2.1 Examples of terms used by patients that should be clarified

Patient's term	Common underlying problems	Useful distinguishing features
Allergy	True allergy (immunoglobulin E-mediated reaction) Intolerance of food or drug, often with nausea or other gastrointestinal upset	Visible rash or swelling, rapid onset Predominantly gastrointestinal symptoms
Indigestion	Acid reflux with oesophagitis Abdominal pain due to: Peptic ulcer Gastritis Cholecystitis Pancreatitis	Retrosternal burning, acid taste Site and nature of discomfort: Epigastric, relieved by eating Epigastric, with vomiting Right upper quadrant, tender Epigastric, severe, tender
Arthritis	Joint pain Muscle pain Immobility due to prior skeletal injury	Redness or swelling of joints Muscle tenderness Deformity at site
Catarrh	Purulent sputum from bronchitis Infected sinonasal discharge Nasal blockage	Cough, yellow or green sputum Yellow or green nasal discharge Anosmia, prior nasal injury/polyps
Fits	Transient syncope from cardiac disease Epilepsy Abnormal involuntary movement	Witnessed pallor during syncope Witnessed tonic/clonic movements No loss of consciousness
Dizziness	Labyrinthitis Syncope from hypotension Cerebrovascular event	Nystagmus, feeling of room spinning, with no other neurological deficit History of palpitation or cardiac disease, postural element Sudden onset, with other neurological deficit

2.2 Characteristics of pain (SOCRATES)

Site

- Somatic pain, often well localised, e.g. sprained ankle
- Visceral pain, more diffuse, e.g. angina pectoris

Onset

- Speed of onset and any associated circumstances

Character

- Described by adjectives, e.g. sharp/dull, burning/tingling, boring/stabbing, crushing/tugging, preferably using the patient's own description rather than offering suggestions

Radiation

- Through local extension
- Referred by a shared neuronal pathway to a distant unaffected site, e.g. diaphragmatic pain at the shoulder tip via the phrenic nerve (C_3, C_4)

Associated symptoms

- Visual aura accompanying migraine with aura
- Numbness in the leg with back pain suggesting nerve root irritation

Timing (duration, course, pattern)

- Since onset
- Episodic or continuous:
  - If episodic, duration and frequency of attacks
  - If continuous, any changes in severity

Exacerbating and relieving factors

- Circumstances in which pain is provoked or exacerbated, e.g. eating
- Specific activities or postures, and any avoidance measures that have been taken to prevent onset
- Effects of specific activities or postures, including effects of medication and alternative medical approaches

Severity

- Difficult to assess, as so subjective
- Sometimes helpful to compare with other common pains, e.g. toothache
- Variation by day or night, during the week or month, e.g. relating to the menstrual cycle

2.3 Questions to ask about common symptoms

System	Question
Cardiovascular	Do you ever have chest pain or tightness? Do you ever wake up during the night feeling short of breath? Have you ever noticed your heart racing or thumping?
Respiratory	Are you ever short of breath? Have you had a cough? If so, do you cough anything up? What colour is your phlegm? Have you ever coughed up blood?
Gastrointestinal	Are you troubled by indigestion or heartburn? Have you noticed any change in your bowel habit recently? Have you ever seen any blood or slime in your stools?
Genitourinary	Do you ever have pain or difficulty passing urine? Do you have to get up at night to pass urine? If so, how often? Have you noticed any dribbling at the end of passing urine? Have your periods been quite regular?
Musculoskeletal	Do you have any pain, stiffness or swelling in your joints? Do you have any difficulty walking or dressing?
Endocrine	Do you tend to feel the heat or cold more than you used to? Have you been feeling thirstier or drinking more than usual?
Neurological	Have you ever had any fits, faints or blackouts? Have you noticed any numbness, weakness or clumsiness in your arms or legs?

2.4 Typical patterns of symptoms related to disease causation

Disease causation	Onset of symptoms	Progression of symptoms	Associated symptoms/pattern of symptoms
Infection	Usually hours, unheralded	Usually fairly rapid over hours or days	Fevers, rigors, localising symptoms, e.g. pleuritic pain and cough
Inflammation	May appear acutely	Coming and going over weeks to months	Nature may be multifocal, often with local tenderness
Metabolic	Very variable	Hours to months	Steady progression in severity with no remission
Malignant	Gradual, insidious	Steady progression over weeks to months	Weight loss, fatigue
Toxic	Abrupt	Rapid	Dramatic onset of symptoms; vomiting often a feature
Trauma	Abrupt	Little change from onset	Diagnosis usually clear from history
Vascular	Sudden	Stepwise progression with acute episodes	Rapid development of associated physical signs
Degenerative	Gradual	Months to years	Gradual worsening with periods of more acute deterioration

2.7 Calculating pack-years of smoking

A 'pack-year' is smoking 20 cigarettes a day (1 pack) for 1 year

$$\frac{\text{Number of cigarettes smoked per day} \times \text{Number of years smoking}}{20}$$

For example, a smoker of 15 cigarettes a day who has smoked for 40 years would have smoked:

$$\frac{15 \times 40}{20} = 30 \text{ pack-years}$$

2.8 Features of alcohol dependence in the history

- A strong, often overpowering, desire to take alcohol
- Inability to control starting or stopping drinking and the amount that is drunk
- Drinking alcohol in the morning
- Tolerance, where increased doses are needed to achieve the effects originally produced by lower doses
- A withdrawal state when drinking is stopped or reduced, including tremor, sweating, rapid heart rate, anxiety, insomnia and occasionally seizures, disorientation or hallucinations (delirium tremens); this is relieved by more alcohol
- Neglect of other pleasures and interests
- Continuing to drink in spite of being aware of the harmful consequences

2.9 Examples of occupational disorders

Occupation	Factor	Disorder	Presents
Shipyard workers, marine engineers, plumbers and heating workers, demolition workers, joiners	Asbestos dust	Pleural plaques Asbestosis Mesothelioma Lung cancer	>15 years later
Stonemasons	Silica dust	Silicosis	After years
Farmers	Fungus spores on mouldy hay	Farmer's lung (hypersensitivity pneumonitis)	After 4–18 hours
Divers	Surfacing from depth too quickly	Decompression sickness Central nervous system, skin, bone and joint symptoms	Immediately, up to 1 week
Industrial workers	Chemicals, e.g. chromium Excessive noise Vibrating tools	Dermatitis on hands Sensorineural hearing loss Vibration white finger	Variable Over months Over months
Bakery workers	Flour dust	Occupational asthma	Variable
Healthcare workers	Cuts, needlestick injuries	Human immunodeficiency virus, hepatitis B and C	Incubation period >3 months

2.10 Systematic enquiry: cardinal symptoms

General health

- Wellbeing
- Appetite
- Weight change
- Energy
- Sleep
- Mood

Cardiovascular system

- Chest pain on exertion (angina)
- Breathlessness:
  - Lying flat (orthopnoea)
  - At night (paroxysmal nocturnal dyspnoea)
  - On minimal exertion – record how much
- Palpitation
- Pain in legs on walking (claudication)
- Ankle swelling

Respiratory system

- Shortness of breath (exercise tolerance)
- Cough
- Wheeze
- Sputum production (colour, amount)
- Blood in sputum (haemoptysis)
- Chest pain (due to inspiration or coughing)

Gastrointestinal system

- Mouth (oral ulcers, dental problems)
- Difficulty swallowing (dysphagia – distinguish from pain on swallowing, i.e. odynophagia)
- Nausea and vomiting
- Vomiting blood (haematemesis)
- Indigestion
- Heartburn
- Abdominal pain
- Change in bowel habit
- Change in colour of stools (pale, dark, tarry black, fresh blood)

Genitourinary system

- Pain passing urine (dysuria)
- Frequency passing urine (at night: nocturia)
- Blood in urine (haematuria)
- Libido
- Incontinence (stress and urge)
- Sexual partners – unprotected intercourse

Men

If appropriate:

- Prostatic symptoms, including difficulty starting (hesitancy):
  - Poor stream or flow
  - Terminal dribbling
- Urethral discharge
- Erectile difficulties

Women

- Last menstrual period (consider pregnancy)
- Timing and regularity of periods
- Length of periods
- Abnormal bleeding
- Vaginal discharge
- Contraception

If appropriate:

- Pain during intercourse (dyspareunia)

Nervous system

- Headaches
- Dizziness (vertigo or lightheadedness)
- Faints
- Fits
- Altered sensation
- Weakness
- Visual disturbance
- Hearing problems (deafness, tinnitus)
- Memory and concentration changes

Musculoskeletal system

- Joint pain, stiffness or swelling
- Mobility
- Falls

Endocrine system

- Heat or cold intolerance
- Change in sweating
- Excessive thirst (polydipsia)

Other

- Bleeding or bruising
- Skin rash

3.1 Information gleaned from a handshake

Features	Diagnosis
Cold, sweaty hands	Anxiety
Cold, dry hands	Raynaud's phenomenon
Hot, sweaty hands	Hyperthyroidism
Large, fleshy, sweaty hands	Acromegaly
Dry, coarse skin	Regular water exposure Manual occupation Hypothyroidism
Delayed relaxation of grip	Myotonic dystrophy
Deformed hands/fingers	Trauma Rheumatoid arthritis Dupuytren's contracture

3.3 Facial expression as a guide to diagnosis

Features	Diagnosis
Poverty of expression	Parkinsonism
Startled expression	Hyperthyroidism
Apathy, with poverty of expression and poor eye contact	Depression
Apathy, with pale and puffy skin	Hypothyroidism
Agitated expression	Anxiety, hyperthyroidism, hypomania

3.4 The nails in systemic disease

Nail changes	Description of nail	Differential diagnosis
Beau's lines	Transverse grooves (see Fig. 3.7B)	Sequella of any severe systemic illness that affects growth of the nail matrix
Clubbing	Loss of angle between nail fold and nail plate (see Fig. 3.8)	Serious cardiac, respiratory or gastrointestinal disease (see Box 3.5)
Leuconychia	White spots, ridges or complete discoloration of nail (see Fig. 3.7C)	Trauma, infection, poisoning, chemotherapy, vitamin deficiency
Lindsay's nails	White/brown 'half-and-half' nails (see Fig. 12.7)	Chronic kidney disease
Koilonychia	Spoon-shaped depression of nail plate (see Fig. 3.7D)	Iron deficiency anaemia, lichen planus, repeated exposure to detergents
Muehrcke's lines	Narrow, white transverse lines (see Fig. 12.6)	Decreased protein synthesis or protein loss
Nail-fold telangiectasia	Dilated capillaries and erythema at nail fold (see Fig. 14.13B)	Connective tissue disorders, including systemic sclerosis, systemic lupus erythematosus, dermatomyositis
Onycholysis	Nail separates from nail bed (see Fig. 3.7A)	Psoriasis, fungal infection, trauma, thyrotoxicosis, tetracyclines (photo-onycholysis)
Onychomycosis	Thickening of nail plate with white, yellow or brown discoloration	Fungal infection
Pitting	Fine or coarse pits in nail (see Fig. 3.7A)	Psoriasis (onycholysis, thickening and ridging may also be present), eczema, alopecia areata, lichen planus
Splinter haemorrhages	Small red streaks that lie longitudinally in nail plate (see Fig. 4.5B)	Trauma, infective endocarditis
Yellow nails	Yellow discoloration and thickening (see Fig. 14.13C)	Yellow nail syndrome

3.5 Causes of clubbing

Congenital or familial (5–10%)

Acquired

- Thoracic (~70%):
  - Lung cancer
  - Chronic suppurative conditions: pulmonary tuberculosis, bronchiectasis, lung abscess, empyema, cystic fibrosis
  - Mesothelioma
  - Fibroma
  - Pulmonary fibrosis
- Cardiovascular:
  - Cyanotic congenital heart disease
  - Infective endocarditis
  - Arteriovenous shunts and aneurysms
- Gastrointestinal:
  - Cirrhosis
  - Inflammatory bowel disease
  - Coeliac disease
- Others:
  - Thyrotoxicosis (thyroid acropachy)
  - Primary hypertrophic osteoarthropathy

3.6 Conditions associated with facial flushing

Physiological

- Fever
- Exercise
- Heat exposure
- Emotional

Drugs (e.g. glyceryl trinitrate, calcium channel blockers, nicotinic acid)

Anaphylaxis

Endocrine

- Menopause
- Androgen deficiency (in men)
- Carcinoid syndrome
- Medullary thyroid cancer

Others

- Serotonin syndrome
- Food/alcohol ingestion
- Neurological (e.g. Frey's syndrome)
- Rosacea
- Mastocytoses

3.7 The relationship between body mass index (BMI), nutritional status and ethnic group

Nutritional status	BMI non-Asian	BMI Asian
Underweight	<18.5	<18.5
Normal	18.5–24.9	18.5–22.9
Overweight	25–29.9	23–24.9
Obese	30–39.9	25–29.9
Morbidly obese	≥40	≥30

3.8 Features to note in any lump or swelling (SPACESPIT)

- Size
- Position
- Attachments
- Consistency
- Edge
- Surface and shape
- Pulsation, thrills and bruits
- Inflammation:
  - Redness
  - Tenderness
  - Warmth
- Transillumination

3.9 Conditions with characteristic facial appearances

Diagnosis	Facial features
Hypothyroidism (see Fig. 10.5)	Sparse, coarse hair and eyebrows, periorbital puffiness, dry, waxy skin, apathetic expression, macroglossia
Graves' disease (autoimmune thyrotoxicosis) (see Fig. 10.2A)	Staring appearance due to lid retraction, proptosis, evidence of weight loss
Hypopituitarism (see Fig. 10.10A)	Pale, often unwrinkled skin with loss of hair
Acromegaly (see Fig. 10.9A)	Thickened, coarse skin with enlarged nose and frontal bones, prognathism (lower jaw protrusion), widely spaced teeth, macroglossia
Cushing's syndrome (see Fig. 10.11A)	Moon-shaped plethoric facies
Osteogenesis imperfecta (see Fig. 3.30A)	Blue sclerae
Hereditary haemorrhagic telangiectasia (see Fig. 3.30B)	Telangiectasia on and around lips
Systemic sclerosis (see Fig. 3.30C)	Tight skin constricting mouth, 'beaking' of nose, loss of nasolabial folds
Myotonic dystrophy (see Fig. 3.30D)	Frontal balding, paucity of expression, bilateral ptosis
Down's syndrome (see Fig. 3.31)	Flat facial profile, up-slanting palpebral fissures, small, low-set ears, macroglossia, Brushfield spots in iris
Systemic lupus erythematosus	'Butterfly' erythematous rash on cheeks

5.1 Respiratory history taking/documentation framework

History of presenting symptoms

Specific respiratory symptoms

- Breathlessness
- Wheeze
- Cough
- Sputum/haemoptysis
- Chest pain
- Fever/rigors/night sweats
- Weight loss
- Sleepiness

Past medical history

- Respiratory disease
- Other illness/hospital encounters

Drug and allergy history

- Drugs causing or relieving respiratory symptoms
- Allergies to pollens/pets/dust; anaphylaxis

Social and family history

- Family history of respiratory disease
- Home circumstances/effect of and on disease
- Smoking
- Occupational history

