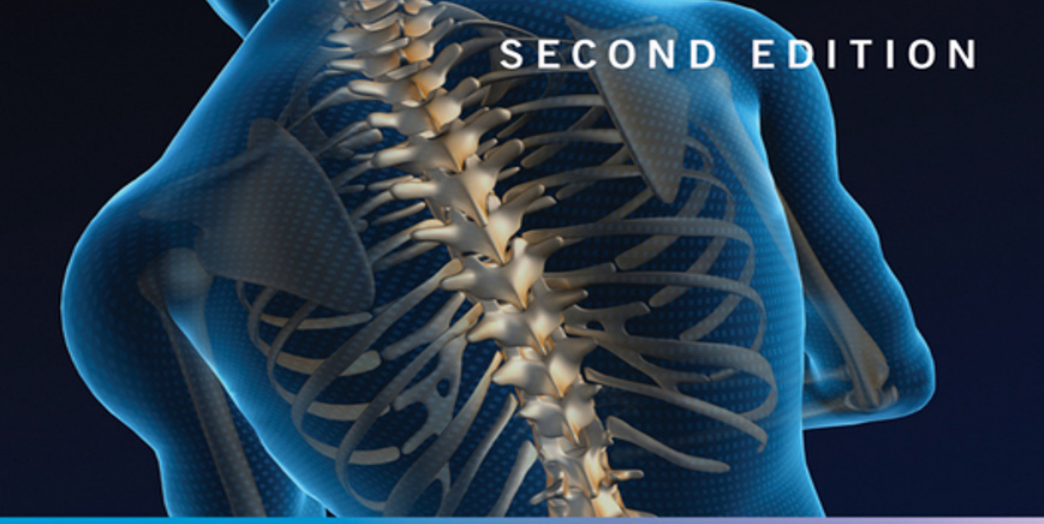

SECOND EDITION

RAPID Medicine

Amir Sam
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WILEY-BLACKWELL

Rapid Medicine

Rapid Medicine

Second Edition

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Contents

Preface

In the conception of this book, we envisioned a text encompassing core medical conditions in an easily accessible format. *Rapid Medicine* covers over 200 diseases in a structured manner. For each condition we have summarised the Definition, Aetiology, Epidemiology, History, Examination, Investigations, Management, Complications and Prognosis. We hope that this will provide a useful pocketbook on the wards and in preparation for exams.

In clinical practice however, patients present with symptoms and signs rather than confirmed diagnoses. It is therefore essential to supplement the knowledge of various diseases with an understanding of the differential diagnoses of clinical presentations. The second edition of *Rapid Medicine* has been configured with this learning strategy in mind. This new edition contains a separate section on the differential diagnoses for a range of symptoms, signs and laboratory test results, reflecting the way in which most of your patients will present to you during your study and clinical practice.

This edition also contains an additional section named 'Shorter Topics'. Here we have included a number of important conditions that medical students need to know about, but perhaps not in as much detail. We hope that you enjoy this book and use it to consolidate your ward-based learning.

Amir H. Sam
James T.H. Teo

List of abbreviations

ABG	arterial blood gas
ABPA	allergic bronchopulmonary aspergillosis
ACAG	acute closed-angle glaucoma
ACE	angiotensin-converting enzyme
ACh	acetylecholine
ACTH	adrenocorticotrophic hormone
ADH	antidiuretic hormone
AF	atrial fibrillation
AFP	alpha feto-protein
AIDS	acquired immune deficiency syndrome
ALP	alkaline phosphatase
ALA	δ-aminolaevulinic acid
ALL	acute lymphoblastic leukaemia
ALS	amyotrophic lateral sclerosis
ALT	alanine transaminase
AML	acute myeloblastic leukaemia
ANA	anti-nuclear antibody
ANCA	anti-neutrophil cytoplasm antibody
APP	amyloid precursor protein
APTT	activated partial thromboplastin time
ARDS	acute respiratory distress syndrome
ARF	acute renal failure
5-ASA	5-aminosalicyclic acid
ASD	atrioseptal defect
ASM	anti-smooth muscle antibody
AST	aspartate aminotransferase
ATN	acute tubular necrosis
AV	atrioventricular
AXR	abdominal X-ray
BCC	basal cell carcinoma
BCG	Bacille Calmette–Guérin
BiPAP	biphasic positive airway pressure
BMI	body mass index
BP	blood pressure
CABG	coronary artery bypass graft
CAH	congenital adrenal hyperplasia
c-ANCA	cytoplasmic anti-neutrophil cytoplasmic antibodies
CAPD	continuous ambulatory peritoneal dialysis
CEA	carcinoembyonic antigen
CHD	coronary heart disease
CK	creatine kinase
CLL	chronic lymphocytic leukaemia
CM	cardiomyopathy
CML	chronic myelocytic leukaemia
CMML	chronic myelomonocytic leukaemia
CMV	cytomegalovirus
CNS	central nervous system
COAD	chronic obstructive airway disease
COMT	catechol-*O*-methyltransferase
COPD	chronic obstructive pulmonary disease

