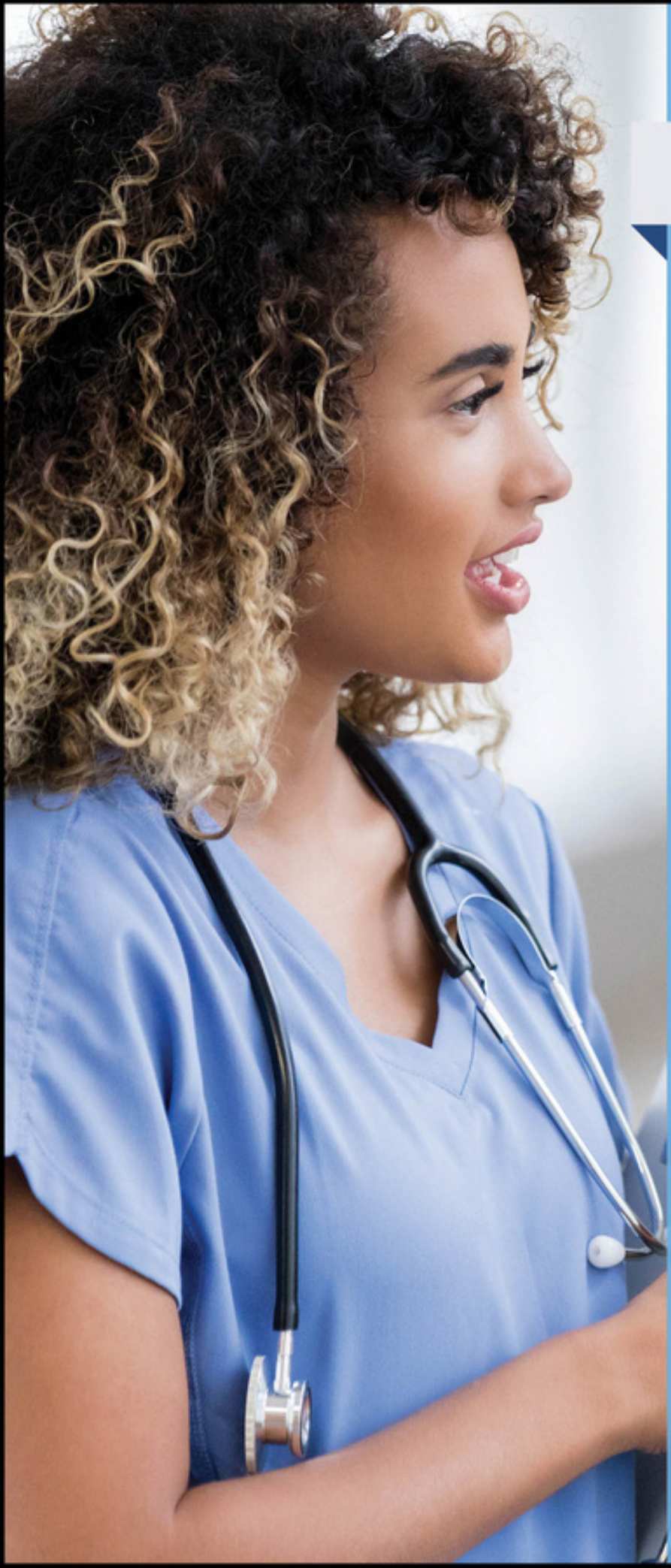

Companion to Medicine at a Glance, Fifth Edition

Medicine at a Glance

Core Cases

Second Edition

Edited by
Patrick Davey
William Ries
Alex Pitcher

WILEY Blackwell

Medicine at a Glance: Core Cases

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Edited by

Patrick Davey
Consultant Cardiologist and Medical Examiner
Northampton General Hospital NHS Trust
Northampton, UK

William Ries
Acute General Medicine
Oxford University Hospitals
Oxford, UK

Alex Pitcher
Consultant Cardiologist
Oxford University Hospitals
Oxford, UK

WILEY Blackwell

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Preface

When studying, it is always important to determine whether or not one has learnt the subject – clearly, this is as true in medicine as any other subject. Different people have very different styles of learning and of testing themselves as to whether they have learnt and understood the subject thoroughly. Some people go on a wing and a prayer, reading and hoping they have retained some information, without testing their knowledge. Some go to the other extreme, reading, shutting the reference book and then writing down that which they have retained. They may do this immediately after reading, or some time later, clearly testing different forms of memory. Yet others, after reading, shut the book, shut their eyes and try to recall mentally their knowledge of the subject. This is often a most enjoyable way of working out what one knows and what one doesn't. Perhaps a down side of this 'shut-eye' mental-testing approach is the degree of mental strength needed to prevent day dreams intruding into working thoughts and distracting us from our studies! Some will discuss the subject with their peers, working out what they know, testing their understanding logically ('if this, then why not this?') and having colleagues help fill in the gaps – this can be a compellingly enjoyable way to learn. In fact, it may be that one of the most important roles of medical student clubs and rooms within medical schools is to encourage this sort of interaction. Perhaps even the most important role of the medical school is to ensure this peer-to-peer bonding, one that allows you to trust colleagues' knowledge and judgement sufficiently to ask them questions to which you don't know the answer, sometimes simple questions and sometimes the apparently 'stupid' question, the one everyone has been meaning to ask, the one so obvious you have been frightened to ask, as you feel you should know the answer, but the one in fact which, more often than not, is the most pertinent and central question to the problem at hand. This ability to interact with colleagues in this fashion will be, probably, the most important aspect of your competence as a future learner and so as a clinician.

Perhaps in medicine the most potent way of learning and testing knowledge is around a case; students see a patient ('clerk them in') using a fairly rigid and stylised system, synthesise this data into a short presentation, so including all the pertinent positives and negatives, which is then presented to a more senior clinician. The key part of this is not so much the acquisition and presentation of the data, though these are all crucial skills for a competent clinician; rather it is the joy of understanding what the data means, what is the data telling us about the patient and their condition? Does it only mean one illness, and if so why? This seems unlikely, but sometimes is the case. Could there be a differential diagnosis (almost inevitably so)? Why? To understand the data, as well as to collect and present it, one needs a full knowledge of the subject of medicine. The data is tested against our knowledge of disease processes, allowing us to reject or accept possible diagnoses. Do all the symptoms fit? Do the investigations support our possible diagnoses? If not, why not? What data needs to fit? What data can be rejected? This allows us to follow one diagnosis or another, reject it, find another, test it and so on. All clinicians are, to a greater or lesser extent medical detectives. All this sleuthing can be tremendous fun and is a most potent way to learn and, as importantly, to know that you have learnt and what still needs to be learnt.

