access to infinite self.

The Wetiko factor

I have been talking and writing for decades about the way five-sense mind is systematically barricaded from expanded awareness. I have used the analogy of a computer (five-sense mind) and someone at the keyboard (expanded awareness). Interaction between the computer and the operator is symbolic of the interaction between five-sense mind and expanded awareness. The computer directly experiences the Internet and the operator experiences the Internet via the computer which is how it's supposed to be – the two working as one. Archons seek to control that point where the operator connects with the computer to stop that interaction ([Fig 20](#)). Now the operator is banging the keyboard and clicking the mouse, but the computer is not responding and this happens when the computer is taken over – *possessed* – by an appropriately-named computer 'virus'. The operator has lost all influence over the computer which goes its own way making decisions under the control of the 'virus'. I have

just described the dynamic through which the force known to Gnostics as Yaldabaoth and Archons disconnects five-sense mind from expanded awareness to imprison humanity in perceptual servitude.

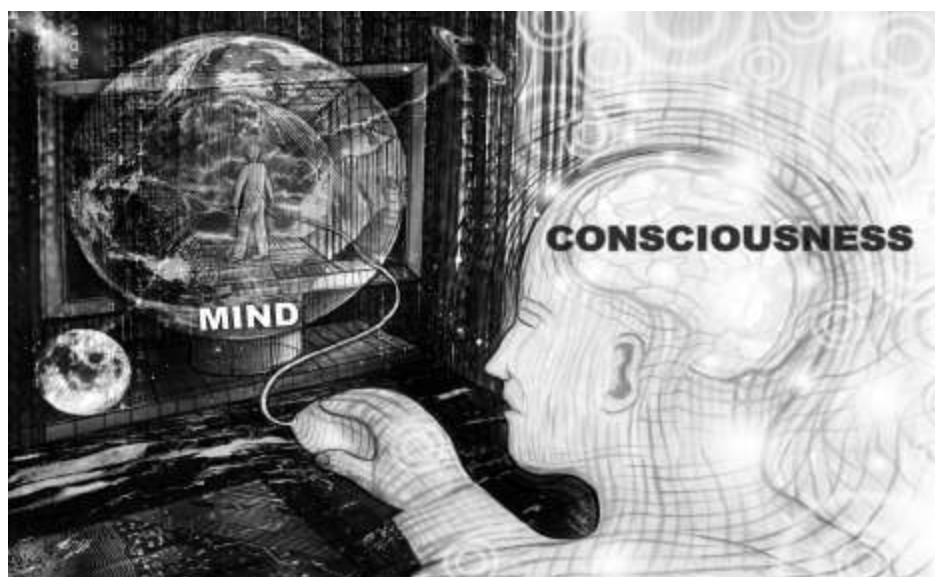


Figure 20: The mind ‘virus’ I have been writing about for decades seeks to isolate five-sense mind (the computer) from the true ‘I’. (Image by Neil Hague).

About a year ago I came across a Native American concept of Wetiko which describes precisely the same phenomenon. Wetiko is the spelling used by the Cree and there are other versions including wintiko and windigo used by other tribal groups. They spell the name with lower case, but I see Wetiko as a proper noun as with Archons and prefer a capital. I first saw an article about Wetiko by writer and researcher Paul Levy which so synced with what I had been writing about the computer/operator disconnection and later the Archons. I then read his book, the fascinating *Dispelling Wetiko, Breaking the Spell of Evil*. The parallels between what I had concluded long before and the Native American concept of Wetiko were so clear and obvious that it was almost funny. For Wetiko see the Gnostic Archons for sure and the Jinn, the Predators, and every other name for a force of evil, inversion and chaos. Wetiko is the Native American name for the force that divides the computer from

the operator (Fig 21). Indigenous author Jack D. Forbes, a founder of the Native American movement in the 1960s, wrote another book about Wetiko entitled *Columbus And Other Cannibals – The Wetiko Disease of Exploitation, Imperialism, and Terrorism* which I also read. Forbes says that Wetiko refers to an evil person or spirit ‘who terrorizes other creatures by means of terrible acts, including cannibalism’. Zulu shaman Credo Mutwa told me that African accounts tell how cannibalism was brought into the world by the Chitauri ‘gods’ – another manifestation of Wetiko. The distinction between ‘evil person or spirit’ relates to Archons/Wetiko possessing a human or acting as pure consciousness. Wetiko is said to be a sickness of the soul or spirit and a state of being that takes but gives nothing back – the Cult and its operatives perfectly described. Black Hawk, a Native American war leader defending their lands from confiscation, said European invaders had ‘poisoned hearts’ – Wetiko hearts – and that this would spread to native societies. Mention of the heart is very significant as we shall shortly see. Forbes writes: ‘Tragically, the history of the world for the past 2,000 years is, in great part, the story of the epidemiology of the wetiko disease.’ Yes, and much longer. Forbes is correct when he says: ‘The wetikos destroyed Egypt and Babylon and Athens and Rome and Tenochtitlan [capital of the Aztec empire] and perhaps now they will destroy the entire earth.’ Evil, he said, is the number one export of a Wetiko culture – see its globalisation with ‘Covid’. Constant war, mass murder, suffering of all kinds, child abuse, Satanism, torture and human sacrifice are all expressions of Wetiko and the Wetiko possessed. The world is Wetiko made manifest, *but it doesn’t have to be*. There is a way out of this even now.



Figure 21: The mind 'virus' is known to Native Americans as 'Wetiko'. (Image by Neil Hague).

Cult of Wetiko

Wetiko is the Yaldabaoth frequency distortion that seeks to attach to human consciousness and absorb it into its own. Once this connection is made Wetiko can drive the perceptions of the target which they believe to be coming from their own mind. All the horrors of history and today from mass killers to Satanists, paedophiles like Jeffrey Epstein and other psychopaths, are the embodiment of Wetiko and express its state of being in all its grotesqueness. The Cult is Wetiko incarnate, Yaldabaoth incarnate, and it seeks to facilitate Wetiko assimilation of humanity in totality into its distortion by manipulating the population into low frequency states that match its own. Paul Levy writes:

'Holographically enforced within the psyche of every human being the wetiko virus pervades and underlies the entire field of consciousness, and can therefore potentially manifest through any one of us at any moment if we are not mindful.' The 'Covid' hoax has achieved this with many people, but others have not fallen into Wetiko's frequency lair. Players in the 'Covid' human catastrophe including Gates, Schwab, Tedros, Fauci, Whitty, Vallance, Johnson, Hancock, Ferguson, Drosten, and all the rest, including the psychopath psychologists, are expressions of Wetiko. This is why

they have no compassion or empathy and no emotional consequence for what they do that would make them stop doing it. Observe all the people who support the psychopaths in authority against the Pushbackers despite the damaging impact the psychopaths have on their own lives and their family's lives. You are again looking at Wetiko possession which prevents them seeing through the lies to the obvious scam going on. *Why can't they see it?* Wetiko won't let them see it. The perceptual divide that has now become a chasm is between the Wetikoed and the non-Wetikoed.

Paul Levy describes Wetiko in the same way that I have long described the Archontic force. They are the same distorted consciousness operating across dimensions of reality: '... the subtle body of wetiko is not located in the third dimension of space and time, literally existing in another dimension ... it is able to affect ordinary lives by mysteriously interpenetrating into our three-dimensional world.' Wetiko does this through its incarnate representatives in the Cult and by weaving itself into The Field which on our level of reality is the electromagnetic information field of the simulation or Matrix. More than that, the simulation *is* Wetiko / Yaldabaoth. Caleb Scharf, Director of Astrobiology at Columbia University, has speculated that 'alien life' could be so advanced that it has transcribed itself into the quantum realm to become what we call physics. He said intelligence indistinguishable from the fabric of the Universe would solve many of its greatest mysteries:

Perhaps hyper-advanced life isn't just external. Perhaps it's already all around. It is embedded in what we perceive to be physics itself, from the root behaviour of particles and fields to the phenomena of complexity and emergence ... In other words, life might not just be in the equations. It might BE the equations [My emphasis].

Scharf said it is possible that 'we don't recognise advanced life because it forms an integral and unsuspecting part of what we've considered to be the natural world'. I agree. Wetiko/Yaldabaoth *is* the simulation. We are literally in the body of the beast. But that doesn't mean it has to control us. We all have the power to overcome Wetiko

influence and the Cult knows that. I doubt it sleeps too well because it knows that.

Which Field?

This, I suggest, is how it all works. There are two Fields. One is the fierce electromagnetic light of the Matrix within the speed of light; the other is the 'watery light' of The Field beyond the walls of the Matrix that connects with the Great Infinity. Five-sense mind and the decoding systems of the body attach us to the Field of Matrix light. They have to or we could not experience this reality. Five-sense mind sees only the Matrix Field of information while our expanded consciousness is part of the Infinity Field. When we open our minds, and most importantly our hearts, to the Infinity Field we have a mission control which gives us an expanded perspective, a road map, to understand the nature of the five-sense world. If we are isolated only in five-sense mind there is no mission control. We're on our own trying to understand a world that's constantly feeding us information to ensure we do not understand. People in this state can feel 'lost' and bewildered with no direction or radar. You can see ever more clearly those who are influenced by the Fields of Big Infinity or little five-sense mind simply by their views and behaviour with regard to the 'Covid' hoax. We have had this division throughout known human history with the mass of the people on one side and individuals who could see and intuit beyond the walls of the simulation – Plato's prisoner who broke out of the cave and saw reality for what it is. Such people have always been targeted by Wetiko/Archon-possessed authority, burned at the stake or demonised as mad, bad and dangerous. The Cult today and its global network of 'anti-hate', 'anti-fascist' Woke groups are all expressions of Wetiko attacking those exposing the conspiracy, 'Covid' lies and the 'vaccine' agenda.

Woke as a whole is Wetiko which explains its black and white mentality and how at one it is with the Wetiko-possessed Cult. Paul Levy said: 'To be in this paradigm is to still be under the thrall of a two-valued logic – where things are either true or false – of a

wetikoized mind.’ Wetiko consciousness is in a permanent rage, therefore so is Woke, and then there is Woke inversion and contradiction. ‘Anti-fascists’ act like fascists because fascists *and* ‘anti-fascists’ are both Wetiko at work. Political parties act the same while claiming to be different for the same reason. Secret society and satanic rituals are attaching initiates to Wetiko and the cold, ruthless, psychopathic mentality that secures the positions of power all over the world is Wetiko. Reframing ‘training programmes’ have the same cumulative effect of attaching Wetiko and we have their graduates described as automatons and robots with a cold, psychopathic, uncaring demeanour. They are all traits of Wetiko possession and look how many times they have been described in this book and elsewhere with regard to personnel behind ‘Covid’ including the police and medical profession. Climbing the greasy pole in any profession in a Wetiko society requires traits of Wetiko to get there and that is particularly true of politics which is not about fair competition and pre-eminence of ideas. It is founded on how many backs you can stab and arses you can lick. This culminated in the global ‘Covid’ coordination between the Wetiko possessed who pulled it off in all the different countries without a trace of empathy and compassion for their impact on humans. Our sight sense can see only holographic form and not the Field which connects holographic form. Therefore we perceive ‘physical’ objects with ‘space’ in between. In fact that ‘space’ is energy/consciousness operating on multiple frequencies. One of them is Wetiko and that connects the Cult psychopaths, those who submit to the psychopaths, and those who serve the psychopaths in the media operations of the world. Wetiko is Gates. Wetiko is the mask-wearing submissive. Wetiko is the fake journalist and ‘fact-checker’. The Wetiko Field is coordinating the whole thing. Psychopaths, gofers, media operatives, ‘anti-hate’ hate groups, ‘fact-checkers’ and submissive people work as one unit *even without human coordination* because they are attached to the *same* Field which is organising it all ([Fig 22](#)). Paul Levy is here describing how Wetiko-possessed people are drawn together and refuse to let any information breach their rigid

perceptions. He was writing long before 'Covid', but I think you will recognise followers of the 'Covid' religion *oh just a little bit*:

People who are channelling the vibratory frequency of wetiko align with each other through psychic resonance to reinforce their unspoken shared agreement so as to uphold their deranged view of reality. Once an unconscious content takes possession of certain individuals, it irresistibly draws them together by mutual attraction and knits them into groups tied together by their shared madness that can easily swell into an avalanche of insanity.

A psychic epidemic is a closed system, which is to say that it is insular and not open to any new information or informing influences from the outside world which contradict its fixed, limited, and limiting perspective.

There we have the Woke mind and the 'Covid' mind. Compatible resonance draws the awakening together, too, which is clearly happening today.

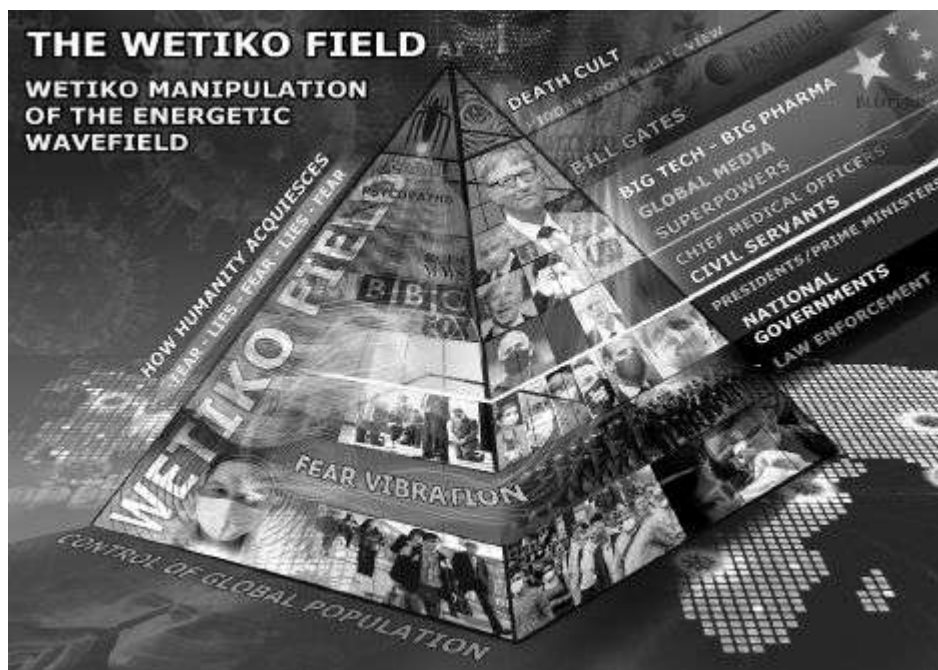


Figure 22: The Wetiko Field from which the Cult pyramid and its personnel are made manifest. (Image by Neil Hague).

Spiritual servitude

Wetiko doesn't care about humans. It's not human; it just possesses humans for its own ends and the effect (depending on the scale of

possession) can be anything from extreme psychopathy to unquestioning obedience. Wetiko's worst nightmare is for human consciousness to expand beyond the simulation. Everything is focussed on stopping that happening through control of information, thus perception, thus frequency. The 'education system', media, science, medicine, academia, are all geared to maintaining humanity in five-sense servitude as is the constant stimulation of low-vibrational mental and emotional states (see 'Covid'). Wetiko seeks to dominate those subconscious spaces between five-sense perception and expanded consciousness where the computer meets the operator. From these subconscious hiding places Wetiko speaks to us to trigger urges and desires that we take to be our own and manipulate us into anything from low-vibrational to psychopathic states. Remember how Islam describes the Jinn as invisible tricksters that 'whisper' and confuse. Wetiko is the origin of the 'trickster god' theme that you find in cultures all over the world. Jinn, like the Archons, are Wetiko which is terrified of humans awakening and reconnecting with our true self for then its energy source has gone. With that the feedback loop breaks between Wetiko and human perception that provides the energetic momentum on which its very existence depends as a force of evil. Humans are both its target and its source of survival, but only if we are operating in low-vibrational states of fear, hate, depression and the background anxiety that most people suffer. We are Wetiko's target because we are its key to survival. It needs us, not the other way round. Paul Levy writes:

A vampire has no intrinsic, independent, substantial existence in its own right; it only exists in relation to us. The pathogenic, vampiric mind-parasite called wetiko is nothing in itself – not being able to exist from its own side – yet it has a 'virtual reality' such that it can potentially destroy our species ...

...The fact that a vampire is not reflected by a mirror can also mean that what we need to see is that there's nothing, no-thing to see, other than ourselves. The fact that wetiko is the expression of something inside of us means that the cure for wetiko is with us as well. The critical issue is finding this cure within us and then putting it into effect.

Evil begets evil because if evil does not constantly expand and find new sources of energetic sustenance its evil, its *distortion*, dies with the assimilation into balance and harmony. Love is the garlic to Wetiko's vampire. Evil, the absence of love, cannot exist in the presence of love. I think I see a way out of here. I have emphasised so many times over the decades that the Archons/Wetiko and their Cult are not all powerful. *They are not*. I don't care how it looks even now *they are not*. I have not called them little boys in short trousers for effect. I have said it because it is true. Wetiko's insatiable desire for power over others is not a sign of its omnipotence, but its insecurity. Paul Levy writes: 'Due to the primal fear which ultimately drives it and which it is driven to cultivate, wetiko's body politic has an intrinsic and insistent need for centralising power and control so as to create imagined safety for itself.' *Yeeeeeees!* Exactly! Why does Wetiko want humans in an ongoing state of fear? Wetiko itself *is* fear and it is petrified of love. As evil is an absence of love, so love is an absence of fear. Love conquers all and *especially* Wetiko which *is* fear. Wetiko brought fear into the world when it wasn't here before. *Fear* was the 'fall', the fall into low-frequency ignorance and illusion – fear is **False Emotion Appearing Real**. The simulation is driven and energised by fear because Wetiko/Yaldabaoth (fear) *are* the simulation. Fear is the absence of love and Wetiko is the absence of love.