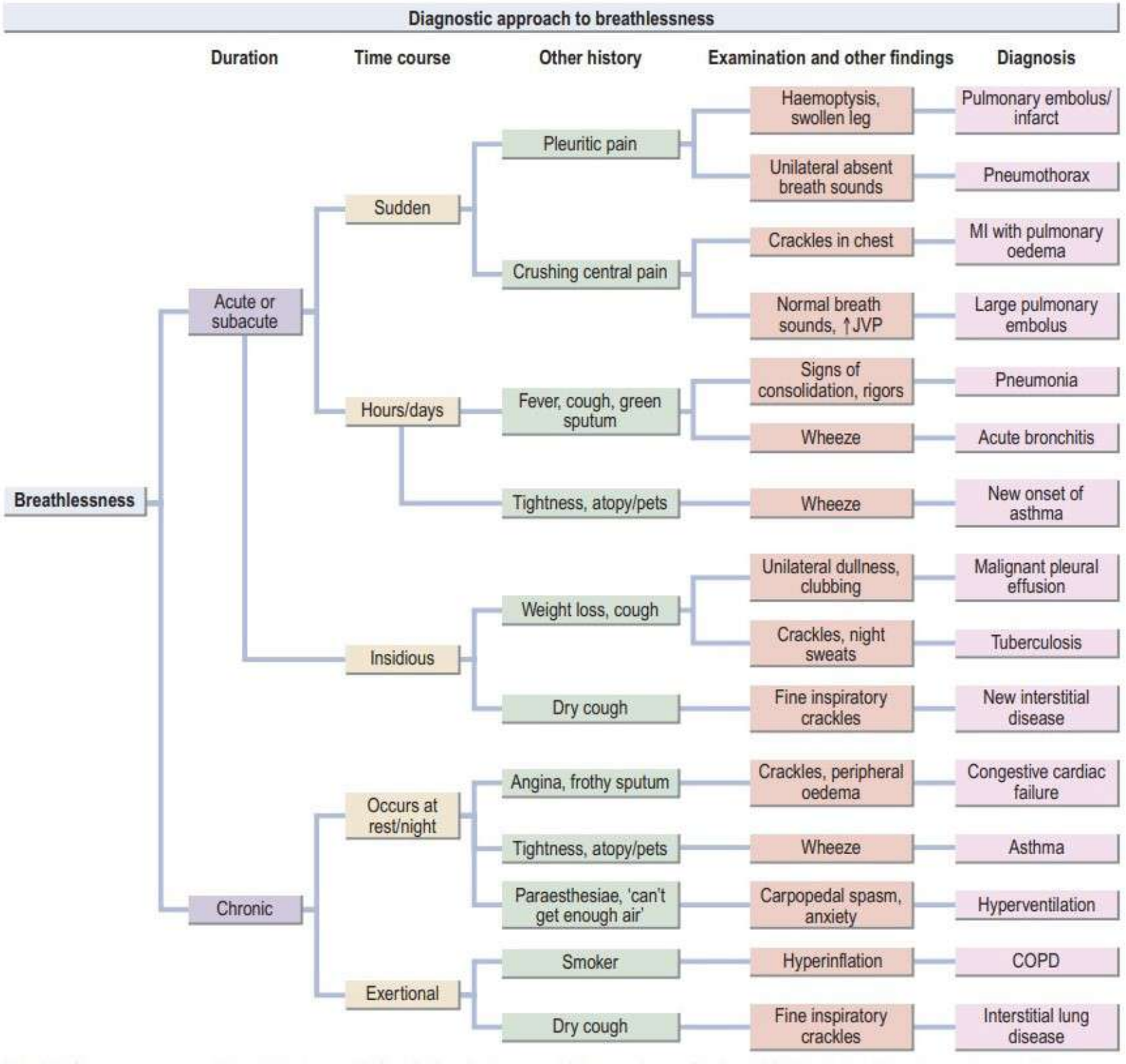
Systematic review

- Systemic diseases involving the lung
- Risk factors for lung disease

5.2 Medical Research Council (MRC) breathlessness scale

Grade	Degree of breathlessness related to activities
1	Not troubled by breathlessness except on strenuous exercise
2	Short of breath when hurrying on the level or walking up a slight hill
3	Walks slower than most people on the level, stops after a mile or so, or stops after 15 minutes walking at own pace
4	Stops for breath after walking about 100 yds or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when undressing

Used with the permission of the Medical Research Council.


Diagnostic approach to breathlessness
Duration
Time course
Other history
Examination and other findings
Diagnosis
Breathlessness
Acute or subacute
Chronic
Sudden
Hours/days
Insidious
Occurs at rest/night
Exertional
Pleuritic pain
Crushing central pain
Fever, cough, green sputum
Tightness, atopy/pets
Weight loss, cough
Dry cough
Angina, frothy sputum
Tightness, atopy/pets
Paraesthesiae, 'can't get enough air'
Smoker
Dry cough
Haemoptysis, swollen leg
Unilateral absent breath sounds
Crackles in chest
Normal breath sounds, ↑JVP
Signs of consolidation, rigors
Wheeze
Wheeze
Unilateral dullness, clubbing
Crackles, night sweats
Fine inspiratory crackles
Crackles, peripheral oedema
Wheeze
Carpopedal spasm, anxiety
Hyperinflation
Fine inspiratory crackles
Pulmonary embolus/ infarct
Pneumothorax
MI with pulmonary oedema
Large pulmonary embolus
Pneumonia
Acute bronchitis
New onset of asthma
Malignant pleural effusion
Tuberculosis
New interstitial disease
Congestive cardiac failure
Asthma
Hyperventilation
COPD
Interstitial lung disease

5.3 Causes of chronic cough and accompanying clues in the history

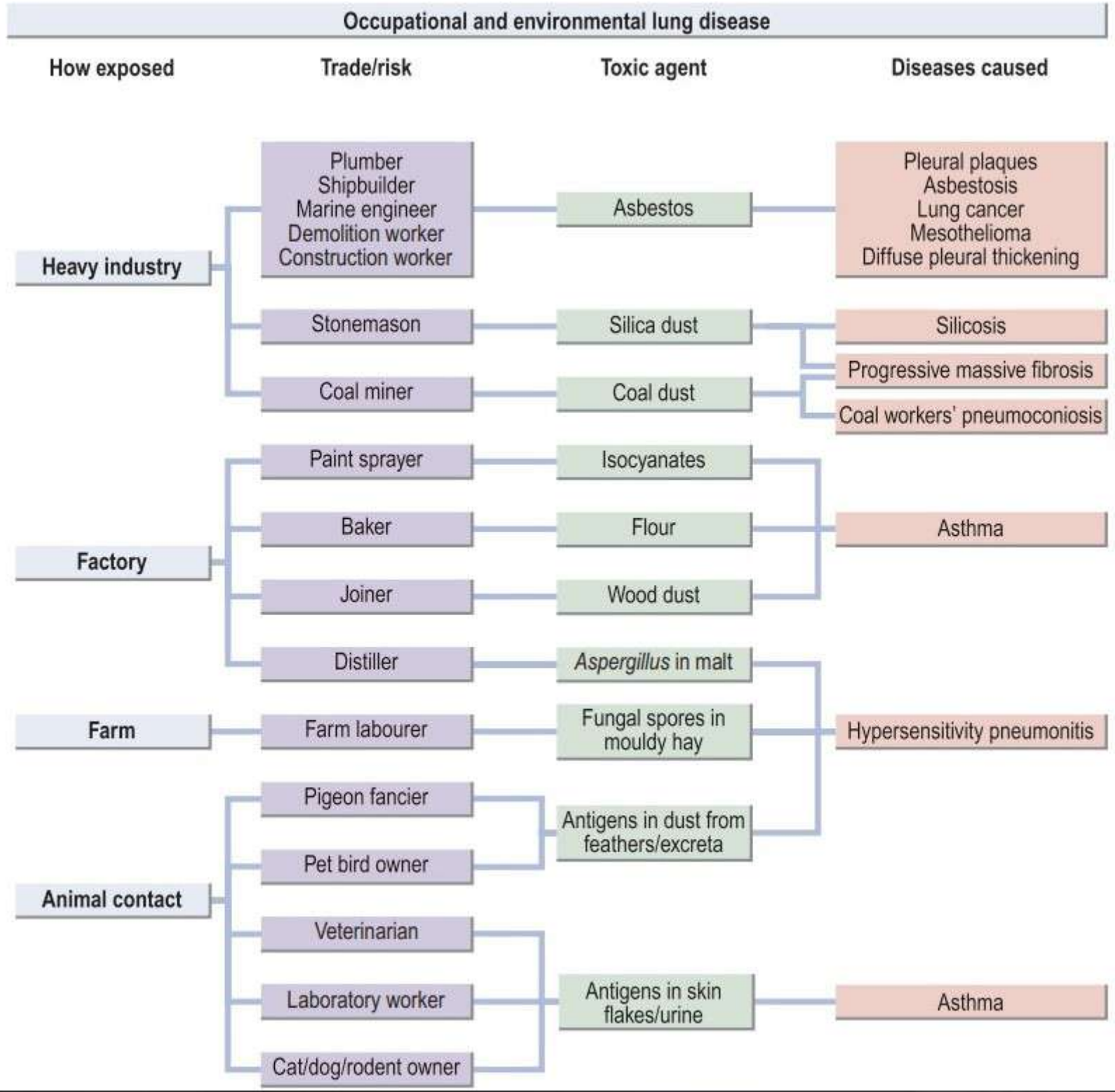
Pathophysiology	Suggestive features in history/examination
Airways inflammation:	
Asthma – 'cough-variant asthma'	Affects children and some adults Often present at night Associated wheeze, atopy
Chronic obstructive pulmonary disease	History of smoking and intermittent sputum
Persisting airway reactivity following acute bronchitis	Recent acute-onset cough and sputum
Bronchiectasis	Daily purulent sputum for long periods Pneumonia or whooping cough in childhood Recurrent haemoptysis
Lung cancer	Persistent cough, especially in smokers Any haemoptysis Pneumonia that fails to clear in 4–6 weeks
Rhinitis with postnasal drip	Chronic sneezing, nasal blockage/ discharge
Oesophageal reflux	Heartburn or regurgitation of acid after eating, bending or lying Nocturnal as well as daytime cough
Drug effects	Patient on angiotensin-converting enzyme inhibitors
Interstitial lung diseases	Persistent dry cough Fine inspiratory crackles at bases
Idiopathic cough	Long history with no signs and negative investigations – diagnosis of exclusion

5.4 Previous illness relevant to respiratory history

History	Current implications
Eczema, hay fever	Allergic tendency relevant to asthma
Childhood asthma	Many wheezy children do not have asthma as adults, yet many adults with asthma had childhood wheeze
Whooping cough, measles, inhaled foreign body	Recognised causes of bronchiectasis, especially if complicated by pneumonia
Pneumonia, pleurisy	Recognised causes of bronchiectasis Recurrent episodes may be a manifestation of bronchiectasis
Tuberculosis	Reactivation if not previously treated effectively Respiratory failure may complicate thoracoplasty Mycetoma in lung cavity may present with haemoptysis
Connective tissue disorders, e.g. rheumatoid arthritis	Lung diseases are recognised complications, e.g. pulmonary fibrosis, effusions, bronchiectasis Immunomodulatory treatments of these diseases may also cause pulmonary toxicity or render patients susceptible to respiratory infection
Previous malignancy	Recurrence, metastatic/pleural disease Chemotherapeutic agents recognised causes of pulmonary fibrosis Radiotherapy-induced pulmonary fibrosis
Cancer, recent travel, surgery or immobility	Pulmonary thromboembolism
Recent surgery, loss of consciousness	Aspiration of foreign body, gastric contents Pneumonia, lung abscess
Neuromuscular disorders	Respiratory failure Aspiration

5.5 Respiratory problems caused by drugs

Respiratory condition	Drug
Bronchoconstriction	Beta-blockers Opioids Non-steroidal anti-inflammatory drugs
Cough	Angiotensin-converting enzyme inhibitors
Bronchiolitis obliterans	Penicillamine
Diffuse parenchymal lung disease	Cytotoxic agents: bleomycin, methotrexate Anti-inflammatory agents: sulfasalazine, penicillamine, gold salts, aspirin Cardiovascular drugs: amiodarone, hydralazine Antibiotics: nitrofurantoin Intravenous drug misuse
Pulmonary thromboembolism	Oestrogens
Pulmonary hypertension	Oestrogens Dexfenfluramine, fenfluramine
Pleural effusion	Amiodarone Nitrofurantoin Phenytoin Methotrexate Pergolide
Respiratory depression	Opioids Benzodiazepines


Occupational and environmental lung disease
How exposed
Trade/risk
Toxic agent
Diseases caused
Heavy industry
Plumber
Shipbuilder
Marine engineer
Demolition worker
Construction worker
Asbestos
Pleural plaques
Asbestosis
Lung cancer
Mesothelioma
Diffuse pleural thickening
Stonemason
Silica dust
Silicosis
Progressive massive fibrosis
Coal miner
Coal dust
Coal workers' pneumoconiosis
Factory
Paint sprayer
Isocyanates
Baker
Flour
Asthma
Joiner
Wood dust
Distiller
Aspergillus in malt
Farm
Farm labourer
Fungal spores in mouldy hay
Hypersensitivity pneumonitis
Animal contact
Pigeon fancier
Antigens in dust from feathers/excreta
Pet bird owner
Veterinarian
Laboratory worker
Antigens in skin flakes/urine
Asthma
Cat/dog/rodent owner

5.6 Categories of respiratory disease and associated features on history and examination

Category of problem	Suggestive features on history	Suggestive features on examination
Infection:	Fever	
Acute bronchitis	Wheeze, cough, sputum	Wheeze
Exacerbation of chronic obstructive pulmonary disease	Acute-on-chronic dyspnoea	Hyperinflation
Pneumonia	Pleuritic pain, rusty sputum, rigors	If lobar, dull to percussion and bronchial breathing
Malignancy	Insidious onset, weight loss, persisting pain or cough	Cervical lymphadenopathy, clubbing, signs of lobar/lung collapse ± effusion
Pulmonary fibrosis	Progressive dyspnoea	Tachypnoea, inspiratory fine crackles at bases, cyanosis
Pleural effusion	Progressive dyspnoea	Unilateral basal dullness and reduced breath sounds
Pulmonary embolism:		
Large	Sudden, severe dyspnoea	Normal breath sounds
Medium	Episodes of pleural pain, haemoptysis	Pleural rub, swollen leg if deep vein thrombosis, crackles if infarct
Multiple small	Progressive dyspnoea	Raised jugular venous pressure, right ventricular heave, loud pulmonary second sound
Asthma	Atopy, hay fever, pet ownership, variable wheeze, disturbance of sleep	Polyphonic expiratory wheeze, eczema

7.2 Causes of cough

	Normal chest X-ray	Abnormal chest X-ray
Acute cough (<3 weeks)	Viral respiratory tract infection Bacterial infection (acute bronchitis) Inhaled foreign body Inhalation of irritant dusts/fumes	Pneumonia Inhaled foreign body Acute hypersensitivity pneumonitis
Chronic cough (>8 weeks)	Gastro-oesophageal reflux disease Asthma Postviral bronchial hyperreactivity Rhinitis/sinusitis Cigarette smoking Drugs, especially angiotensin-converting enzyme inhibitors Irritant dusts/fumes	Lung tumour Tuberculosis Interstitial lung disease Bronchiectasis

7.22 Causes of diminished vesicular breathing

Reduced conduction

- Obesity/thick chest wall
- Pleural effusion or thickening
- Pneumothorax

Reduced airflow

- Generalised, e.g. COPD
- Localised, e.g. collapsed lung due to occluding lung cancer

7.25 Causes of crackles

Phase of inspiration	Cause
Early	Small airways disease, as in bronchiolitis
Middle	Pulmonary oedema
Late	Pulmonary fibrosis (fine) Pulmonary oedema (medium) Bronchial secretions in COPD, pneumonia, lung abscess, tubercular lung cavities (coarse)
Biphasic	Bronchiectasis (coarse)

7.27 Causes of bronchial breath sounds

Common

- Lung consolidation (pneumonia)

Uncommon

- Localised pulmonary fibrosis
- At the top of a pleural effusion
- Collapsed lung (where the underlying major bronchus is patent)

7.10 Symptoms of obstructive sleep apnoea/ hypopnoea syndrome (OSAHS)

- Snoring
- Witnessed apnoeas
- Unrefreshing sleep
- Restless sleep
- Nocturia
- Excessive daytime sleepiness
- Impaired concentration
- Choking episodes during sleep
- Irritability/personality change
- Decreased libido

7.21 Percussion note

Type	Detected over
Resonant	Normal lung
Hyperresonant	Pneumothorax
Dull	Pulmonary consolidation
	Pulmonary collapse
	Severe pulmonary fibrosis
Stony dull	Pleural effusion
	Haemothorax

7.20 Common causes of tracheal deviation

Towards the side of the lung lesion

- Upper lobe or lung collapse
- Upper lobe fibrosis
- Pneumonectomy

Away from the side of the lung lesion

- Tension pneumothorax
- Massive pleural effusion

Upper mediastinal mass

- Retrosternal goitre
- Lymphoma
- Lung cancer

7.9 Acute breathlessness: commonly associated symptoms

No chest pain

- Pulmonary embolism
- Pneumothorax
- Metabolic acidosis
- Hypovolaemia/shock
- Acute left ventricular failure/pulmonary oedema

Pleuritic chest pain

- Pneumonia
- Pneumothorax
- Pulmonary embolism
- Rib fracture

Central chest pain

- Myocardial infarction with left ventricular failure
- Massive pulmonary embolism/infarction

Wheeze and cough

- Asthma
- COPD

7.8 Causes of chest pain

Non-central

Pleural
- Infection: pneumonia, bronchiectasis, tuberculosis
- Malignancy: lung cancer, mesothelioma, metastatic
- Pneumothorax
- Pulmonary infarction
- Connective tissue disease: rheumatoid arthritis, SLE