Real-life cases and real-life clinicians, however, may not always be available and it is not possible to see representative examples of all the commonest and most serious conditions during a clinical course. Another way to learn, which addresses the breadth of cases one is likely to see in a long clinical career (and be tested on in examinations), is the case-based approach from a textbook. This is the aim of this book, to introduce you to a case and then to test your understanding of that case, largely using multiple choice questions and answers. Each answer is followed by a detailed explanation, with supporting illustrations, and a reference to the relevant chapter in the supporting textbook, *Medicine at a Glance*, 5th edition http://www.wiley.com/go/medicine5e. *Core Cases* can be used as a stand-alone volume, or in conjunction with the main textbook. There are different ways to test your knowledge using textbook-based MCQs – one could read the question, mentally answer it, then look the answer up. I would suggest, however, that the best way is to read the question and write down the answer you think is right – this way, you commit yourself and so find the truth as to whether you know, or whether you only think you know! Every answer has a detailed explanation of what the answer is and why, and also a suggestion from *Medicine at a Glance* for further reading.

I hope you will enjoy this book and wish you every success in your endeavours. As always, we would be most pleased to have any feedback (medicalstudent@wiley.co.uk).

Patrick Davey
William Ries
Alex Pitcher

List of Contributors

Laura Benjamin
Wellcome Trust Clinical Research Fellow
London

Chris B. Bunker
Professor of Dermatology & Consultant Dermatologist
Chelsea & Westminster, Royal Marsden Hospitals and
Imperial College School of Medicine
London

Keith Channon
Professor of Cardiovascular Medicine & Honorary Consultant
Cardiologist
Department of Cardiovascular Medicine
University of Oxford
John Radcliffe Hospital
Oxford

Graham Collins
Department of Haematology
John Radcliffe Hospital
Oxford

Ophelia Dadzie
Locum Consultant Dermatopathologist and Dermatologist
St John's Institute of Dermatology
Guy's and St Thomas' NHS Foundation Trust
London

Patrick Davey
Consultant Cardiologist and Medical Examiner
Northampton General Hospital NHS Trust
Northampton, UK

Suzanne Donnelly
Formerly of Department of Rheumatology
St George's Hospital
London

Peggy Frith
Consultant Ophthalmic Physician
The Radcliffe Infirmary
Oxford

Jonathan Gleadle
Lecturer in Nephrology
The Wellcome Trust
Centre for Human Genetics
Oxford

Christopher Hingston
SpR Intensive Care Medicine
University Hospital of Wales
Cardiff

Mark Juniper
Consultant Physician
Great Western Hospital
Swindon

David Keeling
Consultant Haematologist
Oxford Haemophilia Centre
The Churchill Hospital
Oxford

David Lalloo
Reader in Tropical Medicine
Liverpool School of Tropical Medicine
Liverpool

Tim J. Littlewood
Consultant Haematologist
Department of Haematology
John Radcliffe Hospital
Oxford

Andrew McLean-Tooke
Royal Victoria Infirmary
Newcastle-upon-Tyne

Faye Mellington
Specialty Registrar (Ophthalmology)
Oxford Eye Hospital
Oxford

Richard Penson
Director of Clinical Research in Medical Gynecologic
Oncology
Massachusetts General Hospital
Boston
USA

Alex Pitcher
Consultant Cardiologist
Oxford University Hospitals
Oxford, UK

Anna Rathmell
Oxford

William Ries
Acute General Medicine
Oxford University Hospitals
Oxford

Jeremy Shearman
Consultant Gastroenterologist
Department of Gastroenterology
Warwick Hospital
Warwick

Gavin Spickett
Consultant in Clinical Immunology, Allergy & General Medicine
Regional Department of Immunology
Royal Victoria Infirmary
Newcastle-upon-Tyne

David Sprigings
Consultant Cardiologist
Northampton General Hospital
Northampton

Jeremy Steele
Consultant in Medical Oncology
St Bartholomew's Hospital
London

Catherine Stroud
Consultant Immunologist
Royal Victoria Infirmary
Newcastle-upon-Tyne

Kevin Talbot
MRC Clinician Scientist
Department of Human Anatomy & Genetics, and
Honorary Consultant Neurologist
Department of Clinical Neurology
University of Oxford
The Radcliffe Infirmary
Oxford

Laura Tookman
Academic Clinical Fellow in Oncology
Institute of Cancer
Barts and The London School of Medicine and Dentistry
London

Helen E. Turner
Consultant Endocrinologist
Endocrinology Department
The Radcliffe Infirmary
Oxford

Katherine Whybrew
General Practitioner
Bristol

Matt Wise
Consultant in Intensive Care Medicine
University Hospital of Wales
Cardiff