Wetiko today

We can now view current events from this level of perspective. The 'Covid' hoax has generated momentous amounts of ongoing fear, anxiety, depression and despair which have empowered Wetiko. No wonder people like Gates have been the instigators when they are Wetiko incarnate and exhibit every trait of Wetiko in the extreme. See how cold and unemotional these people are like Gates and his cronies, how dead of eye they are. That's Wetiko. Sabbatians are Wetiko and everything they control including the World Health Organization, Big Pharma and the 'vaccine' makers, national 'health'

hierarchies, corporate media, Silicon Valley, the banking system, and the United Nations with its planned transformation into world government. All are controlled and possessed by the Wetiko distortion into distorting human society in its image. We are with this knowledge at the gateway to understanding the world. Divisions of race, culture, creed and sexuality are diversions to hide the real division between those possessed and influenced by Wetiko and those that are not. The 'Covid' hoax has brought both clearly into view. Human behaviour is not about race. Tyrants and dictatorships come in all colours and creeds. What unites the US president bombing the innocent and an African tribe committing genocide against another as in Rwanda? What unites them? *Wetiko*. All wars are Wetiko, all genocide is Wetiko, all hunger over centuries in a world of plenty is Wetiko. Children going to bed hungry, including in the West, is Wetiko. Cult-generated Woke racial divisions that focus on the body are designed to obscure the reality that divisions in behaviour are manifestations of mind, not body. Obsession with body identity and group judgement is a means to divert attention from the real source of behaviour – mind and perception. Conflict sown by the Woke both within themselves and with their target groups are Wetiko providing lunch for itself through still more agents of the division, chaos, and fear on which it feeds. The Cult is seeking to assimilate the entirety of humanity and all children and young people into the Wetiko frequency by manipulating them into states of fear and despair. Witness all the suicide and psychological unravelling since the spring of 2020. Wetiko psychopaths want to impose a state of unquestioning obedience to authority which is no more than a conduit for Wetiko to enforce its will and assimilate humanity into itself. It needs us to believe that resistance is futile when it fears resistance and even more so the game-changing non-cooperation with its impositions. It can use violent resistance for its benefit. Violent impositions and violent resistance are *both* Wetiko. The Power of Love with its Power of No will sweep Wetiko from our world. Wetiko and its Cult know that. They just don't want us to know.

AI Wetiko

This brings me to AI or artificial intelligence and something else Wetikos don't want us to know. What is AI *really*? I know about computer code algorithms and AI that learns from data input. These, however, are more diversions, the expeditionary force, for the real AI that they want to connect to the human brain as promoted by Silicon Valley Wetikos like Kurzweil. What is this AI? It is the frequency of *Wetiko*, the frequency of the Archons. The connection of AI to the human brain is the connection of the Wetiko frequency to create a Wetiko hive mind and complete the job of assimilation. The hive mind is planned to be controlled from Israel and China which are both 100 percent owned by Wetiko Sabbatians. The assimilation process has been going on minute by minute in the 'smart' era which fused with the 'Covid' era. We are told that social media is scrambling the minds of the young and changing their personality. This is true, but what is social media? Look more deeply at how it works, how it creates divisions and conflict, the hostility and cruelty, the targeting of people until they are destroyed. That's Wetiko. Social media is manipulated to tune people to the Wetiko frequency with all the emotional exploitation tricks employed by platforms like Facebook and its Wetiko front man, Zuckerberg. Facebook's Instagram announced a new platform for children to overcome a legal bar on them using the main site. This is more Wetiko exploitation and manipulation of kids. Amnesty International likened the plan to foxes offering to guard the henhouse and said it was incompatible with human rights. Since when did Wetiko or Zuckerberg (I repeat myself) care about that? Would Brin and Page at Google, Wojcicki at YouTube, Bezos at Amazon and whoever the hell runs Twitter act as they do if they were not channelling Wetiko? Would those who are developing technologies for no other reason than human control? How about those designing and selling technologies to kill people and Big Pharma drug and 'vaccine' producers who know they will end or devastate lives? Quite a thought for these people to consider is that if you are Wetiko in a human life you are Wetiko on the 'other side' unless your frequency

changes and that can only change by a change of perception which becomes a change of behaviour. Where Gates is going does not bear thinking about although perhaps that's exactly where he wants to go. Either way, that's where he's going. His frequency will make it so.

The frequency lair

I have been saying for a long time that a big part of the addiction to smartphones and devices is that a frequency is coming off them that entraps the mind. People spend ages on their phones and sometimes even a minute or so after they put them down they pick them up again and it all repeats. 'Covid' lockdowns will have increased this addiction a million times for obvious reasons. Addictions to alcohol overindulgence and drugs are another way that Wetiko entraps consciousness to attach to its own. Both are symptoms of low-vibrational psychological distress which alcoholism and drug addiction further compound. Do we think it's really a coincidence that access to them is made so easy while potions that can take people into realms beyond the simulation are banned and illegal? I have explored smartphone addiction in other books, the scale is mind-blowing, and that level of addiction does not come without help. Tech companies that make these phones are Wetiko and they will have no qualms about destroying the minds of children. We are seeing again with these companies the Wetiko perceptual combination of psychopathic enforcers and weak and meek unquestioning compliance by the rank and file.

The global Smart Grid is the Wetiko Grid and it is crucial to complete the Cult endgame. The simulation is radiation and we are being deluged with technological radiation on a devastating scale. Wetiko frauds like Elon Musk serve Cult interests while occasionally criticising them to maintain his street-cred. 5G and other forms of Wi-Fi are being directed at the earth from space on a volume and scale that goes on increasing by the day. Elon Musk's (officially) SpaceX Starlink project is in the process of putting tens of thousands of satellites in low orbit to cover every inch of the planet with 5G and other Wi-Fi to create Kurzweil's global 'cloud' to which the

human mind is planned to be attached very soon. SpaceX has approval to operate 12,000 satellites with more than 1,300 launched at the time of writing and applications filed for 30,000 more. Other operators in the Wi-Fi, 5G, low-orbit satellite market include OneWeb (UK), Telesat (Canada), and AST & Science (US). Musk tells us that AI could be the end of humanity and then launches a company called Neuralink to connect the human brain to computers. Musk's (in theory) Tesla company is building electric cars and the driverless vehicles of the smart control grid. As frauds and bullshitters go Elon Musk in my opinion is Major League.

5G and technological radiation in general are destructive to human health, genetics and psychology and increasing the strength of artificial radiation underpins the five-sense perceptual bubbles which are themselves expressions of radiation or electromagnetism. Freedom activist John Whitehead was so right with his 'databit by databit, we are building our own electronic concentration camps'. The Smart Grid and 5G is a means to control the human mind and infuse perceptual information into The Field to influence anyone in sync with its frequency. You can change perception and behaviour en masse if you can manipulate the population into those levels of frequency and this is happening all around us today. The arrogance of Musk and his fellow Cult operatives knows no bounds in the way that we see with Gates. Musk's satellites are so many in number already they are changing the night sky when viewed from Earth. The astronomy community has complained about this and they have seen nothing yet. Some consequences of Musk's Wetiko hubris include: Radiation; visible pollution of the night sky; interference with astronomy and meteorology; ground and water pollution from intensive use of increasingly many spaceports; accumulating space debris; continual deorbiting and burning up of aging satellites, polluting the atmosphere with toxic dust and smoke; and ever-increasing likelihood of collisions. A collective public open letter of complaint to Musk said:

We are writing to you ... because SpaceX is in process of surrounding the Earth with a network of thousands of satellites whose very purpose is to irradiate every square inch of the

Earth. SpaceX, like everyone else, is treating the radiation as if it were not there. As if the mitochondria in our cells do not depend on electrons moving undisturbed from the food we digest to the oxygen we breathe.

As if our nervous systems and our hearts are not subject to radio frequency interference like any piece of electronic equipment. As if the cancer, diabetes, and heart disease that now afflict a majority of the Earth's population are not metabolic diseases that result from interference with our cellular machinery. As if insects everywhere, and the birds and animals that eat them, are not starving to death as a result.

People like Musk and Gates believe in their limitless Wetiko arrogance that they can do whatever they like to the world because they own it. Consequences for humanity are irrelevant. It's absolutely time that we stopped taking this shit from these self-styled masters of the Earth when you consider where this is going.

Why is the Cult so anti-human?

I hear this question often: Why would they do this when it will affect them, too? Ah, but will it? Who is this *them*? Forget their bodies. They are just vehicles for Wetiko consciousness. When you break it all down to the foundations we are looking at a state of severely distorted consciousness targeting another state of consciousness for assimilation. The rest is detail. The simulation is the fly-trap in which unique sensations of the five senses create a cycle of addiction called reincarnation. Renegade Minds see that everything which happens in our reality is a smaller version of the whole picture in line with the holographic principle. Addiction to the radiation of smart technology is a smaller version of addiction to the whole simulation. Connecting the body/brain to AI is taking that addiction on a giant step further to total ongoing control by assimilating human incarnate consciousness into Wetiko. I have watched during the 'Covid' hoax how many are becoming ever more profoundly attached to Wetiko's perceptual calling cards of aggressive response to any other point of view ('There is no other god but me'), psychopathic lack of compassion and empathy, and servile submission to the narrative and will of authority. Wetiko is the psychopaths *and* subservience to psychopaths. The Cult of Wetiko is

so anti-human because it is *not* human. It embarked on a mission to destroy human by targeting everything that it means to be human and to survive as human. 'Covid' is not the end, just a means to an end. The Cult with its Wetiko consciousness is seeking to change Earth systems, including the atmosphere, to suit them, not humans. The gathering bombardment of 5G alone from ground and space is dramatically changing The Field with which the five senses interact. There is so much more to come if we sit on our hands and hope it will all go away. It is not meant to go away. It is meant to get ever more extreme and we need to face that while we still can – just.

Carbon dioxide is the gas of life. Without that human is over. Kaput, gone, history. No natural world, no human. The Cult has created a cock and bull story about carbon dioxide and climate change to justify its reduction to the point where Gates and the ignoramus Biden 'climate chief' John Kerry want to suck it out of the atmosphere. Kerry wants to do this because his master Gates does. Wetikos have made the gas of life a demon with the usual support from the Wokers of Extinction Rebellion and similar organisations and the bewildered puppet-child that is Greta Thunberg who was put on the world stage by Klaus Schwab and the World Economic Forum. The name Extinction Rebellion is both ironic and as always Wetiko inversion. The gas that we need to survive must be reduced to save us from extinction. The most basic need of human is oxygen and we now have billions walking around in face nappies depriving body and brain of this essential requirement of human existence. More than that 5G at 60 gigahertz interacts with the oxygen molecule to reduce the amount of oxygen the body can absorb into the bloodstream. The obvious knock-on consequences of that for respiratory and cognitive problems and life itself need no further explanation. Psychopaths like Musk are assembling a global system of satellites to deluge the human atmosphere with this insanity. The man should be in jail. Here we have two most basic of human needs, oxygen and carbon dioxide, being dismantled.

Two others, water and food, are getting similar treatment with the United Nations Agendas 21 and 2030 – the Great Reset – planning to

centrally control all water and food supplies. People will not even own rain water that falls on their land. Food is affected at the most basic level by reducing carbon dioxide. We have genetic modification or GMO infiltrating the food chain on a mass scale, pesticides and herbicides polluting the air and destroying the soil. Freshwater fish that provide livelihoods for 60 million people and feed hundreds of millions worldwide are being 'pushed to the brink' according the conservationists while climate change is the only focus. Now we have Gates and Schwab wanting to dispense with current food sources all together and replace them with a synthetic version which the Wetiko Cult would control in terms of production and who eats and who doesn't. We have been on the Totalitarian Tiptoe to this for more than 60 years as food has become ever more processed and full of chemical shite to the point today when it's not natural food at all. As Dr Tom Cowan says: 'If it has a label don't eat it.' Bill Gates is now the biggest owner of farmland in the United States and he does nothing without an ulterior motive involving the Cult. Klaus Schwab wrote: 'To feed the world in the next 50 years we will need to produce as much food as was produced in the last 10,000 years ... food security will only be achieved, however, if regulations on genetically modified foods are adapted to reflect the reality that gene editing offers a precise, efficient and safe method of improving crops.' Liar. People and the world are being targeted with aluminium through vaccines, chemtrails, food, drink cans, and endless other sources when aluminium has been linked to many health issues including dementia which is increasing year after year. Insects, bees and wildlife essential to the food chain are being deleted by pesticides, herbicides and radiation which 5G is dramatically increasing with 6G and 7G to come. The pollinating bee population is being devastated while wildlife including birds, dolphins and whales are having their natural radar blocked by the effects of ever-increasing radiation. In the summer windscreens used to be splattered with insects so numerous were they. It doesn't happen now. Where have they gone?

Synthetic everything

The Cult is introducing genetically-modified versions of trees, plants and insects including a Gates-funded project to unleash hundreds of millions of genetically-modified, lab-altered and patented male mosquitoes to mate with wild mosquitoes and induce genetic flaws that cause them to die out. Clinically-insane Gates-funded Japanese researchers have developed mosquitos that spread vaccine and are dubbed 'flying vaccinators'. Gates is funding the modification of weather patterns in part to sell the myth that this is caused by carbon dioxide and he's funding geoengineering of the skies to change the atmosphere. Some of this came to light with the Gates-backed plan to release tonnes of chalk into the atmosphere to 'deflect the Sun and cool the planet'. Funny how they do this while the heating effect of the Sun is not factored into climate projections focussed on carbon dioxide. The reason is that they want to reduce carbon dioxide (so don't mention the Sun), but at the same time they do want to reduce the impact of the Sun which is so essential to human life and health. I have mentioned the sun-cholesterol-vitamin D connection as they demonise the Sun with warnings about skin cancer (caused by the chemicals in sun cream they tell you to splash on). They come from the other end of the process with statin drugs to reduce cholesterol that turns sunlight into vitamin D. A lack of vitamin D leads to a long list of health effects and how vitamin D levels must have fallen with people confined to their homes over 'Covid'. Gates is funding other forms of geoengineering and most importantly chemtrails which are dropping heavy metals, aluminium and self-replicating nanotechnology onto the Earth which is killing the natural world. See *Everything You Need To Know, But Have Never Been Told* for the detailed background to this.

Every human system is being targeted for deletion by a force that's not human. The Wetiko Cult has embarked on the process of transforming the human body from biological to synthetic biological as I have explained. Biological is being replaced by the artificial and synthetic – Archontic 'countermimicry' – right across human society. The plan eventually is to dispense with the human body altogether

and absorb human consciousness – which it wouldn't really be by then – into cyberspace (the simulation which is Wetiko/Yaldabaoth). Preparations for that are already happening if people would care to look. The alternative media rightly warns about globalism and 'the globalists', but this is far bigger than that and represents the end of the human race as we know it. The 'bad copy' of prime reality that Gnostics describe was a bad copy of harmony, wonder and beauty to start with before Wetiko/Yaldabaoth set out to change the simulated 'copy' into something very different. The process was slow to start with. Entrapped humans in the simulation timeline were not technologically aware and they had to be brought up to intellectual speed while being suppressed spiritually to the point where they could build their own prison while having no idea they were doing so. We have now reached that stage where technological intellect has the potential to destroy us and that's why events are moving so fast. Central American shaman Don Juan Matus said:

Think for a moment, and tell me how you would explain the contradictions between the intelligence of man the engineer and the stupidity of his systems of belief, or the stupidity of his contradictory behaviour. Sorcerers believe that the predators have given us our systems of beliefs, our ideas of good and evil; our social mores. They are the ones who set up our dreams of success or failure. They have given us covetousness, greed, and cowardice. It is the predator who makes us complacent, routinary, and egomaniacal.

In order to keep us obedient and meek and weak, the predators engaged themselves in a stupendous manoeuvre – stupendous, of course, from the point of view of a fighting strategist; a horrendous manoeuvre from the point of those who suffer it. They gave us their mind. The predators' mind is baroque, contradictory, morose, filled with the fear of being discovered any minute now.

For 'predators' see Wetiko, Archons, Yaldabaoth, Jinn, and all the other versions of the same phenomenon in cultures and religions all over the world. The theme is always the same because it's true and it's real. We have reached the point where we have to deal with it. The question is – how?

Don't fight – walk away

I thought I'd use a controversial subheading to get things moving in terms of our response to global fascism. What do you mean 'don't fight'? What do you mean 'walk away'? We've got to fight. We can't walk away. Well, it depends what we mean by fight and walk away. If fighting means physical combat we are playing Wetiko's game and falling for its trap. It wants us to get angry, aggressive, and direct hate and hostility at the enemy we think we must fight. Every war, every battle, every conflict, has been fought with Wetiko leading both sides. It's what it does. Wetiko wants a fight, anywhere, any place. Just hit me, son, so I can hit you back. Wetiko hits Wetiko and Wetiko hits Wetiko in return. I am very forthright as you can see in exposing Wetikos of the Cult, but I don't hate them. I refuse to hate them. It's what they want. What you hate you become. What you *fight* you become. Wokers, 'anti-haters' and 'anti-fascists' prove this every time they reach for their keyboards or don their balaclavas. By walk away I mean to disengage from Wetiko which includes ceasing to cooperate with its tyranny. Paul Levy says of Wetiko:

The way to 'defeat' evil is not to try to destroy it (for then, in playing evil's game, we have already lost), but rather, to find the invulnerable place within ourselves where evil is unable to vanquish us – this is to truly 'win' our battle with evil.

Wetiko is everywhere in human society and it's been on steroids since the 'Covid' hoax. Every shouting match over wearing masks has Wetiko wearing a mask and Wetiko not wearing one. It's an electrical circuit of push and resist, push and resist, with Wetiko pushing *and* resisting. Each polarity is Wetiko empowering itself. Dictionary definitions of 'resist' include 'opposing, refusing to accept or comply with' and the word to focus on is 'opposing'. What form does this take – setting police cars alight or 'refusing to accept or comply with'? The former is Wetiko opposing Wetiko while the other points the way forward. This is the difference between those aggressively demanding that government fascism must be obeyed who stand in stark contrast to the great majority of Pushbackers. We saw this clearly with a march by thousands of Pushbackers against lockdown in London followed days later by a Woker-hijacked

protest in Bristol in which police cars were set on fire. Masks were virtually absent in London and widespread in Bristol. Wetiko wants lockdown on every level of society and infuses its aggression to police it through its unknowing stooges. Lockdown protesters are the ones with the smiling faces and the hugs, The two blatantly obvious states of being – getting more obvious by the day – are the result of Wokers and their like becoming ever more influenced by the simulation Field of Wetiko and Pushbackers ever more influenced by The Field of a far higher vibration beyond the simulation. Wetiko can't invade the heart which is where most lockdown opponents are coming from. It's the heart that allows them to see through the lies to the truth in ways I will be highlighting.