Chest wall
- Malignancy: lung cancer, mesothelioma, bony metastases
- Persistent cough/ breathlessness
- Muscle sprains/tears
- Bornholm's disease (Coxsackie B infection)
- Tietze's syndrome (costochondritis)
- Rib fracture
- Intercostal nerve compression
- Thoracic shingles (herpes zoster)

Central

Tracheal
- Infection
- Irritant dusts

Cardiac
- Massive pulmonary thromboembolism
- Acute myocardial infarction/ ischaemia

Oesophageal
- Oesophagitis
- Rupture

Great vessels
- Aortic dissection

Mediastinal
- Lung cancer
- Thymoma
- Lymphadenopathy
- Metastases
- Mediastinitis

7.6 Breathlessness: modes of onset, duration and progression

Minutes

- Pulmonary thromboembolism
- Pneumothorax
- Asthma
- Inhaled foreign body
- Acute left ventricular failure

Hours to days

- Pneumonia
- Asthma
- Exacerbation of COPD

Weeks to months

- Anaemia
- Pleural effusion
- Respiratory neuromuscular disorders

Months to years

- COPD
- Pulmonary fibrosis
- Pulmonary tuberculosis

7.5 Causes of breathlessness

Non-cardiorespiratory

- Anaemia
- Metabolic acidosis
- Obesity
- Psychogenic
- Neurogenic

Cardiac

- Left ventricular failure
- Mitral valve disease
- Cardiomyopathy
- Constrictive pericarditis
- Pericardial effusion

Respiratory

Airways

- Laryngeal tumour
- Foreign body
- Asthma
- COPD
- Bronchiectasis
- Lung cancer
- Bronchiolitis
- Cystic fibrosis

Parenchyma

- Pulmonary fibrosis
- Alveolitis
- Sarcoidosis
- Tuberculosis
- Pneumonia
- Diffuse infections, e.g. *Pneumocystis jiroveci* pneumonia
- Tumour (metastatic, lymphangitis)

Pulmonary circulation

- Pulmonary thromboembolism
- Pulmonary vasculitis
- Primary pulmonary hypertension

Pleural

- Pneumothorax
- Effusion
- Diffuse pleural fibrosis

Chest wall

- Kyphoscoliosis
- Ankylosing spondylitis

Neuromuscular

- Myasthenia gravis
- Neuropathies
- Muscular dystrophies
- Guillain–Barré syndrome

7.4 Causes of haemoptysis

Tumour

Malignant

- Lung cancer
- Endobronchial metastases

Benign

- Bronchial carcinoid

Infection

- Bronchiectasis
- Tuberculosis
- Lung abscess
- Mycetoma
- Cystic fibrosis

Vascular

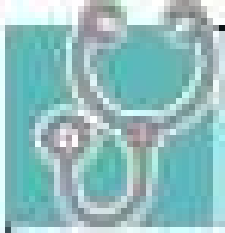
- Pulmonary infarction
- Vasculitis
- Polyangiitis
- Trauma
- Inhaled foreign body
- Chest trauma
- Cardiac
- Mitral valve disease
- Haematological
- Blood dyscrasias
- Arteriovenous malformation
- Goodpasture's syndrome
- Iatrogenic
- Bronchoscopic biopsy
- Transthoracic lung biopsy
- Bronchoscopic diathermy
- Acute left ventricular failure
- Anticoagulation

7.3 Types of sputum

Type	Appearance	Cause
Serous	Clear, watery	Acute pulmonary oedema
	Frothy, pink	Alveolar cell cancer
Mucoid	Clear, grey	Chronic bronchitis/chronic obstructive pulmonary disease
	White, viscid	Asthma
Purulent	Yellow	Acute bronchopulmonary infection
		Asthma (eosinophils)
	Green	Longer-standing infection
		Pneumonia
		Bronchiectasis
		Cystic fibrosis
		Lung abscess
Rusty	Rusty red	Pneumococcal pneumonia

7.2 Causes of cough

	Normal chest X-ray	Abnormal chest X-ray
Acute cough (<3 weeks)	Viral respiratory tract infection Bacterial infection (acute bronchitis) Inhaled foreign body Inhalation of irritant dusts/fumes	Pneumonia Inhaled foreign body Acute hypersensitivity pneumonitis
Chronic cough (>8 weeks)	Gastro-oesophageal reflux disease Asthma Postviral bronchial hyperreactivity Rhinitis/sinusitis Cigarette smoking Drugs, especially angiotensin-converting enzyme inhibitors Irritant dusts/fumes	Lung tumour Tuberculosis Interstitial lung disease Bronchiectasis



7.6 Breathlessness: modes of onset, duration and progression

Minutes	
• Pulmonary thromboembolism • Pneumothorax	• Exacerbation of Asthma • Inhaled foreign body • Acute left ventricular failure
Hours to days	
• Pneumonia • Asthma	• Exacerbation of COPD
Weeks to months	
• Anaemia • Pleural effusion	• Respiratory neuromuscular disorders
Months to years	
• COPD • Pulmonary fibrosis	• Pulmonary tuberculosis

7.5 Causes of breathlessness

Non-cardiorespiratory

- Anaemia
- Metabolic acidosis
- Obesity
- Psychogenic
- Neurogenic

Cardiac

- Left ventricular failure
- Mitral valve disease
- Cardiomyopathy
- Constrictive pericarditis
- Pericardial effusion

Respiratory

Airways
- Laryngeal tumour
- Foreign body
- Asthma
- COPD
- Bronchiectasis
- Lung cancer
- Bronchiolitis
- Cystic fibrosis

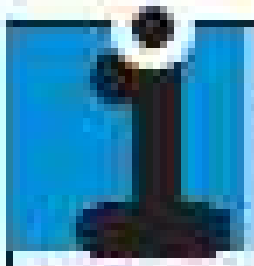
Parenchyma
- Pulmonary fibrosis
- Alveolitis
- Sarcoidosis
- Tuberculosis
- Pneumonia
- Diffuse infections, e.g. *Pneumocystis jiroveci* pneumonia
- Tumour (metastatic, lymphangitis)

Pulmonary circulation
- Pulmonary thromboembolism
- Pulmonary vasculitis
- Primary pulmonary hypertension

Pleural
- Pneumothorax
- Effusion
- Diffuse pleural fibrosis

Chest wall
- Kyphoscoliosis
- Ankylosing spondylitis

Neuromuscular
- Myasthenia gravis
- Neuropathies
- Muscular dystrophies
- Guillain–Barré syndrome



7.21 Percussion note

Type	Detected over
Resonant	Normal lung
Hyperresonant	Pneumothorax
Dull	Pulmonary consolidation
	Pulmonary collapse
	Severe pulmonary fibrosis
	Pleural effusion
	Haemothorax

4.1 Common symptoms of heart disease

Symptom	Cardiovascular causes	Other causes
Chest discomfort	Myocardial infarction Angina Pericarditis Aortic dissection	Oesophageal spasm Pneumothorax Musculoskeletal pain
Breathlessness	Heart failure Valvular disease Angina Pulmonary embolism Pulmonary hypertension	Respiratory disease Anaemia Obesity Anxiety
Palpitation	Tachyarrhythmias Ectopic beats	Anxiety Hyperthyroidism Drugs
Syncope/ presyncope	Arrhythmias Postural hypotension Aortic stenosis Hypertrophic cardiomyopathy Atrial myxoma	Simple faints Epilepsy Anxiety
Oedema	Heart failure Constrictive pericarditis Venous stasis Lymphoedema	Nephrotic syndrome Liver disease Drugs Immobility

4.2 Canadian Cardiovascular Society: functional classification of stable angina

Grade	Description
1	Ordinary physical activity, such as walking and climbing stairs, does not cause angina. Angina with strenuous, rapid or prolonged exertion at work or during recreation
2	Slight limitation of ordinary activity. Walking or climbing stairs rapidly, walking uphill, walking or climbing stairs after meals, in cold, in wind, or when under emotional stress, or only during the few hours after awakening
3	Marked limitation of ordinary physical activity. Walking 1–2 blocks on the level and climbing less than one flight in normal conditions
4	Inability to carry on any physical activity without discomfort; angina may be present at rest

4.3 Cardiovascular causes of chest pain and their characteristics

	Angina	Myocardial infarction	Aortic dissection	Pericardial pain	Oesophageal pain
Site	Retrosternal	Retrosternal	Interscapular/retrosternal	Retrosternal or left-sided	Retrosternal or epigastric
Onset	Progressive increase in intensity over 1–2 minutes	Rapid over a few minutes	Very sudden	Gradual; postural change may suddenly aggravate	Over 1–2 minutes; can be sudden (spasm)
Character	Constricting, heavy	Constricting, heavy	Tearing or ripping	Sharp, 'stabbing', pleuritic	Gripping, tight or burning
Radiation	Sometimes arm(s), neck, epigastrium	Often to arm(s), neck, jaw, sometimes epigastrium	Back, between shoulders	Left shoulder or back	Often to back, sometimes to arms
Associated features	Breathlessness	Sweating, nausea, vomiting, breathlessness, feeling of impending death (angor animi)	Sweating, syncope, focal neurological signs, signs of limb ischaemia, mesenteric ischaemia	Flu-like prodrome, breathlessness, fever	Heartburn, acid reflux
Timing	Intermittent, with episodes lasting 2–10 minutes	Acute presentation; prolonged duration	Acute presentation; prolonged duration	Acute presentation; variable duration	Intermittent, often at night-time; variable duration
Exacerbating/ relieving factors	Triggered by emotion, exertion, especially if cold, windy Relieved by rest, nitrates	'Stress' and exercise rare triggers, usually spontaneous Not relieved by rest or nitrates	Spontaneous No manœuvres relieve pain	Sitting up/lying down may affect intensity NSAIDs help	Lying flat/some foods may trigger Not relieved by rest; nitrates sometimes relieve
Severity	Mild to moderate	Usually severe	Very severe	Can be severe	Usually mild but oesophageal spasm can mimic myocardial infarction
Cause	Coronary atherosclerosis, aortic stenosis, hypertrophic cardiomyopathy	Plaque rupture and coronary artery occlusion	Thoracic aortic dissection rupture	Pericarditis (usually viral, also post myocardial infarction)	Oesophageal spasm, reflux, hiatus hernia

NSAIDs, *non-steroidal anti-inflammatory drugs.*

4.4 Some mechanisms and causes of heart failure

Mechanism	Cause
Reduced ventricular contractility (systolic dysfunction)	Myocardial infarction Dilated cardiomyopathy, e.g. genetic, idiopathic, alcohol excess, cytotoxic drugs, peripartum cardiomyopathy Myocarditis
Impaired ventricular filling (diastolic dysfunction)	Left ventricular hypertrophy Constrictive pericarditis Hypertrophic or restrictive cardiomyopathy
Increased metabolic and cardiac demand (rare)	Thyrotoxicosis Arteriovenous fistulae Paget's disease
Valvular or congenital lesions	Mitral and/or aortic valve disease Tricuspid and/or pulmonary valve disease (rare) Ventricular septal defect Patent ductus arteriosus

4.5 New York Heart Association classification of heart failure symptom severity

Class	Description
I	No limitations. Ordinary physical activity does not cause undue fatigue, dyspnoea or palpitation (asymptomatic left ventricular dysfunction)
II	Slight limitation of physical activity. Such patients are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnoea or angina pectoris (symptomatically 'mild' heart failure)
III	Marked limitation of physical activity. Less than ordinary physical activity will lead to symptoms (symptomatically 'moderate' heart failure)
IV	Symptoms of congestive heart failure are present, even at rest. With any physical activity, increased discomfort is experienced (symptomatically 'severe' heart failure)

4.6 Descriptions of arrhythmias

	Extrasystoles	Sinus tachycardia	Supraventricular tachycardia	Atrial fibrillation	Ventricular tachycardia
Site	–	–	–	–	–
Onset	Sudden	Gradual	Sudden, with 'jump'	Sudden	Sudden
Character	'Jump', missed beat or flutter	Regular, fast, 'pounding'	Regular, fast	Irregular, usually fast; slower in elderly	Regular, fast
Radiation	–	–	–	–	–
Associated features	Nil	Anxiety	Polyuria, lightheadedness, chest tightness	Polyuria, breathlessness Syncope uncommon	Presyncope, syncope, chest tightness
Timing	Brief	A few minutes	Minutes to hours	Variable	Variable
Exacerbating/ relieving factors	Fatigue, caffeine, alcohol may trigger Often relieved by walking (increases sinus rate)	Exercise or anxiety may trigger	Usually at rest, trivial movements, e.g. bending, may trigger Vagal manœuvres may relieve	Exercise or alcohol may trigger; often spontaneous	Exercise may trigger; often spontaneous
Severity	Mild (usually)	Mild to moderate	Moderate to severe	Very variable, may be asymptomatic	Often severe

4.7 Symptoms related to medication

Symptom	Medication
Angina	Aggravated by thyroxine or drug-induced anaemia, e.g. aspirin or NSAIDs
Dyspnoea	Beta-blockers in patients with asthma Exacerbation of heart failure by beta-blockers, some calcium channel antagonists (verapamil, diltiazem), NSAIDs
Palpitation	Tachycardia and/or arrhythmia from thyroxine, β_2 stimulants, e.g. salbutamol, digoxin toxicity, hypokalaemia from diuretics, tricyclic antidepressants
Syncope/ presyncope	Vasodilators, e.g. nitrates, alpha-blockers, ACE inhibitors and angiotensin II receptor antagonists Bradycardia from rate-limiting agents, e.g. beta-blockers, some calcium channel antagonists (verapamil, diltiazem), digoxin, amiodarone
Oedema	Glucocorticoids, NSAIDs, some calcium channel antagonists, e.g. nifedipine, amlodipine

ACE, *angiotensin-converting enzyme;* NSAIDs, *non-steroidal anti-inflammatory drugs.*

4.8 Key elements of the past cardiac history

	Ischaemic heart disease	Heart failure	Valvular disease
Baseline symptoms	Exertional angina? If so, ascertain functional limitation (see Box 4.2)/response to GTN spray	Dyspnoea, fatigue, ankle swelling Record usual functional status (see Box 4.5)	Often asymptomatic Exertional dyspnoea (common), chest pain or syncope
Major events	Previous myocardial infarction/unstable angina	Hospitalisation for decompensated heart failure Ventricular arrhythmias	Infective endocarditis Previous rheumatic fever
Investigations	Coronary angiography (invasive or computed tomography): presence, extent and severity of coronary artery disease Exercise electrocardiogram (or other stress test): evidence of inducible ischaemia? Exercise capacity and symptoms	Echocardiogram (± cardiac magnetic resonance imaging): left ventricular size, wall thickness and systolic function; valvular disease; right ventricular function	Echocardiogram (transthoracic ± transoesophageal): nature and severity of valve lesion; ventricular size and function
Procedures	Percutaneous coronary intervention (angioplasty and stenting) Coronary artery bypass graft surgery	Implantable cardioverter–defibrillator Cardiac resynchronisation therapy	Surgical valve repair or replacement (note whether mechanical or bioprosthetic) Transcatheter valve procedures

GTN, *glyceryl trinitrate.*

4.9 Causes of abnormal pulse rate or rhythm

Abnormality	Sinus rhythm	Arrhythmia
Fast rate (tachycardia, >100 bpm)	Exercise Pain Excitement/anxiety Fever Hyperthyroidism Medication: Sympathomimetics, e.g. salbutamol Vasodilators	Atrial fibrillation Atrial flutter Supraventricular tachycardia Ventricular tachycardia
Slow rate (bradycardia, <60 bpm)	Sleep Athletic training Hypothyroidism Medication: Beta-blockers Digoxin Verapamil, diltiazem	Carotid sinus hypersensitivity Sick sinus syndrome Second-degree heart block Complete heart block
Irregular pulse	Sinus arrhythmia Atrial extrasystoles Ventricular extrasystoles	Atrial fibrillation Atrial flutter with variable response Second-degree heart block with variable response

4.10 Haemodynamic effects of respiration

	Inspiration	Expiration
Pulse/heart rate	Accelerates	Slows
Systolic blood pressure	Falls (up to 10 mmHg)	Rises
Jugular venous pressure	Falls	Rises
Second heart sound	Splits	Fuses

4.11 Common causes of atrial fibrillation

- Hypertension
- Heart failure
- Myocardial infarction
- Thyrotoxicosis
- Alcohol-related heart disease
- Mitral valve disease
- Infection, e.g. respiratory, urinary
- Following surgery, especially cardiothoracic surgery