Paul Wordsworth
Professor of Rheumatology
Nuffield Orthopaedic Centre
Oxford

List of Abbreviations

AAA	abdominal aortic aneurysm
AAION	arteritic anterior ischaemic optic neuropathy
Ab	antibody
ABG	arterial blood gas
ABPA	allergic bronchopulmonary aspergillosis
AC	acromioclavicular
ACE	angiotensin-converting enzyme
AChR	acetylcholine receptors
ACS	acute coronary syndrome
ACTH	adrenocorticotrophic hormone
ADH	antidiuretic hormone
ADP	adenosine diphosphate
ADPKD	autosomal dominant polycystic kidney disease
AF	atrial fibrillation
AFB	acid-fast bacilli
α-FP	α-fetoprotein
Ag	antigen
AIDP	acute inflammatory demyelinating polyradiculoneuropathy
AIDS	acquired immune deficiency syndrome
AIH	autoimmune hepatitis
AIHA	autoimmune haemolytic anaemia
AION	anterior ischaemic optic neuropathy
ALI	acute lung injury
ALL	acute lymphoid leukaemia
ALP	alkaline phosphatase
ALT	alanine transaminase
AMA	antimitochondrial antibody
AML	acute myeloid leukaemia
ANA	antinuclear antibody
ANCA	antineutrophil cytoplasmic antibody
ANF	antinuclear factor
APC	activated protein C
APKD	adult polycystic kidney disease
APML	acute promyelocytic leukaemia
APS	antiphospholipid syndrome
APTT	activated partial thromboplastin time
AR	aortic regurgitation
ARDS	adult respiratory distress syndrome
AS	ankylosing spondylitis
ASD	atrial septal defect
ASO	antistreptolysin O
AST	aspartate transaminase
α_1-AT	α_1-antitrypsin
ATLL	adult T-cell lymphoma/leukaemia
ATN	acute tubular necrosis
ATP	adenosine triphosphate
AV	atrioventricular
AVNRT	atrioventricular nodal re-entrant tachycardia
AVRT	atrioventricular re-entrant tachycardia
AXR	abdominal X-ray
BAL	bronchoalveolar lavage
BBV	blood-borne viruses
BCC	basal cell carcinoma
BCE	basal cell epithelioma
BCG	bacilli Calmette–Guérin
BCSP	bowel cancer screening programme
bd	*bis die* (twice a day)
BDZ	benzodiazepine
BE	base excess
BLS	basic life support
BMD	bone marrow density
BMI	body mass index
BMZ	basement membrane zone
BNF	*British National Formulary*
BOOP	bronchiolitis obliterans organising pneumonia
BP	blood pressure
BRVO	branch retinal vein occlusion
CABG	coronary artery bypass graft
CAD	coronary artery disease
CAH	congenital adrenal hyperplasia
CBD	common bile duct, cortico-basal degeneration
CBT	cognitive behavioural therapy
CCDC	consultant in communicable disease control
CCP	cyclic citrullinated peptide
CCU	coronary care unit
CGD	chronic granulomatous disease
CEA	carcinoembryonic antigen
CF	cystic fibrosis
CFA	cystic fibrosis alveolitis
CFS	chronic fatigue syndrome
CFTR	cystic fibrosis transmembrane conductance regulator
cGMP	cyclic guanosine monophosphate
CHAD	cold haemagglutinin disease
CHART	continuous hyperfractionated accelerated radiotherapy
CHD	congenital heart disease
CIDP	chronic idiopathic demyelinating polyneuropathy
CIDP	chronic inflammatory demyelinating neuropathy
CJD	Creutzfeldt–Jakob disease
CK	creatine kinase
CKD	chronic kidney disease
CLL	chronic lymphoblastic leukaemia
CMC	carpometacarpal
CML	chronic myeloid leukaemia
CMV	cytomegalovirus
CNS	central nervous system
CO_2	carbon dioxide
COAD	chronic obstructive airway disease
COPD	chronic obstructive pulmonary disease
COX	cyclo-oxygenase
cP	centipoise
CPAP	continuous positive airway pressure
CPK	creatine phosphokinase
CPM	central pontine myelinolysis
CPR	cardiopulmonary resuscitation
CREST	calcinosis, Raynaud's, oesophagitis, sclerodactyly telangiectasia

CRH corticotrophin-releasing hormone
CRP C-reactive protein
CRVO central retinal vein occlusion
CS Churg–Strauss
CSM carotid sinus massage
CSF cerebrospinal fluid
CT computed tomography
CTPA computerised tomographic pulmonary angiography
CVA cerebrovascular accident
CVID common variable immunodeficiency
CVP central venous pressure
CWP coal worker's pneumoconiosis
CXR chest X-ray
CYP cytochrome P450
D&V diarrhoea and vomiting
DC direct current
ddAVP deamino-D-arginine vasopressin
DEXA dual emission X-ray absorptiometry
DH dermatitis herpetiformis
DHEA dehydroepiandrosterone
DHF/DSS dengue haemorrhagic fever/dengue shock syndrome
DIC disseminated intravascular coagulation
DIF direct immunofluorescence
DIP desquamative interstitial pneumonia, distal interphalangeal
DKA diabetic ketoacidosis
DLB dementia with Lewy bodies
DM dermatomyositis, diabetes mellitus
DMARD disease-modifying antirheumatic drug
DMSA [^{99m}Tc] mercaptosuccinic acid
DNA deoxyribonucleic acid
DNAR 'do not attempt resuscitation'
dsDNA double-stranded DNA
DOAC direct oral anticoagulant
DU duodenal ulcer
DVT deep venous thrombosis
EAA extrinsic allergic alveolitis
EBV Epstein–Barr virus
ECG electrocardiogram
EEG electroencephalograph
EGFR epidermal growth factor receptor
eGPA eosinophilic granulomatosis with polyangiitis
ELISA enzyme-linked immunosorbent assay
EM electron microscopy
EMA endomysial antibodies, eosin 5-maleimide
EMG electromyography
EN erythema nodosum
ENT ear, nose, throat
EPAP expiratory positive airway pressure
EPO erythropoietin
ER endoplasmic reticulum
ERA enteric reactive arthritis
ERCP endoscopic retrograde cholangiopancreatography
ESR erythrocyte sedimentation rate
ESRF end-stage renal failure
ET essential thrombocythaemia
EUS endoscopic ultrasound
EVL endoscopic variceal ligation
FAB French–American–British classification
FBC full blood count
FDP fibrin degradation product
FEV_1 forced expiratory volume in 1s
FFA free fatty acid
FFP fresh frozen plasma
FNAC fine needle aspiration cytology
FOB faecal occult blood
FPG fasting plasma glucose
FRC functional residual capacity
FSGS focal segmental glomerulosclerosis
FSH follicle-stimulating hormone
FTD frontotemporal dementia
5FU 5-fluorouracil
FUO fever of unknown origin
FVC forced vital capacity
G6PD glucose-6-phosphate dehydrogenase
GABA γ-aminobutyric acid
GBM glomerular basement membrane
GCS Glasgow Coma Scale
GFR glomerular filtration rate
GGT gamma-glutamyl transferase
GH growth hormone
GHRH GH-releasing hormone
GI gastrointestinal
GN glomerulonephritis
GnRH gonadotrophin-releasing hormone
GORD gastro-oesophageal reflux disease
GP general practitioner
GPA granulomatosis with polyangiitis
GPI glycosyl-phosphatidylinositol
γ-GT γ-glutamyl transferase
GTN glyceryl trinitrate
GU genitourinary
HAART highly active anti-retroviral therapy
HAV hepatitis A virus
Hb haemoglobin
HBOC hereditary breast and ovarian cancer
HBsAg hepatitis B surface antigen
HBV hepatitis B virus
HCC hepatocellular carcinoma
hCG human chorionic gonadotrophin
Hct haematocrit
HCV hepatitis C virus
HD Huntington's disease
HDL high-density lipoprotein
HFE haemochromatosis gene
HHS hyperosmolar hyperglycaemic state
HHV human herpes virus
5-HIAA 5-hydroxyindoleacetic acid
HIB *Haemophilus influenzae* B
HIT heparin-induced thrombocytopenia
HIV human immunodeficiency virus
HLA human leukocyte antigen
HMG-CoA hydroxymethyl-glutaryl coenzyme A
HMSN hereditary motor and sensory neuropathy
HNPCC hereditary non-polyposis colon cancer