Renegade Minds know that calmness is the place from which wisdom comes. You won't find wisdom in a hissing fit and wisdom is what we need in abundance right now. Calmness is not weakness – you don't have to scream at the top of your voice to be strong. Calmness is indeed a sign of strength. 'No' means I'm not doing it. NOOOO!!! doesn't mean you're not doing it even more. Volume does not advance 'No – I'm not doing it'. You are just not doing it. Wetiko possessed and influenced don't know how to deal with that. Wetiko wants a fight and we should not give it one. What it needs more than anything is our *cooperation* and we should not give that either. Mass rallies and marches are great in that they are a visual representation of feeling, but if it ends there they are irrelevant. You demand that Wetikos act differently? Well, they're not going to are they? They are Wetikos. We don't need to waste our time demanding that something doesn't happen when that will make no difference. We need to delete the means that *allows* it to happen. This, invariably, is our cooperation. You can demand a child stop firing a peashooter at the dog or you can refuse to buy the peashooter. If you provide the means you are cooperating with the dog being smacked on the nose with a pea. How can the authorities enforce mask-wearing if millions in a country refuse? What if the 74 million Pushbackers that voted for Trump in 2020 refused to wear masks, close their businesses or stay in their homes. It would be unenforceable. The

few control the many through the compliance of the many and that's always been the dynamic be it 'Covid' regulations or the Roman Empire. I know people can find it intimidating to say no to authority or stand out in a crowd for being the only one with a face on display; but it has to be done or it's over. I hope I've made clear in this book that where this is going will be far more intimidating than standing up now and saying 'No' – I will not cooperate with my own enslavement and that of my children. There might be consequences for some initially, although not so if enough do the same. The question that must be addressed is what is going to happen if we don't? It is time to be strong and unyieldingly so. No means no. Not here and there, but *everywhere* and *always*. I have refused to wear a mask and obey all the other nonsense. I will not comply with tyranny. I repeat: Fascism is not imposed by fascists – there are never enough of them. Fascism is imposed by the population acquiescing to fascism. *I will not do it*. I will die first, or my body will. Living meekly under fascism is a form of death anyway, the death of the spirit that Martin Luther King described.

Making things happen

We must not despair. This is not over till it's over and it's far from that. The 'fat lady' must refuse to sing. The longer the 'Covid' hoax has dragged on and impacted on more lives we have seen an awakening of phenomenal numbers of people worldwide to the realisation that what they have believed all their lives is not how the world really is. Research published by the system-serving University of Bristol and King's College London in February, 2021, concluded: 'One in every 11 people in Britain say they trust David Icke's take on the coronavirus pandemic.' It will be more by now and we have gathering numbers to build on. We must urgently progress from seeing the scam to ceasing to cooperate with it. Prominent German lawyer Reiner Fuellmich, also licenced to practice law in America, is doing a magnificent job taking the legal route to bring the psychopaths to justice through a second Nuremberg tribunal for crimes against humanity. Fuellmich has an impressive record of

beating the elite in court and he formed the German Corona Investigative Committee to pursue civil charges against the main perpetrators with a view to triggering criminal charges. Most importantly he has grasped the foundation of the hoax – the PCR test not testing for the ‘virus’ – and Christian Drosten is therefore on his charge sheet along with Gates frontman Tedros at the World Health Organization. Major players must not be allowed to inflict their horrors on the human race without being brought to book. A life sentence must follow for Bill Gates and the rest of them. A group of researchers has also indicted the government of Norway for crimes against humanity with copies sent to the police and the International Criminal Court. The lawsuit cites participation in an internationally-planned false pandemic and violation of international law and human rights, the European Commission’s definition of human rights by coercive rules, Nuremberg and Hague rules on fundamental human rights, and the Norwegian constitution. We must take the initiative from hereon and not just complain, protest and react.

There are practical ways to support vital mass non-cooperation. Organising in numbers is one. Lockdown marches in London in the spring in 2021 were mass non-cooperation that the authorities could not stop. There were too many people. Hundreds of thousands walked the London streets in the centre of the road for mile after mile while the Face-Nappies could only look on. They were determined, but calm, and just *did it* with no histrionics and lots of smiles. The police were impotent. Others are organising group shopping without masks for mutual support and imagine if that was happening all over. Policing it would be impossible. If the store refuses to serve people in these circumstances they would be faced with a long line of trolleys full of goods standing on their own and everything would have to be returned to the shelves. How would they cope with that if it kept happening? I am talking here about moving on from complaining to being pro-active; from watching things happen to making things happen. I include in this our relationship with the police. The behaviour of many Face-Nappies

has been disgraceful and anyone who thinks they would never find concentration camp guards in the 'enlightened' modern era have had that myth busted big-time. The period and setting may change – Wetikos never do. I watched film footage from a London march in which a police thug viciously kicked a protestor on the floor who had done nothing. His fellow Face-Nappies stood in a ring protecting him. What he did was a criminal assault and with a crowd far outnumbering the police this can no longer be allowed to happen unchallenged. I get it when people chant 'shame on you' in these circumstances, but that is no longer enough. They *have* no shame those who do this. Crowds needs to start making a citizen's arrest of the police who commit criminal offences and brutally attack innocent people and defenceless women. A citizen's arrest can be made under section 24A of the UK Police and Criminal Evidence (PACE) Act of 1984 and you will find something similar in other countries. I prefer to call it a Common Law arrest rather than citizen's for reasons I will come to shortly. Anyone can arrest a person committing an indictable offence or if they have reasonable grounds to suspect they are committing an indictable offence. On both counts the attack by the police thug would have fallen into this category. A citizen's arrest can be made to stop someone:

- Causing physical injury to himself or any other person
- Suffering physical injury
- Causing loss of or damage to property
- Making off before a constable can assume responsibility for him

A citizen's arrest may also be made to prevent a breach of the peace under Common Law and if they believe a breach of the peace will happen or anything related to harm likely to be done or already done in their presence. This is the way to go I think – the Common Law version. If police know that the crowd and members of the public will no longer be standing and watching while they commit

their thuggery and crimes they will think twice about acting like Brownshirts and Blackshirts.

Common Law – common sense

Mention of Common Law is very important. Most people think the law is the law as in one law. This is not the case. There are two bodies of law, Common Law and Statute Law, and they are not the same. Common Law is founded on the simple premise of do no harm. It does not recognise victimless crimes in which no harm is done while Statute Law does. There is a Statute Law against almost everything. So what is Statute Law? Amazingly it's the law of the *sea* that was brought ashore by the Cult to override the law of the land which is Common Law. They had no right to do this and as always they did it anyway. They had to. They could not impose their will on the people through Common Law which only applies to do no harm. How could you stitch up the fine detail of people's lives with that? Instead they took the law of the sea, or Admiralty Law, and applied it to the population. Statute Law refers to all the laws spewing out of governments and their agencies including all the fascist laws and regulations relating to 'Covid'. The key point to make is that Statute Law is *contract law*. It only applies between *contracting* corporations. Most police officers don't even know this. They have to be kept in the dark, too. Long ago when merchants and their sailing ships began to trade with different countries a contractual law was developed called Admiralty Law and other names. Again it only applied to *contracts* agreed between *corporate* entities. If there is no agreed contract the law of the sea had no jurisdiction *and that still applies to its new alias of Statute Law*. The problem for the Cult when the law of the sea was brought ashore was an obvious one. People were not corporations and neither were government entities. To overcome the latter they made governments and all associated organisations corporations. All the institutions are *private corporations* and I mean governments and their agencies, local councils, police, courts, military, US states, the whole lot. Go to the

Dun and Bradstreet corporate listings website for confirmation that they are all corporations. You are arrested by a private corporation called the police by someone who is really a private security guard and they take you to court which is another private corporation. Neither have jurisdiction over you unless you consent and *contract* with them. This is why you hear the mantra about law enforcement policing by *consent* of the people. In truth the people 'consent' only in theory through monumental trickery.

Okay, the Cult overcame the corporate law problem by making governments and institutions corporate entities; but what about people? They are not corporations are they? Ah ... well in a sense, and *only* a sense, they are. Not people exactly – the illusion of people. The Cult creates a corporation in the name of everyone at the time that their birth certificate is issued. Note birth/ *berth* certificate and when you go to court under the law of the sea on land you stand in a *dock*. These are throwbacks to the origin. My Common Law name is David Vaughan Icke. The name of the corporation created by the government when I was born is called Mr David Vaughan Icke usually written in capitals as MR DAVID VAUGHAN ICKE. That is not me, the living, breathing man. It is a fictitious corporate entity. The trick is to make you think that David Vaughan Icke and MR DAVID VAUGHAN ICKE are the same thing. *They are not*. When police charge you and take you to court they are prosecuting the corporate entity and not the living, breathing, man or woman. They have to trick you into identifying as the corporate entity and contracting with them. Otherwise they have no jurisdiction. They do this through a language known as legalese. Lawful and legal are not the same either. Lawful relates to Common Law and legal relates to Statute Law. Legalese is the language of Statue Law which uses terms that mean one thing to the public and another in legalese. Notice that when a police officer tells someone why they are being charged he or she will say at the end: 'Do you understand?' To the public that means 'Do you comprehend?' In legalese it means 'Do you stand under me?' Do you stand under my authority? If you say

yes to the question you are unknowingly agreeing to give them jurisdiction over you in a contract between two corporate entities.

This is a confidence trick in every way. Contracts have to be agreed between informed parties and if you don't know that David Vaughan Icke is agreeing to be the corporation MR DAVID VAUGHAN ICKE you cannot knowingly agree to contract. They are deceiving you and another way they do this is to ask for proof of identity. You usually show them a driving licence or other document on which your corporate name is written. In doing so you are accepting that you are that corporate entity when you are not. Referring to yourself as a 'person' or 'citizen' is also identifying with your corporate fiction which is why I made the Common Law point about the citizen's arrest. If you are approached by a police officer you identify yourself immediately as a living, breathing, man or woman and say 'I do not consent, I do not contract with you and I do not understand' or stand under their authority. I have a Common Law birth certificate as a living man and these are available at no charge from commonlawcourt.com. Businesses registered under the Statute Law system means that its laws apply. There are, however, ways to run a business under Common Law. Remember all 'Covid' laws and regulations are Statute Law – the law of *contracts* and you do not have to contract. This doesn't mean that you can kill someone and get away with it. Common Law says do no harm and that applies to physical harm, financial harm etc. Police are employees of private corporations and there needs to be a new system of non-corporate Common Law constables operating outside the Statute Law system. If you go to davidicke.com and put Common Law into the search engine you will find videos that explain Common Law in much greater detail. It is definitely a road we should walk.

With all my heart

I have heard people say that we are in a spiritual war. I don't like the term 'war' with its Wetiko dynamic, but I know what they mean. Sweep aside all the bodily forms and we are in a situation in which two states of consciousness are seeking very different realities.

Wetiko wants upheaval, chaos, fear, suffering, conflict and control. The other wants love, peace, harmony, fairness and freedom. That's where we are. We should not fall for the idea that Wetiko is all-powerful and there's nothing we can do. Wetiko is not all-powerful. It's a joke, pathetic. It doesn't have to be, but it has made that choice for now. A handful of times over the years when I have felt the presence of its frequency I have allowed it to attach briefly so I could consciously observe its nature. The experience is not pleasant, the energy is heavy and dark, but the ease with which you can kick it back out the door shows that its real power is in persuading us that it has power. It's all a con. Wetiko is a con. It's a trickster and not a power that can control us if we unleash our own. The con is founded on manipulating humanity to give its power to Wetiko which recycles it back to present the illusion that it has power when its power is *ours* that we gave away. This happens on an energetic level and plays out in the world of the seen as humanity giving its power to Wetiko authority which uses that power to control the population when the power is only the power the population has handed over. How could it be any other way for billions to be controlled by a relative few? I have had experiences with people possessed by Wetiko and again you can kick its arse if you do it with an open heart. Oh yes – the *heart* which can transform the world of perceived 'matter'.

We are receiver-transmitters and processors of information, but what information and where from? Information is processed into perception in three main areas – the brain, the heart and the belly. These relate to thinking, knowing, and emotion. Wetiko wants us to be head and belly people which means we think within the confines of the Matrix simulation and low-vibrational emotional reaction scrambles balance and perception. A few minutes on social media and you see how emotion is the dominant force. Woke is all emotion and is therefore thought-free and fact-free. Our heart is something different. It *knows* while the head *thinks* and has to try to work it out because it doesn't know. The human energy field has seven prime vortexes which connect us with wider reality ([Fig 23](#)). Chakra means

‘wheels of light’ in the Sanskrit language of ancient India. The main ones are: The crown chakra on top of the head; brow (or ‘third eye’) chakra in the centre of the forehead; throat chakra; heart chakra in the centre of the chest; solar plexus chakra below the sternum; sacral chakra beneath the navel; and base chakra at the bottom of the spine. Each one has a particular function or functions. We feel anxiety and nervousness in the belly where the sacral chakra is located and this processes emotion that can affect the colon to give people ‘the shits’ or make them ‘shit scared’ when they are nervous. Chakras all play an important role, but the Mr and Mrs Big is the heart chakra which sits at the centre of the seven, above the chakras that connect us to the ‘physical’ and below those that connect with higher realms (or at least should). Here in the heart chakra we feel love, empathy and compassion – ‘My heart goes out to you’. Those with closed hearts become literally ‘heart-less’ in their attitudes and behaviour (see Bill Gates). Native Americans portrayed Wetiko with what Paul Levy calls a ‘frigid, icy heart, devoid of mercy’ (see Bill Gates).



Figure 23: The chakra system which interpenetrates the human energy field. The heart chakra is the governor – or should be.

Wetiko trembles at the thought of heart energy which it cannot infiltrate. The frequency is too high. What it seeks to do instead is close the heart chakra vortex to block its perceptual and energetic influence. Psychopaths have ‘hearts of stone’ and emotionally-damaged people have ‘heartache’ and ‘broken hearts’. The astonishing amount of heart disease is related to heart chakra

disruption with its fundamental connection to the 'physical' heart. Dr Tom Cowan has written an outstanding book challenging the belief that the heart is a pump and making the connection between the 'physical' and spiritual heart. Rudolph Steiner who was way ahead of his time said the same about the fallacy that the heart is a pump. *What?* The heart is not a pump? That's crazy, right? Everybody knows that. Read Cowan's *Human Heart, Cosmic Heart* and you will realise that the very idea of the heart as a pump is ridiculous when you see the evidence. How does blood in the feet so far from the heart get pumped horizontally up the body by the heart?? Cowan explains in the book the real reason why blood moves as it does. Our 'physical' heart is used to symbolise love when the source is really the heart vortex or spiritual heart which is our most powerful energetic connection to 'out there' expanded consciousness. That's why we feel *knowing* – intuitive knowing – in the centre of the chest. Knowing doesn't come from a process of thoughts leading to a conclusion. It is there in an instant all in one go. Our heart knows because of its connection to levels of awareness that *do* know. This is the meaning and source of intuition – intuitive *knowing*.

For the last more than 30 years of uncovering the global game and the nature of reality my heart has been my constant antenna for truth and accuracy. An American intelligence insider once said that I had quoted a disinformant in one of my books and yet I had only quoted the part that was true. He asked: 'How do you do that?' By using my heart antenna was the answer and anyone can do it. Heart-centred is how we are meant to be. With a closed heart chakra we withdraw into a closed mind and the bubble of five-sense reality. If you take a moment to focus your attention on the centre of your chest, picture a spinning wheel of light and see it opening and expanding. You will feel it happening, too, and perceptions of the heart like joy and love as the heart impacts on the mind as they interact. The more the chakra opens the more you will feel expressions of heart consciousness and as the process continues, and becomes part of you, insights and knowings will follow. An open

heart is connected to that level of awareness that knows all is *One*. You will see from its perspective that the fault-lines that divide us are only illusions to control us. An open heart does not process the illusions of race, creed and sexuality except as brief experiences for a consciousness that is all. Our heart does not see division, only unity (Figs 24 and 25). There's something else, too. Our hearts love to laugh. Mark Twain's quote that says 'The human race has one really effective weapon, and that is laughter' is really a reference to the heart which loves to laugh with the joy of knowing the true nature of infinite reality and that all the madness of human society is an illusion of the mind. Twain also said: 'Against the assault of laughter nothing can stand.' This is so true of Wetiko and the Cult. Their insecurity demands that they be taken seriously and their power and authority acknowledged and feared. We should do nothing of the sort. We should not get aggressive or fearful which their insecurity so desires. We should laugh in their face. Even in their no-face as police come over in their face-nappies and expect to be taken seriously. They don't take themselves seriously looking like that so why should we? Laugh in the face of intimidation. Laugh in the face of tyranny. You will see by its reaction that you have pressed all of its buttons. Wetiko does not know what to do in the face of laughter or when its targets refuse to concede their joy to fear. We have seen many examples during the 'Covid' hoax when people have expressed their energetic power and the string puppets of Wetiko retreat with their tail limp between their knees. Laugh – the world is bloody mad after all and if it's a choice between laughter and tears I know which way I'm going.



Figure 24: Head consciousness without the heart sees division and everything apart from everything else.



Figure 25: Heart consciousness sees everything as One.

'Vaccines' and the soul

The foundation of Wetiko/Archon control of humans is the separation of incarnate five-sense mind from the infinite 'I' and closing the heart chakra where the True 'I' lives during a human life. The goal has been to achieve complete separation in both cases. I was interested therefore to read an account by a French energetic healer of what she said she experienced with a patient who had been given the 'Covid' vaccine. Genuine energy healers can sense information and consciousness fields at different levels of being which are referred to as 'subtle bodies'. She described treating the patient who later returned after having, without the healer's knowledge, two doses of the 'Covid vaccine'. The healer said:

I noticed immediately the change, very heavy energy emanating from [the] subtle bodies. The scariest thing was when I was working on the heart chakra, I connected with her soul: it was detached from the physical body, it had no contact and it was, as if it was floating in a state of total confusion: a damage to the consciousness that loses contact with the physical body, i.e. with our biological machine, there is no longer any communication between them.

I continued the treatment by sending light to the heart chakra, the soul of the person, but it seemed that the soul could no longer receive any light, frequency or energy. It was a very powerful experience for me. Then I understood that this substance is indeed used to detach consciousness so that this consciousness can no longer interact through this body that it possesses in life, where there is no longer any contact, no frequency, no light, no more energetic balance or mind.

This would create a human that is rudderless and at the extreme almost zombie-like operating with a fractional state of consciousness at the mercy of Wetiko. I was especially intrigued by what the healer said in the light of the prediction by the highly-informed Rudolf Steiner more than a hundred years ago. He said:

In the future, we will eliminate the soul with medicine. Under the pretext of a 'healthy point of view', there will be a vaccine by which the human body will be treated as soon as possible directly at birth, so that the human being cannot develop the thought of the existence of soul and Spirit. To materialistic doctors will be entrusted the task of removing the soul of humanity.

As today, people are vaccinated against this disease or that disease, so in the future, children will be vaccinated with a substance that can be produced precisely in such a way that people, thanks to this vaccination, will be immune to being subjected to the 'madness' of spiritual life. He would be extremely smart, but he would not develop a conscience, and that is the true goal of some materialistic circles.