4.12 Causes of increased pulse volume

Physiological

- Exercise
- Pregnancy
- Advanced age
- Increased environmental temperature

Pathological

- Hypertension
- Fever
- Thyrotoxicosis
- Anaemia
- Aortic regurgitation
- Paget's disease of bone
- Peripheral atrioventricular shunt

4.13 British Hypertension Society classification of blood pressure (BP) levels

BP	Systolic BP (mmHg)	Diastolic BP (mmHg)
Optimal	<120	<80
Normal	<130	<85
High normal	130–139	85–89
Hypertension		
Grade 1 (mild)	140–159	90–99
Grade 2 (moderate)	160–179	100–109
Grade 3 (severe)	>180	>110
Isolated systolic hypertension		
Grade 1	140–159	<90
Grade 2	>160	<90

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4.14 Clinical clues to secondary hypertension

Clinical feature	Cause
Widespread vascular disease Renal bruit	Renovascular disease, including renal artery stenosis
Episodes of sweating, headache and palpitation	Phaeochromocytoma
Hypokalaemia	Primary aldosteronism
Cushingoid facies, central obesity, abdominal striae, proximal muscle weakness Chronic glucocorticoid use	Cushing's syndrome
Low-volume femoral pulses with radiofemoral delay	Coarctation of the aorta
Bilateral palpable kidneys	Adult polycystic kidney disease (p. 243)

4.15 Differences between carotid artery and jugular venous pulsation

Carotid	Jugular
Rapid outward movement	Rapid inward movement
One peak per heart beat	Two peaks per heart beat (in sinus rhythm)
Palpable	Impalpable
Pulsation unaffected by pressure at the root of the neck	Pulsation diminished by pressure at the root of the neck
Independent of respiration	Height of pulsation varies with respiration
Independent of the position of the patient	Varies with the position of the patient
Independent of abdominal pressure	Rises with abdominal pressure

4.16 Abnormalities of the jugular venous pulse

Condition	Abnormalities
Heart failure	Elevation, sustained abdominojugular reflux >10 seconds
Pulmonary embolism, tamponade	Elevation
Pericardial effusion	Elevation, ~~prominent~~ flattened 'y' descent
Pericardial constriction	Elevation, Kussmaul's sign, prominent 'y' descent 'x' descent
Superior vena cava obstruction	Elevation, loss of pulsation
Atrial fibrillation	Absent 'a' waves
Tricuspid stenosis	~~Giant~~ 'a' waves Large, prominent
Tricuspid regurgitation	Giant 'v' or 'cv' waves
Complete heart block	'Cannon' waves

4.17 Cardiac auscultation: the best sites for hearing an abnormality

Site	Sound
Cardiac apex • Midsystolic of M prolapse • Pansystolic of MR • Opening snap of MS	First heart sound Third and fourth heart sounds Mid-diastolic murmur of mitral stenosis
Lower left sternal border Apex ←	Early diastolic murmurs of aortic and tricuspid regurgitation ~~Opening snap of mitral stenosis~~ Pansystolic murmur of ventricular septal defect
Upper left sternal border S_2 splitting	Second heart sound Pulmonary valve murmurs
Upper right sternal border	Systolic ejection (outflow) murmurs, e.g. aortic stenosis, hypertrophic cardiomyopathy
Left axilla	Radiation of the pansystolic murmur of mitral regurgitation
Below left clavicle	Continuous 'machinery' murmur of a persistent patent ductus arteriosus

tricuspid → pansystolic

4.18 Abnormalities of intensity of the first heart sound

Quiet

- Low cardiac output
- Poor left ventricular function
- Rheumatic mitral regurgitation
- Long P–R interval (first-degree heart block)

Loud

- Increased cardiac output
- Large stroke volume
- Mitral stenosis
- Short P–R interval
- Atrial myxoma (rare)

Variable

- Atrial fibrillation
- Extrasystoles
- Complete heart block

4.19 Abnormalities of the second heart sound

Quiet

- Low cardiac output
- Calcific aortic stenosis
- Aortic regurgitation

Loud

- Systemic hypertension (aortic component)
- Pulmonary hypertension (pulmonary component)

Split

Widens in inspiration (enhanced physiological splitting)

- Right bundle branch block
- Pulmonary stenosis
- Pulmonary hypertension
- Ventricular septal defect

Fixed splitting (unaffected by respiration)

- Atrial septal defect

Widens in expiration (reversed splitting)

- Aortic stenosis
- Hypertrophic cardiomyopathy
- Left bundle branch block
- Ventricular pacing

4.20 Grades of intensity of murmur

Grade	Description
1	Heard by an expert in optimum conditions
2	Heard by a non-expert in optimum conditions
3	Easily heard; no thrill
4	A loud murmur, with a thrill
5	Very loud, often heard over a wide area, with thrill
6	Extremely loud, heard without a stethoscope

4.21 Causes of systolic murmurs

Ejection systolic murmurs

- Increased flow through normal valves:
  - Severe anaemia, fever, athletes (bradycardia → large stroke volume), pregnancy
  - Atrial septal defect (pulmonary flow murmur)
  - Other causes of flow murmurs (increased stroke volume in aortic regurgitation)
- Normal or reduced flow though a stenotic valve:
  - Aortic stenosis
  - Pulmonary stenosis
- Subvalvular obstruction:
  - Hypertrophic obstructive cardiomyopathy

Pansystolic murmurs

- Mitral regurgitation
- Tricuspid regurgitation
- Ventricular septal defect
- Leaking mitral or tricuspid prosthesis

Late systolic murmurs

- Mitral valve prolapse

4.23 The clinical features of arterial, neurogenic and venous claudication

	Arterial	Neurogenic	Venous
Pathology	Stenosis or occlusion of major lower limb arteries	Lumbar nerve root or cauda equina compression (spinal stenosis)	Obstruction to the venous outflow of the leg due to iliofemoral venous occlusion
Site of pain	Muscles, usually the calf but may involve thigh and buttocks	Ill-defined Whole leg May be associated with numbness and tingling	Whole leg 'Bursting' in nature
Laterality	Unilateral or bilateral	Often bilateral	Nearly always unilateral
Onset	Gradual after walking the 'claudication distance'	Often immediate on walking or standing up	Gradual, from the moment walking starts
Relieving features	On stopping walking, the pain disappears completely in 1–2 minutes	Bending forwards and stopping walking Patient may sit down for full relief	Leg elevation
Colour	Normal or pale	Normal	Cyanosed Often visible varicose veins
Temperature	Normal or cool	Normal	Normal or increased
Oedema	Absent	Absent	Always present
Pulses	Reduced or absent	Normal	Present but may be difficult to feel owing to oedema
Straight-leg raising	Normal	May be limited	Normal

4.22 Fontaine classification of lower limb ischaemia

Stage	Description
I	Asymptomatic
II	Intermittent claudication
III	Night/rest pain
IV	Tissue loss (ulceration/gangrene)

4.24 Signs of acute limb ischaemia

- Pallor
- Pulselessness
- Perishing cold
- Paraesthesia
- Pain (worse when muscle squeezed)
- Paralysis

4.25 Acute limb ischaemia: embolus versus thrombosis in situ

	Embolus	Thrombosis
Onset and severity	Acute (seconds or minutes), ischaemia profound (no pre-existing collaterals)	Insidious (hours or days), ischaemia less severe (pre-existing collaterals)
Embolic source	Present	Absent
Previous claudication	Absent	Present
Pulses in contralateral leg	Present	Often absent, reflecting widespread peripheral arterial disease
Diagnosis	Clinical	Angiography
Treatment	Embolectomy and anticoagulation	Medical, bypass surgery, catheter-directed thrombolysis

4.26 Signs suggesting vascular disease

Sign	Implication
Hands and arms	
Tobacco stains	Smoking
Purple discoloration of the fingertips	Atheroembolism from a proximal subclavian aneurysm
Pits and healed scars in the finger pulps	Secondary Raynaud's syndrome
Calcinosis and visible nail-fold capillary loops	Systemic sclerosis and CREST (calcinosis, Raynaud's phenomenon, oesophageal dysfunction, sclerodactyly, telangiectasia)
Wasting of the small muscles of the hand	Thoracic outlet syndrome
Face and neck	
Corneal arcus and xanthelasma	Hypercholesterolaemia
Horner's syndrome	Carotid artery dissection or aneurysm
Hoarseness of the voice and 'bovine' cough	Recurrent laryngeal nerve palsy from a thoracic aortic aneurysm
Prominent veins in the neck, shoulder and anterior chest	Axillary/subclavian vein occlusion
Abdomen	
Epigastric/umbilical pulsation	Aortoiliac aneurysm
Mottling of the abdomen	Ruptured abdominal aortic aneurysm or saddle embolism occluding aortic bifurcation
Evidence of weight loss	Visceral ischaemia

4.28 Clinical features of venous and arterial ulceration

Clinical feature	Venous ulceration	Arterial ulceration	Neuropathic ulceration
Sex	More common in women	More common in men	Equal in men and women
Risk factors	Thrombophilia, family history, previous deep vein thrombosis, varicose veins	Known peripheral vascular disease or risk factors for atherosclerotic disease, e.g. smoking, diabetes, dyslipidaemia, hypertension	Diabetes or other peripheral neuropathy (loss of sensation, loss of intrinsic foot muscle function, autonomic dysregulation)
Pain	Often painless but some patients have some pain that improves with elevating the leg	Severe pain, except in diabetics with neuropathy; improves on dependency	Painless or neuropathic pain
Site	Gaiter areas; 80% medial (long saphenous vein), 20% lateral (short saphenous vein)	Pressure areas (malleoli, heel, fifth metatarsal base, metatarsal heads and toes)	Pressure areas, sole of foot, tips of toes
Appearance	Shallow, irregular margin Slough on granulating base	Regular, 'punched out' Sloughy or necrotic base	Macerated, moist white skin surrounded by callus, often on load-bearing aspects (motor neuropathy)
Surrounding skin	Lipodermatosclerosis always present Oedema	Shiny, hairless, trophic changes	Dry due to reduced sweating (autonomic neuropathy)
Veins	Full and usually varicose	Empty with 'guttering' on elevation	Normal
Temperature	Warm Palpable pulses	Cold Absent pulses	Warm or cold due to autonomic neuropathy Palpable pulses

6.42 Features of deep vein thrombosis of the lower limb

Clinical feature	Non-occlusive thrombus	Occlusive thrombus
Pain	Often absent	Usually present
Calf tenderness	Often absent	Usually present
Swelling	Absent	Present
Temperature	Normal or slightly increased	Increased
Superficial veins	Normal	Distended
Pulmonary embolism	High risk	Low risk

4.29 Risk factors for deep vein thrombosis

- Obesity
- Smoking
- Recent bed rest or operations (especially to the leg, pelvis or abdomen)
- Recent travel, especially long flights
- Previous trauma to the leg, especially long-bone fractures, plaster of Paris splintage and immobilisation
- Pregnancy or features suggesting pelvic disease
- Malignant disease
- Previous deep vein thrombosis
- Family history of thrombosis
- Inherited thrombophilia, e.g. factor V Leiden
- Recent central venous catheterisation, injection of drug
- Use of oral contraceptive or hormone replacement therapy

6.38 Diseases associated with secondary Raynaud's syndrome

- Connective tissue syndromes, e.g. systemic sclerosis, CREST (calcinosis, Raynaud's phenomenon, oesophageal dysfunction, sclerodactyly, telangiectasia) and systemic lupus erythematosus
- Atherosclerosis/embolism from proximal source, e.g. subclavian artery aneurysm
- Drug-related, e.g. nicotine, beta-blockers, ergot
- Thoracic outlet syndrome
- Malignancy
- Hyperviscosity syndromes, e.g. Waldenström's macroglobulinaemia, polycythaemia
- Vibration-induced disorders (power tools)
- Cold agglutinin disorders

6.41 Clinical features of venous and arterial ulceration

Clinical feature	Venous ulceration	Arterial ulceration
Age	Develops at age 40–45 but may not present for years; multiple recurrences common	First presents in over-60s
Sex	More common in women	More common in men
Past medical history	Deep vein thrombosis (DVT) or suggestive of occult DVT, i.e. leg swelling after childbirth, hip/knee replacement or long bone fracture	Peripheral arterial disease, cardio- and cerebrovascular disease
Risk factors	Thrombophilia, family history, previous DVT	Smoking, diabetes, hypercholesterolaemia and hypertension
Pain	One-third have pain (not usually severe) that improves with elevating the leg	Severe pain, except in diabetics with neuropathy; improves on dependency
Site	Gaiter areas; usually medial to long saphenous vein; 20% are lateral to short saphenous vein	Pressure areas (malleoli, heel, fifth metatarsal base, metatarsal heads and toes)
Margin	Irregular, often with neoepithelium (appears whiter than mature skin)	Regular, indolent, 'punched out'
Base	Often pink and granulating under green slough	Sloughy (green) or necrotic (black), with no granulation
Surrounding skin	Lipodermatosclerosis always present	No venous skin changes
Veins	Full and usually varicose	Empty with 'guttering' on elevation
Swelling (oedema)	Usually present	Absent
Temperature	Warm	Cold
Pulses	Present, but may be difficult to feel	Absent

6.1 Surface markings of the main non-alimentary tract abdominal organs

Structure	Position
Liver	Upper border: fifth right intercostal space on full expiration Lower border: at the costal margin in the mid-clavicular line on full inspiration
Spleen	Underlies left ribs 9–11, posterior to the mid-axillary line
Gallbladder	At the intersection of the right lateral vertical plane and the costal margin, i.e. tip of the ninth costal cartilage
Pancreas	Neck of the pancreas lies at the level of L1; head lies below and right; tail lies above and left
Kidneys	Upper pole lies deep to the 12th rib posteriorly, 7 cm from the midline; the right is 2–3 cm lower than the left

8.26 Gastrointestinal (GI) 'alarm features'

- Persistent vomiting
- Dysphagia
- Fever
- Weight loss
- GI bleeding
- Anaemia
- Painless, watery, high-volume diarrhoea
- Nocturnal symptoms disturbing sleep

6.3 Non-alimentary causes of abdominal pain

Disorder	Clinical features
Myocardial infarction	Epigastric pain without tenderness *Angor animi* (feeling of impending death) Hypotension Cardiac arrhythmias
Dissecting aortic aneurysm	Tearing interscapular pain *Angor animi* Hypotension Asymmetry of femoral pulses
Acute vertebral collapse	Lateralised pain restricting movement Tenderness overlying involved vertebra
Cord compression	Pain on percussion of thoracic spine Hyperaesthesia at affected dermatome with sensory loss below Spinal cord signs
Pleurisy	Lateralised pain on coughing Chest signs, e.g. pleural rub
Herpes zoster	Hyperaesthesia in dermatomal distribution Vesicular eruption
Diabetic ketoacidosis	Cramp-like pain Vomiting Air hunger Tachycardia Ketotic breath
Salpingitis or tubal pregnancy	Suprapubic and iliac fossa pain, localised tenderness Nausea, vomiting Fever
Torsion of testis/ovary	Lower abdominal pain Nausea, vomiting Localised tenderness

8.5 Diagnosing abdominal pain

	Disorder			
	Peptic ulcer	**Biliary colic**	**Acute pancreatitis**	**Renal colic**
Site	Epigastrium	Epigastrium/right hypochondrium	Epigastrium/left hypochondrium	Loin
Onset	Gradual	Rapidly increasing	Sudden	Rapidly increasing
Character	Gnawing	Constant	Constant	Constant
Radiation	Into back	Below right scapula	Into back	Into genitalia and inner thigh
Timing				
Frequency/periodicity	Remission for weeks/ months	Able to enumerate attacks	Able to enumerate attacks	Usually a discrete episode
Special times	Nocturnal and especially when hungry	Unpredictable	After heavy drinking	Following periods of dehydration
Duration	½–2 hours	4–24 hours	>24 hours	4–24 hours
Exacerbating factors	Stress, spicy foods, alcohol, non-steroidal anti-inflammatory drugs (NSAIDs)	Unable to eat during bouts	Alcohol Unable to eat during bouts	
Relieving factors	Food, antacids, vomiting		Eased by sitting upright	
Severity	Mild to moderate	Severe	Severe	Severe