HOCM hypertrophic obstructive cardiomyopathy
HPV human papillomavirus
HR heart rate
HRCT high-resolution computed tomography
HRT hormone replacement therapy
HSP Henoch–Schönlein purpura
HSV herpes simplex virus
HSV highly selective vagotomy
5-HT 5-hydroxytryptamine (serotonin)
HTLV human T-cell leukaemia virus
HUS haemolytic uraemic syndrome
IBD inflammatory bowel disease
IBS inflammatory bowel syndrome
ICD implantable cardioverter defibrillator
Ig immunoglobulin
IGF insulin growth factor
IGRA interferon gamma release assay
IHD ischaemic heart disease
IL interleukin
IM intramuscular
INR international normalised ratio
IOP intraocular pressures
IPAP inspiratory positive airway pressure
IPPV intermittent positive pressure ventilation
IPSS inferior petrosal sinus sampling
ITP immune thrombocytopenic purpura
ITU intensive therapy unit
IV intravenous
IVC inferior vena cava
IVIG intravenous immunoglobulin
IVU intravenous urogram
JVP jugular venous pressure
KCl potassium chloride
KOH potassium hydroxide
KS Kaposi's sarcoma
LA left artery
LAD left anterior descending (coronary artery)
LBD Lewy body dementia
LDH lactate dehydrogenase
LDL low-density lipoprotein
LFT liver function test
LH luteinising hormone
LMW low molecular weight
LMWH low-molecular-weight heparin
LN lymph nodes
LP lumbar puncture
LSD lysergic acid diethylamide
LTOT long-term oxygen therapy
LUQ left upper quadrant
LV left ventricle, left ventricular
LVF left ventricular failure
LVH left ventricular hypertrophy
MAC *Mycobacterium avium-intracellulare* complex
MALT mucosa-associated lymphoid tissue
MAP mean arterial pressure
MCA middle cerebral artery
MCP metacarpophalangeal
M,C&S microscopy, culture and sensitivity
MCV mean cell volume
MDS myelodysplastic syndrome
MDT multidisciplinary team
ME myalgic encephalomyelitis
MELAS mitochondrial encephalopathy, lactic acidosis, stroke-like episodes
MEN multiple endocrine neoplasia
MET medical emergency team
MGUS monoclonal gammopathy of uncertain significance
MHC major histocompatibility complex
MI myocardial infarction
MMSE mini mental state examination
MND motor neuron disease
MODY maturity-onset diabetes in the young
MPS myocardial perfusion scan
MR mitral regurgitation
MRC Medical Research Council
MRCP magnetic resonance cholangiopancreatography/cholangiogram
MRI magnetic resonance imaging
MRSA methicillin-resistant *Staphylococcus aureus*
MS multiple sclerosis
MSA multiple system atrophy
MSU midstream urine
MTC medullary thyroid cancer
MTP metatarsophalangeal
MUS medically unexplained symptom
MuSK muscle-specific tyrosine kinase receptors
MV mechanical ventilation
MVP mitral valve prolapse
NAAION non-arteritic anterior ischaemic optic neuropathy
NAAT nucleic acid amplification testing
NaCl sodium chloride
NADPH reduced nicotinamide adenine dinucleotide phosphate
NG nasogastric
NGU non-gonococcal urethritis
NHL non-Hodgkin's lymphoma
NHS National Health Service
NILS non-invasive liver screen
NIV non-invasive ventilation
NO nitric oxide
nocte at night
NPV negative pressure ventilation
NSAID non-steroidal anti-inflammatory drug
OA osteoarthritis
OCD obsessive compulsive disorder
OCP oral contraceptive pill
od *omni die* (once a day)
OGD oesophago-gastroduodenoscopy
OGTT oral glucose tolerance test
OSA obstructive sleep apnoea
PAN polyarteritis nodosa
p-ANCA perinuclear staining antineutrophil cytoplasmic antibodies
PBC primary biliary cirrhosis
PCI percutaneous coronary intervention
PCOS polycystic ovary syndrome
PCP phencyclidine, *Pneumocystis carinii* pneumonia