Steiner said the vaccine would detach the physical body from the etheric body (subtle bodies) and 'once the etheric body is detached the relationship between the universe and the etheric body would become extremely unstable, and man would become an automaton'. He said 'the physical body of man must be polished on this Earth by spiritual will – so the vaccine becomes a kind of arymanique (Wetiko) force' and 'man can no longer get rid of a given materialistic feeling'. Humans would then, he said, become 'materialistic of constitution and can no longer rise to the spiritual'. I have been writing for years about DNA being a receiver-transmitter of information that connects us to other levels of reality and these 'vaccines' changing DNA can be likened to changing an antenna and what it can transmit and receive. Such a disconnection would clearly lead to changes in personality and perception. Steiner further predicted the arrival of AI. Big Pharma 'Covid vaccine' makers, expressions of Wetiko, are testing their DNA-manipulating evil on children as I write with a view to giving the 'vaccine' to babies. If it's a soul-body disconnecter – and I say that it is or can be – every child would be disconnected from 'soul' at birth and the 'vaccine' would create a closed system in which spiritual guidance from the greater self would play no part. This has been the ambition of Wetiko all

along. A Pentagon video from 2005 was leaked of a presentation explaining the development of vaccines to change behaviour by their effect on the brain. Those that believe this is not happening with the 'Covid' genetically-modifying procedure masquerading as a 'vaccine' should make an urgent appointment with Naivety Anonymous. Klaus Schwab wrote in 2018:

Neurotechnologies enable us to better influence consciousness and thought and to understand many activities of the brain. They include decoding what we are thinking in fine levels of detail through new chemicals and interventions that can influence our brains to correct for errors or enhance functionality.

The plan is clear and only the heart can stop it. With every heart that opens, every mind that awakens, Wetiko is weakened. Heart and love are far more powerful than head and hate and so nothing like a majority is needed to turn this around.

Beyond the Phantom

Our heart is the prime target of Wetiko and so it must be the answer to Wetiko. We *are* our heart which is part of one heart, the infinite heart. Our heart is where the true self lives in a human life behind firewalls of five-sense illusion when an imposter takes its place – *Phantom Self*; but our heart waits patiently to be set free any time we choose to see beyond the Phantom, beyond Wetiko. A Wetikoed Phantom Self can wreak mass death and destruction while the love of forever is locked away in its heart. The time is here to unleash its power and let it sweep away the fear and despair that is Wetiko. Heart consciousness does not seek manipulated, censored, advantage for its belief or religion, its activism and desires. As an expression of the One it treats all as One with the same rights to freedom and opinion. Our heart demands fairness for itself no more than for others. From this unity of heart we can come together in mutual support and transform this Wetikoed world into what reality is meant to be – a place of love, joy, happiness, fairness, justice and freedom. Wetiko has another agenda and that's why the world is as

it is, but enough of this nonsense. Wetiko can't stay where hearts are open and it works so hard to keep them closed. Fear is its currency and its food source and love in its true sense has no fear. Why would love have fear when it knows it is *All That Is, Has Been, And Ever Can Be* on an eternal exploration of all possibility? Love in this true sense is not the physical attraction that passes for love. This can be an expression of it, yes, but Infinite Love, a love without condition, goes far deeper to the core of all being. It *is* the core of all being. Infinite reality was born from love beyond the illusions of the simulation. Love infinitely expressed is the knowing that all is One and the swiftly-passing experience of separation is a temporary hallucination. You cannot disconnect from Oneness; you can only *perceive* that you have and withdraw from its influence. This is the most important of all perception trickery by the mind parasite that is Wetiko and the foundation of all its potential for manipulation.

If we open our hearts, open the sluice gates of the mind, and redefine self-identity amazing things start to happen. Consciousness expands or contracts in accordance with self-identity. When true self is recognised as infinite awareness and label self – Phantom Self – is seen as only a series of brief experiences life is transformed. Consciousness expands to the extent that self-identity expands and everything changes. You see unity, not division, the picture, not the pixels. From this we can play the long game. No more is an experience something in and of itself, but a fleeting moment in the eternity of forever. Suddenly people in uniform and dark suits are no longer intimidating. Doing what your heart knows to be right is no longer intimidating and consequences for those actions take on the same nature of a brief experience that passes in the blink of an infinite eye. Intimidation is all in the mind. Beyond the mind there is no intimidation.

An open heart does not consider consequences for what it knows to be right. To do so would be to consider not doing what it knows to be right and for a heart in its power that is never an option. The Renegade Mind is really the Renegade Heart. Consideration of consequences will always provide a getaway car for the mind and

the heart doesn't want one. What is right in the light of what we face today is to stop cooperating with Wetiko in all its forms and to do it without fear or compromise. You cannot compromise with tyranny when tyranny always demands more until it has everything. Life is your perception and you are your destiny. Change your perception and you change your life. Change collective perception and we change the world.

Come on people ... One human family, One heart, One goal ...
FREEEEEEEDOM!

We must settle for nothing less.

Postscript

The big scare story as the book goes to press is the 'Indian' variant and the world is being deluged with propaganda about the 'Covid catastrophe' in India which mirrors in its lies and misrepresentations what happened in Italy before the first lockdown in 2020.

The *New York Post* published a picture of someone who had 'collapsed in the street from Covid' in India in April, 2021, which was actually taken during a gas leak in May, 2020. Same old, same old. Media articles in mid-February were asking why India had been so untouched by 'Covid' and then as their vaccine rollout gathered pace the alleged 'cases' began to rapidly increase. Indian 'Covid vaccine' maker Bharat Biotech was funded into existence by the Bill and Melinda Gates Foundation (the pair announced their divorce in May, 2021, which is a pity because they so deserve each other). The Indian 'Covid crisis' was ramped up by the media to terrify the world and prepare people for submission to still more restrictions. The scam that worked the first time was being repeated only with far more people seeing through the deceit. Davidicke.com and Ickonic.com have sought to tell the true story of what is happening by talking to people living through the Indian nightmare which has nothing to do with 'Covid'. We posted a letter from 'Alisha' in Pune who told a very different story to government and media mendacity. She said scenes of dying people and overwhelmed hospitals were designed to hide what was really happening – genocide and starvation. Alisha said that millions had already died of starvation during the ongoing lockdowns while government and media were lying and making it look like the 'virus':

Restaurants, shops, gyms, theatres, basically everything is shut. The cities are ghost towns. Even so-called 'essential' businesses are only open till 11am in the morning. You basically have just an hour to buy food and then your time is up.

Inter-state travel and even inter-district travel is banned. The cops wait at all major crossroads to question why you are traveling outdoors or to fine you if you are not wearing a mask.

The medical community here is also complicit in genocide, lying about hospitals being full and turning away people with genuine illnesses, who need immediate care. They have even created a shortage of oxygen cylinders.

This is the classic Cult modus operandi played out in every country. Alisha said that people who would not have a PCR test not testing for the 'virus' were being denied hospital treatment. She said the people hit hardest were migrant workers and those in rural areas. Most businesses employed migrant workers and with everything closed there were no jobs, no income and no food. As a result millions were dying of starvation or malnutrition. All this was happening under Prime Minister Narendra Modi, a 100-percent asset of the Cult, and it emphasises yet again the scale of pure anti-human evil we are dealing with. Australia banned its people from returning home from India with penalties for trying to do so of up to five years in jail and a fine of £37,000. The manufactured 'Covid' crisis in India was being prepared to justify further fascism in the West. Obvious connections could be seen between the Indian 'vaccine' programme and increased 'cases' and this became a common theme. The Seychelles, the most per capita 'Covid vaccinated' population in the world, went back into lockdown after a 'surge of cases'.

Long ago the truly evil Monsanto agricultural biotechnology corporation with its big connections to Bill Gates devastated Indian farming with genetically-modified crops. Human rights activist Gurcharan Singh highlighted the efforts by the Indian government to complete the job by destroying the food supply to hundreds of millions with 'Covid' lockdowns. He said that 415 million people at the bottom of the disgusting caste system (still going whatever they say) were below the poverty line and struggled to feed themselves every year. Now the government was imposing lockdown at just the

time to destroy the harvest. This deliberate policy was leading to mass starvation. People may reel back at the suggestion that a government would do that, but Wetiko-controlled 'leaders' are capable of any level of evil. In fact what is described in India is in the process of being instigated worldwide. The food chain and food supply are being targeted at every level to cause world hunger and thus control. Bill Gates is not the biggest owner of farmland in America for no reason and destroying access to food aids both the depopulation agenda and the plan for synthetic 'food' already being funded into existence by Gates. Add to this the coming hyper-inflation from the suicidal creation of fake 'money' in response to 'Covid' and the breakdown of container shipping systems and you have a cocktail that can only lead one way and is meant to. The Cult plan is to crash the entire system to 'build back better' with the Great Reset.

'Vaccine' transmission

Reports from all over the world continue to emerge of women suffering menstrual and fertility problems after having the fake 'vaccine' and of the non-'vaccinated' having similar problems when interacting with the 'vaccinated'. There are far too many for 'coincidence' to be credible. We've had menopausal women getting periods, others having periods stop or not stopping for weeks, passing clots, sometimes the lining of the uterus, breast irregularities, and miscarriages (which increased by 400 percent in parts of the United States). Non-'vaccinated' men and children have suffered blood clots and nose bleeding after interaction with the 'vaccinated'. Babies have died from the effects of breast milk from a 'vaccinated' mother. Awake doctors – the small minority – speculated on the cause of non-'vaccinated' suffering the same effects as the 'vaccinated'. Was it nanotechnology in the synthetic substance transmitting frequencies or was it a straight chemical bioweapon that was being transmitted between people? I am not saying that some kind of chemical transmission is not one possible answer, but the foundation of all that the Cult does is frequency and

this is fertile ground for understanding how transmission can happen. American doctor Carrie Madej, an internal medicine physician and osteopath, has been practicing for the last 20 years, teaching medical students, and she says attending different meetings where the agenda for humanity was discussed. Madej, who operates out of Georgia, did not dismiss other possible forms of transmission, but she focused on frequency in search of an explanation for transmission. She said the Moderna and Pfizer 'vaccines' contained nano-lipid particles as a key component. This was a brand new technology never before used on humanity. 'They're using a nanotechnology which is pretty much little tiny computer bits ... nanobots or hydrogel.' Inside the 'vaccines' was 'this sci-fi kind of substance' which suppressed immune checkpoints to get into the cell. I referred to this earlier as the 'Trojan horse' technique that tricks the cell into opening a gateway for the self-replicating synthetic material and while the immune system is artificially suppressed the body has no defences. Madej said the substance served many purposes including an on-demand ability to 'deliver the payload' and using the nano 'computer bits' as biosensors in the body. 'It actually has the ability to accumulate data from your body, like your breathing, your respiration, thoughts, emotions, all kinds of things.'

She said the technology obviously has the ability to operate through Wi-Fi and transmit and receive energy, messages, frequencies or impulses. 'Just imagine you're getting this new substance in you and it can react to things all around you, the 5G, your smart device, your phones.' We had something completely foreign in the human body that had never been launched large scale at a time when we were seeing 5G going into schools and hospitals (plus the Musk satellites) and she believed the 'vaccine' transmission had something to do with this: '... if these people have this inside of them ... it can act like an antenna and actually transmit it outwardly as well.' The synthetic substance produced its own voltage and so it could have that kind of effect. This fits with my own contention that the nano receiver-transmitters are designed to connect people to the

Smart Grid and break the receiver-transmitter connection to expanded consciousness. That would explain the French energy healer's experience of the disconnection of body from 'soul' with those who have had the 'vaccine'. The nanobots, self-replicating inside the body, would also transmit the synthetic frequency which could be picked up through close interaction by those who have not been 'vaccinated'. Madej speculated that perhaps it was 5G and increased levels of other radiation that was causing the symptoms directly although interestingly she said that non-'vaccinated' patients had shown improvement when they were away from the 'vaccinated' person they had interacted with. It must be remembered that you can control frequency and energy with your mind and you can consciously create energetic barriers or bubbles with the mind to stop damaging frequencies from penetrating your field. American paediatrician Dr Larry Palevsky said the 'vaccine' was not a 'vaccine' and was never designed to protect from a 'viral' infection. He called it 'a massive, brilliant propaganda of genocide' because they didn't have to inject everyone to get the result they wanted. He said the content of the jabs was able to infuse any material into the brain, heart, lungs, kidneys, liver, sperm and female productive system. 'This is genocide; this is a weapon of mass destruction.' At the same time American colleges were banning students from attending if they didn't have this life-changing and potentially life-ending 'vaccine'. Class action lawsuits must follow when the consequences of this college fascism come to light. As the book was going to press came reports about fertility effects on sperm in 'vaccinated' men which would absolutely fit with what I have been saying and hospitals continued to fill with 'vaccine' reactions. Another question is what about transmission via blood transfusions? The NHS has extended blood donation restrictions from seven days after a 'Covid vaccination' to 28 days after even a sore arm reaction.

I said in the spring of 2020 that the then touted 'Covid vaccine' would be ongoing each year like the flu jab. A year later Pfizer CEO, the appalling Albert Bourla, said people would 'likely' need a 'booster dose' of the 'vaccine' within 12 months of getting 'fully

vaccinated' and then a yearly shot. 'Variants will play a key role', he said confirming the point. Johnson & Johnson CEO Alex Gorsky also took time out from his 'vaccine' disaster to say that people may need to be vaccinated against 'Covid-19' each year. UK Health Secretary, the psychopath Matt Hancock, said additional 'boosters' would be available in the autumn of 2021. This is the trap of the 'vaccine passport'. The public will have to accept every last 'vaccine' they introduce, including for the fake 'variants', or it would cease to be valid. The only other way in some cases would be continuous testing with a test not testing for the 'virus' and what is on the swabs constantly pushed up your nose towards the brain every time?

'Vaccines' changing behaviour

I mentioned in the body of the book how I believed we would see gathering behaviour changes in the 'vaccinated' and I am already hearing such comments from the non-'vaccinated' describing behaviour changes in friends, loved ones and work colleagues. This will only increase as the self-replicating synthetic material and nanoparticles expand in body and brain. An article in the *Guardian* in 2016 detailed research at the University of Virginia in Charlottesville which developed a new method for controlling brain circuits associated with complex animal behaviour. The method, dubbed 'magnetogenetics', involves genetically-engineering a protein called ferritin, which stores and releases iron, to create a magnetised substance – 'Magneto' – that can activate specific groups of nerve cells from a distance. This is claimed to be an advance on other methods of brain activity manipulation known as optogenetics and chemogenetics (the Cult has been developing methods of brain control for a long time). The ferritin technique is said to be non-invasive and able to activate neurons 'rapidly and reversibly'. In other words, human thought and perception. The article said that earlier studies revealed how nerve cell proteins 'activated by heat and mechanical pressure can be genetically engineered so that they become sensitive to radio waves and magnetic fields, by attaching them to an iron-storing protein called ferritin, or to inorganic

paramagnetic particles'. Sensitive to radio waves and magnetic fields? You mean like 5G, 6G and 7G? This is the human-AI Smart Grid hive mind we are talking about. The *Guardian* article said:

... the researchers injected Magneto into the striatum of freely behaving mice, a deep brain structure containing dopamine-producing neurons that are involved in reward and motivation, and then placed the animals into an apparatus split into magnetised and non-magnetised sections.

Mice expressing Magneto spent far more time in the magnetised areas than mice that did not, because activation of the protein caused the striatal neurons expressing it to release dopamine, so that the mice found being in those areas rewarding. This shows that Magneto can remotely control the firing of neurons deep within the brain, and also control complex behaviours.

Make no mistake this basic methodology will be part of the 'Covid vaccine' cocktail and using magnetics to change brain function through electromagnetic field frequency activation. The Pentagon is developing a 'Covid vaccine' using ferritin. Magnetism would explain changes in behaviour and why videos are appearing across the Internet as I write showing how magnets stick to the skin at the point of the 'vaccine' shot. Once people take these 'vaccines' anything becomes possible in terms of brain function and illness which will be blamed on 'Covid-19' and 'variants'. Magnetic field manipulation would further explain why the non-'vaccinated' are reporting the same symptoms as the 'vaccinated' they interact with and why those symptoms are reported to decrease when not in their company. Interestingly 'Magneto', a 'mutant', is a character in the Marvel Comic *X-Men* stories with the ability to manipulate magnetic fields and he believes that mutants should fight back against their human oppressors by any means necessary. The character was born Erik Lehnsherr to a Jewish family in Germany.

Cult-controlled courts

The European Court of Human Rights opened the door for mandatory 'Covid-19 vaccines' across the continent when it ruled in a Czech Republic dispute over childhood immunisation that legally

enforced vaccination could be 'necessary in a democratic society'. The 17 judges decided that compulsory vaccinations did not breach human rights law. On the face of it the judgement was so inverted you gasp for air. If not having a vaccine infused into your body is not a human right then what is? Ah, but they said human rights law which has been specifically written to delete all human rights at the behest of the state (the Cult). Article 8 of the European Convention on Human Rights relates to the right to a private life. The crucial word here is '*except*':

There shall be no interference by a public authority with the exercise of this right EXCEPT such as is in accordance with the law and is necessary in a democratic society in the interests of national security, public safety or the economic wellbeing of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others [My emphasis].

No interference *except* in accordance with the law means there *are* no 'human rights' *except* what EU governments decide you can have at their behest. 'As is necessary in a democratic society' explains that reference in the judgement and 'in the interests of national security, public safety or the economic well-being of the country, for the prevention of disorder or crime, for the protection of health or morals, or for the protection of the rights and freedoms of others' gives the EU a coach and horses to ride through 'human rights' and scatter them in all directions. The judiciary is not a check and balance on government extremism; it is a vehicle to enforce it. This judgement was almost laughably predictable when the last thing the Cult wanted was a decision that went against mandatory vaccination. Judges rule over and over again to benefit the system of which they are a part. Vaccination disputes that come before them are invariably delivered in favour of doctors and authorities representing the view of the state which owns the judiciary. Oh, yes, and we have even had calls to stop putting 'Covid-19' on death certificates within 28 days of a 'positive test' because it is claimed the practice makes the 'vaccine' appear not to work. They are laughing at you.

The scale of madness, inhumanity and things to come was highlighted when those not 'vaccinated' for 'Covid' were refused evacuation from the Caribbean island of St Vincent during massive volcanic eruptions. Cruise ships taking residents to the safety of another island allowed only the 'vaccinated' to board and the rest were left to their fate. Even in life and death situations like this we see 'Covid' stripping people of their most basic human instincts and the insanity is even more extreme when you think that fake 'vaccine'-makers are not even claiming their body-manipulating concoctions stop 'infection' and 'transmission' of a 'virus' that doesn't exist. St Vincent Prime Minister Ralph Gonsalves said: 'The chief medical officer will be identifying the persons already vaccinated so that we can get them on the ship.' Note again the power of the chief medical officer who, like Whitty in the UK, will be answering to the World Health Organization. This is the Cult network structure that has overridden politicians who 'follow the science' which means doing what WHO-controlled 'medical officers' and 'science advisers' tell them. Gonsalves even said that residents who were 'vaccinated' after the order so they could board the ships would still be refused entry due to possible side effects such as 'wooziness in the head'. The good news is that if they were woozy enough in the head they could qualify to be prime minister of St Vincent.