CPAP	continuous positive airway pressure
CPR	cardiopulmonary resuscitation
CREST	syndrome of calcinosis, Raynaud's, oesophageal dysmotility, sclerodactyly and telangiectasia
CRF	corticotrophin-releasing factor/chronic renal failure
CRH	cortisol-releasing hormone
CRP	C-reactive protein
CSF	cerebrospinal fluid
CSS	Churg–Strauss syndrome
CT	computerized tomography
CTP	carboxyterminal propeptide
CVA	cerebrovascular accident
CVP	central venous pressure
CVS	chorionic villus sampling/cardiovascular system
CXR	chest X-ray
DCM	dilated cardiomyopathy
DDAVP	desmopressin
DHEA	dehydroepiandrosterone
DHEAS	dehydroepiandrosterone sulphate
DIC	disseminated intravascular coagulation
DIDMOAD	syndrome of diabetes insipidus, diabetes mellitus, optic atrophy and deafness
DIP	desquamative interstitial pneumonia/distal interphalangeal
DKA	diabetic ketoacidosis
DMD	duchenne muscular dystrophy
DNA	deoxyribonucleic acid
DOPA	dihydroxyphenylalanine
DPTA	diethylenetriamine penta-acetate
DVT	deep vein thrombosis
EBV	Epstein–Barr virus
ECG	electrocardiogram
EDTA	ethylenediaminetetra-acetate
EEG	electroencephalogram
ELISA	enzyme-linked immunoabsorbent assay
EMD	electrical–mechanical dissociation
EMG	electromyogram
ENT	ear, nose and throat
ERCP	endoscopic retrograde cholangio-pancreatography
ESR	erythrocyte sedimentation rate
ETT	exercise tolerance test
FAB	French–American–British classification
FBC	full blood count
***FEV*$_1$**	forced expiratory volume in 1 s
FFP	fresh frozen plasma
FSH	follicle-stimulating hormone
FVC	forced vital capacity
GABA	gamma-aminobutyric acid
GAD	glutamic acid decarboxylase
GBM	glomerular basement membrane
GCA	giant cell arteritis
GCS	glasgow Coma Scale
GFR	glomerular filtration rate
GGT	γ-glutamyl transferase
GH	growth hormone

GHRH	growth-hormone-releasing hormone
GI	gastrointestinal
GnRH	gonadotrophin-releasing hormone
G6PD	glucose-6-phosphate dehydrogenase
GTT	glucose tolerance test
HAART	highly active antiiretroviral treatment
HACEK	haemophilus, actinobacillus, cardiobacterium, eikenella, kingella
HAV	hepatitis A
Hb	haemoglobin
HBIG	hepatitis B immunoglobulin
HBV	hepatitis B virus
HCC	hepatocellular carcinoma
hCG	human chorionic gonadotrophin
HCM	hypertrophic cardiomyopathy
HCV	hepatitis C virus
HDL	high-density lipoprotein
HDV	hepatitis D virus
HEV	hepatitis E
5-HIAA	5-hydroxyindole acetic acid
HIDA	hepatoiminodiacetic acid
HIV	human immunodeficiency virus
HLA	human leukocyte antigen
HNF	hepatocyte nuclear factor
HONK	hyperosmolar non-ketotic
HSP	Henoch–Schönlein purpura
HSV	herpes simplex virus
HTLV	human T-cell lymphoma virus
HUS	haemolytic–uraemic syndrome
IBD	inflammatory bowel disease
IBS	irritable bowel syndrome
ICP	intracranial pressure
ICT	immunochromato- graphic test
IDDM	insulin-dependent diabetes mellitus
Ig	immunoglobulin
IGF-	insulin-like growth factor
IHD	ischaemic heart disease
IL	interleukin
IM	intramuscular
INR	international normalized ratio
IOP	intraocular pressure
IPPV	intermittent positive pressure ventilation
ITP	immune thrombocytopenic purpura
ITU	intensive therapy unit
IV	intravenous
IVIG	intravenous infusions of immunoglobulin
IVU	intravenous urogram
JVP	jugular venous pressure
KD	Kawasaki's disease
KUB	abdominal radiograph of kidneys, ureter and bladder
LBBB	left bundle branch block
LDH	lactate dehydrogenase
LDL	low-density lipoprotein
LFT	liver function test
LH	luteinizing hormone/laparoscopic hysterectomy