PCR polymerase chain reaction
PCT porphyria cutanea tarda
PCWP pulmonary capillary wedge pressure
PD Parkinson's disease
PDA patent ductus arteriosus
PE pulmonary embolism
PEA pulseless electrical activity
PEEP positive end-expiratory pressure
PEFR peak expiratory flow rate
PEG percutaneous endoscopic gastrostomy
PEG polyethylene glycol
PET positron emission tomography
PION posterior ischaemic optic neuropathy
PIP proximal interphalangeal
PM polymyositis
PML progressive multifocal leukoencephalopathy
PMR polymyalgia rheumatica
PNH paroxysmal nocturnal haemoglobinuria
PNS peripheral nervous system
po *per os* (by mouth)
PPAR-γ peroxisome proliferator-activated receptor γ
PPI proton pump inhibitor
PR per rectum
PRL prolactin
PRV polycythaemia rubra vera
PS psychoactive substance
PSA prostate-specific antigen
PSC primary sclerosing cholangitis
PSP progressive supranuclear palsy
PT prothrombin time
PTCA percutaneous transluminal coronary angioplasty
PTH parathyroid hormone
PTLD post-transplant lymphoproliferative disorder
PUVA psoralens and ultraviolet A
PV polycythaemia vera, plasma viscosity
QDS *quater die sumendum* (4 times a day)
RA rheumatoid arthritis, right atrium
RBBB right bundle branch block
RBC red blood cell
RCC red cell count
RCT randomised controlled trial
REM rapid eye movement
RF rheumatoid factor
RNA ribonucleic acid
RP retinitis pigmentosa
RPGN rapidly progressive glomerulonephritis
RR respiratory rate
RUQ right upper quadrant
RV right ventricle, right ventricular
RVH right ventricular hypertrophy
SACD subacute combined degeneration of the cord
SAH subarachnoid haemorrhage
SARA sexually acquired reactive arthritis
SBE subacute bacterial endocarditis
SBP spontaneous bacterial peritonitis
SCC squamous cell carcinoma
SCID severe combined immunodeficiency
SCLC small cell lung cancer
SDH subdural haemorrhage
SGLT2 sodium-glucose co-transporter 2
SIADH syndrome of inappropriate antidiuretic hormone secretion
SIMV synchronised intermittent mandatory ventilation
SLA soluble liver antigen
SLE systemic lupus erythematosus
SMA smooth muscle actin antibody
SOB shortness of breath
SPB spontaneous bacterial peritonitis
SRH stigmata of recent haemorrhage
SSRIs selective serotonin reuptake inhibitors
STD sexually transmitted disease
STEMI ST segment elevation myocardial infarction
SVC superior vena cava
SVCO superior vena cava obstruction
SVR sustained viral response
SVT supraventricular tachyarrhythmia, supraventricular tachycardia
T3 triiodothyronine
T4 thyroxine
TB tuberculosis
tds *ter die sumendus* (3 times a day)
TED thyroid eye disease
TEN toxic epidermal necrolysis
TGF transforming growth factor
TIA transient ischaemic attack
TIBC total iron-binding capacity
TIMI thrombolysis in myocardial infarction
TIPSS transjugular intrahepatic portosystemic shunt
TLC total lung capacity
TLCO transfer factor of the lung for carbon monoxide
TMJ temporomandibular joint
TNF tumour necrosis factor
tPA tissue plasminogen activator
TPN total parenteral nutrition
TRALI transfusion-related acute lung injury
TRUS transrectal ultrasonography
TSH thyroid-stimulating hormone
TST tuberculin skin test
TT thrombin time
TTE transthoracic echocardiogram
TTP thrombotic thrombocytopenic purpura
TURP transurethral resection of the prostate
U&Es urea and electrolytes
UC ulcerative colitis
UFC urinary free cortisol
UFH unfractionated heparin
UIP usual interstitial pneumonia
URTI upper respiratory tract infection
US ultrasound
UTI urinary tract infection
UVA ultraviolet A
UVB ultraviolet B
VAP ventilator-associated pneumonia
VC vital capacity
VEGF vascular endothelium growth factor

VEP	visual evoked potential
VF	ventricular fibrillation
VHL	Von Hippel–Lindau syndrome
VIN	vulval intraepithelial neoplasia
VIP	vasoactive intestinal peptide
VLDL	very-low-density lipoprotein
V/Q	ventilation/perfusion
VSD	ventricular septal defect
VT	ventricular tachycardia
VWD	von Willebrand's disease
vWF	von Willebrand's factor
VZV	varicella-zoster virus
WCC	white cell count
WHO	World Health Organization
WoB	work of breathing
WPW	Wolff–Parkinson–White

1 Cardiovascular: Cases and Questions

Case 1: A patient with high blood pressure

A 28-year-old woman registers with a new GP. She is invited for a routine health check-up. The nurse discovers that the patient's BP is 165/95 mmHg. The patient says she has rushed to get to the surgery. The value is checked several times at home over the next few weeks but is persistently elevated. She is otherwise fit and well.

1. *What would you do for this woman next?*
- (a) Offer lifestyle advice alone, including a low-salt diet and increased exercise
- (b) Refer for an echocardiogram to look for left ventricular hypertrophy (LVH)
- (c) Suspect 'white coat' hypertension; repeat the BP measurement in 6 months or sooner if symptoms
- (d) Arrange 24-hour ambulatory recording

2. *Which of the following is not a secondary cause of hypertension?*
- (a) Addison's disease
- (b) Cushing's disease
- (c) Renal disease
- (d) Coarctation of the aorta

3. *What changes on the 12-lead ECG might you expect to see in a patient with chronic hypertension?*
- (a) Bifid P waves
- (b) Prominent S wave in V1 and prominent R wave in V5/V6
- (c) Right bundle branch block
- (d) First degree heart block

Case 2: A patient with xanthelasma

A 42-year-old non-smoking man is seen by his GP for a routine check-up. During the examination the GP notices that the man has xanthelasma around both eyes. His examination is unremarkable, other than being slightly overweight. Blood pressure is 120/80 mmHg. Lipid levels are as follows:

LDL	4.4 mmol/L
HDL	1.0 mmol/L
Total cholesterol	6.2 mmol/L

1. *How would you initially manage this man's hyperlipidaemia?*
- (a) Offer lifestyle advice and organise repeat blood lipid tests in 3 months
- (b) Commence atorvastatin 20 mg *nocte*
- (c) Only offer lifestyle advice
- (d) Use an alternative lipid-lowering agent, e.g. a fibrate or cholestyramine

2. *Which of the following may cause hyperlipidaemia?*
- (a) Chronic kidney disease
- (b) Liver disease
- (c) Hypothyroidism
- (d) Diabetes
- (e) Any of the above

3. *How do the commonly used 'statin' group of drugs work?*
- (a) Decrease absorption of fat from the gastrointestinal tract
- (b) HMG-CoA reductase inhibition (involved in cholesterol synthesis)
- (c) Increase the stimulation of lipoprotein lipase activity
- (d) Bile acid sequestration in the gastrointestinal tract

4. *Which of the following is a well-recognised side effect of the statin group of drugs?*
- (a) Lethargy
- (b) Visual disturbance
- (c) Myositis
- (d) Chronic kidney disease

Case 3: A patient with severe central chest pain

A 53-year-old man presents to the emergency department with severe central chest pain radiating through to his scapulae. The pain came on suddenly. He is known to be hypertensive. Examination reveals that he is sweaty, pale and unwell. Although he is in pain, he is cooperative and able to answer questions. His BP is 80/40 mmHg. His jugular venous pressure is not raised. There is an early diastolic murmur but his chest is clear. His abdomen is soft. ECG shows sinus rhythm with ECG evidence of left ventricular hypertrophy. There is no ECG evidence of acute myocardial infarction (MI). Chest X-ray film shows a widened mediastinum.