Microchipping freedom

The European judgement will be used at some point to justify moves to enforce the 'Covid' DNA-manipulating procedure. Sandra Ro, CEO of the Global Blockchain Business Council, told a World Economic Forum event that she hoped 'vaccine passports' would help to 'drive forced consent and standardisation' of global digital identity schemes: 'I'm hoping with the desire and global demand for some sort of vaccine passport – so that people can get travelling and working again – [it] will drive forced consent, standardisation, and frankly, cooperation across the world.' The lady is either not very bright, or thoroughly mendacious, to use the term 'forced consent'.

You do not 'consent' if you are forced – you *submit*. She was describing what the plan has been all along and that's to enforce a digital identity on every human without which they could not function. 'Vaccine passports' are opening the door and are far from the end goal. A digital identity would allow you to be tracked in everything you do in cyberspace and this is the same technique used by Cult-owned China to enforce its social credit system of total control. The ultimate 'passport' is planned to be a microchip as my books have warned for nearly 30 years. Those nice people at the Pentagon working for the Cult-controlled Defense Advanced Research Projects Agency (DARPA) claimed in April, 2021, they have developed a microchip inserted under the skin to detect 'asymptomatic Covid-19 infection' before it becomes an outbreak and a 'revolutionary filter' that can remove the 'virus' from the blood when attached to a dialysis machine. The only problems with this are that the 'virus' does not exist and people transmitting the 'virus' with no symptoms is brain-numbing bullshit. This is, of course, not a ruse to get people to be microchipped for very different reasons. DARPA also said it was producing a one-stop 'vaccine' for the 'virus' and all 'variants'. One of the most sinister organisations on Planet Earth is doing this? Better have it then. These people are insane because Wetiko that possesses them is insane.

Researchers from the Salk Institute in California announced they have created an embryo that is part human and part monkey. My books going back to the 1990s have exposed experiments in top secret underground facilities in the United States where humans are being crossed with animal and non-human 'extraterrestrial' species. They are now easing that long-developed capability into the public arena and there is much more to come given we are dealing with psychiatric basket cases. Talking of which – Elon Musk's scientists at Neuralink trained a monkey to play Pong and other puzzles on a computer screen using a joystick and when the monkey made the correct move a metal tube squirted banana smoothie into his mouth which is the basic technique for training humans into unquestioning compliance. Two Neuralink chips were in the monkey's skull and

more than 2,000 wires ‘fanned out’ into its brain. Eventually the monkey played a video game purely with its brain waves. Psychopathic narcissist Musk said the ‘breakthrough’ was a step towards putting Neuralink chips into human skulls and merging minds with artificial intelligence. *Exactly*. This man is so dark and Cult to his DNA.

World Economic Fascism (WEF)

The World Economic Forum is telling you the plan by the statements made at its many and various events. Cult-owned fascist YouTube CEO Susan Wojcicki spoke at the 2021 WEF Global Technology Governance Summit (see the name) in which 40 governments and 150 companies met to ensure ‘the responsible design and deployment of emerging technologies’. Orwellian translation: ‘Ensuring the design and deployment of long-planned technologies will advance the Cult agenda for control and censorship.’ Freedom-destroyer and Nuremberg-bound Wojcicki expressed support for tech platforms like hers to censor content that is ‘technically legal but could be harmful’. Who decides what is ‘harmful’? She does and they do. ‘Harmful’ will be whatever the Cult doesn’t want people to see and we have legislation proposed by the UK government that would censor content on the basis of ‘harm’ no matter if the information is fair, legal and provably true. Make that *especially* if it is fair, legal and provably true. Wojcicki called for a global coalition to be formed to enforce content moderation standards through automated censorship. This is a woman and mega-censor so self-deluded that she shamelessly accepted a ‘free expression’ award – *Wojcicki* – in an event sponsored by her own *YouTube*. They have no shame and no self-awareness.

You know that ‘Covid’ is a scam and Wojcicki a Cult operative when YouTube is censoring medical and scientific opinion purely on the grounds of whether it supports or opposes the Cult ‘Covid’ narrative. Florida governor Ron DeSantis compiled an expert panel with four professors of medicine from Harvard, Oxford, and Stanford Universities who spoke against forcing children and

vaccinated people to wear masks. They also said there was no proof that lockdowns reduced spread or death rates of 'Covid-19'. Cult-gofer Wojcicki and her YouTube deleted the panel video 'because it included content that contradicts the consensus of local and global health authorities regarding the efficacy of masks to prevent the spread of Covid-19'. This 'consensus' refers to what the Cult tells the World Health Organization to say and the WHO tells 'local health authorities' to do. Wojcicki knows this, of course. The panellists pointed out that censorship of scientific debate was responsible for deaths from many causes, but Wojcicki couldn't care less. She would not dare go against what she is told and as a disgrace to humanity she wouldn't want to anyway. The UK government is seeking to pass a fascist 'Online Safety Bill' to specifically target with massive fines and other means non-censored video and social media platforms to make them censor 'lawful but harmful' content like the Cult-owned Facebook, Twitter, Google and YouTube. What is 'lawful but harmful' would be decided by the fascist Blair-created Ofcom.

Another WEF obsession is a cyber-attack on the financial system and this is clearly what the Cult has planned to take down the bank accounts of everyone – except theirs. Those that think they have enough money for the Cult agenda not to matter to them have got a big lesson coming if they continue to ignore what is staring them in the face. The World Economic Forum, funded by Gates and fronted by Klaus Schwab, announced it would be running a 'simulation' with the Russian government and global banks of just such an attack called Cyber Polygon 2021. What they simulate – as with the 'Covid' Event 201 – they plan to instigate. The WEF is involved in a project with the Cult-owned Carnegie Endowment for International Peace called the WEF-Carnegie Cyber Policy Initiative which seeks to merge Wall Street banks, 'regulators' (I love it) and intelligence agencies to 'prevent' (arrange and allow) a cyber-attack that would bring down the global financial system as long planned by those that control the WEF and the Carnegie operation. The Carnegie Endowment for International Peace sent an instruction to First World

War US President Woodrow Wilson not to let the war end before society had been irreversibly transformed.

The Wuhan lab diversion

As I close, the Cult-controlled authorities and lapdog media are systematically pushing 'the virus was released from the Wuhan lab' narrative. There are two versions – it happened by accident and it happened on purpose. Both are nonsense. The perceived existence of the never-shown-to-exist 'virus' is vital to sell the impression that there is actually an infective agent to deal with and to allow the endless potential for terrifying the population with 'variants' of a 'virus' that does not exist. The authorities at the time of writing are going with the 'by accident' while the alternative media is promoting the 'on purpose'. Cable news host Tucker Carlson who has questioned aspects of lockdown and 'vaccine' compulsion has bought the Wuhan lab story. 'Everyone now agrees' he said. Well, I don't and many others don't and the question is *why* does the system and its media suddenly 'agree'? When the media moves as one unit with a narrative it is always a lie – witness the hour by hour mendacity of the 'Covid' era. Why would this Cult-owned combination which has unleashed lies like machine gun fire suddenly 'agree' to tell the truth??

Much of the alternative media is buying the lie because it fits the conspiracy narrative, but it's the *wrong* conspiracy. The real conspiracy is that *there is no virus* and that is what the Cult is desperate to hide. The idea that the 'virus' was released by accident is ludicrous when the whole 'Covid' hoax was clearly long-planned and waiting to be played out as it was so fast in accordance with the Rockefeller document and Event 201. So they prepared everything in detail over decades and then sat around strumming their fingers waiting for an 'accidental' release from a bio-lab? *What??* It's crazy. Then there's the 'on purpose' claim. You want to circulate a 'deadly virus' and hide the fact that you've done so and you release it down the street from the highest-level bio-lab in China? I repeat – *What??*

You would release it far from that lab to stop any association being made. But, no, we'll do it in a place where the connection was certain to be made. Why would you need to scam 'cases' and 'deaths' and pay hospitals to diagnose 'Covid-19' if you had a real 'virus'? What are sections of the alternative media doing believing this crap? Where were all the mass deaths in Wuhan from a 'deadly pathogen' when the recovery to normal life after the initial propaganda was dramatic in speed? Why isn't the 'deadly pathogen' now circulating all over China with bodies in the street? Once again we have the technique of tell them what they want to hear and they will likely believe it. The alternative media has its 'conspiracy' and with Carlson it fits with his 'China is the danger' narrative over years. China *is* a danger as a global Cult operations centre, but not for this reason. The Wuhan lab story also has the potential to instigate conflict with China when at some stage the plan is to trigger a Problem-Reaction-Solution confrontation with the West. Question everything – *everything* – and especially when the media agrees on a common party line.

Third wave ... fourth wave ... fifth wave ...

As the book went into production the world was being set up for more lockdowns and a 'third wave' supported by invented 'variants' that were increasing all the time and will continue to do so in public statements and computer programs, but not in reality. India became the new Italy in the 'Covid' propaganda campaign and we were told to be frightened of the new 'Indian strain'. Somehow I couldn't find it within myself to do so. A document produced for the UK government entitled 'Summary of further modelling of easing of restrictions – Roadmap Step 2' declared that a third wave was inevitable (of course when it's in the script) and it would be the fault of children and those who refuse the health-destroying fake 'Covid vaccine'. One of the computer models involved came from the Cult-owned *Imperial College* and the other from Warwick University which I wouldn't trust to tell me the date in a calendar factory. The document states that both models presumed extremely high uptake

of the 'Covid vaccines' and didn't allow for 'variants'. The document states: 'The resurgence is a result of some people (mostly children) being ineligible for vaccination; others choosing not to receive the vaccine; and others being vaccinated but not perfectly protected.' The mendacity takes the breath away. Okay, blame those with a brain who won't take the DNA-modifying shots and put more pressure on children to have it as 'trials' were underway involving children as young as six months with parents who give insanity a bad name. Massive pressure is being put on the young to have the fake 'vaccine' and child age consent limits have been systematically lowered around the world to stop parents intervening. Most extraordinary about the document was its claim that the 'third wave' would be driven by 'the resurgence in both hospitalisations and deaths ... dominated by *those that have received two doses of the vaccine*, comprising around 60-70% of the wave respectively'. The predicted peak of the 'third wave' suggested 300 deaths per day with 250 of them *fully 'vaccinated' people*. How many more lies do acquiescers need to be told before they see the obvious? Those who took the jab to 'protect themselves' are projected to be those who mostly get sick and die? So what's in the 'vaccine'? The document went on:

It is possible that a summer of low prevalence could be followed by substantial increases in incidence over the following autumn and winter. Low prevalence in late summer should not be taken as an indication that SARS-CoV-2 has retreated or that the population has high enough levels of immunity to prevent another wave.

They are telling you the script and while many British people believed 'Covid' restrictions would end in the summer of 2021 the government was preparing for them to be ongoing. Authorities were awarding contracts for 'Covid marshals' to police the restrictions with contracts starting in July, 2021, and going through to January 31st, 2022, and the government was advertising for 'Media Buying Services' to secure media propaganda slots worth a potential £320 million for 'Covid-19 campaigns' with a contract not ending until March, 2022. The recipient – via a list of other front companies – was reported to be American media marketing giant Omnicom Group

Inc. While money is no object for 'Covid' the UK waiting list for all other treatment – including life-threatening conditions – passed 4.5 million. Meantime the Cult is seeking to control all official 'inquiries' to block revelations about what has really been happening and why. It must not be allowed to – we need Nuremberg jury trials in every country. The cover-up doesn't get more obvious than appointing ultra-Zionist professor Philip Zelikow to oversee two dozen US virologists, public health officials, clinicians, former government officials and four American 'charitable foundations' to 'learn the lessons' of the 'Covid' debacle. The personnel will be those that created and perpetuated the 'Covid' lies while Zelikow is the former executive director of the 9/11 Commission who ensured that the truth about those attacks never came out and produced a report that must be among the most mendacious and manipulative documents ever written – see *The Trigger* for the detailed exposure of the almost unimaginable 9/11 story in which Sabbatians can be found at every level.

Passive no more

People are increasingly challenging the authorities with amazing numbers of people taking to the streets in London well beyond the ability of the Face-Nappies to stop them. Instead the Nappies choose situations away from the mass crowds to target, intimidate, and seek to promote the impression of 'violent protestors'. One such incident happened in London's Hyde Park. Hundreds of thousands walking through the streets in protest against 'Covid' fascism were ignored by the Cult-owned BBC and most of the rest of the mainstream media, but they delighted in reporting how police were injured in 'clashes with protestors'. The truth was that a group of people gathered in Hyde Park at the end of one march when most had gone home and they were peacefully having a good time with music and chat. Face-Nappies who couldn't deal with the full-march crowd then waded in with their batons and got more than they bargained for. Instead of just standing for this criminal brutality the crowd used their numerical superiority to push the Face-Nappies out of the

park. Eventually the Nappies turned and ran. Unfortunately two or three idiots in the crowd threw drink cans striking two officers which gave the media and the government the image they wanted to discredit the 99.9999 percent who were peaceful. The idiots walked straight into the trap and we must always be aware of potential agent provocateurs used by the authorities to discredit their targets.

This response from the crowd – the can people apart – must be a turning point when the public no longer stand by while the innocent are arrested and brutally attacked by the Face-Nappies. That doesn't mean to be violent, that's the last thing we need. We'll leave the violence to the Face-Nappies and government. But it does mean that when the Face-Nappies use violence against peaceful people the numerical superiority is employed to stop them and make citizen's arrests or Common Law arrests for a breach of the peace. The time for being passive in the face of fascism is over.

We are the many, they are the few, and we need to make that count before there is no freedom left and our children and grandchildren face an ongoing fascist nightmare.

COME ON PEOPLE – IT'S TIME.

One final thought ...

The power of love
A force from above
Cleaning my soul
Flame on burn desire
Love with tongues of fire
Purge the soul
Make love your goal

I'll protect you from the hooded claw
Keep the vampires from your door
When the chips are down I'll be around
With my undying, death-defying
Love for you

Envy will hurt itself
Let yourself be beautiful
Sparkling love, flowers
And pearls and pretty girls
Love is like an energy
Rushin' rushin' inside of me

This time we go sublime
Lovers entwine, divine, divine,
Love is danger, love is pleasure
Love is pure – the only treasure

I'm so in love with you
Purge the soul
Make love your goal

The power of love
A force from above
Cleaning my soul
The power of love
A force from above
A sky-scraping dove

Flame on burn desire
Love with tongues of fire
Purge the soul
Make love your goal

Frankie Goes To Hollywood

APPENDIX

Cowan-Kaufman-Morell Statement on Virus Isolation (SOVI)

Isolation: The action of isolating; the fact or condition of being isolated or standing alone; separation from other things or persons; solitariness

Oxford English Dictionary

The controversy over whether the SARS-CoV-2 virus has ever been isolated or purified continues. However, using the above definition, common sense, the laws of logic and the dictates of science, any unbiased person must come to the conclusion that the SARS-CoV-2 virus has never been isolated or purified. As a result, no confirmation of the virus' existence can be found. The logical, common sense, and scientific consequences of this fact are:

- the structure and composition of something not shown to exist can't be known, including the presence, structure, and function of any hypothetical spike or other proteins;
- the genetic sequence of something that has never been found can't be known;
- "variants" of something that hasn't been shown to exist can't be known;
- it's impossible to demonstrate that SARS-CoV-2 causes a disease called Covid-19.

In as concise terms as possible, here's the proper way to isolate, characterize and demonstrate a new virus. First, one takes samples (blood, sputum, secretions) from many people (e.g. 500) with symptoms which are unique and specific enough to characterize an illness. Without mixing these samples with ANY tissue or products that also contain genetic material, the virologist macerates, filters and ultracentrifuges i.e. *purifies* the specimen. This common virology technique, done for decades to isolate bacteriophages¹ and so-called giant viruses in every virology lab, then allows the virologist to demonstrate with electron microscopy thousands of identically sized and shaped particles. These particles are the isolated and purified virus.

These identical particles are then checked for uniformity by physical and/or microscopic techniques. Once the purity is determined, the particles may be further characterized. This would include examining the structure, morphology, and chemical composition of the particles. Next, their genetic makeup is characterized by extracting the genetic material directly from the purified particles and using genetic-sequencing techniques, such as Sanger sequencing, that have also been around for decades. Then one does an analysis to confirm that these uniform particles are exogenous (outside) in origin as a virus is conceptualized to be, and not the normal breakdown products of dead and dying tissues.² (As of May 2020, we know that virologists have no way to determine whether the particles they're seeing are viruses or just normal breakdown products of dead and dying tissues.)³

1 Isolation, characterization and analysis of bacteriophages from the haloalkaline lake Elmenteita, Kenya Julia Khayeli Akhwale et al, PLOS One, Published: April 25, 2019.
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0215734> – accessed 2/15/21

2 "Extracellular Vesicles Derived From Apoptotic Cells: An Essential Link Between Death and Regeneration," Maojiao Li et al, Frontiers in Cell and Developmental Biology, 2020 October 2.
<https://www.frontiersin.org/articles/10.3389/fcell.2020.573511/full> – accessed 2/15/21

If we have come this far then we have fully isolated, characterized, and genetically sequenced an exogenous virus particle. However, we still have to show it is causally related to a disease. This is carried out by exposing a group of healthy subjects (animals are usually used) to this isolated, purified virus in the manner in which the disease is thought to be transmitted. If the animals get sick with the same disease, as confirmed by clinical and autopsy findings, one has now shown that the virus actually causes a disease. This demonstrates infectivity and transmission of an infectious agent.

None of these steps has even been attempted with the SARS-CoV-2 virus, nor have all these steps been successfully performed for any so-called pathogenic virus. Our research indicates that a single study showing these steps does not exist in the medical literature.

Instead, since 1954, virologists have taken unpurified samples from a relatively few people, often less than ten, with a similar disease. They then minimally process this sample and inoculate this unpurified sample onto tissue culture containing usually four to six other types of material – all of which contain identical genetic material as to what is called a “virus.” The tissue culture is starved and poisoned and naturally disintegrates into many types of particles, some of which contain genetic material. Against all common sense, logic, use of the English language and scientific integrity, this process is called “virus isolation.” This brew containing fragments of genetic material from many sources is then subjected to genetic analysis, which then creates in a computer-simulation process the alleged sequence of the alleged virus, a so called in silico genome. At no time is an actual virus confirmed by electron microscopy. At no time is a genome extracted and sequenced from an actual virus. This is scientific fraud.