6.4 Typical clinical features in patients with an 'acute abdomen'

Condition	History	Examination
Acute appendicitis	Nausea, vomiting, central abdominal pain that later shifts to right iliac fossa	Fever, tenderness, guarding or palpable mass in right iliac fossa, pelvic peritonitis on rectal examination
Perforated peptic ulcer with acute peritonitis	Vomiting at onset associated with severe acute-onset abdominal pain, previous history of dyspepsia, ulcer disease, non-steroidal anti-inflammatory drugs or glucocorticoid therapy	Shallow breathing with minimal abdominal wall movement, abdominal tenderness and guarding, board-like rigidity, abdominal distension and absent bowel sounds
Acute pancreatitis	Anorexia, nausea, vomiting, constant severe epigastric pain, previous alcohol abuse/cholelithiasis	Fever, periumbilical or loin bruising, epigastric tenderness, variable guarding, reduced or absent bowel sounds
Ruptured aortic aneurysm	Sudden onset of severe, tearing back/loin/abdominal pain, hypotension and past history of vascular disease and/or high blood pressure	Shock and hypotension, pulsatile, tender, abdominal mass, asymmetrical femoral pulses
Acute mesenteric ischaemia	Anorexia, nausea, vomiting, bloody diarrhoea, constant abdominal pain, previous history of vascular disease and/or high blood pressure	Atrial fibrillation, heart failure, asymmetrical peripheral pulses, absent bowel sounds, variable tenderness and guarding
Intestinal obstruction	Colicky central abdominal pain, nausea, vomiting and constipation	Surgical scars, hernias, mass, distension, visible peristalsis, increased bowel sounds
Ruptured ectopic pregnancy	Premenopausal female, delayed or missed menstrual period, hypotension, unilateral iliac fossa pain, pleuritic shoulder-tip pain, 'prune juice'-like vaginal discharge	Suprapubic tenderness, periumbilical bruising, pain and tenderness on vaginal examination (cervical excitation), swelling/fullness in fornix on vaginal examination
Pelvic inflammatory disease	Sexually active young female, previous history of sexually transmitted infection, recent gynaecological procedure, pregnancy or use of intrauterine contraceptive device, irregular menstruation, dyspareunia, lower or central abdominal pain, backache, pleuritic right upper quadrant pain (Fitz-Hugh–Curtis syndrome)	Fever, vaginal discharge, pelvic peritonitis causing tenderness on rectal examination, right upper quadrant tenderness (perihepatitis), pain/tenderness on vaginal examination (cervical excitation), swelling/fullness in fornix on vaginal examination

- Appetite and weight change
- Abdominal pain, altered bowel habit
- Gastrointestinal bleeding
- Pruritus, dark urine, rigors
- Drug and alcohol history
- Past medical history (pancreatitis, biliary surgery)
- Previous jaundice or hepatitis
- Blood transfusions (hepatitis B or C)
- Family history, e.g. congenital spherocytosis, haemochromatosis
- Sexual and contact history (hepatitis B or C)
- Travel history and immunisations (hepatitis A)
- Skin tattooing (hepatitis B or C)

Jaundice Related Symptoms

6.6 Common causes of jaundice

Increased bilirubin production

- Haemolysis (unconjugated hyperbilirubinaemia)

Impaired bilirubin excretion

- Congenital:
  - Gilbert's syndrome (unconjugated)
- Hepatocellular:
  - Viral hepatitis
  - Cirrhosis
  - Drugs
  - Autoimmune hepatitis
- Intrahepatic cholestasis:
  - Drugs
  - Primary biliary cirrhosis
- Extrahepatic cholestasis:
  - Gallstones
  - Cancer: pancreas, cholangiocarcinoma

6.7 Urine and stool analysis in jaundice

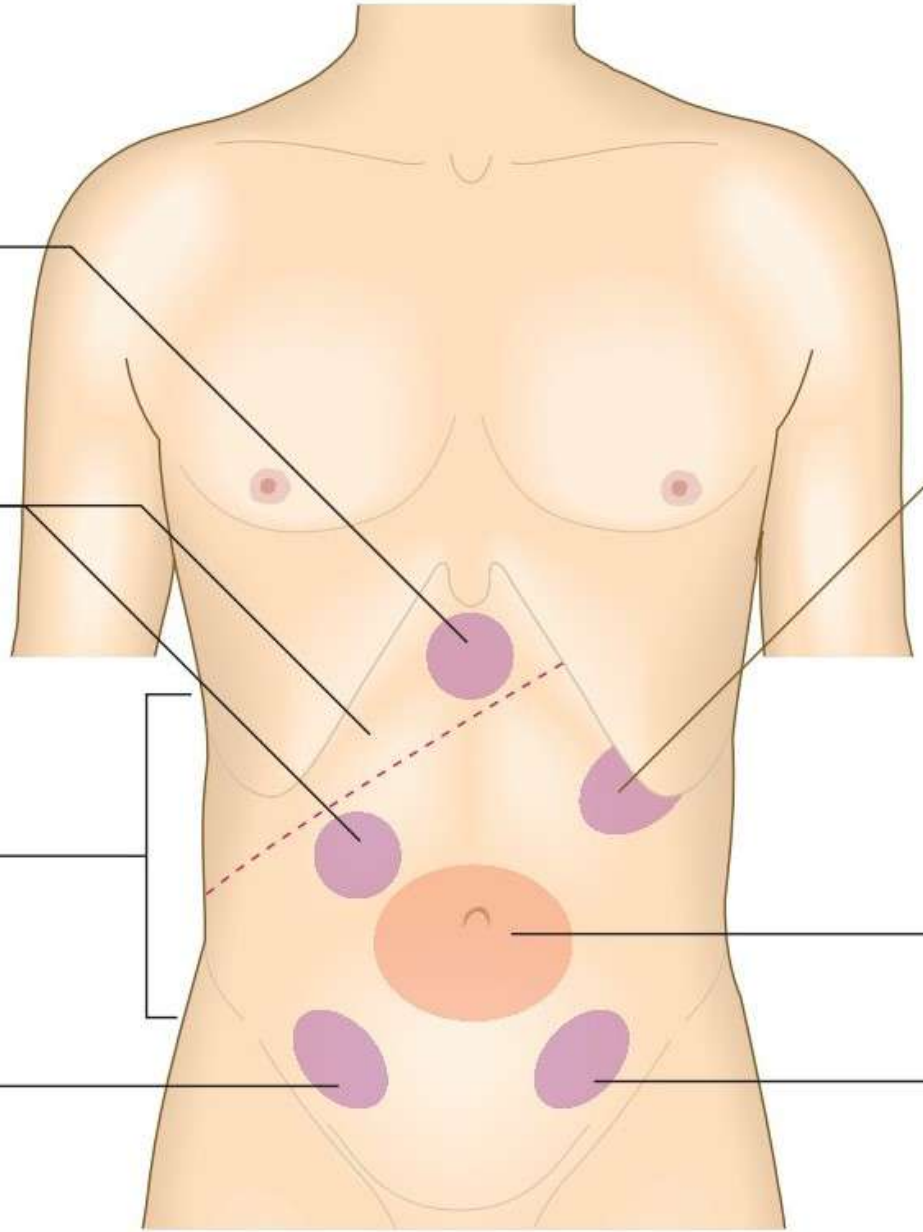
	Urine			Stools
	Colour	Bilirubin	Urobilinogen	Colour
Unconjugated	Normal	–	++++	Normal
Hepatocellular	Dark	++	++	Normal
Obstructive	Dark	++++	–	Pale

6.8 Examples of drug-induced gastrointestinal conditions

Symptom	Drug
Weight gain	Oral glucocorticoids
Dyspepsia and gastrointestinal bleeding	Aspirin Non-steroidal anti-inflammatory drugs
Nausea	Many drugs, including selective serotonin reuptake inhibitor antidepressants
Diarrhoea (pseudomembranous colitis)	Antibiotics Proton pump inhibitors
Constipation	Opioids
Jaundice: hepatitis	Paracetamol (overdose) Pyrazinamide Rifampicin Isoniazid
Jaundice: cholestatic	Flucloxacillin Chlorpromazine Co-amoxiclav
Liver fibrosis	Methotrexate

6.9 Specific signs in the 'acute abdomen'

Sign	Disease associations	Examination
Murphy's	Acute cholecystitis: Sensitivity 50–97% Specificity 50–80%	As the patient takes a deep breath in, gently palpate in the right upper quadrant of the abdomen; the acutely inflamed gallbladder contacts the examining fingers, evoking pain with the arrest of inspiration
Rovsing's	Acute appendicitis: Sensitivity 20–70% Specificity 40–96%	Palpation in the left iliac fossa produces pain in the right iliac fossa
Iliopsoas	Retroileal appendicitis, iliopsoas abscess, perinephric abscess	Ask the patient to flex their thigh against the resistance of your hand; a painful response indicates an inflammatory process involving the right psoas muscle
Grey Turner's and Cullen's	Haemorrhagic pancreatitis, aortic rupture and ruptured ectopic pregnancy (see Fig. 6.25)	Bleeding into the falciform ligament; bruising develops around the umbilicus (Cullen) or in the loins (Grey Turner)



Epigastric mass
- Gastric cancer
- Pancreatic cancer
- Aortic aneurysm

Hepatomegaly
- Palpable liver not always enlarged
- Always percuss upper border
- Palpable gallbladder

Generalised distension
- Fat (obesity)
- Fluid (ascites)
- Flatus (obstruction/ileus)
- Faeces (constipation)
- Fetus (pregnancy)

Right iliac fossa mass
- Caecal cancer
- Crohn's disease
- Appendix abscess

Left upper quadrant mass
- ? Spleen:
  - Edge
  - Can't get above it
  - Moves towards right iliac fossa on inspiration
  - Dull percussion note to 9th–11th ribs mid-axillary line
  - Notch
- ? Kidney:
  - Rounded
  - Can get above it
  - Moves inferiorly on inspiration
  - Resonant to percussion above it
  - Ballottable

Tender to palpation
- ? Peritonitis:
  - Guarding
  - Rebound
  - Absent bowel sounds
  - Rigidity
- ? Obstruction:
  - Distended
  - Tinkling bowel sounds
  - Visible peristalsis

Left iliac fossa mass
- Sigmoid colon cancer
- Constipation
- Diverticular mass

8.7 Causes of dysphagia

Oral

- Tonsillitis, glandular fever, pharyngitis, peritonsillar abscess
- Painful mouth ulcers

Neurological

- Bulbar or pseudobulbar palsy
- Cerebrovascular accident

Neuromuscular

- Achalasia
- Pharyngeal pouch
- Myasthenia gravis
- Oesophageal dysmotility

Mechanical

- Oesophageal cancer
- Peptic oesophagitis
- Other benign strictures, e.g. after prolonged nasogastric intubation
- Extrinsic compression, e.g. lung cancer
- Systemic sclerosis

8.11 Causes of abdominal distension

Factor	Consider
Fat	Obesity
Flatus	Pseudo-obstruction, obstruction
Faeces	Subacute obstruction, constipation
Fluid	Ascites, tumours (especially ovarian), distended bladder
Fetus	Check date of the last menstrual period
Functional	Bloating, often associated with irritable bowel syndrome

Causes of rectal bleeding

- Haemorrhoids
- Anal fissure
- Colorectal polyps
- Colorectal cancer
- Inflammatory bowel disease
- Ischaemic colitis
- Complicated diverticular disease
- Vascular malformation

6.11 Grading of hepatic encephalopathy (West Haven)

Stage	State of consciousness
0	No change in personality or behaviour No asterixis (flapping tremor)
1	Impaired concentration and attention span Sleep disturbance, slurred speech Euphoria or depression Asterixis present
2	Lethargy, drowsiness, apathy or aggression Disorientation, inappropriate behaviour, slurred speech
3	Confusion and disorientation, bizarre behaviour Drowsiness or stupor Asterixis usually absent
4	Comatose with no response to voice commands Minimal or absent response to painful stimuli

Reproduced from Conn HO, Leevy CM, Vlahcevic ZR, et al. Comparison of lactulose and neomycin in the treatment of chronic portal-systemic encephalopathy. A double blind controlled trial. Gastroenterology 1977; 72(4):573, with permission from Elsevier Inc.

6.12 Differentiating a palpable spleen from the left kidney

Distinguishing feature	Spleen	Kidney
Mass is smooth and regular in shape	More likely	Polycystic kidneys are bilateral irregular masses
Mass descends in inspiration	Yes, travels superficially and diagonally	Yes, moves deeply and vertically
Ability to feel deep to the mass	Yes	No
Palpable notch on the medial surface	Yes	No
Bilateral masses palpable	No	Sometimes, e.g. polycystic kidneys
Percussion resonant over the mass	No	Sometimes
Mass extends beyond the midline	Sometimes	No (except with horseshoe kidney)

6.10 Causes of hepatomegaly

Chronic parenchymal liver disease

- Alcoholic liver disease
- Hepatic steatosis
- Autoimmune hepatitis
- Viral hepatitis
- Primary biliary cirrhosis

Malignancy

- Primary hepatocellular cancer
- Secondary metastatic cancer

Right heart failure

Haematological disorders

- Lymphoma
- Leukaemia
- Myelofibrosis
- Polycythaemia

Rarities

- Amyloidosis
- Budd–Chiari syndrome
- Sarcoidosis
- Glycogen storage disorders

6.13 Causes of splenomegaly

Haematological disorders

- Lymphoma and lymphatic leukaemias
- Myeloproliferative diseases, polycythaemia rubra vera and myelofibrosis
- Haemolytic anaemia, congenital spherocytosis

Portal hypertension

Infections

- Glandular fever
- Malaria, kala-azar (leishmaniasis)
- Bacterial endocarditis
- Brucellosis, tuberculosis, salmonellosis

Rheumatological conditions

- Rheumatoid arthritis (Felty's syndrome)
- Systemic lupus erythematosus

Rarities

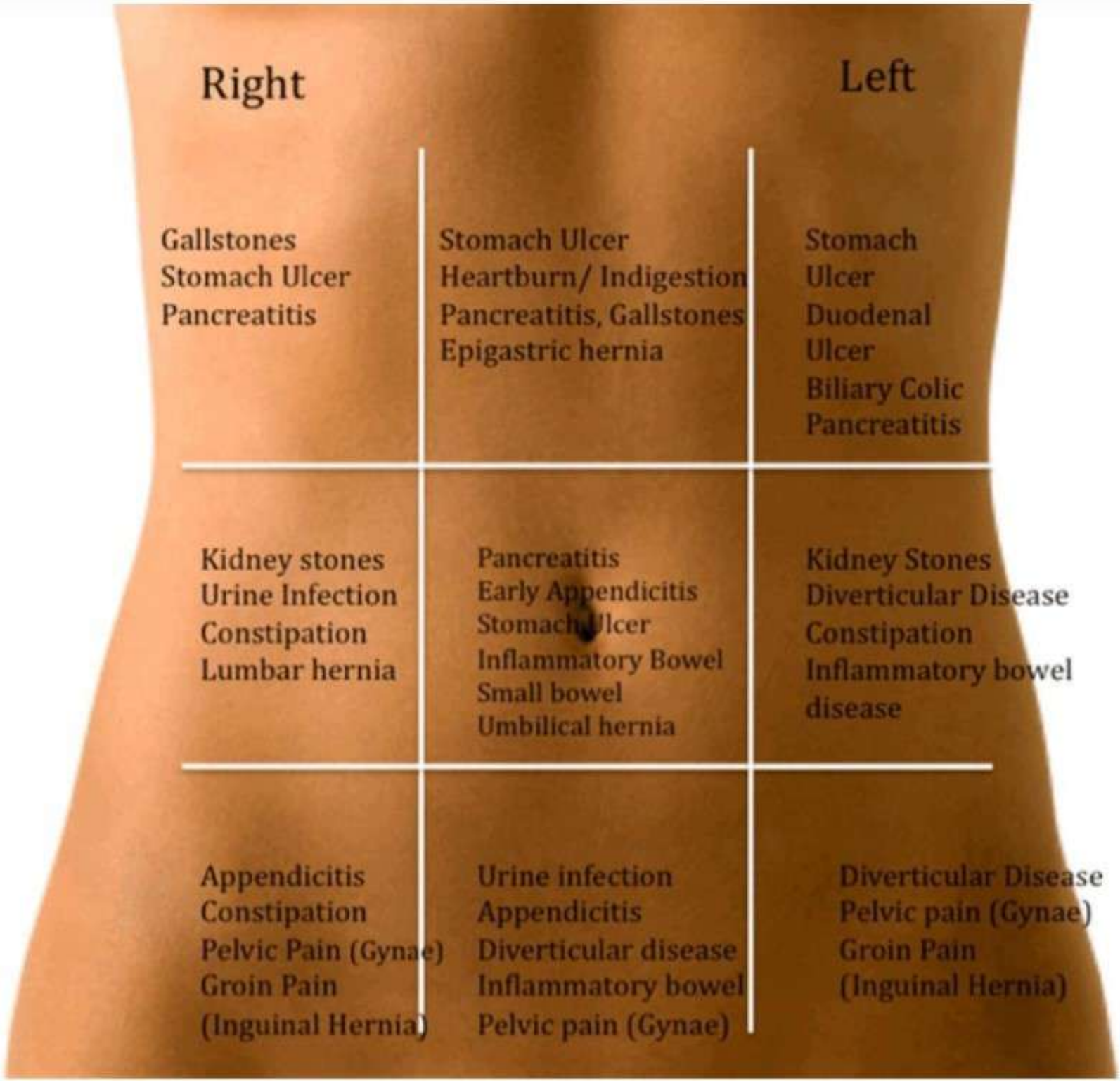
- Sarcoidosis
- Amyloidosis
- Glycogen storage disorders