1. *What is your provisional diagnosis?*
- (a) Pulmonary embolism
- (b) Myocardial infarction (MI) (non-ST elevation)
- (c) Costochondritis
- (d) Aortic dissection

2. *How will you confirm your suspicions?*
- (a) CT scan
- (b) Lateral chest X-ray
- (c) Transthoracic echocardiography
- (d) Urgent thoracotomy

3. *How will you treat the BP?*
- (a) Intravenous bolus of 1000 mL Hartmann's solution
- (b) Intravenous bolus of 500 mL of a colloid solution, such as gelofusine
- (c) Commence a noradrenaline infusion to aim for BP 120/80 mmHg
- (d) Manage conservatively

Case 4: A patient with dizzy spells and a history of angina

A 68-year-old man who has been having dizzy spells over the last few months is referred to you. He has not lost consciousness but the dizzy spells are becoming more frequent, particularly if he exerts himself. He has a history of angina for which he takes bisoprolol and uses a glyceryl trinitrate (GTN) spray. He also has hypercholesterolaemia and has had a transurethral resection of his prostate in the past. On examination, he has several xanthelasma around the eyes and corneal arcus. There are no splinter haemorrhages. Neurological examination is normal.

BP is 110/75 mmHg. The pulse is regular, slow rising, with a rate of 60 beats/min. The apex beat is non-displaced and easily palpable. He has a systolic murmur which radiates across the praecordium

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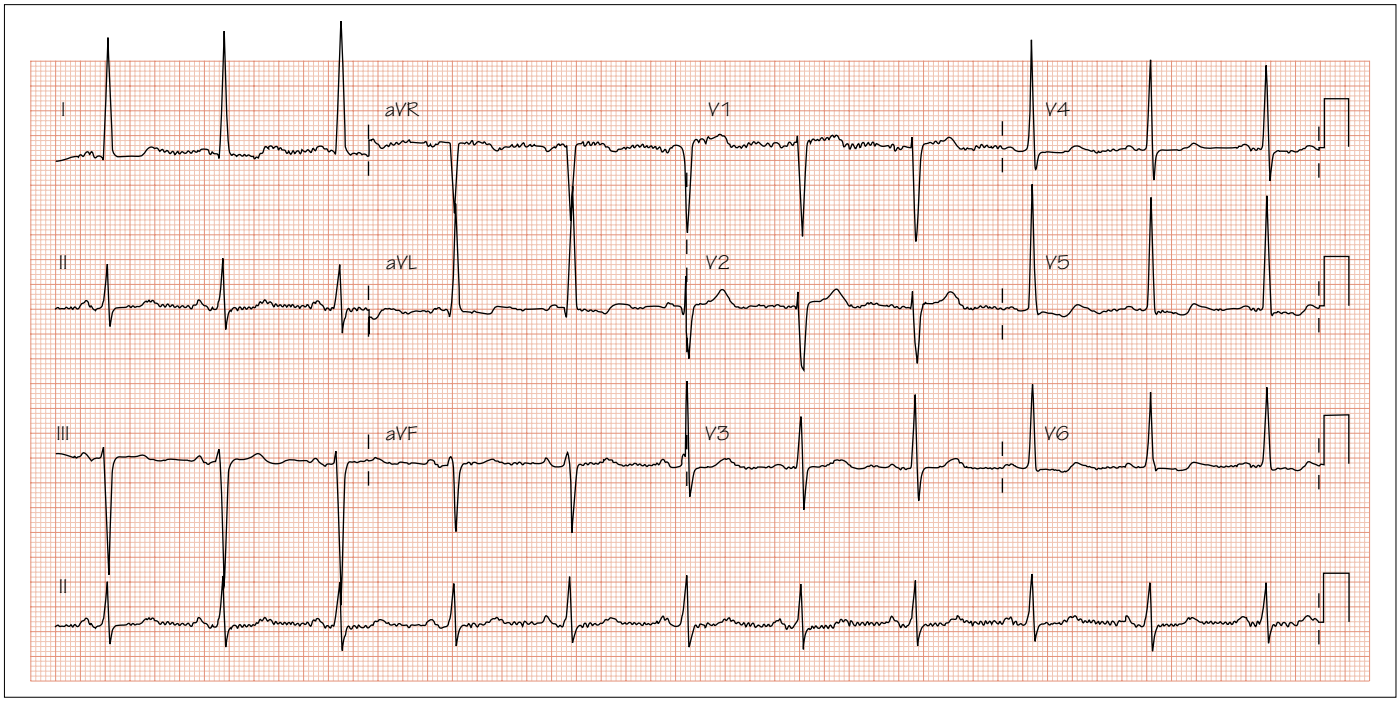

Figure 1.4.1

and to the carotids. Chest sounds are clear and chest X-ray appears normal. A 12-lead ECG is recorded (Figure 1.4.1).

1. *What is the most likely cause of this man's dizziness?*
- (a) Aortic valve stenosis
- (b) Aortic valve regurgitation
- (c) Mitral valve regurgitation
- (d) Micturition syncope

2. *How will you go about investigating this patient further?*
- (a) Exercise stress test
- (b) Coronary angiography
- (c) Transthoracic echocardiogram
- (d) 24-hour ECG

3. *What does the ECG (Figure 1.4.1) show?*
- (a) Ischaemia in the lateral leads (V4–6)
- (b) Left ventricular hypertrophy (LVH) with a strain pattern
- (c) Right axis deviation
- (d) Normal ECG

Case 5: A woman with sudden shortness of breath and palpitations

A 68-year-old woman is admitted to the emergency department with sudden shortness of breath and palpitations. She is known to have angina and is complaining of chest pain, similar to her usual exertional pain.