LKM	liver/kidney microsomal (antibodies)
LMN	lower motor neurone
LMW	low molecular weight
MAO	monoamine oxidase
MCH	mean cell haemoglobin
MCP	metacarpal-phalangeal
MCV	mean cell volume
MEC	mixed essential cryoglobulinaemia
MEN	multiple endocrine neoplasia
MI	myocardial infarct
MIBG	meta-iodobenzyguanidine
MODS	multiple organ dysfunction syndrome
MODY	maturity-onset diabetes of the young
MP	microscopic polyangiitis
MPGN	membranoproliferative glomerulonephritis
MRCP	magnetic resonance cholangio-pancreography
MPTP	1-methyl-4-phenyl-1,2,3,6-tetrahydro- pyridine
MRI	magnetic resonance imaging
MS	multiple sclerosis
MSE	mental state examination
MSU	midstream urine
MTP	metatarsophalangeal
NAC	*N*-acetylcysteine
NAPQI	*N*-acetyl-*p*-benzoquinoneimine
NASH	non-alcoholic streatohepatitis
NIDDM	non-insulin-dependent diabetes mellitus
NK	natural killer
NSAIDs	non-steroidal anti-inflammatory drugs
NSIP	non-specific interstitial pneumonia
OGD	oesaphago-gastro-duodenoscopy
OTC	over-the-counter
PAF	platelet-activating factor
PAN	polyarteritis nodosa
pANCA	perinuclear antineutrophil cytoplasmic antibodies
PAS	periodic acid–Schiff
PBG	porphobilinogen
PCOS	polycystic ovarian syndrome
PCP	*Pneumocystis carinii* pneumonia
PCR	polymerase chain reaction
PCS	primary sclerosing cholangitis
PCV	packed cell volume
PCWP	pulmonary capillary wedge pressure
PEEP	positive end expiratory pressure
PEFR	peak expiratory flow rate
PEG	percutaneous endoscopic gastronomy
PET	positron emission tomography
PIP	peripheral-interphalangeal
PKD	polycystic kidney disease
PKDL	post kala azar dermal leishmaniasis
PMR	polymyalgia rheumatica
POAG	primary open-angle glaucoma
POEMS	syndrome of polyneuropathy, endocrinopathy, monoclonal gammopathy and skin pigmentation
PPAR	peroxisome proliferator-activated receptor

PPD	purified protein derivative of tuberculin
PR	per rectum
PSC	primary sclerosing cholangitis
PT	prothrombin time
PTH	parathyroid hormone
PUVA	psoralen and ultraviolet A therapy
QBC	quantitative buffy coat test
RA	refractory anaemia
RAEB	refractory anaemia with excess blasts
RAEB-t	RAEB in transformation
RAO	retinal artery occlusion
RAPD	relative afferent pupillary defect
RARS	refractory anaemia with ring sideroblasts
RAST	radio-allergosorbent test
RBBB	right bundle branch block
RBC	red blood cell
RCM	restrictive cardiomyopathy
REAL	Revised American and European Lymphoma classification
RP	relapsing polychondritis
RNA	ribonucleic acid
RTA	renal tubular acidosis
RUQ	right upper quadrant
RVO	retinal vein occlusion
SAA	serum amyloid A
SAP	serum amyloid P
SAPHO	syndrome of synovitis, acne, palmoplantar pustulosis, hyperostosis, osteitis
SBP	spontaneous bacterial peritonitis
SC	subcutaneous
SCC	squamous cell carcinoma
SHBG	sex-hormone-binding globulin
SIADH	syndrome of inappropriate ADH
SIRS	systemic inflammatory response syndrome
SLE	systemic lupus erythematosus
SMA	smooth muscle antibody
SPECT	single photon emission computerized tomography
SXR	skull X-ray
$t_{1/2}$	half-life
T_3	tri-iodothyronine
T_4	thyroxine
TA	Takayasu's disease
TB	tuberculosis
t.d.s.	three times per day
TEN	toxic epidermal necrolysis
TFT	thyroid function test
TIA	transient ischaemic attack
TIBC	total iron-binding capacity
TIPS	transjugular intrahepatic portosystemic shunt
TLCO	carbon monoxide transfer factor
TNF	tumour necrosis factor
tPA	tissue plasminogen activator
TPN	total parenteral nutrition
TRAP	tartrate-resistant acid phosphatase
TRH	thyroid-releasing hormone
TSH	thyroid-stimulating hormone