The observation that the unpurified specimen — inoculated onto tissue culture along with toxic antibiotics, bovine fetal tissue, amniotic fluid and other tissues — destroys the kidney tissue onto which it is inoculated is given as evidence of the virus' existence and pathogenicity. This is scientific fraud.

From now on, when anyone gives you a paper that suggests the SARS-CoV-2 virus has been isolated, please check the methods sections. If the researchers used Vero cells or any other culture method, you know that their process was not isolation. You will hear the following excuses for why actual isolation isn't done:

1. There were not enough virus particles found in samples from patients to analyze.
2. Viruses are intracellular parasites; they can't be found outside the cell in this manner.

If No. 1 is correct, and we can't find the virus in the sputum of sick people, then on what evidence do we think the virus is dangerous or even lethal? If No. 2 is correct, then how is the virus spread from person to person? We are told it emerges from the cell to infect others. Then why isn't it possible to find it?

Finally, questioning these virology techniques and conclusions is not some distraction or divisive issue. Shining the light on this truth is essential to stop this terrible fraud that humanity is confronting. For, as we now know, if the virus has never been isolated, sequenced or shown to cause illness, if the virus is imaginary, then why are we wearing masks, social distancing and putting the whole world into prison?

Finally, if pathogenic viruses don't exist, then what is going into those injectable devices erroneously called "vaccines," and what is their purpose? This scientific question is the most urgent and relevant one of our time.

We are correct. The SARS-CoV2 virus does not exist.

Sally Fallon Morell, MA

Dr. Thomas Cowan, MD

Dr. Andrew Kaufman, MD

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Index

A

abusive relationships

- blaming themselves, abused as [ref1](#)
- children [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
- conspiracy theories [ref1](#)
- domestic abuse [ref1](#), [ref2](#)
- economic abuse and dependency [ref1](#)
- isolation [ref1](#)
- physical abuse [ref1](#)
- psychological abuse [ref1](#)
- signs of abuse [ref1](#)

addiction

- alcoholism [ref1](#)
- frequencies [ref1](#)
- substance abuse [ref1](#), [ref2](#)
- technology [ref1](#), [ref2](#), [ref3](#)

Adelson, Sheldon [ref1](#), [ref2](#), [ref3](#)

Agenda 21/Agenda 2030 (UN) [ref1](#), [ref2](#), [ref3](#), [ref4](#)

AIDs/HIV [ref1](#)

- causal link between HIV and AIDs [ref1](#), [ref2](#)

retroviruses [ref1](#)

- testing [ref1](#), [ref2](#)
- trial-run for Covid-19, as [ref1](#), [ref2](#)

aliens/extraterrestrials [ref1](#), [ref2](#)

aluminium [ref1](#)

Amazon [ref1](#), [ref2](#), [ref3](#)

amplification cycles [ref1](#), [ref2](#)
anaphylactic shock [ref1](#), [ref2](#), [ref3](#), [ref4](#)
animals [ref1](#), [ref2](#), [ref3](#)
antibodies [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Antifa [ref1](#), [ref2](#), [ref3](#), [ref4](#)
antigens [ref1](#), [ref2](#)
anti-Semitism [ref1](#), [ref2](#), [ref3](#)
Archons [ref1](#), [ref2](#)
 consciousness [ref1](#), [ref2](#), [ref3](#)
 energy [ref1](#), [ref2](#), [ref3](#)
 ennoa [ref1](#)
 genetic manipulation [ref1](#), [ref2](#)
 inversion [ref1](#), [ref2](#), [ref3](#)
 lockdowns [ref1](#)
 money [ref1](#)
 radiation [ref1](#)
 religion [ref1](#), [ref2](#)
 technology [ref1](#), [ref2](#), [ref3](#)
 Wetiko factor [ref1](#), [ref2](#), [ref3](#), [ref4](#)
artificial intelligence (AI) [ref1](#)
army made up of robots [ref1](#), [ref2](#)
 Human 2.0 [ref1](#), [ref2](#)
 Internet [ref1](#)
 MHRA [ref1](#)
 Morgellons fibres [ref1](#), [ref2](#)
 Smart Grid [ref1](#)
 Wetiko factor [ref1](#)
asymptomatic, Covid-19 as [ref1](#), [ref2](#), [ref3](#)
aviation industry [ref1](#)

B

banking, finance and money [ref1](#), [ref2](#), [ref3](#)

2008 crisis [ref1](#), [ref2](#)

boom and bust [ref1](#)

cashless digital money systems [ref1](#)

central banks [ref1](#)

credit [ref1](#)

digital currency [ref1](#)

fractional reserve lending [ref1](#)

Great Reset [ref1](#)

guaranteed income [ref1](#), [ref2](#), [ref3](#)

Human 2.0 [ref1](#)

incomes, destruction of [ref1](#), [ref2](#)

interest [ref1](#)

one per cent [ref1](#), [ref2](#)

scams [ref1](#)

BBC [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Becker-Phelps, Leslie [ref1](#)

Behavioural Insights Team (BIT) (Nudge Unit) [ref1](#), [ref2](#), [ref3](#)

behavioural scientists *and* psychologists, advice from [ref1](#), [ref2](#)

Bezos, Jeff [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Biden, Hunter [ref1](#)

Biden, Joe [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#), [ref11](#),
[ref12](#), [ref13](#), [ref14](#), [ref15](#), [ref16](#), [ref17](#)

Big Pharma

cholesterol [ref1](#)

health professionals [ref1](#), [ref2](#)

immunity from prosecution in US [ref1](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Wetiko factor [ref1](#), [ref2](#)

WHO [ref1](#), [ref2](#), [ref3](#)

Bill and Melinda Gates Foundation [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#),
[ref7](#)

billionaires [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#) [ref10](#), [ref11](#)
bird flu (H5N1) [ref1](#)
Black Lives Matter (BLM) [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Blair, Tony [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Brin, Sergei [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
British Empire [ref1](#)
Bush, George HW [ref1](#), [ref2](#)
Bush, George W [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Byrd, Robert [ref1](#)

C

Canada

Global Cult [ref1](#)
hate speech [ref1](#)
internment [ref1](#)
masks [ref1](#)
old people [ref1](#)
SARS-COV-2 [ref1](#)
satellites [ref1](#)
vaccines [ref1](#)
wearable technology [ref1](#)

Capitol Hill riot [ref1](#), [ref2](#)

agents provocateur [ref1](#)
Antifa [ref1](#)
Black Lives Matter (BLM) [ref1](#), [ref2](#)
QAnon [ref1](#)
security precautions, lack of [ref1](#), [ref2](#), [ref3](#)

carbon dioxide [ref1](#), [ref2](#)

care homes, deaths in [ref1](#), [ref2](#)

cashless digital money systems [ref1](#)

censorship [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

fact-checkers [ref1](#)

masks [ref1](#)

media [ref1](#), [ref2](#)

private messages [ref1](#)

social media [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

transgender persons [ref1](#)

vaccines [ref1](#), [ref2](#), [ref3](#)

Wokeness [ref1](#)

Centers for Disease Control (CDC) (United States) [ref1](#), [ref2](#), [ref3](#),
[ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#), [ref11](#), [ref12](#), [ref13](#)

centralisation [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

chakras [ref1](#)

change agents [ref1](#), [ref2](#), [ref3](#)

chemtrails [ref1](#), [ref2](#), [ref3](#)

chief medical officers and scientific advisers [ref1](#), [ref2](#), [ref3](#), [ref4](#),
[ref5](#), [ref6](#)

children *see also* **young people**

abuse [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)

care, taken into [ref1](#), [ref2](#), [ref3](#)

education [ref1](#), [ref2](#), [ref3](#), [ref4](#)

energy [ref1](#)

family courts [ref1](#)

hand sanitisers [ref1](#)

human sacrifice [ref1](#)

lockdowns [ref1](#), [ref2](#), [ref3](#)

masks [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

mental health [ref1](#)

old people [ref1](#)

parents, replacement of [ref1](#), [ref2](#)

Psyop (psychological operation), Covid as a [ref1](#), [ref2](#)

reframing [ref1](#)

smartphone addiction [ref1](#)

social distancing and isolation [ref1](#)
social media [ref1](#)
transgender persons [ref1](#), [ref2](#)
United States [ref1](#)
vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
Wetiko factor [ref1](#)

China [ref1](#), [ref2](#), [ref3](#), [ref4](#)

anal swab tests [ref1](#)
Chinese Revolution [ref1](#), [ref2](#), [ref3](#)
digital currency [ref1](#)
Global Cult [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)
guaranteed income [ref1](#)
Imperial College [ref1](#)
Israel [ref1](#)
lockdown [ref1](#), [ref2](#)
masculinity crisis [ref1](#)
masks [ref1](#)
media [ref1](#)
origins of virus in China [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
pollution causing respiratory diseases [ref1](#)
Sabbatians [ref1](#), [ref2](#)
Smart Grid [ref1](#), [ref2](#)
social credit system [ref1](#)
testing [ref1](#), [ref2](#)
United States [ref1](#), [ref2](#)
vaccines [ref1](#), [ref2](#)
Wetiko factor [ref1](#)
wet market conspiracy [ref1](#)
Wuhan [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

cholesterol [ref1](#), [ref2](#)

Christianity [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

criticism [ref1](#)
cross, inversion of the [ref1](#)

Nag Hammadi texts [ref1](#), [ref2](#), [ref3](#)

Roman Catholic Church [ref1](#), [ref2](#)

Sabbatians [ref1](#), [ref2](#)

Satan [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Wokeness [ref1](#)

class [ref1](#), [ref2](#)

climate change hoax [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Agenda 21/Agenda 2030 [ref1](#), [ref2](#), [ref3](#)

carbon dioxide [ref1](#), [ref2](#)

Club of Rome [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

fear [ref1](#)

funding [ref1](#)

Global Cult [ref1](#)

green new deals [ref1](#)

green parties [ref1](#)

inversion [ref1](#)

perception, control of [ref1](#)

PICC [ref1](#)

reframing [ref1](#)

temperature, increases in [ref1](#)

United Nations [ref1](#), [ref2](#)

Wikipedia [ref1](#)

Wokeness [ref1](#), [ref2](#)

Clinton, Bill [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

Clinton, Hillary [ref1](#), [ref2](#), [ref3](#)

the cloud [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Club of Rome and climate change hoax [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

cognitive therapy [ref1](#)

Cohn, Roy [ref1](#)

Common Law [ref1](#)

Admiralty Law [ref1](#)

arrests [ref1](#), [ref2](#)

contractual law, Statute Law as [ref1](#)

corporate entities, people as [ref1](#)

legalese [ref1](#)

sea, law of the [ref1](#)

Statute Law [ref1](#)

Common Purpose leadership programme [ref1](#), [ref2](#)

communism [ref1](#), [ref2](#)

co-morbidities [ref1](#)

computer-generated virus,

Covid-19 as [ref1](#), [ref2](#), [ref3](#)

computer models [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

connections [ref1](#), [ref2](#), [ref3](#), [ref4](#)

consciousness [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Archons [ref1](#), [ref2](#), [ref3](#)

expanded [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

experience [ref1](#)

heart [ref1](#)

infinity [ref1](#), [ref2](#)

religion [ref1](#), [ref2](#)

self-identity [ref1](#)

simulation thesis [ref1](#)

vaccines [ref1](#)

Wetiko factor [ref1](#), [ref2](#)

conspiracy theorists [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

contradictory rules [ref1](#)

contrails [ref1](#)

Corman-Drosten test [ref1](#), [ref2](#), [ref3](#), [ref4](#)

countermimicry [ref1](#), [ref2](#), [ref3](#)

Covid-19 vaccines *see* vaccines

Covidiots [ref1](#), [ref2](#)

Cowan, Tom [ref1](#), [ref2](#), [ref3](#), [ref4](#)

crimes against humanity [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

cyber-operations [ref1](#)

cyberwarfare [ref1](#)

D

DARPA (Defense Advanced Research Projects Agency) [ref1](#)

deaths

care homes [ref1](#)

certificates [ref1](#), [ref2](#), [ref3](#), [ref4](#)

mortality rate [ref1](#)

post-mortems/autopsies [ref1](#)

recording [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

deceit

pyramid of deceit [ref1](#), [ref2](#)

sequence of deceit [ref1](#)

decoding [ref1](#), [ref2](#), [ref3](#)

dehumanisation [ref1](#), [ref2](#), [ref3](#)

Delphi technique [ref1](#)

democracy [ref1](#)

dependency [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Descartes, René [ref1](#)

DNA

numbers [ref1](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)

DNR (do not resuscitate)

orders [ref1](#)

domestic abuse [ref1](#), [ref2](#)

downgrading of Covid-19 [ref1](#)

Drosten, Christian [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Duesberg, Peter [ref1](#), [ref2](#)

E

economic abuse [ref1](#)

Edmunds, John [ref1](#), [ref2](#)

education [ref1](#), [ref2](#), [ref3](#), [ref4](#)

electromagnetic spectrum [ref1](#), [ref2](#)

Enders, John [ref1](#)

energy

Archons [ref1](#), [ref2](#), [ref3](#)

children and young people [ref1](#)

consciousness [ref1](#)

decoding [ref1](#)

frequencies [ref1](#), [ref2](#), [ref3](#), [ref4](#)

heart [ref1](#)

human energy field [ref1](#)

source, humans as an energy [ref1](#), [ref2](#)

vaccines [ref1](#)

viruses [ref1](#)

ennoia [ref1](#)

Epstein, Jeffrey [ref1](#), [ref2](#)

eternal 'I' [ref1](#), [ref2](#)

ethylene oxide [ref1](#)

European Union [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Event [ref1](#) *and* Bill Gates [ref2](#)

exosomes, Covid-19 as natural defence mechanism called [ref1](#)

experience [ref1](#), [ref2](#)

Extinction Rebellion [ref1](#), [ref2](#)

F

Facebook

addiction [ref1](#), 448–50

Facebook

Archons [ref1](#)

censorship [ref1](#), [ref2](#), [ref3](#)

hate speech [ref1](#)

monopoly, as [ref1](#)

private messages, censorship of [ref1](#)

Sabbatians [ref1](#)

United States election fraud [ref1](#)

vaccines [ref1](#)

Wetiko factor [ref1](#)

fact-checkers [ref1](#)

Fauci, Anthony [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#),
[ref11](#), [ref12](#)

fear [ref1](#), [ref2](#), [ref3](#), [ref4](#)

climate change [ref1](#)

computer models [ref1](#)

conspiracy theories [ref1](#)

empty hospitals [ref1](#)

Italy [ref1](#), [ref2](#), [ref3](#)

lockdowns [ref1](#), [ref2](#), [ref3](#), [ref4](#)

masks [ref1](#), [ref2](#)

media [ref1](#), [ref2](#)

medical staff [ref1](#)

Psyop (psychological operation), Covid as a [ref1](#)

Wetiko factor [ref1](#), [ref2](#)

female infertility [ref1](#)

Fermi Paradox [ref1](#)

Ferguson, Neil [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

fertility, decline in [ref1](#)

The Field [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

finance *see* **banking, finance and money**

five-senses [ref1](#), [ref2](#)

Archons [ref1](#), [ref2](#), [ref3](#)

censorship [ref1](#)
consciousness, expansion of [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
decoding [ref1](#)
education [ref1](#), [ref2](#)
the Field [ref1](#), [ref2](#)
God, personification of [ref1](#)
infinity [ref1](#), [ref2](#)
media [ref1](#)
paranormal [ref1](#)
perceptual programming [ref1](#), [ref2](#)
Phantom Self [ref1](#)
pneuma not nous, using [ref1](#)
reincarnation [ref1](#)
self-identity [ref1](#)
Wetiko factor [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
5G [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
Floyd, George and protests, killing of [ref1](#)
flu, re-labelling of [ref1](#), [ref2](#), [ref3](#)
food and water, control of [ref1](#), [ref2](#)
Freemasons [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
Frei, Rosemary [ref1](#)
frequencies
addictions [ref1](#)
Archons [ref1](#), [ref2](#), [ref3](#)
awareness [ref1](#)
chanting and mantras [ref1](#)
consciousness [ref1](#)
decoding [ref1](#), [ref2](#)
education [ref1](#)
electromagnetic (EMF) frequencies [ref1](#)
energy [ref1](#), [ref2](#), [ref3](#), [ref4](#)
fear [ref1](#)

the Field [ref1](#), [ref2](#) 5G [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
five-senses [ref1](#), [ref2](#)
ghosts [ref1](#)
Gnostics [ref1](#)
hive-minds [ref1](#)
human, meaning of [ref1](#)
light [ref1](#), [ref2](#)
love [ref1](#), [ref2](#)
magnetism [ref1](#)
perception [ref1](#)
reality [ref1](#), [ref2](#), [ref3](#)
simulation [ref1](#)
terror [ref1](#)
vaccines [ref1](#)
Wetiko [ref1](#), [ref2](#), [ref3](#)
Fuellmich, Reiner [ref1](#), [ref2](#), [ref3](#)
furlough/rescue payments [ref1](#)

G

Gallo, Robert [ref1](#), [ref2](#), [ref3](#)

Gates, Bill

Archons [ref1](#), [ref2](#), [ref3](#)
climate change [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Daily Pass tracking system [ref1](#)
Epstein [ref1](#)
fascism [ref1](#)
five senses [ref1](#)
GAVI [ref1](#)
Great Reset [ref1](#)
GSK [ref1](#)
Imperial College [ref1](#), [ref2](#)
Johns Hopkins University [ref1](#), [ref2](#), [ref3](#)

lockdowns [ref1](#), [ref2](#)
masks [ref1](#)
Nuremberg trial, proposal for [ref1](#), [ref2](#)
Rockefellers [ref1](#), [ref2](#)
social distancing and isolation [ref1](#)
Sun, dimming the [ref1](#)
synthetic meat [ref1](#), [ref2](#)
vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Wellcome Trust [ref1](#)
Wetiko factor [ref1](#), [ref2](#), [ref3](#)
WHO [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
Wokeness [ref1](#)
World Economic Forum [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Gates, Melinda [ref1](#), [ref2](#), [ref3](#)
GAVI vaccine alliance [ref1](#)
genetics, manipulation of [ref1](#), [ref2](#), [ref3](#)
Germany [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#) *see also* **Nazi Germany**
Global Cult [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
anti-human, why Global Cult is [ref1](#)
Black Lives Matter (BLM) [ref1](#), [ref2](#), [ref3](#), [ref4](#)
China [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)
climate change hoax [ref1](#)
contradictory rules [ref1](#)
Covid-19 [ref1](#), [ref2](#), [ref3](#)
fascism [ref1](#)
geographical origins [ref1](#)
immigration [ref1](#)
Internet [ref1](#)
mainstream media [ref1](#), [ref2](#)
masks [ref1](#), [ref2](#)
monarchy [ref1](#)
non-human dimension [ref1](#)

perception [ref1](#)
political parties [ref1](#), [ref2](#)
pyramidal hierarchy [ref1](#), [ref2](#), [ref3](#)
reframing [ref1](#)
Sabbatian-Frankism [ref1](#), [ref2](#)
science, manipulation of [ref1](#)
spider and the web [ref1](#)
transgender persons [ref1](#)
vaccines [ref1](#)
who controls the Cult [ref1](#)
Wokeness [ref1](#), [ref2](#), [ref3](#), [ref4](#)

globalisation [ref1](#), [ref2](#)