She appears clammy on examination. Her heart rate is 150–170 beats/min, and BP is recorded at 88/40 mmHg. She has a respiratory rate of 22 breaths/min and peripheral oxygen saturations of 92% with 15 L/min of supplemental oxygen. Fine crepitations are auscultated across her chest. An ECG has been performed (Figure 1.5.1).

1. *What does the ECG show?*
- (a) Sinus tachycardia
- (b) Atrial fibrillation (AF)
- (c) Atrial flutter
- (d) Wolff–Parkinson–White syndrome with pre-excitation

2. *How should this tachyarrhythmia be managed acutely?*
- (a) Amiodarone
- (b) Digoxin
- (c) Synchronised electrical cardioversion
- (d) Lidocaine

Case 6: A 72-year-old patient with shortness of breath

A 72-year-old woman has been referred to the chest clinic due to gradually progressive shortness of breath. She suffers with atrial fibrillation for which she takes digoxin. She is prescribed a direct oral anticoagulant to reduce the risk of AF-related thromboembolism.

On examination, she is comfortable although slightly short of breath at rest. She is flushed. She has a low, rumbling murmur heard in mid-diastole and has a tapping apex beat which is undisplaced. A right ventricular (parasternal) heave is noted. Her peripheral heart rate is 68 beats/min. The rhythm is irregularly irregular. Her jugular venous pressure is visible 6 cm above the sternal angle. There is mild pitting oedema to her ankles.

1. *What is the significance of the parasternal heave?*
- (a) Hyperdynamic circulation
- (b) Systemic hypertension
- (c) Pulmonary hypertension
- (d) Heart failure

2. *What does the clinical examination suggest?*
- (a) Mitral stenosis
- (b) Aortic regurgitation
- (c) Pulmonary regurgitation
- (d) Pulmonary stenosis

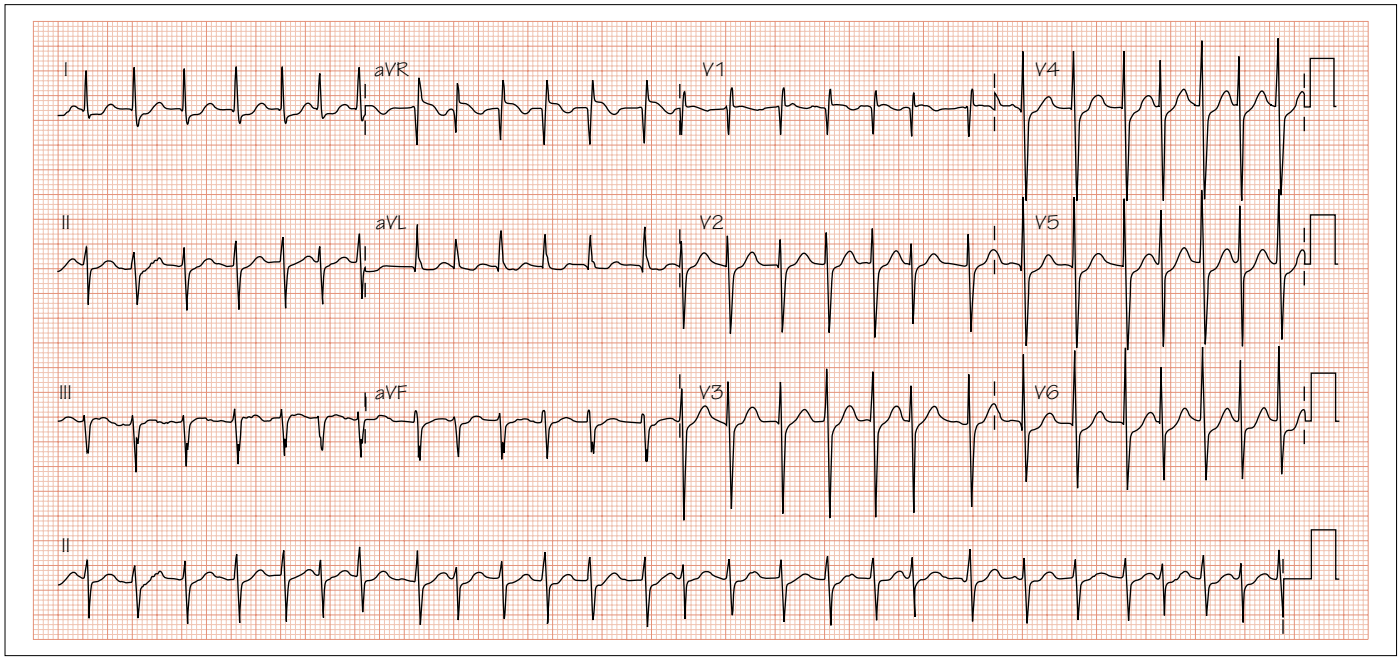

Figure 1.5.1

3. *What chest X-ray signs are associated with left atrial enlargement?*
   (a) Splayed carina
   (b) Double right heart border
   (c) Bulge in left heart border
   (d) Any of the above

Case 7: A patient in cardiac arrest on the ward

You respond to a cardiac arrest call on a medical ward. Upon arrival, the nursing team report that the patient is in asystole and that CPR has been ongoing for the last 4 minutes. Intravenous access has already been gained.

1. *What is the first step that you take?*
   (a) Give atropine 3 mg
   (b) Give adrenaline 1 mg
   (c) Check electrode contact and lead selection
   (d) Intubate the patient urgently
2. *With regard to the ECG electrodes, what is the correct positioning?*
   (a) Red – left arm; green – right leg; yellow – right arm
   (b) Red – right arm; yellow – left arm; green – left leg
   (c) Red – right arm; yellow – left arm; green – right leg
   (d) It is not important as you are only looking for electrical activity
3. *Asystole is confirmed and CPR continues until an attempt is made to intubate the patient. How long can CPR be interrupted to achieve this?*
   (a) 5 seconds
   (b) 10 seconds
   (c) 30 seconds
   (d) It should not be interrupted under any circumstances

Case 8: A patient in cardiac arrest

A patient is brought to the emergency department in cardiac arrest by air ambulance. The patient is already intubated and cardiopulmonary resuscitation is ongoing. The air ambulance team report that the rhythm has been pulseless electrical activity since they arrived at the patient.