TTP	thrombotic thrombocytopenic purpura
UC	ulcerative colitis
U&E	urea and electrolytes
UIP	usual interstitial pneumonia
UMN	upper motor neurone
UTI	urinary tract infection
UV	ultraviolet
VCA	viral capsid antigen
VDRL	venereal disease research laboratory
VF	ventricular fibrillation
VLDL	very low-density lipoprotein
VQ	ventilation: perfusion ratio
VSD	ventriculoseptal defect
VT	ventricular tachycardia
vWF	von Willebrand's factor
VZV	varicella zoster virus
VZIG	varicella zoster immunoglobulin
WCC	white cell count
WG	Wegener's granulomatosis
WHO	World Health Organization

List of symbols

<	less than
>	greater than
/	or
↑	increased
↓	decreased
♀	female
♂	male

Medical Conditions

Aortic dissection

DEFINITION A condition where a tear in the aortic intima allows blood to surge into the aortic wall, causing a split between the inner and outer tunica media, and creating a false lumen.

AETIOLOGY Degenerative changes in the smooth muscle of the aortic media are the predisposing event. Common causes and predisposing factors are:

- hypertension;
- aortic atherosclerosis;
- connective tissue disease (e.g. SLE, Marfan's, Ehlers–Danlos);
- congenital cardiac abnormalities (e.g. aortic coarctation);
- aortitis (e.g. Takayasu's aortitis, tertiary syphilis);
- iatrogenic (e.g. during angiography or angioplasty);
- trauma;
- crack cocaine.

Stanford classification divides dissection into:

- *type A* with ascending aorta tear (most common);
- *type B* with descending aorta tear distal to the left subclavian artery.

Expansion of the false aneurysm may obstruct the subclavian, carotid, coeliac and renal arteries.

EPIDEMIOLOGY Most common in ♂ between 40 and 60 years.

HISTORY Sudden central 'tearing' pain, may radiate to the back (may mimic an MI). Aortic dissection can lead to occlusion of the aorta and its branches:

Carotid obstruction: Hemiparesis, dysphasia, blackout.
Coronary artery obstruction: Chest pain (angina or MI).
Subclavian obstruction: Ataxia, loss of consciousness.
Anterior spinal artery: Paraplegia.
Coeliac obstruction: Severe abdominal pain (ischaemic bowel).
Renal artery obstruction: Anuria, renal failure.

EXAMINATION Murmur on the back below left scapula, descending to abdomen.
Blood pressure (BP): Hypertension (BP discrepancy between arms of >20 mmHg), wide pulse pressure. If hypotensive may signify tamponade, check for pulsus paradoxus.
Aortic insufficiency: Collapsing pulse, early diastolic murmur over aortic area.
Unequal arm pulses.
There may be a palpable abdominal mass.

INVESTIGATIONS
Bloods: FBC, cross-match 10 units of blood, U&E (renal function), clotting.
CXR: Widened mediastinum, localized bulge in the aortic arch.
ECG: Often normal. Signs of left ventricular hypertrophy or inferior MI if dissection compromises the ostia of the right coronary artery.
CT-thorax: False lumen of dissection can be visualized.
Echocardiography: Transoesophageal is highly specific.
Cardiac catheterization and aortography.