Gnostics [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Google [ref1](#), [ref2](#), [ref3](#), [ref4](#)

government

behavioural scientists and psychologists, advice from [ref1](#), [ref2](#)

definition [ref1](#)

Joint Biosecurity Centre (JBC) [ref1](#)

people, abusive relationship with [ref1](#)

Great Reset [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

fascism [ref1](#), [ref2](#), [ref3](#)

financial system [ref1](#)

Human 2.0 [ref1](#)

water and food, control of [ref1](#)

green parties [ref1](#)

Griesz-Brisson, Margarite [ref1](#)

guaranteed income [ref1](#), [ref2](#), [ref3](#)

H

Hancock, Matt [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

hand sanitisers [ref1](#)

heart [ref1](#), [ref2](#)

hive-minds/groupthink [ref1](#), [ref2](#), [ref3](#)

holographs [ref1](#), [ref2](#), [ref3](#), [ref4](#)

hospitals, empty [ref1](#)

human, meaning of [ref1](#)

Human 2.0 [ref1](#)

addiction to technology [ref1](#)

artificial intelligence (AI) [ref1](#), [ref2](#)

elimination of Human 1.0 [ref1](#)

fertility, decline in [ref1](#)

Great Reset [ref1](#)

implantables [ref1](#)

money [ref1](#)

mRNA [ref1](#)

nanotechnology [ref1](#)

parents, replacement of [ref1](#), [ref2](#)

Smart Grid, connection to [ref1](#), [ref2](#)

synthetic biology [ref1](#), [ref2](#), [ref3](#), [ref4](#)

testosterone levels, decrease in [ref1](#)

transgender = transhumanism [ref1](#), [ref2](#), [ref3](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#)

human sacrifice [ref1](#), [ref2](#), [ref3](#)

Hunger Games Society [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Huxley, Aldous [ref1](#), [ref2](#), [ref3](#)

I

identity politics [ref1](#), [ref2](#), [ref3](#)

Illuminati [ref1](#), [ref2](#)

illusory physical reality [ref1](#)

immigration [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Imperial College [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

implantables [ref1](#), [ref2](#)

incomes, destruction of [ref1](#), [ref2](#)

Infinite Awareness [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Internet [ref1](#), [ref2](#) *see also* social media

artificial intelligence (AI) [ref1](#)

independent journalism, lack of [ref1](#)

Internet of Bodies (IoB) [ref1](#)

Internet of Everything (IoE) [ref1](#), [ref2](#)

Internet of Things (IoT) [ref1](#), [ref2](#)

lockdowns [ref1](#)

Psyop (psychological operation), Covid as a [ref1](#)
trolls [ref1](#)

intersectionality [ref1](#)

inversion

Archons [ref1](#), [ref2](#), [ref3](#)

climate change hoax [ref1](#)

energy [ref1](#)

Judaism [ref1](#), [ref2](#), [ref3](#)

symbolism [ref1](#)

Wetiko factor [ref1](#)

Wokeness [ref1](#), [ref2](#), [ref3](#)

Islam

Archons [ref1](#)

crypto-Jews [ref1](#)

Islamic State [ref1](#), [ref2](#)

Jinn and Djinn [ref1](#), [ref2](#), [ref3](#)

Ottoman Empire [ref1](#)

Wahhabism [ref1](#)

isolation *see* **social distancing** *and* **isolation**

Israel

China [ref1](#)

Cyber Intelligence Unit Beersheba complex [ref1](#)

expansion of illegal settlements [ref1](#)

formation [ref1](#)
Global Cult [ref1](#)
Judaism [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
medical experiments, consent for [ref1](#)
Mossad [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Palestine-Israel conflict [ref1](#), [ref2](#), [ref3](#)
parents, replacement of [ref1](#)
Sabbatians [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
September 11, 2001, terrorist attacks on United States [ref1](#)
Silicon Valley [ref1](#)
Smart Grid [ref1](#), [ref2](#)
United States [ref1](#), [ref2](#)
vaccines [ref1](#)
Wetiko factor [ref1](#)

Italy

fear [ref1](#), [ref2](#), [ref3](#)
Lombardy [ref1](#), [ref2](#), [ref3](#)
vaccines [ref1](#)

J

Johns Hopkins University [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Johnson, Boris [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
Joint Biosecurity Centre (JBC) [ref1](#)

Judaism

anti-Semitism [ref1](#), [ref2](#), [ref3](#)
Archons [ref1](#), [ref2](#)
crypto-Jews [ref1](#)
inversion [ref1](#), [ref2](#), [ref3](#)
Israel [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Labour Party [ref1](#)
Nazi Germany [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Sabbatians [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Silicon Valley [ref1](#)
Torah [ref1](#)
United States [ref1](#), [ref2](#)
Zionists [ref1](#), [ref2](#), [ref3](#)

K

Kaufman, Andrew [ref1](#), [ref2](#), [ref3](#), [ref4](#)
knowledge [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
Koch's postulates [ref1](#)
Kurzweil, Ray [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Kushner, Jared [ref1](#), [ref2](#)

L

Labour Party [ref1](#), [ref2](#)
Lanka, Stefan [ref1](#), [ref2](#)
Lateral Flow Device (LFD) [ref1](#)
Levy, Paul [ref1](#), [ref2](#), [ref3](#)
Life Program [ref1](#)
lockdowns [ref1](#), [ref2](#), [ref3](#)
 amplification tampering [ref1](#)
 Archons [ref1](#)
 Behavioural Insights Team [ref1](#)
 Black Lives Matter (BLM) [ref1](#)
 care homes, deaths in [ref1](#)
 children
abuse [ref1](#), [ref2](#)
mental health [ref1](#)
 China [ref1](#), [ref2](#)
 computer models [ref1](#)
 consequences [ref1](#), [ref2](#)
 dependency [ref1](#), [ref2](#), [ref3](#)

domestic abuse [ref1](#)
fall in cases [ref1](#)
fear [ref1](#), [ref2](#), [ref3](#), [ref4](#)
guaranteed income [ref1](#)
Hunger Games Society [ref1](#), [ref2](#), [ref3](#)
interaction, destroying [ref1](#)
Internet [ref1](#), [ref2](#)
overdoses [ref1](#)
perception [ref1](#)
police-military state [ref1](#), [ref2](#)
protests [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
psychopathic personality [ref1](#), [ref2](#), [ref3](#)
reporting/snitching, encouragement of [ref1](#), [ref2](#)
testing [ref1](#)
vaccines [ref1](#)
Wetiko factor [ref1](#)
WHO [ref1](#)
love [ref1](#), [ref2](#), [ref3](#)
Lucifer [ref1](#), [ref2](#), [ref3](#)

M

Madej, Carrie [ref1](#), [ref2](#)
Magufuli, John [ref1](#), [ref2](#)
mainstream media [ref1](#)
BBC [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
censorship [ref1](#), [ref2](#)
China [ref1](#)
climate change hoax [ref1](#)
fear [ref1](#), [ref2](#)
Global Cult [ref1](#), [ref2](#)
independent journalism, lack of [ref1](#)
Ofcom [ref1](#), [ref2](#), [ref3](#)

perception [ref1](#), [ref2](#)

Psyop (psychological operation), Covid as a [ref1](#)

Sabbatians [ref1](#), [ref2](#)

social disapproval [ref1](#)

social distancing and isolation [ref1](#)

United States [ref1](#), [ref2](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Mao Zedong [ref1](#), [ref2](#), [ref3](#)

Marx and Marxism [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)

masculinity [ref1](#)

masks/face coverings [ref1](#), [ref2](#), [ref3](#)

 censorship [ref1](#)

 children [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

 China, made in [ref1](#)

 dehumanisation [ref1](#), [ref2](#), [ref3](#)

 fear [ref1](#), [ref2](#)

 flu [ref1](#)

 health professionals [ref1](#), [ref2](#), [ref3](#), [ref4](#)

 isolation [ref1](#)

 laughter [ref1](#)

mass non-cooperation [ref1](#)

microplastics, risk of [ref1](#)

mind control [ref1](#)

multiple masks [ref1](#)

oxygen deficiency [ref1](#), [ref2](#), [ref3](#)

police [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

pollution, as cause of plastic [ref1](#)

Psyop (psychological operation), Covid as a [ref1](#)

reframing [ref1](#), [ref2](#)

risk assessments, lack of [ref1](#), [ref2](#)

self-respect [ref1](#)

surgeons [ref1](#)

United States [ref1](#)
vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Wetiko factor [ref1](#)
'worms' [ref1](#)
The Matrix movies [ref1](#), [ref2](#), [ref3](#)
measles [ref1](#), [ref2](#)
media see mainstream media
Medicines and Healthcare products Regulatory Agency (MHRA)
[ref1](#), [ref2](#), [ref3](#), [ref4](#)
Mesopotamia [ref1](#)
messaging [ref1](#)
military-police state [ref1](#), [ref2](#), [ref3](#)
mind control [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#) *see also* MKUltra
MKUltra [ref1](#), [ref2](#), [ref3](#)
monarchy [ref1](#)
money *see* banking, finance and money
Montagnier, Luc [ref1](#), [ref2](#), [ref3](#)
Mooney, Bel [ref1](#)
Morgellons disease [ref1](#), [ref2](#)
mortality rate [ref1](#)
Mullis, Kary [ref1](#), [ref2](#), [ref3](#)
Musk, Elon [ref1](#)

N

Nag Hammadi texts [ref1](#), [ref2](#), [ref3](#)
nanotechnology [ref1](#), [ref2](#), [ref3](#)
narcissism [ref1](#)
Nazi Germany [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
near-death experiences [ref1](#), [ref2](#)
Neocons [ref1](#), [ref2](#), [ref3](#)

Neuro-Linguistic Programming (NLP) and the Delphi technique
[ref1](#)

NHS (National Health Service)

amplification cycles [ref1](#)

Common Purpose [ref1](#), [ref2](#)

mind control [ref1](#)

NHS England [ref1](#)

saving the NHS [ref1](#), [ref2](#)

vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

whistle-blowers [ref1](#), [ref2](#), [ref3](#)

No-Problem-Reaction-Solution [ref1](#), [ref2](#), [ref3](#), [ref4](#)

non-human dimension of Global Cult [ref1](#)

nous [ref1](#)

numbers, reality as [ref1](#)

Nuremberg Codes [ref1](#), [ref2](#), [ref3](#)

Nuremberg-like tribunal, proposal for [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#),
[ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#), [ref11](#), [ref12](#)

O

Obama, Barack [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)

O'Brien, Cathy [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Ochel, Evita [ref1](#)

Ofcom [ref1](#), [ref2](#), [ref3](#)

old people [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Oneness [ref1](#), [ref2](#), [ref3](#)

Open Society Foundations (Soros) [ref1](#), [ref2](#), [ref3](#)

oxygen 406, 528–34

P

paedophilia [ref1](#), [ref2](#)

Page, Larry [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

Palestine-Israel conflict [ref1](#), [ref2](#), [ref3](#)

pandemic, definition of [ref1](#)

pandemic and health crisis scenarios/simulations [ref1](#), [ref2](#), [ref3](#),
[ref4](#)

paranormal [ref1](#)

PCR tests [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Pearl Harbor attacks, prior knowledge of [ref1](#)

Pelosi, Nancy [ref1](#), [ref2](#), [ref3](#)

perception [ref1](#), [ref2](#), [ref3](#), [ref4](#)

climate change hoax [ref1](#)

control [ref1](#), [ref2](#), [ref3](#)

decoding [ref1](#), [ref2](#)

enslavement [ref1](#)

externally-delivered perceptions [ref1](#)

five senses [ref1](#)

human labels [ref1](#)

media [ref1](#), [ref2](#)

political parties [ref1](#), [ref2](#)

Psyop (psychological operation), Covid as a [ref1](#)

sale of perception [ref1](#)

self-identity [ref1](#), [ref2](#)

Wokeness [ref1](#)

Phantom Self [ref1](#), [ref2](#), [ref3](#)

pharmaceutical industry *see* **Big Pharma**

phthalates [ref1](#)

Plato's Allegory of the Cave [ref1](#), [ref2](#)

pneuma [ref1](#)

police

Black Lives Matter (BLM) [ref1](#)

brutality [ref1](#)

citizen's arrests [ref1](#), [ref2](#)

common law arrests [ref1](#), [ref2](#)

Common Purpose [ref1](#)

defunding [ref1](#)

lockdowns [ref1](#), [ref2](#)

masks [ref1](#), [ref2](#), [ref3](#), [ref4](#)

police-military state [ref1](#), [ref2](#), [ref3](#)

psychopathic personality [ref1](#), [ref2](#), [ref3](#), [ref4](#)

reframing [ref1](#)

United States [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Wokeness [ref1](#)

polio [ref1](#)

political correctness [ref1](#), [ref2](#), [ref3](#), [ref4](#)

political parties [ref1](#), [ref2](#), [ref3](#), [ref4](#)

political puppets [ref1](#)

pollution [ref1](#), [ref2](#), [ref3](#)

post-mortems/autopsies [ref1](#)

Postage Stamp Consensus [ref1](#), [ref2](#)

pre-emptive programming [ref1](#)

Problem-Reaction-Solution [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

Project for the New American Century [ref1](#), [ref2](#), [ref3](#), [ref4](#)

psychopathic personality [ref1](#)

Archons [ref1](#)

heart energy [ref1](#)

lockdowns [ref1](#), [ref2](#), [ref3](#)

police [ref1](#), [ref2](#), [ref3](#), [ref4](#)

recruitment [ref1](#), [ref2](#)

vaccines [ref1](#)

wealth [ref1](#)

Wetiko [ref1](#), [ref2](#)

Psyop (psychological operation), Covid as a [ref1](#), [ref2](#), [ref3](#), [ref4](#),
[ref5](#)

Pushbackers [ref1](#), [ref2](#), [ref3](#), [ref4](#)

pyramid structure [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Q

QAnon Psyop [ref1](#), [ref2](#), [ref3](#)

R

racism *see also* **Black Lives**

Matter (BLM)

anti-racism industry [ref1](#)

class [ref1](#)

critical race theory [ref1](#)

culture [ref1](#)

intersectionality [ref1](#)

reverse racism [ref1](#)

white privilege [ref1](#), [ref2](#)

white supremacy [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Wokeness [ref1](#), [ref2](#), [ref3](#)

radiation [ref1](#), [ref2](#)

randomness, illusion of [ref1](#), [ref2](#), [ref3](#)

reality [ref1](#), [ref2](#), [ref3](#)

reframing [ref1](#), [ref2](#)

change agents [ref1](#), [ref2](#)

children [ref1](#)

climate change [ref1](#)

Common Purpose leadership programme [ref1](#), [ref2](#)

contradictory rules [ref1](#)

enforcers [ref1](#)

masks [ref1](#), [ref2](#)

NLP and the Delphi technique [ref1](#)

police [ref1](#)

Wetiko factor [ref1](#)

Wokeness [ref1](#), [ref2](#)

religion *see also* particular religions

alien invasions [ref1](#)

Archons [ref1](#), [ref2](#)
consciousness [ref1](#), [ref2](#)
control, system of [ref1](#), [ref2](#), [ref3](#)
criticism, prohibition on [ref1](#)
five senses [ref1](#)
good and evil, war between [ref1](#)
hidden non-human forces [ref1](#), [ref2](#)
Sabbatians [ref1](#)
save me syndrome [ref1](#)
Wetiko [ref1](#)
Wokeness [ref1](#)
repetition and mind control [ref1](#), [ref2](#), [ref3](#)
reporting/snitching, encouragement of [ref1](#), [ref2](#)
Reptilians/Grey entities [ref1](#)
rewiring the mind [ref1](#)
Rivers, Thomas Milton [ref1](#), [ref2](#)
Rockefeller family [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)
Rockefeller Foundation documents [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Roman Empire [ref1](#)
Rothschild family [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)
RT-PCR tests [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
Russia
 collusion inquiry in US [ref1](#)
Russian Revolution [ref1](#), [ref2](#)
Sabbatians [ref1](#)

S

Sabbatian-Frankism [ref1](#), [ref2](#)
 anti-Semitism [ref1](#), [ref2](#)
 banking and finance [ref1](#), [ref2](#), [ref3](#)
 China [ref1](#), [ref2](#)
 Israel [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Judaism [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Lucifer [ref1](#)
media [ref1](#), [ref2](#)
Nazis [ref1](#), [ref2](#)
QAnon [ref1](#)
Rothschilds [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
Russia [ref1](#)
Saudi Arabia [ref1](#)
Silicon Valley [ref1](#)
Sumer [ref1](#)
United States [ref1](#), [ref2](#), [ref3](#)
Wetiko factor [ref1](#)
Wokeness [ref1](#), [ref2](#), [ref3](#)
SAGE (Scientific Advisory Group for Emergencies) [ref1](#), [ref2](#), [ref3](#),
[ref4](#)
SARS-1 [ref1](#)
SARs-CoV-2 [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)
Satan/Satanism [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
satellites in low-orbit [ref1](#)
Saudi Arabia [ref1](#)
Save Me Syndrome [ref1](#)
scapegoating [ref1](#)
Schwab, Klaus [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#),
[ref11](#), [ref12](#)
science, manipulation of [ref1](#)
self-identity [ref1](#), [ref2](#), [ref3](#), [ref4](#)
self-respect, attacks on [ref1](#)
September 11, 2001, terrorist attacks on United States [ref1](#), [ref2](#),
[ref3](#), [ref4](#)
77th Brigade of UK military [ref1](#), [ref2](#), [ref3](#)
Silicon Valley/tech giants [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#) *see also*
Facebook

Israel [ref1](#)

Sabbatians [ref1](#)

technocracy [ref1](#)

Wetiko factor [ref1](#)

Wokeness [ref1](#)

simulation hypothesis [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

Smart Grid [ref1](#), [ref2](#), [ref3](#)

artificial intelligence (AI) [ref1](#)

China [ref1](#), [ref2](#)

control centres [ref1](#)

the Field [ref1](#)

Great Reset [ref1](#)

Human 2.0 [ref1](#), [ref2](#)