6.14 Causes of ascites

Diagnosis	Comment
Common	
Hepatic cirrhosis with portal hypertension	Transudate
Intra-abdominal malignancy with peritoneal spread	Exudate, cytology may be positive
Uncommon	
Hepatic vein occlusion (Budd–Chiari syndrome)	Transudate in acute phase
Constrictive pericarditis and right heart failure	Check jugular venous pressure and listen for pericardial rub
Hypoproteinaemia (nephrotic syndrome, protein-losing enteropathy)	Transudate
Tuberculous peritonitis	Low glucose content
Pancreatitis, pancreatic duct disruption	Very high amylase content

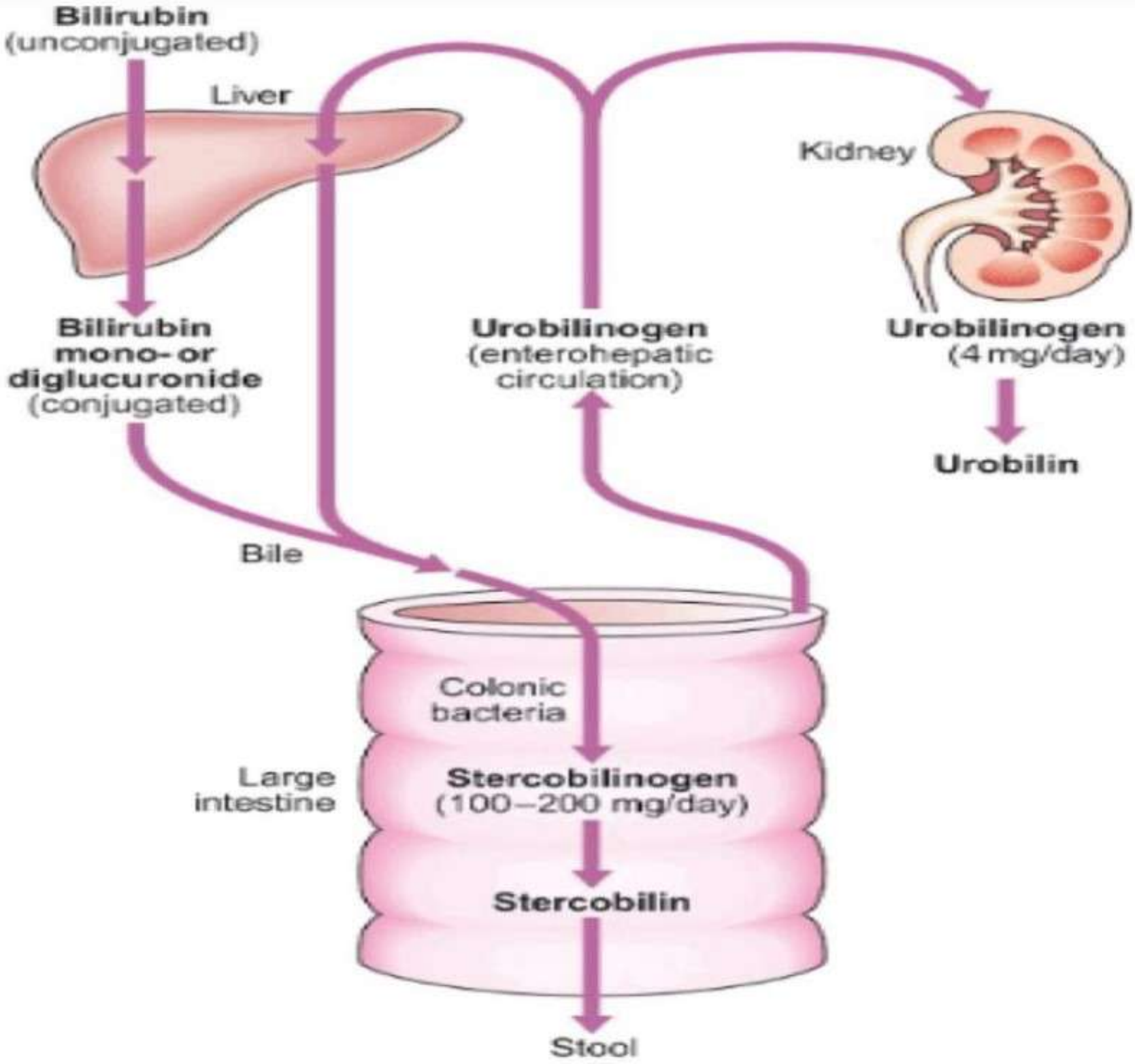
6.16 Causes of abnormal stool appearance

Stool appearance	Cause
Abnormally pale	Biliary obstruction
Pale and greasy	Steatorrhoea
Black and tarry (melaena)	Bleeding from the upper gastrointestinal tract
Grey/black	Oral iron or bismuth therapy
Silvery	Steatorrhoea plus upper gastrointestinal bleeding, e.g. pancreatic cancer
Fresh blood in or on stool	Large bowel, rectal or anal bleeding
Stool mixed with pus	Infective colitis or inflammatory bowel disease
Rice-water stool (watery with mucus and cell debris)	Cholera


Right
Left
Gallstones
Stomach Ulcer
Pancreatitis
Stomach Ulcer
Heartburn/ Indigestion
Pancreatitis, Gallstones
Epigastric hernia
Stomach
Ulcer
Duodenal
Ulcer
Biliary Colic
Pancreatitis
Kidney stones
Urine Infection
Constipation
Lumbar hernia
Pancreatitis
Early Appendicitis
Stomach Ulcer
Inflammatory Bowel
Small bowel
Umbilical hernia
Kidney Stones
Diverticular Disease
Constipation
Inflammatory bowel
disease
Appendicitis
Constipation
Pelvic Pain (Gynae)
Groin Pain
(Inguinal Hernia)
Urine infection
Appendicitis
Diverticular disease
Inflammatory bowel
Pelvic pain (Gynae)
Diverticular Disease
Pelvic pain (Gynae)
Groin Pain
(Inguinal Hernia)

Serum-ascites albumin gradient (SAAG)

	SAAG (g/dL)	
	≥ 1.1	< 1.1
Total protein (g/dL)		
< 2.5	Cirrhosis	Nephrotic syndrome
	Acute liver failure	
≥ 2.5	CHF	Peritoneal carcinomatosis
	Constrictive pericarditis	TB peritonitis
	Budd-Chiari syndrome	Pancreatic ascites
	Veno-occlusive disease	Chylous ascites


Bilirubin
(unconjugated)
Liver
Kidney
Bilirubin
mono- or
diglucuronide
(conjugated)
Urobilinogen
(enterohepatic
circulation)
Urobilinogen
(4 mg/day)
Urobilin
Bile
Colonic
bacteria
Large
intestine
Stercobilinogen
(100–200 mg/day)
Stercobilin
Stool

9.2 Features of bladder outlet obstruction due to prostatic hyperplasia

- Slow flow
- Hesitancy
- Incomplete emptying (the need to pass urine again within a few minutes of micturition)
- Dribbling after micturition
- Frequency and nocturia (due to incomplete bladder emptying)
- A palpable bladder

9.6 Causes of urinary incontinence

- Pelvic floor weakness following childbirth
- Pelvic surgery or radiotherapy
- Detrusor overactivity
- Bladder outlet obstruction
- Urinary tract infection
- Degenerative brain diseases and stroke
- Neurological diseases, e.g. multiple sclerosis
- Spinal cord damage

9.11 Urinary incontinence: points to cover in the history

- Age at onset and frequency of wetting
- Occurrence during sleep (enuresis)
- Any other urinary symptoms
- Provocative factors, e.g. coughing, sneezing, exercising
- Past medical, obstetric and surgical histories
- Number of pads used. Are they damp, wet or soaked?
- Impact on daily living

9.7 Abnormalities of urine colour

Orange-brown

- Conjugated bilirubin
- Rhubarb, senna
- Concentrated normal urine, e.g. very low fluid intake
- Drugs: sulfasalazine

Red-brown

- Blood, myoglobin, free haemoglobin, porphyrins
- Beetroot, blackberries
- Drugs: rifampicin, rifabutin, clofazimine, entacapone

Brown-black

- Conjugated bilirubin
- Drugs: L-dopa, metronidazole, nitrofurantoin, chloroquine, primaquine
- Homogentisic acid (in alkaptonuria or ochronosis)

Blue-green

- Drugs/dyes, e.g. propofol, fluorescein, triamterene

9.9 Causes of proteinuria

Renal disease

- Glomerulonephritis
- Diabetes mellitus
- Amyloidosis
- Systemic lupus erythematosus
- Drugs, e.g. gold, penicillamine
- Malignancy, e.g. myeloma
- Infection

Non-renal disease

- Fever
- Severe exertion
- Severe hypertension
- Burns
- Heart failure
- Orthostatic proteinuria*

*Occurs when a patient is upright but not lying down; the first morning sample will not show proteinuria.

9.10 Causes of transient proteinuria

- Cold exposure
- Vigorous exercise
- Febrile illness
- Abdominal surgery
- Heart failure

9.12 Some hereditary and congenital conditions affecting the kidneys and urinary tract

Name	Principal findings	Commonly associated abnormalities	Most common form of inheritance
Adult polycystic kidney disease	Bilateral enlarged kidneys, sometimes massive, with nodular surface	Liver cysts Intracranial berry aneurysms Mitral or aortic valve abnormalities	Autosomal dominant
Alport's syndrome	Haematuria, proteinuria, renal failure	Nerve deafness Lens and retinal abnormalities	X-linked dominant
Medullary sponge kidney	Tubular dilatation; renal stones	Other congenital abnormalities, e.g. hemihypertrophy, cardiac valve abnormalities, Marfan's syndrome	Congenital, rarely familial
Nail–patella syndrome	Proteinuria Renal failure (30%)	Nail dysplasia, patellar dysplasia or aplasia	Autosomal dominant
Cystinosis	Tubular dysfunction; renal failure	Rickets, growth retardation, retinal depigmentation and visual impairment	Autosomal recessive
Tuberous sclerosis complex	Renal cysts Renal angiolipomata	Seizures, mental retardation, facial angiofibromata, retinal lesions	Autosomal dominant
Prune-belly syndrome	Dilated bladder and urinary tract; urinary infection and renal failure	Absent abdominal wall musculature	Sporadic mutation

12.2 Causes of acute kidney injury

Prerenal

- Hypovolaemia (e.g. blood loss, diarrhoea, vomiting, diuresis, inadequate oral intake)
- Relative hypovolaemia (e.g. heart failure, nephrotic syndrome)
- Sepsis
- Drugs (e.g. antihypertensives, diuretics, non-steroidal anti-inflammatory drugs)
- Renal artery stenosis or occlusion
- Hepatorenal syndrome

Intrarenal

- Glomerular disease (e.g. systemic vasculitis, systemic lupus erythematosus, immunoglobulin A nephropathy)
- Interstitial nephritis (drug-induced)
- Acute tubular necrosis/injury (may follow a prerenal cause)
- Multiple myeloma
- Rhabdomyolysis
- Intrarenal crystal deposition (e.g. urate nephropathy, ethylene glycol poisoning)
- Thrombotic microangiopathy (e.g. haemolytic uraemic syndrome, scleroderma renal crisis)
- Accelerated-phase hypertension
- Cholesterol emboli

Postrenal

- Renal stones (in papilla, ureter or bladder)
- Papillary necrosis
- Ureteric or bladder transitional cell carcinoma
- Intra-abdominal or pelvic malignancy (e.g. cervical carcinoma)
- Retroperitoneal fibrosis
- Blood clot
- Bladder outflow obstruction (e.g. prostatic enlargement)
- Neurogenic bladder
- Urethral stricture
- Posterior urethral valves
- Iatrogenic (e.g. ureteric damage at surgery, blocked urethral catheter)

7.1 Clinical characteristics of headache syndromes

	Onset	Duration/periodicity	Pain location	Associated features
Primary syndromes				
Migraine	Evolves over 30–120 mins	Usually last <24 h, recurrent with weeks/months symptom-free	Classically unilateral but may be anywhere including face/neck	Aura (usually visual), nausea/vomiting, photophobia and phonophobia
Cluster headache	Rapid onset, often waking patient from sleep	30–120 mins, 1–4 attacks within 24 h, clusters usually last weeks to months, with months to years of remission	Orbital/retro-orbital; always same side during cluster, may switch sides between clusters	Autonomic features, including conjunctival injection, tearing, nasal stuffiness, ptosis, miosis, agitation
Stabbing headache	Abrupt, rarely from sleep	Very brief, seconds or less	Anywhere over head	Common in migraineurs
Secondary syndromes				
Meningitis	Usually evolves over a day or two, can be abrupt	Depends on cause and treatment, usually days to weeks	Global, including neck stiffness	Fever, meningism, rash, false localising signs, signs of raised intracranial pressure
Subarachnoid haemorrhage	Abrupt, immediately maximal, rare from sleep	May be fatal at onset, usually days to weeks	Anywhere, poor localising value	20% isolated headache only; nausea/vomiting, reduced consciousness, false localising signs, III nerve palsies
Temporal arteritis	Gradual onset of temple pain and scalp tenderness	Continuous	Temple and scalp	Usually in those >55 years; unwell, jaw pain on chewing, visual symptoms, tender temporal arteries, elevated erythrocyte sedimentation rate and C-reactive protein

7.2 Features that help discriminate vasovagal syncope from epileptic seizure

Feature	Vasovagal syncope	Seizure
Triggers	Typically pain, illness, emotion	Often none (sleep deprivation, alcohol, drugs)
Prodrome	Feeling faint/ lightheaded, nausea, tinnitus, vision dimming	Focal onset (not always present)
Duration of unconsciousness	<60 s	1–2 mins
Convulsion	May occur but usually brief myoclonic jerks	Usual, tonic–clonic 1–2 mins
Colour	Pale/grey	Flushed/cyanosed, may be pale
Injuries	Uncommon, sometimes biting of tip of tongue	Lateral tongue biting, headache, generalised myalgia, back pain (sometimes vertebral compression fractures), shoulder fracture/ dislocation (rare)
Recovery	Rapid, no confusion	Gradual, over 30 mins; patient is often confused, sometimes agitated/ aggressive, amnesic

7.3 Clinical classification of stroke

Total anterior circulation syndrome (TACS)

- Hemiparesis, hemianopia and higher cortical deficit (e.g. dysphasia or visuospatial loss)

Partial anterior circulation syndrome (PACS)

- Two of the three components of a TACS
- OR isolated higher cortical deficit
- OR motor/sensory deficit more restricted than LACS (see below)

Posterior circulation syndrome (POCS)

- Ipsilateral cranial nerve palsy with contralateral motor and/or sensory deficit
- OR bilateral motor and/or sensory deficit
- OR disorder of conjugate eye movement
- OR cerebellar dysfunction without ipsilateral long-tract deficits
- OR isolated homonymous visual field defect

Lacunar syndrome (LACS)

- Pure motor > 2 out of 3 of face, arm, leg
- OR pure sensory > 2 out of 3 of face, arm, leg
- OR pure sensorimotor > 2 out of 3 of face, arm, leg
- OR ataxic hemiparesis