MANAGEMENT
Acute: If suspected, CT-thorax should be performed urgently concurrent to resuscitation. Resuscitate and restore blood volume with blood products. Monitor pulse and BP in both arms, central venous pressure monitoring, urinary catheter. Best managed in ITU setting.

Aortic dissection (continued)

Type A dissection: Treated surgically. Emergency surgery because of the risk of cardiac tamponade. Affected aorta is replaced by a tube graft. Aortic valve may also be replaced.

Type B dissection: Can be treated medically, surgically or by endovascular stenting. Control BP and prevent further dissection with IV nitroprusside and/or IV labetalol (use calcium channel blocker if β-blocker contraindicated). Surgical repair may be appropriate for patients with intractable or recurrent pain, aortic expansion, end-organ ischemia or progression of dissection, and has similar outcome rates. Endovascular repair is a newer technique using endovascular stents and is available in some centres, although evidence of benefit is still lacking (ADSORB trial results pending).

COMPLICATIONS Aortic rupture, cardiac tamponade, pulmonary oedema, MI, syncope, cerebrovascular, renal, mesenteric or spinal ischaemia.

PROGNOSIS Untreated mortality: 30% at 24 h, 75% at 2 weeks.
Operative mortality of 5–10%. A further 10% have neurological sequelae.
Prognosis for type B better than type A.

Aortic regurgitation

DEFINITION Reflux of blood from aorta into left ventricle (LV) during diastole. Aortic regurgitation (AR) is also called aortic insufficiency.

AETIOLOGY

Aortic valve leaflet abnormalities or damage: Bicuspid aortic valve, infective endocarditis, rheumatic fever, trauma.

Aortic root/ascending aorta dilation: Systemic hypertension, aortic dissection, aortitis (e.g. syphilis, Takayasu's arteritis), arthritides (rheumatoid arthritis, seronegative arthritides), Marfan's syndrome, pseudoxanthoma elasticum, Ehlers–Danlos syndrome, osteogenesis imperfecta.

Reflux of blood into the LV during diastole results in left ventricular dilation and ↑ end-diastolic volume and ↑ stroke volume. The combination of ↑ stroke volume and low end-diastolic pressure in the aorta may explain the collapsing pulse and the wide pulse pressure. In acute AR, the LV cannot adapt to the rapid increase in end-diastolic volume caused by regurgitant blood.

EPIDEMIOLOGY Chronic AR often begins in the late 50s, documented most frequently in patients >80 years.

HISTORY Chronic AR: initially asymptomatic. Later, symptoms of heart failure: exertional dyspnoea, orthopnoea, fatigue. Occasionally angina.

Severe acute AR: sudden cardiovascular collapse.

Symptoms related to the aetiology, e.g. chest or back pain in patients with aortic dissection.

EXAMINATION Collapsing 'water-hammer' pulse and wide pulse pressure. Thrusting and heaving (volume-loaded) displaced apex beat.

Early diastolic murmur at lower left sternal edge, better heard with the patient sitting forward with the breath held in expiration. An ejection systolic murmur is often heard because of ↑ flow across the valve.

Austin Flint mid-diastolic murmur: Over the apex, from turbulent reflux hitting anterior cusp of the mitral valve and causing a physiological mitral stenosis.

Rare signs associated with a hyperdynamic pulse:

Quincke's sign: Visible pulsations on nail-bed.

de Musset's sign: Head nodding in time with pulse.

Becker's sign: Visible pulsations of the pupils and retinal arteries.

Müller's sign: Visible pulsation of the uvula.

Corrigan's sign: Visible pulsations in neck.

Traube's sign: 'Pistol shot' (systolic and diastolic sounds) heard on auscultation of the femoral arteries.

Duroziez's sign: A systolic and diastolic bruit heard on partial compression of femoral artery with a stethoscope.

Rosenbach's sign: Systolic pulsations of the liver.

Gerhard's sign: Systolic pulsations of the spleen.

Hill's sign: Popliteal cuff systolic pressure exceeding brachial pressure by >60 mmHg.

INVESTIGATIONS

CXR: Cardiomegaly. Dilation of the ascending aorta. Signs of pulmonary oedema may be seen with left heart failure.

ECG: May show signs of left ventricular hypertrophy (deep S wave in $V_{1–2}$, tall R wave in $V_{5–6}$, inverted T waves in I, aVL, $V_{5–6}$ and left-axis deviation).