1. *Which of the following is not listed as one of the 4 'H's and 4 'T's of reversible cardiac arrest causes?*
   (a) Haemorrhage
   (b) Hypothermia
   (c) Thrombus
   (d) Tension pneumothorax
2. *Which of the following drugs can be used to treat hyperkalaemia in the arrest situation?*
   (a) Glucagon
   (b) Sodium bicarbonate
   (c) Calcium gluconate
   (d) None of the above

Case 9: A fit woman with shortness of breath and flu-like symptoms

A 22-year-old woman, who is a keen long-distance runner and usually extremely fit and well, has been brought into the emergency department. Since yesterday she has become increasingly short of breath. It is considerably worse today. She has been unwell with a flu-like illness and fever for the last week, but had been able to train until a few days ago. She now also has mild central chest discomfort.

On examination, she is short of breath and in distress. Her respiratory rate is 34 breaths/min, BP 88/50 mmHg and pulse 140 beats/min. Her temperature is 38.5 °C and SpO_2 is 89% with an oxygen reservoir bag and mask. Her jugular venous pressure (JVP) is raised to the ear and there are loud heart sounds including a third heart sound. There is no peripheral oedema. There are widespread fine inspiratory crackles.

1. *What is the most likely cause of her symptoms?*
   (a) Heart failure
   (b) Pulmonary embolus

(c) Chest infection
(d) Status asthmaticus

2. *Which of the following would best explain the underlying cause of heart failure?*
   (a) Myocardial infarction
   (b) Congenital heart disease
   (c) Myocarditis
   (d) Pericardial effusion
3. *Which of the following treatment options might not be used in the acute setting?*
   (a) Non-invasive ventilation (CPAP)
   (b) Furosemide
   (c) Glyceryl trinitrate (GTN) infusion
   (d) β-blocker
   (e) Inotropes and vasopressors
4. *Which of the following are recognised to cause myocarditis?*
   (a) Viruses, bacteria, radiation, drugs, parasite infection
   (b) Viruses, connective tissue disorders, bacteria
   (c) Bacteria, drugs, connective tissue disorders, spirochete infections
   (d) All of the above

Case 10: A patient with shortness of breath and chest tightness

A 58-year-old woman has been brought into the emergency department complaining of sudden onset of severe shortness of breath and some mild chest tightness whilst eating her breakfast. She has had similar symptoms related to exertion over the past few months, albeit much less severe. These had settled on resting. She has had type 2 diabetes mellitus for many years and is now managed with insulin. She smokes 10 cigarettes a day and has a strong family history of ischaemic heart disease.

Examination shows her to be clammy and distressed. She is apyrexial with a BP 90/40 mmHg and a pulse rate of 110 beats/min. There are no cardiac murmurs but a third heart sound is audible. Her jugular venous pressure (JVP) is raised. The chest sounds wheezy. Her respiratory rate is 28 breaths/min with an SpO_2 of 86% on 4 L/min of supplemental oxygen.

Her ECG and chest X-ray are shown in Figure 1.10.1.

1. *What is the most likely cause of this patient's problems?*
   (a) Exacerbation of chronic obstructive pulmonary disease (COPD) or asthma
   (b) Diabetic ketoacidosis
   (c) Myocardial infarction (MI)
   (d) Severe indigestion
2. *What is the most likely cause of the chest X-ray findings?*
   (a) Acute respiratory distress syndrome (ARDS)
   (b) Pulmonary oedema
   (c) Bilateral pneumonia
   (d) Pneumothorax
3. *Which of the following are complications of an MI?*
   (a) Arrhythmias
   (b) Mitral valve regurgitation
   (c) Pericarditis
   (d) All of the above
   (e) Only arrhythmias and mitral valve regurgitation

Case 11: A drug user with a cough and chest pain

A 26-year-old known intravenous drug user presents with a long history of cough, pleuritic chest pain and occasional haemoptysis. He also describes night sweats and fevers. Examination reveals a cachectic man who is pyrexial (temperature of 39.2 °C). He has a raised jugular venous pressure and pansystolic murmur, which is loudest over the left sternal edge and accentuated by inspiration. His C-reactive protein (CRP) is 160 mg/L, and his white cell count (WCC) is 18.4×10^9/L. Chest X-ray is normal.

1. *What is the most likely diagnosis to be considered in this patient?*
   (a) Pulmonary tuberculosis
   (b) Chest infection
   (c) Pulmonary embolism
   (d) Infective endocarditis
2. *How many sets of blood cultures should you take in this setting as a minimum?*
   (a) One
   (b) Two
   (c) Three
   (d) Four
3. *What is a mycotic aneurysm?*
   (a) Inflammation and dilatation of a vessel wall caused by septic emboli
   (b) Fungal infection occurring in an aneurysmal dilatation
   (c) Fungal infection causing inflammation and dilatation of a vessel wall
   (d) Fungal plaque obstructing valvular outflow that is prone to rupture

Case 12: A patient with angina and raised blood pressure

A 67-year-old man, who is known to have well-controlled angina, was recently noted by his GP to be slightly hypertensive despite treatment. He takes bendroflumethiazide 2.5 mg od, bisoprolol 5 mg od and ramipril 5 mg bd as well as aspirin 75 mg od. His BP is over 160/95 mmHg on several occasions and it is decided to add further antihypertensive therapy.

1. *Which drug would be appropriate to add to his prescription?*
   (a) Amlodipine (calcium channel blocker)
   (b) Hydralazine (nitrate)
   (c) Losartan (an angiotensin II receptor antagonist)
   (d) Doxazosin (α-antagonist)

   He is commenced on an additional antihypertensive medication, but 2 weeks later returns complaining of swollen ankles. He is otherwise asymptomatic.
2. *What is the likely cause of this man's ankle oedema?*
   (a) Heart failure caused by the new medication
   (b) Lymphoedema
   (c) Treatment side effect
   (d) Orthostatic oedema
3. *What is a commonly seen side effect of bendroflumethiazide?*
   (a) Hyponatraemia
   (b) Paradoxical hypertension
   (c) Hyperkalaemia
   (d) Stevens–Johnson syndrome