2 Parietal lobe

Dominant side

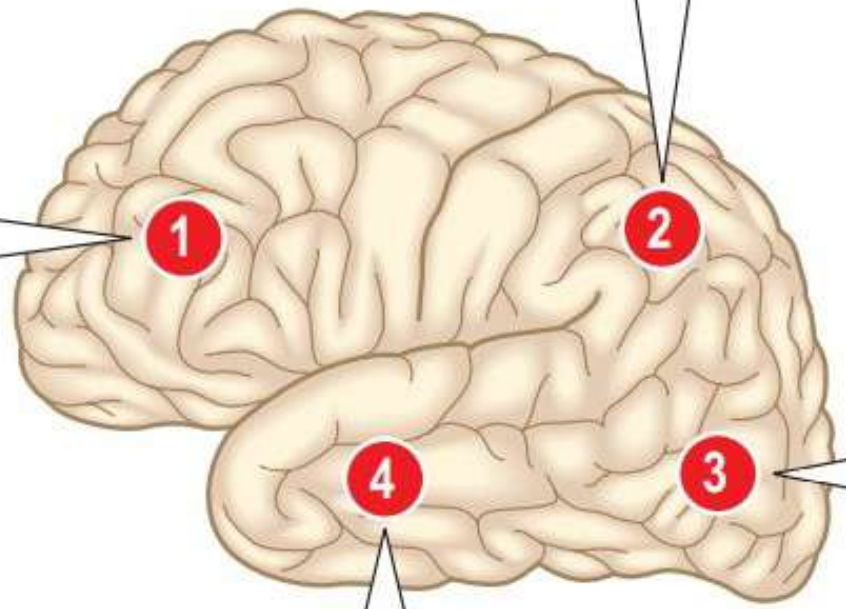
FUNCTION	LESIONS
Calculation	Dyscalculia
Language	Dysphasia
Planned movement	Dyslexia
Appreciation of size, shape, weight and texture	Apraxia
	Agnosia
	Homonymous hemianopia

Non-dominant side

FUNCTION	LESIONS
Spatial orientation	Neglect of non-dominant side
Constructional skills	Spatial disorientation
	Constructional apraxia
	Dressing apraxia
	Homonymous hemianopia

1 Frontal lobe

FUNCTION	LESIONS
Personality	Disinhibition
Emotional response	Lack of initiative
Social behaviour	Antisocial behaviour
	Impaired memory
	Incontinence
	Grasp reflexes
	Anosmia



3 Occipital lobe

FUNCTION	LESIONS
Analysis of vision	Homonymous hemianopia
	Hemianopic scotomas
	Visual agnosia
	Impaired face recognition (prosopagnosia)
	Visual hallucinations (lights, lines and zigzags)

4 Temporal lobe

Dominant side

FUNCTION	LESIONS
Auditory perception	Dysphasia
Speech, language	Dyslexia
Verbal memory	Poor memory
Smell	Complex hallucinations (smell, sound, vision)
	Homonymous hemianopia

Non-dominant side

FUNCTION	LESIONS
Auditory perception	Poor non-verbal memory
Music, tone sequences	Loss of musical skills
Non-verbal memory (faces, shapes, music)	Complex hallucinations
Smell	Homonymous hemianopia

A

7.4 Summary of the 12 cranial nerves

Nerve	Examination	Abnormalities/symptoms
I	Sense of smell, each nostril	Anosmia/parosmia
II	Visual acuity Visual fields Pupil size and shape Pupil light reflex Fundoscopy	Partial sight/blindness Scotoma; hemianopia Anisocoria Impairment or loss Optic disc and retinal changes
III	Light and accommodation reflex	Impairment or loss
III, IV and VI	Eye position and movements	Strabismus, diplopia, nystagmus
V	Facial sensation Corneal reflex Muscles of mastication Jaw jerk	Impairment, distortion or loss Impairment or loss Weakness of chewing movements Increase in upper motor neurone lesions
VII	Muscles of facial expression Taste over anterior two-thirds of tongue	Facial weakness Ageusia (loss of taste)
VIII	Whisper and tuning fork tests Vestibular tests	Impaired hearing/deafness Nystagmus and vertigo
IX	Pharyngeal sensation	Not routinely tested
X	Palate movements	Unilateral or bilateral impairment
XI	Trapezius and sternomastoid	Weakness of scapular and neck movement
XII	Tongue appearance and movement	Dysarthria and chewing/ swallowing difficulties

7.5 Comparison of bulbar and pseudobulbar palsy

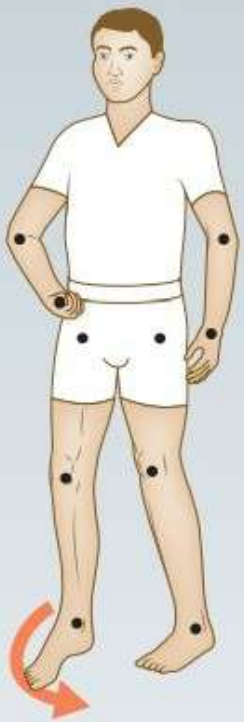
	Bulbar palsy	Pseudobulbar palsy
Level of motor lesion	Lower motor neurone	Upper motor neurone
Speech	Dysarthria	Dysarthria and dysphonia
Swallowing	Dysphagia	Dysphagia
Tongue	Weak, wasted and fasciculating	Spastic, slow-moving
Jaw jerk	Absent	Present/brisk
Emotional lability	Absent	May be present
Causes	Motor neurone disease	Cerebrovascular disease, motor neurone disease, multiple sclerosis

7.6 Features of motor neurone lesions

	Upper motor neurone lesion	Lower motor neurone lesion
Inspection	Usually normal (may be disuse wasting in longstanding lesions)	Muscle wasting, fasciculations
Tone	Increased with clonus	Normal or decreased, no clonus
Weakness	Preferentially affects extensors in arms, flexors in leg	Usually more focal, in distribution of nerve root or peripheral nerve
Deep tendon reflexes	Increased	Decreased/absent
Plantar response	Extensor (Babinski sign)	Flexor

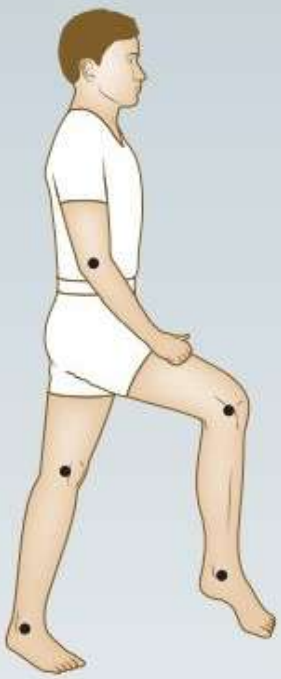
7.7 Common gait abnormalities

Gait disturbance	Description	Causes
Parkinsonian	Stooped posture Shuffling (reduced stride length) Loss of arm swing Postural instability Freezing	Parkinson's disease and other Parkinsonian syndromes
Gait apraxia	Small, shuffling steps (*marche à petits pas*) Difficulty in starting to walk/freezing Better 'cycling' on bed than walking	Cerebrovascular disease Hydrocephalus
Spastic	Stiff 'walking-through-mud' or scissors gait	Spinal cord lesions
Myopathic	Waddling (proximal weakness) Bilateral Trendelenburg signs	Muscular dystrophies and acquired myopathies
Foot drop	Foot slapping	Neuropathies Common peroneal nerve palsy L5 radiculopathy
Central ataxia	Wide-based, 'drunken' Tandem gait poor	Cerebellar disease
Sensory ataxia	Wide-based Positive Romberg sign	Neuropathies Spinal cord disorders
Functional	Variable, often bizarre, inconsistent Knees flexed, buckling Dragging immobile leg behind	Functional neurological disorders



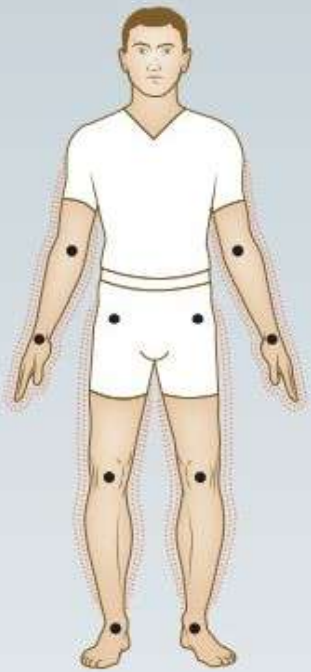
A Spastic hemiparesis

One arm held immobile and close to the side with elbow, wrist and fingers flexed
Leg extended with plantar flexion of the foot
On walking, the foot is dragged, scraping the toe in a circle (circumduction)
Caused by upper motor neurone lesion, e.g. stroke



B Steppage gait

Foot is dragged or lifted high and slapped on to the floor
Unable to walk on the heels
Caused by foot drop owing to lower motor neurone lesion



C Sensory or cerebellar ataxia

Gait is unsteady and wide-based. Feet are thrown forward and outward and brought down on the heels
In sensory ataxia, patients watch the ground. With their eyes closed, they cannot stand steadily (positive Romberg sign)
In cerebellar ataxia, turns are difficult and patients cannot stand steadily with feet together whether eyes are open or closed
Caused by polyneuropathy or posterior column damage, e.g. syphilis

D Parkinsonian gait

Posture is stooped with head and neck forwards
Arms are flexed at elbows and wrists. Little arm swing
Steps are short and shuffling and patient is slow in getting started (festinant gait)
Caused by lesions in the basal ganglia

7.8 Medical Research Council grading of muscle power

Grade	Description
0	No muscle contraction visible
1	Flicker of contraction but no movement
2	Joint movement when effect of gravity eliminated
3	Movement against gravity but not against resistance
4[a]	Movement against resistance but weaker than normal
5	Normal power

[a]*May be further classified as 4+ or 4–.*

7.9 Nerve and muscle supplies of commonly tested movements

Movement	Muscle	Nerve and root
Shoulder abduction	Deltoid	Axillary C5
Elbow flexion	Biceps[a] Brachioradialis (supinator reflex)[a]	Musculocutaneous C5[a]/6 Radial C6[a]
Elbow extension	Triceps[a]	Radial C7
Wrist extension	Extensor carpi radialis longus	Posterior interosseous C6
Finger extension	Extensor digitorum communis	Posterior interosseous C7
Finger flexion	Flexor pollicis longus (thumb) Flexor digitorum profundus (index and middle fingers) Flexor digitorum profundus (ring and little fingers)	Anterior interosseous C8 Ulnar C8
Finger abduction	First dorsal interosseous	Ulnar T1
Thumb abduction	Abductor pollicis brevis	Median T1
Hip flexion	Iliopsoas	Iliofemoral nerve L1/2
Hip extension	Gluteus maximus	Sciatic L5/S1
Knee flexion	Hamstrings	Sciatic S1
Knee extension	Quadriceps[a]	Femoral L3[a]/4
Ankle dorsiflexion	Tibialis anterior	Deep peroneal L4/5
Ankle plantar flexion	Gastrocnemius and soleus[a]	Tibial S1[a]/2
Great toe extension (dorsiflexion)	Extensor hallucis longus	Deep peroneal L5
Ankle eversion	Peronei	Superficial peroneal L5/S1
Ankle inversion	Tibialis posterior	Tibial nerve L4/5

[a]*Indicates nerve root innervation of commonly elicited deep tendon reflexes.*

7.10 Primitive reflexes

Snout reflex

- Lightly tap the lips. Lip pouting is an abnormal response

Grasp reflex

- Firmly stroke the palm from the radial side. In an abnormal response, your finger is gripped by the patient's hand

Palmomental reflex

- Apply firm pressure to the palm next to the thenar eminence with a tongue depressor. An abnormal response is ipsilateral puckering of the chin

Glabellar tap

- Stand behind the patient and tap repeatedly between their eyebrows with the tip of your index finger. Normally, the blink response stops after three or four taps

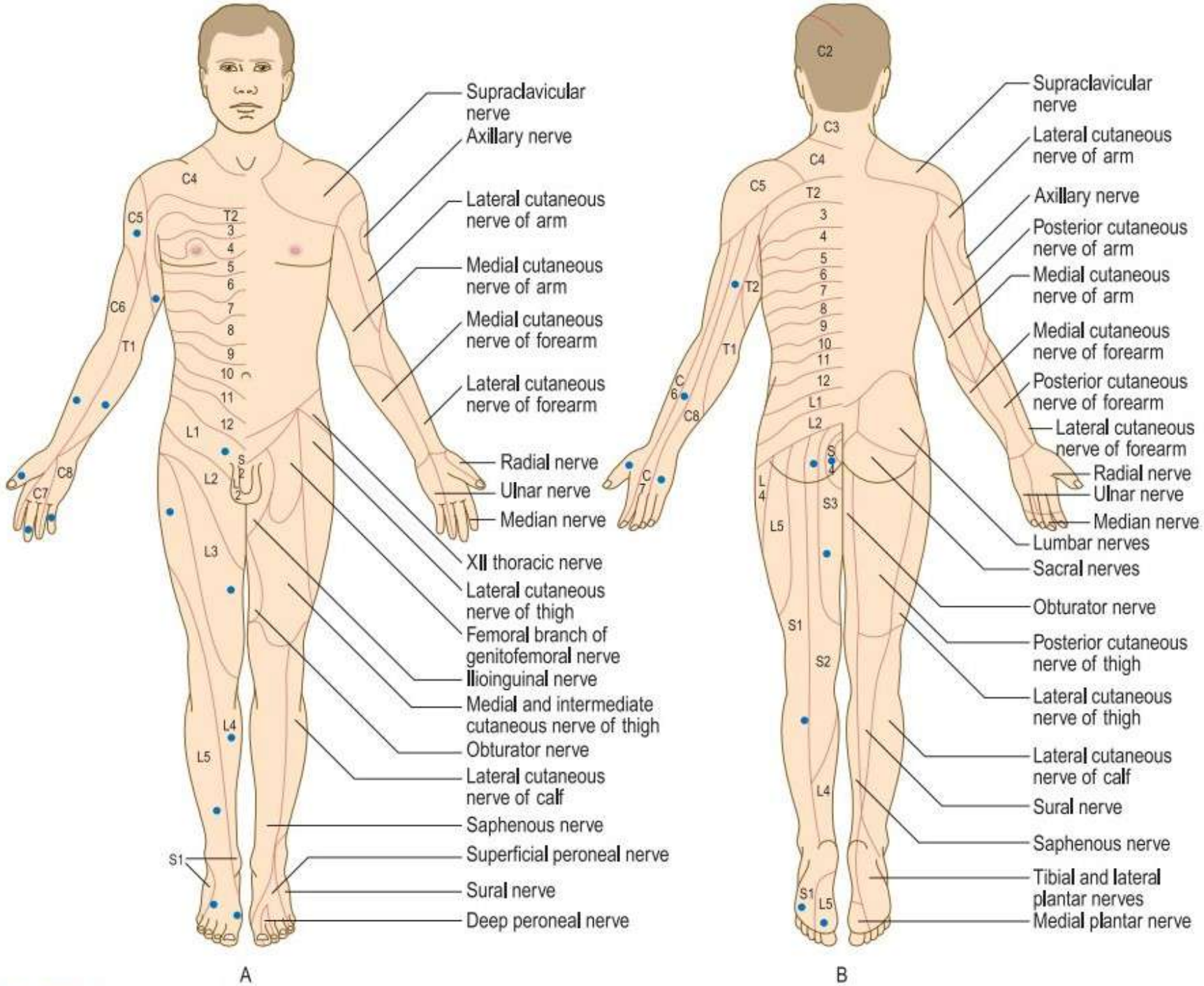


Fig. 7.26 Dermatomal and sensory peripheral map innervation. Points (shown in blue) for testing cutaneous sensation of the limbs. By applying stimuli at the points marked, both the dermatomal and main peripheral nerve distributions are tested simultaneously. **A** Anterior view. **B** Posterior view.