Aortic regurgitation (continued)

Echocardiogram: 2D echo and M-mode may indicate the underlying cause (e.g. aortic root dilation, bicuspid aortic valve) or the effects of AR (left ventricular dilation/dysfunction and fluttering of the anterior mitral valve leaflet). Doppler echocardiography for detecting AR and assessing severity. Periodic (annual) follow-up echocardiogram for serial measurements of LV size and function.

Cardiac catheterization with angiography: If there is uncertainty about the functional state of the ventricle or the presence of coronary artery disease.

MANAGEMENT

Aortic valve replacement: In patients with symptoms of ventricular decompensation, or LV dysfunction: ejection fraction <50%, LV enlargement (end-systolic dimension >55 mm; end-diastolic dimension >75 mm).

Vasodilators (ACE inhibitor or nifedipine): In patients with LV systolic dysfunction (left ventricular ejection fraction (LVEF) <50%), or progressive LV dilatation. Vasodilators ↓ systemic vascular resistance and the afterload, i.e. the burden on the volume-loaded LV. Treat the complications (e.g. heart failure).

COMPLICATIONS Left ventricular failure and pulmonary oedema.

PROGNOSIS Chronic AR is often well tolerated for many years without symptoms.

Prognosis depends on the underlying aetiology. Acute AR caused by aortic dissection or infective endocarditis is fatal if not treated urgently.

Aortic stenosis

DEFINITION Narrowing of the left ventricular outflow at the level of the aortic valve.

AETIOLOGY

1. Stenosis secondary to rheumatic heart disease (commonest worldwide);
2. calcification of a congenital bicuspid aortic valve;
3. calcification/degeneration of a tricuspid aortic valve in the elderly.

EPIDEMIOLOGY Prevalence in ~3% of 75-year-olds. ♂ > ♀. Those with bicuspid aortic valve may present earlier (as young adults).

HISTORY May be asymptomatic initially.
Angina (because of ↑ oxygen demand of the hypertrophied ventricles).
Syncope or dizziness on exercise.
Symptoms of heart failure (e.g. dyspnoea).

EXAMINATION

BP: Narrow pulse pressure.
Pulse: Slow-rising.
Palpation: Thrill in the aortic area (if severe). Forceful sustained thrusting undisplaced apex beat.
Auscultation: Harsh ejection systolic murmur at aortic area, radiating to the carotid artery and apex. Second heart sound (A2 component) may be softened or absent (because of calcification). A bicuspid valve may produce an ejection click.
Distinguish from aortic sclerosis[1] **and hypertrophic obstructive cardiomyopathy (HOCM).**[2]

INVESTIGATIONS

ECG: Signs of left ventricular hypertrophy (deep S wave in $V_{1–2}$, tall R wave in $V_{5–6}$, inverted T waves in I, aVL, $V_{5–6}$ and left-axis deviation), LBBB.
CXR: Post-stenotic enlargement of the ascending aorta, calcification of aortic valve.
Echocardiogram: Visualizes structural changes of the valves and level of stenosis (valvar, supravalvar or subvalvar). Estimation of aortic valve area and pressure gradient across the valve in systole and left ventricular function may be assessed.
Cardiac angiography: Allows differentiation from other causes of angina, and to assess for concomitant coronary artery disease (50% of patients with severe aortic stenosis have significant coronary artery disease).

MANAGEMENT General principle is surgical management unless contraindicated.
Surgical: Valve replacement is recommended if valve pressure difference is >50 mmHg in a symptomatic patient. If unfit for surgery, balloon dilation (valvoplasty) may be performed but this is considered to be a palliative procedure due to high rate of complications (e.g. MI, myocardial perforation, severe AR).
Medical: Manage left ventricular failure (*see* Cardiac failure); ACE inhibitors and vasodilators should be used very cautiously in aortic stenosis. Antibiotic prophylaxis against infective endocarditis.

[1]Aortic sclerosis is senile degeneration with no left ventricular outflow tract obstruction. The pulse character is normal, a thrill is not palpable and the ejection systolic murmur radiates only faintly. The S_2 heart sound is normal.

[2]HOCM: *see* Cardiomyopathy.