Israel [ref1](#), [ref2](#)

vaccines [ref1](#)

Wetiko factor [ref1](#)

social disapproval [ref1](#)

social distancing and isolation [ref1](#), [ref2](#), [ref3](#)

abusive relationships [ref1](#), [ref2](#)

children [ref1](#)

flats and apartments [ref1](#)

heart issues [ref1](#)

hugs [ref1](#)

Internet [ref1](#)

masks [ref1](#)

media [ref1](#)

older people [ref1](#), [ref2](#)

one-metre (three feet) rule [ref1](#)

rewiring the mind [ref1](#)

simulation, universe as a [ref1](#)

SPI-B [ref1](#)

substance abuse [ref1](#)

suicide and self-harm [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
technology [ref1](#)
torture, as [ref1](#), [ref2](#)
two-metre (six feet) rule [ref1](#)
women [ref1](#)
social justice [ref1](#), [ref2](#), [ref3](#), [ref4](#)
social media *see also* **Facebook bans on alternative views** [ref1](#)
censorship [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
children [ref1](#)
emotion [ref1](#)
perception [ref1](#)
private messages [ref1](#)
Twitter [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Wetiko factor [ref1](#)
YouTube [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Soros, George [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
Spain [ref1](#)
SPI-B (Scientific Pandemic Insights Group on Behaviours) [ref1](#),
[ref2](#), [ref3](#), [ref4](#)
spider and the web [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Starmer, Keir [ref1](#)
Statute Law [ref1](#)
Steiner, Rudolf [ref1](#), [ref2](#), [ref3](#)
Stockholm syndrome [ref1](#)
streptomycin [ref1](#)
suicide and self-harm [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Sumer [ref1](#), [ref2](#)
Sunstein, Cass [ref1](#), [ref2](#), [ref3](#)
swine flu (H1N1) [ref1](#), [ref2](#), [ref3](#)
synchronicity [ref1](#)
synthetic biology [ref1](#), [ref2](#), [ref3](#), [ref4](#)
synthetic meat [ref1](#), [ref2](#)

T

technology *see also* **artificial intelligence (AI)**; **Internet**;

social media addiction [ref1](#), [ref2](#), [ref3](#), [ref4](#)

Archons [ref1](#), [ref2](#)

the cloud [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

cyber-operations [ref1](#)

cyberwarfare [ref1](#)

radiation [ref1](#), [ref2](#)

social distancing and isolation [ref1](#)

technocracy [ref1](#)

Tedros Adhanom Ghebreyesus [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#),
[ref8](#), [ref9](#), [ref10](#), [ref11](#), [ref12](#), [ref13](#)

telepathy [ref1](#)

Tenpenny, Sherri [ref1](#)

Tesla, Nikola [ref1](#)

testosterone levels, decrease in [ref1](#)

testing for Covid-19 [ref1](#), [ref2](#)

anal swab tests [ref1](#)

cancer [ref1](#)

China [ref1](#), [ref2](#), [ref3](#)

Corman-Drosten test [ref1](#), [ref2](#), [ref3](#), [ref4](#)

death certificates [ref1](#), [ref2](#)

fraudulent testing [ref1](#)

genetic material, amplification of [ref1](#)

Lateral Flow Device (LFD) [ref1](#)

PCR tests [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

vaccines [ref1](#), [ref2](#), [ref3](#)

Thunberg, Greta [ref1](#), [ref2](#), [ref3](#)

Totalitarian Tiptoe [ref1](#), [ref2](#), [ref3](#), [ref4](#)

transgender persons

activism [ref1](#)

artificial wombs [ref1](#)

censorship [ref1](#)
child abuse [ref1](#), [ref2](#)
Human 2.0 [ref1](#), [ref2](#), [ref3](#)
Wokeness [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
women, deletion of rights and status of [ref1](#), [ref2](#)
young persons [ref1](#)
travel restrictions [ref1](#)
Trudeau, Justin [ref1](#), [ref2](#), [ref3](#)
Trump, Donald [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#),
[ref11](#)
Twitter [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)

U

UKColumn [ref1](#), [ref2](#)
United Nations (UN) [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#) *see also* **Agenda 21/Agenda 2030 (UN)**
United States [ref1](#), [ref2](#)
American Revolution [ref1](#)
borders [ref1](#), [ref2](#)
Capitol Hill riot [ref1](#), [ref2](#)
children [ref1](#)
China [ref1](#), [ref2](#)
CIA [ref1](#), [ref2](#)
Daily Pass tracking system [ref1](#)
demographics by immigration, changes in [ref1](#)
Democrats [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
election fraud [ref1](#)
far-right domestic terrorists, pushbackers as [ref1](#)
Federal Reserve [ref1](#)
flu/respiratory diseases statistics [ref1](#)
Global Cult [ref1](#), [ref2](#)
hand sanitisers, FDA warnings on [ref1](#)

immigration, effects of illegal [ref1](#)
impeachment [ref1](#)
Israel [ref1](#), [ref2](#)
Judaism [ref1](#), [ref2](#), [ref3](#)
lockdown [ref1](#)
masks [ref1](#)
mass media [ref1](#), [ref2](#)
nursing homes [ref1](#)
Pentagon [ref1](#), [ref2](#), [ref3](#), [ref4](#)
police [ref1](#), [ref2](#), [ref3](#), [ref4](#)
pushbackers [ref1](#)
Republicans [ref1](#), [ref2](#)
borders [ref1](#), [ref2](#)
Democrats [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Russia, inquiry into collusion with [ref1](#)
Sabbatians [ref1](#), [ref2](#), [ref3](#)
September 11, 2001, terrorist attacks [ref1](#), [ref2](#), [ref3](#), [ref4](#)
UFO sightings, release of information on [ref1](#)
vaccines [ref1](#)
white supremacy [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Woke Democrats [ref1](#), [ref2](#)

V

vaccines [ref1](#), [ref2](#), [ref3](#)
adverse reactions [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Africa [ref1](#)
anaphylactic shock [ref1](#), [ref2](#), [ref3](#), [ref4](#)
animals [ref1](#), [ref2](#)
anti-vax movement [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
AstraZeneca/Oxford [ref1](#), [ref2](#), [ref3](#), [ref4](#)
autoimmune diseases, rise in [ref1](#), [ref2](#)
Big Pharma [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#)

bioweapon, as real [ref1](#), [ref2](#)
black and ethnic minority communities [ref1](#)
blood clots [ref1](#), [ref2](#)
Brain Computer Interface (BCI) [ref1](#)
care homes, deaths in [ref1](#)
censorship [ref1](#), [ref2](#), [ref3](#)
chief medical officers and scientific advisers, financial interests of
[ref1](#), [ref2](#)
children [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#), [ref10](#)
China [ref1](#), [ref2](#)
clinical trials [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
compensation [ref1](#)
compulsory vaccinations [ref1](#), [ref2](#), [ref3](#)
computer programs [ref1](#)
consciousness [ref1](#)
cover-ups [ref1](#)
creation before Covid [ref1](#)
cytokine storm [ref1](#)
deaths and illnesses caused by vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
definition [ref1](#)
developing countries [ref1](#)
digital tattoos [ref1](#)
DNA-manipulation [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#),
[ref10](#)
emergency approval [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
female infertility [ref1](#)
funding [ref1](#)
genetic suicide [ref1](#)
Global Cult [ref1](#)
heart chakras [ref1](#)
hesitancy [ref1](#)
Human 2.0 [ref1](#), [ref2](#), [ref3](#), [ref4](#)
immunity from prosecution [ref1](#), [ref2](#), [ref3](#)

implantable technology [ref1](#)
Israel [ref1](#)
Johnson & Johnson [ref1](#), [ref2](#), [ref3](#), [ref4](#)
lockdowns [ref1](#)
long-term effects [ref1](#)
mainstream media [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
masks [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Medicines and Healthcare products Regulatory Agency (MHRA)
[ref1](#), [ref2](#)
messaging [ref1](#)
Moderna [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
mRNA vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)
nanotechnology [ref1](#), [ref2](#)
NHS [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
older people [ref1](#), [ref2](#)
operating system [ref1](#)
passports [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Pfizer/BioNTech [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
polyethylene glycol [ref1](#)
pregnant women [ref1](#)
psychopathic personality [ref1](#)
races, targeting different [ref1](#)
reverse transcription [ref1](#)
Smart Grid [ref1](#)
social distancing [ref1](#)
social media [ref1](#)
sterility [ref1](#)
synthetic material, introduction of [ref1](#)
tests [ref1](#), [ref2](#), [ref3](#)
travel restrictions [ref1](#)
variants [ref1](#), [ref2](#)
viruses, existence of [ref1](#)
whistle-blowing [ref1](#)

WHO [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Wokeness [ref1](#)
working, vaccine as [ref1](#)
young people [ref1](#)
Vallance, Patrick [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#)
variants [ref1](#), [ref2](#), [ref3](#)
vegans [ref1](#)
ventilators [ref1](#), [ref2](#)
virology [ref1](#), [ref2](#)
virtual reality [ref1](#), [ref2](#), [ref3](#)
viruses, existence of [ref1](#)
visual reality [ref1](#), [ref2](#)
vitamin D [ref1](#), [ref2](#)
von Braun, Wernher [ref1](#), [ref2](#)

W

war-zone hospital myths [ref1](#)
waveforms [ref1](#), [ref2](#)
wealth [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#) [ref10](#), [ref11](#)
wet market conspiracy [ref1](#)
Wetiko factor [ref1](#)
 alcoholism and drug addiction [ref1](#)
 anti-human, why Global Cult is [ref1](#)
 Archons [ref1](#), [ref2](#), [ref3](#), [ref4](#)
 artificial intelligence (AI) [ref1](#)
 Big Pharma [ref1](#), [ref2](#)
 children [ref1](#)
 China [ref1](#)
 consciousness [ref1](#), [ref2](#)
 education [ref1](#)
 Facebook [ref1](#)

fear [ref1](#), [ref2](#)
frequency [ref1](#), [ref2](#)
Gates [ref1](#), [ref2](#)
Global Cult [ref1](#), [ref2](#)
heart [ref1](#), [ref2](#)
lockdowns [ref1](#)
masks [ref1](#)
Native American concept [ref1](#)
psychopathic personality [ref1](#), [ref2](#)
reframing/retraining programmes [ref1](#)
religion [ref1](#)
Silicon Valley [ref1](#)
Smart Grid [ref1](#)
smartphone addiction [ref1](#), [ref2](#)
social media [ref1](#)
war [ref1](#), [ref2](#)
WHO [ref1](#)
Wokeness [ref1](#), [ref2](#), [ref3](#)
Yaldabaoth [ref1](#), [ref2](#), [ref3](#), [ref4](#)
whistle-blowing [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
white privilege [ref1](#), [ref2](#)
white supremacy [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
Whitty, Christopher [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#),
[ref10](#)
‘who benefits’ [ref1](#)
Wi-Fi [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Wikipedia [ref1](#), [ref2](#)
Wojcicki, Susan [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#)
Wokeness
 Antifa [ref1](#), [ref2](#), [ref3](#), [ref4](#)
 anti-Semitism [ref1](#)
 billionaire social justice warriors [ref1](#), [ref2](#), [ref3](#)

Capitol Hill riot [ref1](#), [ref2](#)
censorship [ref1](#)
Christianity [ref1](#)
climate change hoax [ref1](#), [ref2](#)
culture [ref1](#)
education, control of [ref1](#)
emotion [ref1](#)
facts [ref1](#)
fascism [ref1](#), [ref2](#), [ref3](#)
Global Cult [ref1](#), [ref2](#), [ref3](#), [ref4](#)
group-think [ref1](#)
immigration [ref1](#)
indigenous people, solidarity with [ref1](#)
inversion [ref1](#), [ref2](#), [ref3](#)
left, hijacking the [ref1](#), [ref2](#)
Marxism [ref1](#), [ref2](#), [ref3](#)
mind control [ref1](#)
New Woke [ref1](#)
Old Woke [ref1](#)
Oneness [ref1](#)
perceptual programming [ref1](#)
 Phantom Self [ref1](#)
police [ref1](#)
defunding the [ref1](#)
reframing [ref1](#)
public institutions [ref1](#)
Pushbackers [ref1](#), [ref2](#), [ref3](#)
racism [ref1](#), [ref2](#), [ref3](#)
reframing [ref1](#), [ref2](#)
religion, as [ref1](#)
Sabbatians [ref1](#), [ref2](#), [ref3](#)
Silicon Valley [ref1](#)
social justice [ref1](#), [ref2](#), [ref3](#), [ref4](#)

transgender [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)
United States [ref1](#), [ref2](#)
vaccines [ref1](#)
Wetiko factor [ref1](#), [ref2](#), [ref3](#)
young people [ref1](#), [ref2](#), [ref3](#)
women, deletion of rights and status of [ref1](#), [ref2](#)
World Economic Forum (WEF) [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#),
[ref8](#), [ref9](#)
World Health Organization (WHO) [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#),
[ref7](#), [ref8](#), [ref9](#)
AIDs/HIV [ref1](#)
amplification cycles [ref1](#)
Big Pharma [ref1](#), [ref2](#), [ref3](#)
cooperation in health emergencies [ref1](#)
creation [ref1](#), [ref2](#)
fatality rate [ref1](#)
funding [ref1](#), [ref2](#), [ref3](#)
Gates [ref1](#)
Internet [ref1](#)
lockdown [ref1](#)
vaccines [ref1](#), [ref2](#), [ref3](#), [ref4](#)
Wetiko factor [ref1](#)
world number 1 (masses) [ref1](#), [ref2](#)
world number 2 [ref1](#)
Wuhan [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#) [ref8](#)

Y

Yaldabaoth [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#)
Yeadon, Michael [ref1](#), [ref2](#), [ref3](#), [ref4](#)
young people *see also* children addiction to technology [ref1](#)
Human 2.0 [ref1](#)
vaccines [ref1](#), [ref2](#)

Wokeness [ref1](#), [ref2](#), [ref3](#)

YouTube [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#)

WHO 548

Z

Zaks, Tal [ref1](#)

Zionism [ref1](#), [ref2](#), [ref3](#)

Zuckerberg, Mark [ref1](#), [ref2](#), [ref3](#), [ref4](#), [ref5](#), [ref6](#), [ref7](#), [ref8](#), [ref9](#),
[ref10](#), [ref11](#), [ref12](#)

Zulus [ref1](#)



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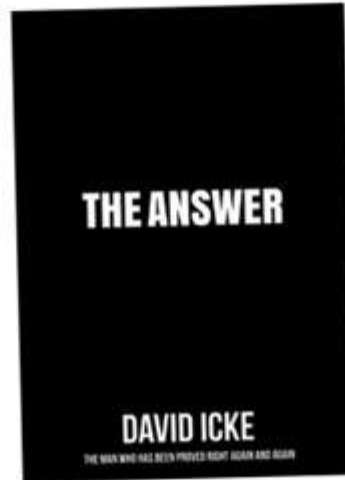
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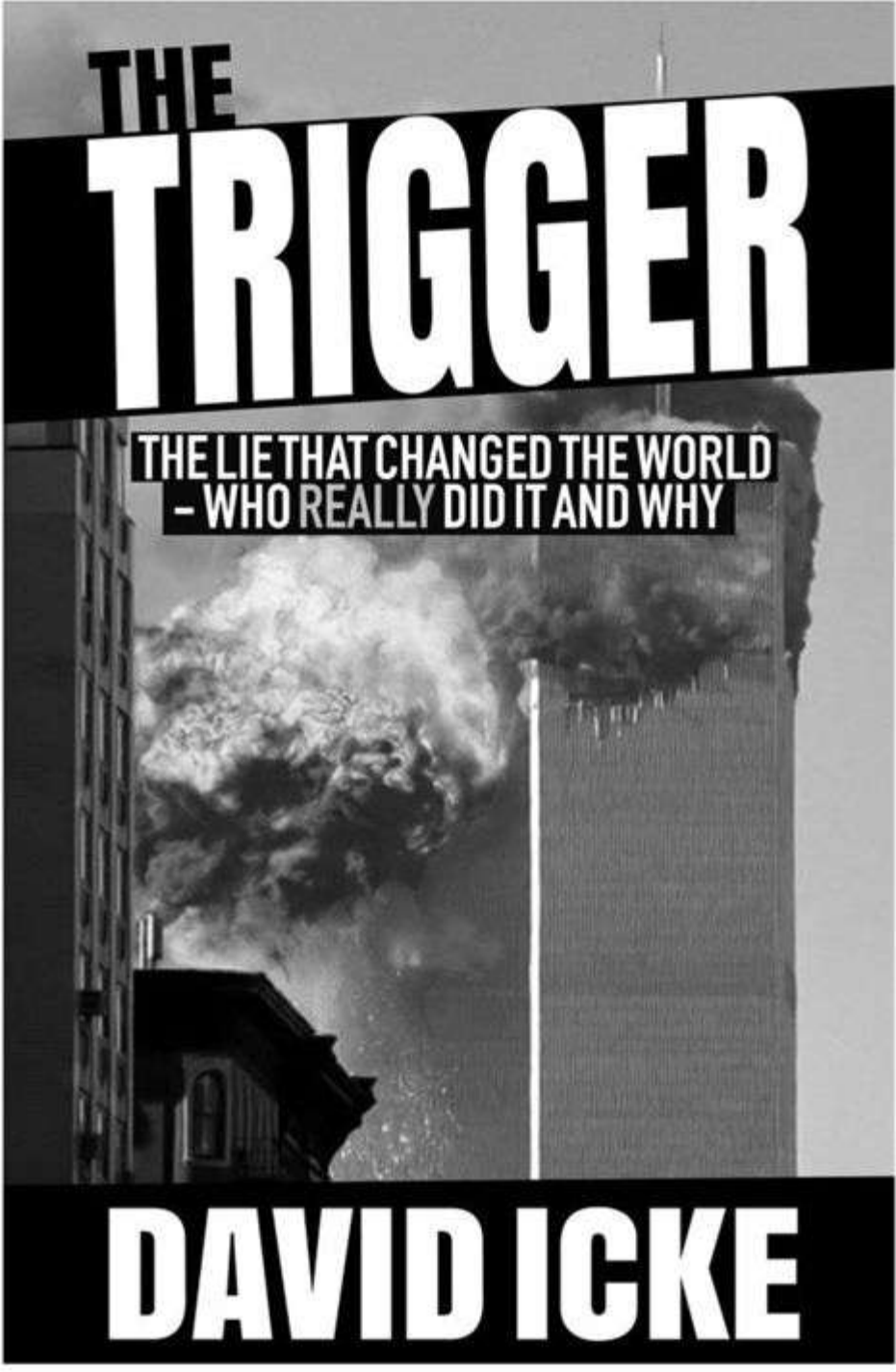
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