7.11 Common features of carpal tunnel syndrome

- It is more common in women
- There is unpleasant tingling in the hand
- It may not observe anatomical boundaries, radiating up the arm to the shoulder
- Weakness is uncommon; if it does occur, it affects thumb abduction
- Symptoms are frequently present at night, waking the patient from sleep
- The patient may hang the hand and arm out of the bed for relief
- There is thenar muscle wasting (in longstanding cases)
- It is commonly associated with pregnancy, diabetes and hypothyroidism

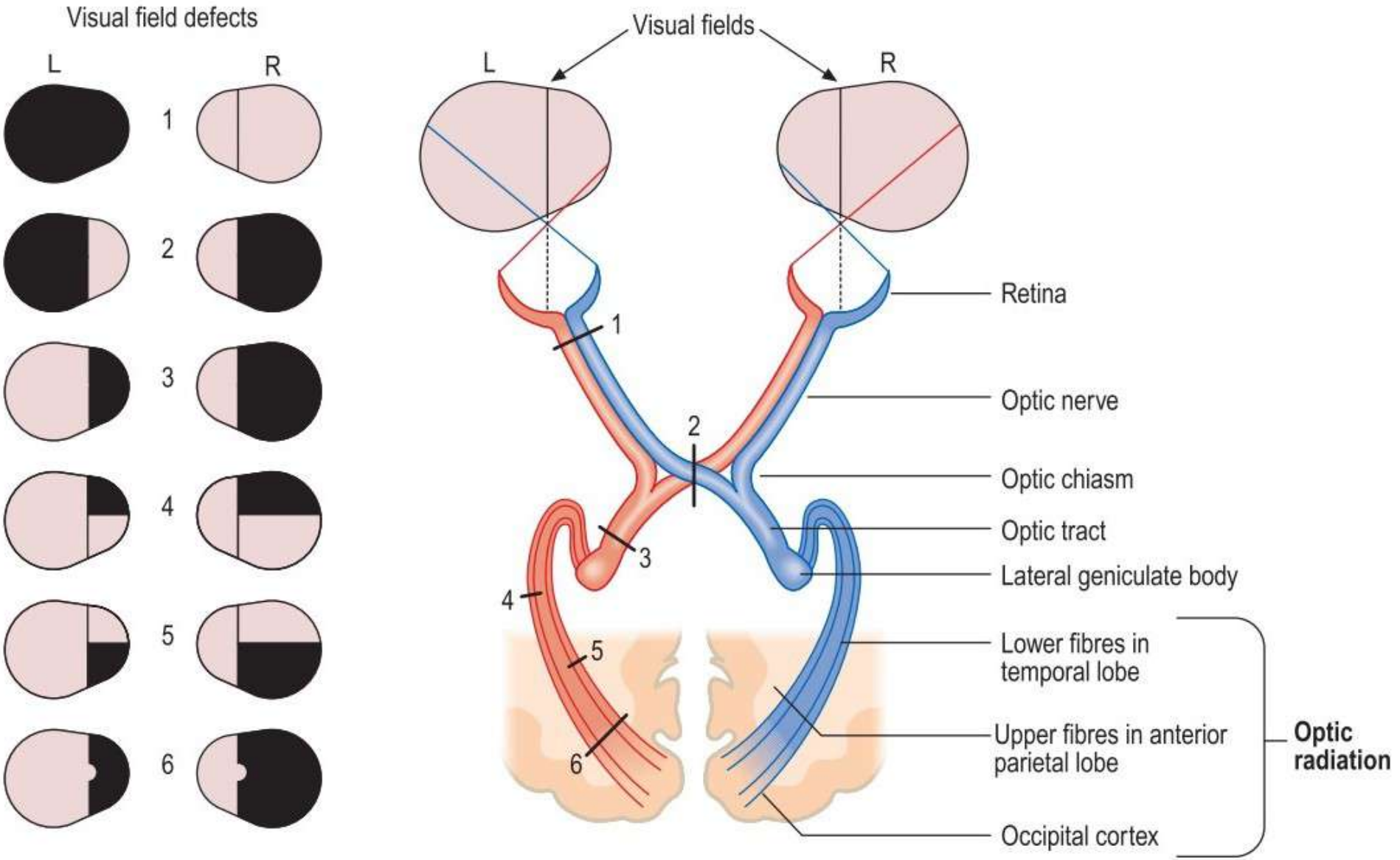


Fig. 8.5 Visual field defects. 1, Total loss of vision in one eye because of a lesion of the optic nerve. **2,** Bitemporal hemianopia due to compression of the optic chiasm. **3,** Right homonymous hemianopia from a lesion of the optic tract. **4,** Upper right quadrantanopia from a lesion of the lower fibres of the optic radiation in the temporal lobe. **5,** Lower quadrantanopia from a lesion of the upper fibres of the optic radiation in the anterior part of the parietal lobe. **6,** Right homonymous hemianopia with sparing of the macula due to a lesion of the optic radiation in the occipital lobe.

8.8 Causes of eyelid ptosis

Cause	Diagnosis	Associated distinguishing features
Neurogenic	Horner's syndrome	Ptosis, miosis, eye movement spared
	Cranial nerve III palsy	Dilated pupil, eye movements affected (see Fig. 8.10)
Myogenic	Myotonic dystrophy	Frontal balding, sustained handgrip
	Chronic progressive external ophthalmoplegia	Bilateral ptosis and impairment of eye movements, often without diplopia, sparing of pupil reflexes
	Oculopharyngeal dystrophy	History of swallowing abnormalities
Neuromuscular junction	Myasthenia gravis	History of variable muscular fatigue
Mechanical	Eyelid tumour	Evident on inspection
	Eyelid inflammation/ infection	Evident on inspection
	Trauma	Scarring/history of trauma
Degenerative	Levator aponeurosis degeneration	Often unilateral, eye movement normal
	Long-term contact lens wear	History of contact lens use

8.9 Causes of anisocoria

Dilated pupil

- Cranial nerve III palsy
- Pharmacological treatment with a dilating agent (e.g. tropicamide or atropine)
- Physiological
- Post-surgical
- Adie's tonic pupil

Constricted pupil

- Horner's syndrome
- Mechanical, e.g. secondary to posterior synechiae in iritis or trauma
- Physiological
- Late-stage Adie's tonic pupil
- Pharmacological treatment with a constricting agent (e.g. pilocarpine)

9.5 Tuning fork tests

	Weber test	Rinne test
Bilateral normal hearing	Central	AC > BC, bilateral
Bilateral symmetrical sensorineural loss	Central	AC > BC, bilateral
Unilateral or asymmetrical sensorineural loss LEFT	Louder right	AC > BC, bilateral[a]
Unilateral conductive loss LEFT	Louder left	BC > AC, left AC > BC, right
Bilateral conductive loss (worse on LEFT)	Louder left	BC > AC, bilateral

[a] *Patients with a severe sensorineural loss may have BC > AC due to BC crossing to the other better-hearing cochlea that is not being tested (false-negative Rinne test).*

AC, *air conduction;* BC, *bone conduction.*

19.14 Glasgow Coma Scale

Eye opening	
Spontaneous	4
To speech	3
To pain	2
No response	1
Verbal response	
Orientated	5
Confused: talks in sentences but disorientated	4
Verbalises: words, not sentences	3
Vocalises: sounds (groans or grunts), not words	2
No vocalisation	1
Motor response	
Obeys commands	6
Localises to pain, e.g. brings hand up beyond chin to supraorbital pain	5
Flexion withdrawal to pain: no localisation to supraorbital pain but flexes elbow to nail bed pressure	4
Abnormal flexion to pain	3
Extension to pain: extends elbow to nail bed pressure	2
No response	1

Record the GCS as a total and its three separate components: e.g. GCS 9/15: E3, V2, M4

11.20 Definitions of paralysis

Term	Definition
Paresis	Partial paralysis
Plegia	Complete paralysis
Monoplegia	Involvement of a single limb
Hemiplegia	Involvement of one-half of the body
Paraplegia/diplegia	Paralysis of the legs
Tetraplegia	Paralysis of all four limbs

11.24 Monosynaptic (deep tendon) reflexes and root innervation

Reflex (muscle)	Nerve root
Biceps	C5
Supinator (brachioradialis)	C6
Triceps	C7
Knee (quadriceps)	L3, 4
Ankle (gastrocnemius, soleus)	S1

2. Symptoms and definitions

Paraesthesia	Tingling, or pins and needles Spontaneous or provoked Not unduly unpleasant or painful
Dysaesthesia	Unpleasant paraesthesia
Hypoaesthesia	Reduced sensation to a normal stimulus
Analgesia	Numbness or loss of sensation
Hyperaesthesia	Increased sensitivity to a stimulus
Allodynia	Painful sensation resulting from a non-painful stimulus
Hyperalgesia	Increased sensitivity to a painful stimulus

10.2 Features suggestive of Graves' hyperthyroidism

History

- Female sex
- Prior episode of hyperthyroidism requiring treatment
- Family history of thyroid or other autoimmune disease
- Ocular symptoms ('grittiness', redness, pain, periorbital swelling)

Physical examination

- Vitiligo
- Thyroid acropachy
- Diffuse thyroid enlargement (can be nodular)
- Thyroid bruit
- Pretibial myxoedema
- Signs of Graves' ophthalmopathy (proptosis, redness, oedema)

13.1 Common causes of arthralgia (joint pain)

Infective

- Viral, e.g. rubella, parvovirus B19, mumps, hepatitis B, chikungunya
- Bacterial, e.g. staphylococci, *Mycobacterium tuberculosis*, *Borrelia*
- Fungal

Postinfective

- Rheumatic fever
- Reactive arthritis

Inflammatory

- Rheumatoid arthritis
- Systemic lupus erythematosus
- Ankylosing spondylitis
- Systemic sclerosis

Degenerative

- Osteoarthritis

Tumour

- Primary, e.g. osteosarcoma, chondrosarcoma
- Metastatic, e.g. from lung, breast, prostate
- Systemic tumour effects, e.g. hypertrophic pulmonary osteoarthropathy

Crystal formation

- Gout, pseudogout

Trauma

- e.g. Road traffic accidents

Others

- Chronic pain disorders, e.g. fibromyalgia (usually diffuse pain)
- Benign joint hypermobility syndrome

13.2 Causes of muscle pain (myalgia)

Infective

- Viral: Coxsackie, cytomegalovirus, echovirus, dengue
- Bacterial: *Streptococcus pneumoniae*, *Mycoplasma*
- Parasitic: schistosomiasis, toxoplasmosis

Traumatic

- Tears
- Haematoma
- Rhabdomyolysis

Inflammatory

- Polymyalgia rheumatic
- Myositis
- Dermatomyositis

Drugs

- Alcohol withdrawal
- Statins
- Triptans

Metabolic

- Hypothyroidism
- Hyperthyroidism
- Addison's disease
- Vitamin D deficiency

Neuropathic

13.3 Common patterns of referred and radicular musculoskeletal pain

Site where pain is perceived	Site of pathology
Occiput	C1, 2
Interscapular region	C3, 4
Tip of shoulder, upper outer aspect of arm	C5
Interscapular region or radial fingers and thumb	C6, 7
Ulnar side of forearm, ring and little fingers	C8
Medial aspect of upper arm	T1
Chest	Thoracic spine
Buttocks, knees, legs	Lumbar spine
Lateral aspect of upper arm	Shoulder
Forearm	Elbow
Anterior thigh, knee	Hip
Thigh, hip	Knee

13.5 Extra-articular signs in rheumatic conditions

Condition	Extra-articular signs
Rheumatoid arthritis	Rheumatoid nodules, palmar erythema, episcleritis, dry eyes, interstitial lung disease, pleural ± pericardial effusion, small-vessel vasculitis, Raynaud's phenomenon, low-grade fever, weight loss, lymphadenopathy, splenomegaly, leg ulcers
Psoriatic arthritis	Psoriasis, nail pitting, onycholysis, enthesitis, dactylitis
Reactive arthritis	Urethritis, mouth and/or genital ulcers, conjunctivitis, iritis, enthesitis (inflammation of tendon or ligament attachments), e.g. Achilles enthesitis/plantar fasciitis, rash (keratoderma blenorrhagica)
Axial spondyloarthritis	Inflammatory bowel disease, psoriasis, enthesitis, iritis, aortic regurgitation, apical interstitial fibrosis
Septic arthritis	Fever, malaise, source of sepsis, e.g. skin, throat, gut
Gout	Tophi, signs of renal failure or alcoholic liver disease
Sjögren's syndrome	'Dry eyes' (keratoconjunctivitis sicca), xerostomia (reduced or absent saliva production), salivary gland enlargement, Raynaud's phenomenon, neuropathy
Systemic lupus erythematosus	Photosensitive rash, especially on face, mucocutaneous ulcers, alopecia, fever, pleural ± pericardial effusion, diaphragmatic paralysis, pulmonary fibrosis (rare), Raynaud's phenomenon, lymphopenia
Systemic sclerosis	Skin tightening (scleroderma, see Fig. 3.30C), telangiectasia, Raynaud's phenomenon, calcific deposits in fingers, dilated nail-fold capillaries, pulmonary fibrosis
Adult-onset Still's disease	Rash, fever, hepatomegaly, splenomegaly
Other	Erythema nodosum of shins in sarcoidosis, viral rashes, drug rashes

13.7 Drugs associated with adverse musculoskeletal effects

Drug	Possible adverse musculoskeletal effects
Glucocorticoids	Osteoporosis, myopathy, osteonecrosis, infection
Statins	Myalgia, myositis, myopathy
Angiotensin-converting enzyme inhibitors	Myalgia, arthralgia, positive antinuclear antibody
Antiepileptics	Osteomalacia, arthralgia
Immunosuppressants	Infections
Quinolones	Tendinopathy, tendon rupture

13.9 Common spinal problems

- Mechanical back pain
- Prolapsed intervertebral disc
- Spinal stenosis
- Ankylosing spondylitis
- Compensatory scoliosis from leg-length discrepancy
- Cervical myelopathy
- Pathological pain/deformity, e.g. osteomyelitis, tumour, myeloma
- Osteoporotic vertebral fracture resulting in kyphosis (or rarely lordosis), especially in the thoracic spine with loss of height
- Cervical rib
- Scoliosis
- Spinal instability, e.g. spondylolisthesis

13.10 Causes of abnormal neck posture

Loss of lordosis or flexion deformity

- Acute lesions, rheumatoid arthritis, trauma

Increased lordosis

- Ankylosing spondylitis

Torticollis (wry neck)

- Sternocleidomastoid contracture, trauma
- Pharyngeal/parapharyngeal infection

Lateral flexion

- Erosion of lateral mass of atlas in rheumatoid arthritis

13.11 Causes of thoracic spine pain

Adolescents and young adults

- Scheuermann's disease
- Axial spondyloarthritis
- Disc protrusion (rare)

Middle-aged and elderly

- Degenerative change
- Osteoporotic fracture

Any age

- Tumour
- Infection

13.12 'Red flag' and 'yellow flag' features for acute low back pain

'Red flag' features

Features that may indicate serious pathology and require urgent referral

History

- Age <20 years or >55 years
- Recent significant trauma (fracture)
- Pain:
  - Thoracic (dissecting aneurysm)
  - Non-mechanical (infection/tumour/pathological fracture)
- Fever (infection)
- Difficulty in micturition
- Faecal incontinence
- Motor weakness
- Sensory changes in the perineum (saddle anaesthesia)
- Sexual dysfunction, e.g. erectile/ejaculatory failure
- Gait change (cauda equina syndrome)
- Bilateral 'sciatica'

Past medical history

- Cancer (metastases)
- Previous glucocorticoid use (osteoporotic collapse)

System review

- Weight loss/malaise without obvious cause, e.g. cancer

'Yellow flag' features

Psychosocial factors associated with greater likelihood of long-term chronicity and disability

- A history of anxiety, depression, chronic pain, irritable bowel syndrome, chronic fatigue, social withdrawal
- A belief that the diagnosis is severe, e.g. cancer. Faulty beliefs can lead to 'catastrophisation' and avoidance of activity
- Lack of belief that the patient can improve leads to an expectation that only passive, rather than active, treatment will be effective
- Ongoing litigation or compensation claims, e.g. work, road traffic accident

13.14 American College of Rheumatology/European League Against Rheumatism classification criteria for rheumatoid arthritis, 2010

Criteria	Score
Duration of symptoms (as reported by patient)	
<6 weeks	0
>6 weeks	1
Joint distribution (0–5)	
1 large joint[a]	0
2–10 large joints	1
1–3 small joints[b] (large joints not counted)	2
4–10 small joints (large joints not counted)	3
>10 joints (at least 1 small joint)	5
Serology (0–3)	
Negative RF and negative ACPA	0
Low positive RF or low positive ACPA	2
High positive RF or high positive ACPA	3
Acute-phase reactants	
Normal CRP and normal ESR	0
Abnormal CRP or abnormal ESR	1

Patients must have at least 1 swollen joint not better explained by another disease.

A score of ≥6 classifies the patient as having definite rheumatoid arthritis. A score of 4–5 is probable rheumatoid arthritis, i.e. a patient may have clinical rheumatoid arthritis but not fulfil all criteria.

[a]*Large joints: shoulders, elbows, hips, knees and ankles*

[b]*Small joints: all metacarpophalangeal and proximal interphalangeal joints, thumb interphalangeal joint, wrists and 2nd–5th metatarsophalangeal joints.*

ACPA, *anti-cyclic citrullinated peptide antibody;* CRP, *C-reactive protein;* ESR, *erythrocyte sedimentation rate;* RF, *rheumatoid factor.*

13.18 Bone conditions associated with pathological fracture

- Osteoporosis
- Osteomalacia
- Primary or secondary tumour
- Osteogenesis imperfecta
- Renal osteodystrophy
- Parathyroid bone disease
- Paget's disease