Aortic stenosis (continued)

COMPLICATIONS Arrhythmias, Stokes–Adams attacks, MI, left ventricular failure and sudden death.

PROGNOSIS Survival differs according to symptoms. In symptomatic patients with severe aortic stenosis causing left ventricular failure, average survival 50% at 18 months without surgery. Average survival with angina 5 years; syncope 3 years; dyspnoea 2 years.

Atrial fibrillation

DEFINITION Characterized by rapid, chaotic and ineffective atrial electrical conduction. Often subdivided into: 'permanent', 'persistent' and 'paroxysmal'.

AETIOLOGY There may be no identifiable cause ('lone' atrial fibrillation (AF)). Secondary causes lead to abnormal atrial electrical pathways that result in AF.

Systemic causes: Thyrotoxicosis, hypertension, pneumonia, alcohol.

Heart: Mitral valve disease, ischaemic heart disease, rheumatic heart disease, cardiomyopathy, pericarditis, sick sinus syndrome,[1] atrial myxoma.

Lung: Bronchial carcinoma, pulmonary embolism.

EPIDEMIOLOGY Very common in the elderly (~5% of those >65 years). May be paroxysmal.

HISTORY Often asymptomatic. Some patients experience palpitations or syncope. Symptoms of the cause of the AF.

EXAMINATION Irregularly irregular pulse, difference in apical beat and radial pulse. Look for thyroid disease and valvular heart disease.

INVESTIGATIONS

ECG: Uneven baseline (fibrillations) with absent P waves, irregular QRS complexes. If there is a saw-tooth baseline, consider if there is atrial flutter.[2]

Blood: Cardiac enzymes, TFT, lipid profile, U&E, Mg^{2+}, Ca^{2+} (risk of digoxin toxicity ↑ with hypokalaemia, hypomagnesaemia or hypercalcaemia).

Echocardiogram: To assess for mitral valve disease, left atrial dilation, left ventricular dysfunction or structural abnormalities.

MANAGEMENT Treat any reversible cause (e.g. thyrotoxicosis, chest infection).
Specific treatment strategy focuses on:

(1) **Rhythm control**[3]:

If the AF is >48 h from onset, anticoagulate (at least 3–4 weeks) before attempting cardioversion.

DC cardioversion: Synchronized DC shock (2 × 100 J, 1 × 200 J).

Chemical cardioversion: Flecainide (contraindicated if there is history of ischaemic heart disease) or amiodarone.

Prophylaxis against AF: Sotalol, amiodarone or flecainide. Also consider providing 'pill-in-the-pocket' strategy for suitable patients.

(2) **Rate control**[3]

Chronic 'permanent' AF: Ventricular rate control with digoxin, verapamil and/or β-blockers. Aim for rate of ~90/min..

[1]Sick sinus (or tachy–brady) syndrome: caused by ischaemia, infarction or fibrosis of the sinus node, presenting with bradycardia (caused by intermittent failure of sinus node depolarization), with ↑ P–P intervals (>2 s) and intermittent tachycardia (caused by ↑ ectopic pacemaker activity). Treated with pacemaker insertion for symptomatic bradycardia, anti-arrhythmics for tachycardia and anticoagulation to reduce risk of thromboembolism.

[2]Atrial flutter is characterized by atrial rate of 300 min^{-1} and ventricular rate of 150 min^{-1} (2:1 heart block as atrioventricular (AV) node conducts every second beat). ECG shows a regular 'saw-tooth' baseline (rate ~300 min^{-1}). Can be reversed by vagal manoeuvres, IV adenosine (with cardiac monitoring) or chemical cardioversion.

[3]The AFFIRM trial showed that rhythm control offers no survival advantage over rate control.

Atrial fibrillation (continued)

(3) **Stroke risk stratification**:
Low-risk patients can be managed with aspirin, and high-risk patients require anticoagulation with warfarin. Risk factors indicating high risk are previous thromboembolic event, age ≥75 years with hypertension, diabetes or vascular disease, and/or clinical evidence of valve disease, heart failure or impaired left ventricular function.

COMPLICATIONS Thromboembolism (e.g. embolic stroke ~4% risk per year, ↑ risk with left atrial enlargement or left ventricular dysfunction). Worsens any existing heart failure.

PROGNOSIS Chronic AF in a diseased heart does not usually return to sinus rhythm.